# VALIDATION REPORT

**Final**

"CGR Guatapara Landfill Project"
in
Brazil

Report No. 2010-BQ-21-MD
Revision No. 1.2

RINA

# VALIDATION REPORT

| | | |
|---|---|---|
| **Project Title:**<br>"CGR Guatapara Landfill Project" | **Country:**<br>Brazil | **Estimated CERs ($tCO_2e$):**<br>205,108 *annual average* |
| **Client:**<br>CGR Guatapará - Centro de Gerenciamento de Resíduos Ltda | **Client contact:**<br>Mr. Rafael Botelho Silveira | |
| **Report No.:**<br>2010-BQ-21-MD | **Revision:**<br>1.2 | **Date of this report:**<br>01/07/2011 |
| **Approved by (Final Report – DCI Director approval):**<br>Roberto Cavanna | | **Date of approval:**<br>04/07/2011 |

**Methodology**

| **Number:** | **Version:** | **Title:** | **Scale** | **SS(s):** |
|---|---|---|---|---|
| ACM0001 | version 11 of 28/05/2009 | "Consolidated baseline and monitoring methodology for landfill gas project activities" | Large | 13 |

RINA Services S.p.A. (RINA), commissioned by CGR Guatapará - Centro de Gerenciamento de Resíduos Ltda, has performed the validation of the project activity "CGR Guatapara Landfill Project" in Brazil, with regard to the relevant requirements for CDM activities.

In conclusion, it is RINA's opinion that the project activity "CGR Guatapara Landfill Project" in Brazil, as described in the PDD version 3 of 01/07/2011 /1/, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009

Hence, RINA requests the registration of the project as a CDM project activity.

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.

| | |
|---|---|
| **Work carried out by:**<br>Vicente San Valero, Lilian Cristine Poll Herrmann, Thaís de Lima Carvalho, Tiago Mendonça de Oliveira | ☒ No distribution without permission from the Client or organizational unit responsible<br>☐ Strictly confidential<br>☐ Unrestricted distribution |
| **Work verified by (Final Report – CRT person responsible approval)**<br>Paolo Teramo | **Keywords:**<br>Climate Change, Kyoto Protocol, Clean Development Mechanism, Validation |

## Abbreviations

| | |
|---|---|
| ABRELPE | "Associação Brasileira de Empresas de Limpeza Pública e Resíduos Especiais" (Brazilian Association of Public Cleansing and Special Waste Companies) |
| ANEEL | "Agência Nacional de Energia Elétrica" (Brazilian Electric Power Energy Agency) |
| ARs | "Avisos de Recebimento" (Receiving acknowledgment receipts) |
| BE | Baseline Emissions |
| CAR | Corrective Action Request |
| CDM | Clean Development Mechanism |
| CDM M&P | CDM Modalities and Procedures |
| CER(s) | Certified Emission Reduction(s) |
| CETESB | Environmental Agency - São Paulo state |
| CCEE | "Camara de Comercialização de Energia Elétrica"- Electric Power Commercialization Chamber |
| $CH_4$ | Methane |
| CGR | "Centro de Gerenciamento de Resíduos" - Centre for Waste Management |
| CIMGC | "Comissão Interministerial de Mudança Global do Clima" (Interministerial Commission on Global Climate Change) |
| CL | Clarification Request |
| $CO_2$ | Carbon dioxide |
| $CO_2e$ | Carbon dioxide equivalent |
| CRT | Coordination and Technical Control Staff |
| DCI | Certification Division of RINA Services Spa |
| DNA | Designated National Authority |
| DOE | Designated Operational Entity |
| EB | Executive Board |
| EIA | Environmental Impact Assessment |
| EPA | Environmental Protection Agency |
| ER | Emission Reductions |
| FAR | Forward Action Request |
| GHG(s) | Greenhouse gas(es) |
| GWP | Global Warming Potential |
| IBGE | "Instituto Brasileiro de Geografia e Estatística" (Brazilian Institute of Geography and Statistics) |
| IPCC | Intergovernmental Panel on Climate Change |
| LFG | Landfill Gas |
| LoA | Letter of Approval |
| MCT | "Ministério da Ciência e Tecnologia" (Ministry of Science and Techonology) |
| MoV | Means of Verification |
| MP | Monitoring Plan |
| MR | Monitoring Report |
| NGO | Non-governmental Organization |
| PNRS | "Política Nacional de Resíduos Sólidos" (National Solid Waste Policy) |
| NYU | New York University |
| NPV | Net Present Value |
| ODA | Official Development Assistance |
| ONS | "Operador Nacional do Sistema" (National Grid Operator) |
| PDD | Project Design Document |
| PE | Project Emissions |

# VALIDATION REPORT

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|---|---|
| PP(s) | Project Participant(s) |
| Ref. | Document Reference |
| RINA | RINA Services Spa |
| SIN | “Sistema Interconectado Nacional” (National Interconnected System) |
| SNIS | “Sistema Nacional de Informações sobre Saneamento – Ministério das Cidades” (Brazilian Information National System about Sanitation – Ministry of the Cities) |
| SS(s) | Sectoral Scope(s) |
| UNFCCC | United Nations Framework Convention on Climate Change |
| VVM | Validation and Verification Manual |

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# VALIDATION REPORT

## Table of Contents Page

# VALIDATION REPORT

## 1 INTRODUCTION

CGR Guatapará - Centro de Gerenciamento de Resíduos Ltda has commissioned RINA to carry out the validation of the "CGR Guatapara Landfill Project" project in Brazil.

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

### 1.1 Objective

The objective of the Validation is to have an independent evaluation of a project activity by a designated operational entity against the requirements of the CDM as set out in decision 3/CMP.1, its annex and relevant decisions of the COP/MOP, on the basis of the project design document. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC requirements and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

### 1.2 Scope

The validation scope is to review the PDD against the UNFCCC criteria for CDM.

UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

Validation is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

## 2 METHODOLOGY

Validation was conducted using RINA procedures in line with the requirements specified in the CDM M&P, the latest version of the CDM Validation and Verification Manual, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

The validation consisted of the following three phases:

- Document review;
- Follow-up actions;
- The resolution of outstanding issues and the issuance of the final validation report.

The following sections outline each step in more detail.

### 2.1 Document Review

The PDD version 3 of 01/07/2011 /1/, as well as previous versions 1 of 16/08/2010 /3/ and version 2 of 08/04/2011 /1/, in particular the applicability of the methodology, the baseline determination, the additionality of the project activity, the starting date of the project, the monitoring plan, the emission reduction calculations provided in the form of an ER calculation spreadsheet, version 2 of 30/03/2011 /2/, as well as previous version 1 of 13/08/2010 /4/ were assessed as part of the validation.

The following table lists the documentation that was reviewed during the validation.

| | |
|---|---|
| /1/ | Econergy Brasil Ltda: CDM-PDD for project activity "CGR Guatapara Landfill Project" in Brazil, version 3 of 01/07/2011.<br><br>Econergy Brasil Ltda: CDM-PDD for project activity "CGR Guatapara Landfill Project" in Brazil, version 2 of 08/04/2011. |
| /2/ | Econergy Brasil Ltda: ER calculation spreadsheet, version 2 of 30/03/2011 ("*Guatapara CER v2 2011 03 30 FES.xlsx*") |
| /3/ | Econergy Brasil Ltda: CDM-PDD for project activity "CGR Guatapara Landfill Project" in Brazil, |

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|---|---|
| | version 1 of 16/08/2010. |
| /4/ | Econergy Brasil Ltda: ER calculation spreadsheet, version 1 of 13/08/2010 ("*Guatapara_CER_2010.08.13_FES.xlsx*") |
| /5/ | CDM Executive Board: Baseline and monitoring methodology ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009. |
| /6/ | CDM Executive Board: "CDM Validation and Verification Manual" - Version 01.2, dated 30/07/2010. |
| /7/ | CDM Executive Board: "Guidelines for completing the Project Design Document (CDM - PDD) and the proposed new baseline and monitoring methodologies (CDM - NM)", version 7, dated 02/08/2008. |
| /8/ | CDM Executive Board: "Guidelines on the demonstration and assessment of prior consideration of the CDM", version 03, dated 11/09/2009. |
| /9/ | CDM Executive Board: "Glossary of CDM terms", version 5, dated 19/08/2009. |
| /10/ | CDM Executive Board: "Tool for the demonstration and assessment of additionality", version 5.2, dated 26/08/2008. |
| /11/ | CDM Executive Board: "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site", version 5.1.0, dated 03/06/2011. |
| /12/ | CDM Executive Board: "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", version 1, dated 16/05/2008. |
| /13/ | CDM Executive Board: "Tool to determine project emissions from flaring gases containing methane", version 1, dated 15/12/2006. |
| /14/ | CDM Executive Board: "Tool to calculate the emission factor for an electricity system", version 2.2.0, dated 03/06/2011. |
| /15/ | CDM Executive Board: "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion", version 2, dated 02/08/2008. |
| /16/ | Destra Desenvolvimento e Tecnologia Ambiental Ltda: Feasibility Study - Capture and Use of Biogas in the CGR Guataparará Landfill, "*Estudo de Viabilidade Captura e Utilização de Biogás no Aterro Sanitário CGR Guatapará, Brasil*" of July 2010. |
| /17/ | CGR Guatapará – Centro de Gerenciamento de Resíduos: Contract between Estre Ambiental S.A. and Geo Vision Soluções Ambientais e Energia Ltda, dated 10/03/2009. |
| /18/ | São Paulo Government: Brazilian Information System about Sanitation: Diagnose of Urban Solid Waste Management, in Portuguese: *"Diagnóstico do Manejo de Resíduos Sólidos Urbanos"*, 2007 (http://www.pmss.gov.br/snis/PaginaCarrega.php?EWRErterterTERTer=80), accessed on 21/02/2011 (in Portuguese). |
| /19/ | Ministry of Science and Technology: Brazilian Greenhouse Gases Emissions Inventory Report for Waste Sector,2006, in Portuguese: *"Primeiro Inventário Brasileiro de Emissões de Methano Antrópicas de Gases de Efeito Estufa"* (http://www.mct.gov.br/index.php/content/view/21465.html) , accessed on 21/02/2011 (in Portuguese). |
| /20/ | Methane to Markets: Brazilian Country Profile for waste sector (http://www.methanetomarkets.org/documents/landfills_cap_brazil.pdf), accessed on 21/02/2011 (in Portuguese). |
| /21/ | São Paulo Government: Understanding methane emissions from passive systems in landfills in Brazil (http://homologa.ambiente.sp.gov.br/biogas/docs/artigos_dissertacoes/magalhaes_alves_santofilho_costa_kelson.pdf) , accessed on 21/02/2011 (in Portuguese). |
| /22/ | Biotecnogas/Multiambiente: Technical Minutes of Piaçaguera Landfill — flare efficiency of 99% as by the technology provider, of August/2007. |
| /23/ | Econergy Brasil Ltda: Financial Analysis Spreadsheets ("*CGR Guatapara CashFlow v2 2011 04 08 FES en.xls*", "*CGR Guatapara - Discount Rate 2011 04 08 FES.xls*" and "*Benchmarks 2011 04 08 MR.xls*"), dated 08/04/2011. |
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| /25/ | CGR Guatapará – Centro de Gerenciamento de Resíduos: Local stakeholders consultation: letters and ARs from 17/08/2010 to 27/08/2010. |

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| /27/ | Banco Central do Brasil (Brazil Central Bank): Historic of Prices and Rates of Public Negotiated Titles: History of Prices and Rates of Public Securities – "Histórico de Preços e Taxas dos Títulos Públicos Negociados NTN-B" (http://www.tesouro.fazenda.gov.br/tesouro_direto/historico.asp), accessed on 02/08/2010 (in Portuguese). |
| /28/ | Ministry of Finance: Finance Ministry Glossary, in Portuguese Glossario do Ministério da Fazenda, (http://www.tesouro.fazenda.gov.br/tesouro_direto/servicos/glossario/glossario_n.asp) , accessed on 02/08/2010 (in Portuguese). |
| /29/ | **NYU Stern:**<br>- Customixed Geometric risk premium estimator (http://www.stern.nyu.edu/~adamodar/pc/datasets/histretSP.xls), accessed on 02/08/2010 (in English);<br>- The Beta used from USA Electricity Companies (http://www.stern.nyu.edu/~adamodar/pc/archives/betas07.xls), accessed on 02/08/2010 (in English);<br>- Country risk premium for the year 2010 / S&P500 (stocks) less US-Tbonds for the year of 2010 /US-Tbonds historical 1928-2009 / US-Tbonds less S&P500 for the historic 1928-2009 (http://www.stern.nyu.edu/~adamodar/pc/archives/ctryprem09.xls), accessed on 02/08/2010 (in English);<br>- Average unlevered beta for the 2010 year (http://www.stern.nyu.edu/~adamodar/pc/archives/betas09.xls), accessed on 02/08/2010 (in English);<br>- Country risk premium for the year 2010 (http://www.stern.nyu.edu/~adamodar/pc/archives/ctryprem09.xls), accessed on 02/08/2010 (in English);<br>- Country risk premium for the year 2010 / Average unlevered beta for the 2009 year (http://www.stern.nyu.edu/~adamodar/pc/archives/ctryprem09.xls), accessed on 02/08/2010 (in English).<br><br>**International Monetary Fund:**<br>Projected inflation rate (2010+2011)/2 from WEO 2010 page 80 table 2.4 (http://www.imf.org/external/pubs/ft/weo/2010/02/pdf/text.pdf), accessed on 02/08/2010 (in English).<br><br>**U.S. Department Of Labor:**<br>- Inflation for the 2010 year (ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt), accessed on 02/08/2010 (in English). |
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| /32/ | IBGE: Statistics – historical series http://www.ibge.gov.br/home/estatistica/indicadores/precos/inpc_ipca/defaultseriesHist.shtm , accessed on 02/08/2010 (in Portuguese). |
| /33/ | MCT: $CO_2$ emission factors from electric energy generation in Brazil's National Interconnected System – Baseline year 2009, in Portuguese:"Fatores de Emissão de $CO_2$ pela geração de energia elétrica no Sistema Interligado Nacional do Brasil - Ano Base 2009" http://www.mct.gov.br/index.php/content/view/303076.html#ancora, accessed on 02/08/2010 (in Portuguese). |
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| /39/ | São Paulo State Environmental Company – CETESB: São Paulo State Greenhouse Gases Emissions Inventory Report in Waste Sector. Page 253. http://www.cetesb.sp.gov.br/userfiles/file/mudancasclimaticas/geesp/file/docs/consulta/relatorios/residuos.pdf, accessed on 07/04/2011 (in Portuguese). |
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| /41/ | United States Environmental Protection Agency, EPA study called "*Project Development Handbook" published in 2010,* Chapter 4*,* http://www.epa.gov/lmop/publications-tools/handbook.html, accessed on 26/04/2011. |
| /42/ | CGR Guatapará – Centro de Gerenciamento de Resíduos, Letter confirming that is no public funding involved, of 08/04/2011. |
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| /45/ | CDM executive board: "Guidelines on the assessment of investment analysis", version 04 of 03/06/2011. |
| /46/ | Adisan Engenharia e Projetos Ltda, Environmental Impact Study (EIA – Estudo de Impacto ambiental) dated 18/06/2010. |
| /47/ | CGR Guatapará – Centro de Gerenciamento de Resíduos, Letter from the company stating that the waste estimation was based on socioeconomic indicators of population and industrial growth. |
| /48/ | IPCC, Guidelines for National Greenhouse Gas Inventories, 2006. |
| /49/ | CGR Guatapará – Centro de Gerenciamento de Resíduos: Temperature data of the city of Ribeirão Preto, from 1961 to 1990. |
| /50/ | Econergy Brasil Ltda: Financial Analysis Spreadsheets ("*CGR Guatapara - CashFlow_v2 2011 04 08 FES en.xls* "), dated 22/05/2011. |
| /51/ | CDM Executive Board: "Tool to determine the mass flow of a greenhouse gas in a gaseous stream", version 02.0.0, dated 03/06/2011. |
| /52/ | Worldbank / ESMAP: *Handbook for the preparation of LFG to energy projects in Latin America and the Caribbean*, dated January 2004. |
| /53/ | MultiAmbiente: Electricity generation equipment quotation, dated 03/11/2009. |
| /54/ | Biotecnogas: Extraction/combustion (flare) unit quotation, dated 27/05/2009. |
| /55/ | Econergy Brasil Ltda: O&M / Administrative-calibration-maintenance equipments costs spreadsheets ("*Anexo II Custos anuais de operação e manutenção MO.xlsx*" & "*Anexo V - Custos de administrativos e equipamentos elétricos.xlsx*"), dated 08/04/2011. |
| /56/ | Ibbotson Associates: Stocks, Bonds, Bills, and Inflation 2007 Yearbook: Valuation Edition, published March 2007. |
| /57/ | CCEE: Auctions results site (http://www.ccee.org.br/cceeinterdsm/v/index.jsp?contentType=RESULTADO_LEILAO&vgnextoid=86e93a115052a210VgnVCM1000005e01010aRCRD&qryRESULTADO-LEILAO-CD-RESULTADO- |

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| | LEILAO=026a226ec743a210VgnVCM1000005e01010a____&x=11&y=15), accessed on 25/04/2011 (in Portuguese). |

## 2.2 Follow-up actions

On 04/11/2010, RINA visited "Fazenda Figueira" (Guatapará city, São Paulo state) to resolve questions and issues identified during the document review and to perform interviews with relevant stakeholders in the host country.

The key personnel interviewed and the main topics of the interviews are summarized in the table below.

| | Date | Name and Role | Organization | Topic |
|---|---|---|---|---|
| /a/ | 04/11/2010 | Rafael Botelho Silveira, Manager | CGR Guatapará | - Clarifications on establishment of baseline, monitoring plan and emission reduction calculations<br>- Resources, training needs and procedures for operation and maintenance<br>- Monitoring Plan / Records (backups)<br>- Maintenance program (calibration)<br>- Project boundaries<br>- Additionality<br>- Baseline and project emissions<br>- Emissions reductions calculations<br>- Environmental Licenses<br>- LoA<br>- Local stakeholders – invitations/confirmations |
| /b/ | 04/11/2010 | Bruno T. A. Caldas, Coordinator | Estre | |
| /c/ | 04/11/2010 | Francisco do Espírito Santo, Consultant | Econergy | |

## 2.3 Resolution of outstanding issues

The objective of this phase of the validation is to resolve any outstanding issues which needed to be clarified for RINA's positive conclusion on the project design.

To guarantee transparency a validation protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of validation and the results from validating the identified criteria. The validation protocol consists of four tables; the different columns in these tables are described in the figure below (see Figure 1). The completed validation protocol is enclosed in Appendix A to this report.

A corrective action request (CAR) is raised if one of the following occurs:

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

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is 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. CARs, CLs and FARs identified are included in the validation protocol in Appendix A of this report.

# VALIDATION REPORT

**Figure 1 Validation protocol tables**

| Validation Protocol, Table 1 - Mandatory requirement | | |
|---|---|---|
| **Requirement** | **Reference** | **Conclusion** |
| The requirements the project must meet. | Makes reference to the documents where the answer to the requirement is found. | This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) if a requirement is not met. A request for clarification (CL) is used when the validation team has identified a need for further clarification. |

| Validation Protocol, Table 3 - Resolution of Corrective Action Requests and Clarification | | | |
|---|---|---|---|
| Corrective action requests and/or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
| The CAR and/or CLs raised in table 2 are repeated here. | Reference to the checklist question number in Table 2 where the CAR or CL is explained. | The responses given by the project participants to address the CARs and/or CLs. | The validation team's assessment and final conclusion of the CARs and/or CLs. |

| Validation Protocol, Table 4 - Forward Action Requests | | |
|---|---|---|
| Forward action request | Reference to Table 2 | Response by project participants<br>Validation Conclusion |
| The FAR raised in table 2 is repeated here. | Reference to the checklist question number in Table 2 where the FAR is explained. | Response by the project participants on how forward action request will be addressed prior to first verification. |

## 2.4 Internal quality control

All the revisions of the validation report before being submitted to the client were subjected to an independent internal technical review to confirm that all validation activities had been completed according to the pertinent RINA instructions.

The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for CDM validation and verification.

## 2.5 Validation team and the technical reviewer(s)

The validation team and the technical reviewers consist of the following personnel:

| Role/Qualification | Last Name | First Name | Country |
|---|---|---|---|
| Team Leader CDM | San Valero | Vicente | Brazil |
| CDM Validator | De Lima Carvalho | Thaís | Brazil |
| Technical Expert CDM | Poll Herrmann | Lilian Cristine | Brazil |
| Technical Reviewer | Valoroso | Rita | Italy |
| Financial Expert | Mendonça de Oliveira | Tiago | Brazil |

## 3 VALIDATION FINDINGS

The validation findings relate to the project design, as documented and described in the PDD version 3 of 01/07/2011 /1/ , as stated in the following section.

The validation requirements, means of validation, reporting requirements and the results from validating the identified criteria are documented in more detail in the Validation Protocol in Appendix A.

### 3.1 Approval and Participation

The project participant is CGR Guatapará – Centro de Gerenciamento de Resíduos from Brazil and is a private entity formed by two companies: Estre Ambiental S.A. and Geo Vision Soluções Ambientais e Energia Ltda, as by evidence /17/ "Contract between Estre Ambiental S.A. and Geo Vision Soluções Ambientais e Energia Ltda, dated 10/03/2009". The project participant is correctly listed in table A.3 of the PDD and the information is consistent with the contact details provided in Annex 1 of the PDD /1/.

The project is a unilateral project and hence the host country is the only Party involved in the proposed project activity. The project's host Party, Brazil, fulfills the requirements to participate in the CDM. No Annex I party has yet been identified.

Brazil ratified the Kyoto Protocol on 23/08/2002 and established its Brazilian Designated National Authority for the CDM, the "Comissão Interministerial de Mudança Global do Clima" (CIMGC).

The Brazilian LoA was not yet received.

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.

The proposed project does not involve any public funding from an Annex I Party, and the validation did not reveal any information that indicated that the project could be seen as a diversion of official development assistance (ODA) funding towards the host country /42/.

### 3.2 Project design document

The PDD for the project activity "CGR Guatapara Landfill Project" in Brazil, version 3 of 01/07/2011 /1/ submitted by CGR Guatapará – Centro de Gerenciamento de Resíduos has been the basis for the validation process.

RINA confirms that the above PDD is based on the currently valid PDD template and is completed in accordance with the applicable guidance document "Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM) /7/.

The main differences between the published PDD for GSP, version 1, and the latest version 3 of 01/07/2011 /1/ are as follows:

- The starting date was changed from 29/10/2010 to 13/09/2011. PP provided as evidence the implementation chronogram date 01/03/2011 /36/, stating that the real action for the implementation of the project activity is the approval of the Brazilian Government previewed to happen on 13/09/2011, according to the schedule of the Brazilian DNA - "Comissão Interministerial de Mudança Global do Clima" (CIMGC);
- The crediting period starting date was changed from 01/07/2011 to 01/01/2012, or the date of registration, whichever is later;
- The annual average over the crediting period of estimated reductions was changed from 183,483 $tCO_2e$ to 205,108 $tCO_2e$;
- The benchmark/discount rate value was recalculated and resulted in 13.08%, higher than the previous of 10.64%;
- The Financial Analysis was revised and real profit tax approach was applied. Moreover, the depreciation and its effects in the cash flow analysis were taken into account.;
- For the estimation of project emissions from electricity consumption ($PE_{EC,y}$) the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" was used instead of the "Tool to calculate

project or leakage $CO_2$ emissions from fossil fuel combustion", which is only applicable to project emissions from heat consumption and this is not the project activity case;

- Information regarding the electricity for self-consumption has been included in section B.7.2. item 2.4 of the PDD version version 3 of 01/07/2011;
- The argumentation regarding the Common Practice Analysis has been properly detailed in the sub-step 4a of the revised PDD version 3 of 01/07/2011;
- Tools versions were updated.

## 3.3 Project Design

The purpose of the proposed project activity is to capture, flare and produce electricity through the biogas captured in the CGR landfill. The project activity implementation will be carried out in two phases. The first phase aims to replace the existing passive venting system with an active gas collection and flare the LFG. The second phase aims to install a power generation facility using captured LFG as fuel, which is yet to be confirmed. During the second phase, the flare is expected to operate whenever there is LFG excess or during periods when electricity is not produced. The LFG collection system will consist of a LFG collection system, centrifugal blower(s), and all other supporting mechanical and electrical subsystems and appurtenances necessary to collect the LFG. The power generation facility will be comprised of LFG engine generator sets of high performance standards. Electricity could be occasionally generated using a standby diesel generator to be located on site. The capacity of the flare system will be 2,500 $m^3$/h, as per the Feasibility Study /16/.

The project design engineering reflects current good practices in Brazil and this type of technology is still not widely applied in Brazil. Very few landfills have already installed equipment for the collection and flare of LFG, according to the "National System of Sanitation Information: Diagnose of urban solid waste management – 2007" - Sistema Nacional de Informações sobre Saneamento: diagnóstico do manejo de resíduos sólidos urbanos – 2007" /43/. The technology / equipments utilized in the project activity are developed / manufactured part in Brazil and part in the United States, Canada and Europe. Basically, the biogas collection system consists of horizontal/vertical drainage (high density polyethylene - HDPE) pipes, headstocks and the final cover of HDPE or similar blanket and are manufactured in Brazil. The LFG combustion system (flare and generators) will be provided by abroad companies, most probably from United States, Canada or Europe, and support (and training) from these companies specialists is planned to be provided during the implementation of the project activity. Hence, some technology transfer from Annex I Parties is expected to occur during the project implementation.

The proposed project activity is located aside the margins of the Highway SP-253 in "Fazenda Figueira", municipal district of Guatapará city, São Paulo state. The Geographical Coordinates are: Latitude: 21º 23' 45" S and Longitude: 47º 57' 18" W, and were confirmed through Google Earth.

The landfill was opened in 2007 and is estimated (based in current filling rate) to close in 2022. There is a possibility of increasing the waste disposal area, however this possibility will be analyzed in the future. Total accumulated waste from 2007 to 2009, as per the Feasibility Study /16/, is 810,528 tonnes. The landfill receives (daily) around 1,700 tonnes of domestic and industrial waste, where approximately 70% is organic waste and the rest is inert, not hazardous and not inert waste (incl. industrial waste classes II-A and II-B). As per the PDD (version 3 of 01/07/2011 /1/) and the ER calculation spreadsheet /2/, the total expected/estimated installed capacity of the project is 5.5 MW (6 engines * 0.912 MW) and the electricity power plant is forecasted to start its operation in 2013 (with 4 engines) and achieve the total installed capacity (6 engines) in 2019. As per the Feasibility Study /16/, the power plant will have a load factor of 90% and is expected to operate 7,884 hours per year (365*24*90%).

As per PDD version 3 of 01/07/2011 /1/, the expected operation lifetime of the project activity is 25 years. LFG management projects are typically expected to operate in excess of 20 years to allow the financial viability of the project /52/. The project is still to be implemented and so no manufacturers (equipments / instruments) were yet defined and also considering that equipments / instruments (due to methodology requirements) can (or have to) be replaced due to fatal failures, the commitment on keeping eventually replaced equipments technical characteristics should not affect emission reductions calculations after the 1st period that anyway will require a re-validation and therefore a verification / confirmation of all registered PDD equipments technical characteristics. Therefore, project's lifetime, mainly if compared with other market / manufacturers and registered projects' equipments lifetime information, verified by RINA (local and/or sectoral expertise), is deemed appropriate for the project activity.

A renewable crediting period of 7 years has been chosen for the project, starting from 01/01/2012, or the date of registration, whichever is later.

The total GHG emission reductions from the "CGR Guatapara Landfill Project" are estimated to be 1,435,755 $tCO_2e$ over the first 7 years crediting period, resulting an annual average emission reduction of 205,108 $tCO_2e$ per year.

As defined in the PDD version 3 of 01/07/2011 /1/, the estimated project starting date is 13/09/2011.

## 3.4 Application of selected baseline and monitoring methodology

The project correctly applies the current approved consolidated baseline and monitoring methodology for selected large scale CDM project activity: ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009.

The proposed project activity meets the criteria defined in the baseline methodology as it ensures that:

(a) The captured gas will be flared; and/or

(b) The captured gas will be used to produce electricity energy.

No distribution network will exist in the project activity.

In the first phase, the LFG will be only flared and power generators will be installed in the second phase. So, the methodology ACM0001 was deemed appropriate.

It is confirmed by validating the Brazilian Information System about Sanitation – Diagnostic of Urban Solid Waste Management of 2007 /43/ referred to in the PDD, by cross-checking the PDD against the Brazilian Information System about Sanitation – Diagnostic of Urban Solid Waste Management of 2007 that no legislation currently requires collecting, recovering, utilizing and/or destroying landfill gas.

Emission sources which are not addressed by the applied methodology and which are expected to contribute more than 1% of the overall expected average annual emissions reduction have not been identified.

RINA hereby confirms that the selected baseline and monitoring methodology has been previously approved by the CDM Executive Board, and is applicable to the Project, which complies with all the applicability conditions therein.

## 3.5 Project boundary and baseline identification

### 3.5.1 Project boundary

According to the approved baseline and monitoring methodology ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009 /5/, the project boundary includes the site of the project activity where the gas is captured and destroyed/used and all the power generation sources connected to the grid to which the project activity is connected. This is in line with the methodology since during the second phase, generators will combust the LFG to produce electricity, using part of it for self consumption and part will be exported to the grid. Therefore, the project boundary will encompass the project area where the landfill (production and collection), the gas flared and/or used for electricity production, including all the power generation sources connected to the national electricity grid to which the project activity will be connected.

Emissions sources included in the project boundary are shown in the table below:

| | GHGs involved | Description |
|---|---|---|
| Baseline emissions - Methane component | $CH_4$ | According to ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009 the baseline emissions are the amount of methane that would have been destroyed/combusted during the year, in tonnes of methane ($tCH_4$) in project scenario discounted by the amount of methane that would have been destroyed/combusted during the year in the absence of the project due to regulatory and/or contractual requirement, in tonnes of methane ($tCH_4$) multiplied by the Global Warming Potential value for methane for the first |

| | | |
|---|---|---|
| | | commitment period which is 21 $tCO_2e/tCH_4$. |
| Baseline emissions - Electricity component | $CO_2$ | According to ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009, the baseline emissions are the net quantity of electricity produced using LFG which in the absence of the project activity would have been produced by power plants connected to the grid or by an on-site/off-site fossil fuel based captive power generation, during year *y*, in megawatt hours (MWh) multiplied by the $CO_2$ emissions intensity of the baseline source of electricity displaced, in $tCO_2e/MWh$. This is estimated as per equation (9). |
| Project emissions - Methane component | $CH_4$ | According to ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009 the project emissions are from flaring of the residual gas stream in year *y* calculated as per the "Tool to determine project emissions from flaring gases containing methane. |
| Project emissions - Electricity component | $CO_2$ | As by *option A1* from "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" the project emissions ($PE_{EC1,y}$) are the quantity of electricity consumed from the grid by the project activity during the year y by the emission factor from the grid in year y ($tCO_2/MWh$) and as by *option B1* from "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" the project emissions ($PE_{EC2,y}$) are the quantity of electricity generated by diesel generator in the project activity during the year y (MWh) by the emission factor from the diesel generator in year y ($tCO_2/MWh$). |
| Leakage | | In accordance with the ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009, no leakage effects need to be accounted. |

By checking the information and the project site, RINA can confirm that the project boundary and emission sources described in the PDD are accurate and complete, and also that the selected sources and gases are justified for the proposed project activity.

### 3.5.2 Baseline identification

According to the approved baseline and monitoring methodology ACM0001 - "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009 /5/ the baseline scenario for the project activity was identified according to "Step 1: Identification of alternative scenarios" of the "Tool for demonstration and assessment of additionality" as the uncontrolled release of landfill gas to the atmosphere and also the generation of electricity from other sources.

***Step 1: Identification of alternative scenarios***

Three realistic and credible alternative scenarios to the project activity were identified with regards to disposal and treatment of the waste:

- LFG1 -The project activity (capture of landfill gas and power generation) undertaken without being registered as a CDM project activity;
- LFG2 - Atmospheric release of the landfill gas (*continuation of the current situation*);
- LFG3 - Capture of landfill gas and its flare, without being registered as a CDM project activity;

The project also intends to produce electricity, hence the credible and realistic baseline power generation alternatives are identifies as follows:

- P1 - Power generated from landfill gas undertaken without being registered as CDM project activity; and
- P6 - Existing and/or new grid-connected power plants (*continuation of the current situation*).

ACM0001 power alternatives P2 (Existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant) and P3 (Existing or construction of a new on-site or off-site renewable based cogeneration plant) are not applicable to the project activity, because there is no alternative to use heat inside the landfill and there is no consumer nearby the project activity as verified during the site visit, and P4 (Existing or construction of a new on-site or off-site fossil fuel fired captive power plant) and P5 (Existing or construction of a new on-site or off-site renewable based captive power plant) were not considered realistic as there is no need for power at the landfill site and power generation is not CGR Guatapara's core business; consequently no captive power is required to be built in the project surroundings.

**Outcome of Step 1a and Step 1b** Five realistic and credible alternative scenarios to the project activity were identified. Alternatives LFG1, LFG3 and P1 comply with the Brazilian laws and regulations. In Brazil, there is no regulation or policy requesting the LFG capture and flare. Alternatives LFG2 and P6, the uncontrolled release of landfill gas to the atmosphere and also the generation of electricity from other sources, that is, a continuation of the current situation (partial or total release of LFG to the atmosphere) represents the business as usual practice for the project site as well as for most of the landfills in Brazil, according to Brazilian Information System about Sanitation – Diagnose of Urban Solid Waste Management, 2007. /43/ RINA verified the above regulation and confirms that no legislation currently requires collecting, recovering, utilizing and/or destroying landfill gas.

***Step 2: Identify the fuel for the baseline choice of energy source taking into account the national and/or sectoral policies as applicable.***

Electricity imported from the grid has been identified as the baseline. The power consumed by the project activity could be bought from Brazilian interconnected electric system. Data for the emission factor is public available by Brazilian DNA. PP presented the Brazilian emission factors according to determination of the Brazilian DNA, where the value is 0.1635 $tCO_2$/MWh as by the Brazilian DNA website /33/. The project activity will supply energy to the grid, displacing energy from fossil fuel fired power plants connected to this grid.

The most plausible baseline scenario for the LFG is identified as atmospheric release of LFG with electricity supplied from grid connected power plants, being applicable to version 11 of ACM0001.

RINA was able to verify all the documented evidence listed above during the validation process and can confirm that:

* all the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
* all documentation used /33/, /35/, /38/, /39/, /43/ is relevant for confirming the baseline scenario/s and correctly quoted and interpreted in the PDD;
* assumptions and data for the identification of the baseline scenario/s are justified appropriately, supported by proper evidences, /33/, /38/, /39/, /43/ and can be deemed reasonable;
* all relevant national and/or sectoral policies and circumstances /18/ /35/ have been identified and correctly considered in the PDD by project participants;
* the approved simplified baseline methodology ACM0001 - "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009 has been correctly applied to identify the most reasonable baseline scenario/s, that reasonably represent the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity.

## 3.6 Additionality

According to the approved baseline and monitoring methodology ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009 /5/, the additionality of the project has been established applying the tool the "Tool for the demonstration and assessment of additionality", version 05.2, dated 26 August 2008 /10/. The additionality of the project activity, presented in the PDD version 3 of 01/07/2011 /1/ was mainly based in an investment analysis (NPV financial indicator).

The above opinion of RINA to the additionality of the proposed project is further explicitly explained in the following steps.

### 3.6.1 Prior consideration of the clean development mechanism

The project's activity starting date is after 02/08/2008. As defined in the PDD version 3 of 01/07/2011 /1/, the project starting date is 13/09/2011. The PDD has been published for global stakeholder consultation on 22/09/2010, which was before the project starting date. Therefore, notification to the UNFCCC secretariat and the Host Party DNA is not necessary, as the PP was already aware and considered the CDM in the decision to implement the project activity, prior to the project activity start date. This is in line with EB 49 Annex 22, "Guidelines on the demonstration and assessment of Prior Consideration of the CDM".

The following timeline was presented, until the Operation Starting date, since the project is still not implemented:

| Key Events | Date |
|---|---|
| PDD in Global Stakeholder Consultation (GSC) for the first time | 07/04/2009 to 06/05/2009 http://cdm.unfccc.int/Projects/Validation/DB/0RXYM30S4G1B0J9KBZ81WGM9CWL93L/view.html |
| Designated Operational Entity (DOE) issues draft validation report | 29/10/2009 |
| PDD in GSC for the second time | 22/09/2010 to 21/10/2010 (http://cdm.unfccc.int/Projects/Validation/DB/TTHCJ77HG0RFG6KHL7ELPCESLGQD9X/view.html |
| Starting date of the project activity (the CGR Guatapara will decide to implement the project activity after to receive the Brazilian Letter of Approval. The date chosen on 13/09/2011 is the forecast date of the Brazilian DNA meeting4. | 13/09/2011 |
| Purchasing equipments (Phase I)* | October/2011 |
| Operation starting date (Phase I)* | January/2012 |
| Purchasing equipments (Phase II)* | June/2012 |
| Operation starting date (Phase II)* | January/2013 |

### 3.6.2 Identification of alternatives

As discussed in section 3.5.2 of this report, the identified alternative scenarios for the project activity are consistent with all applicable and enforced legislation. The alternative scenarios that have been considered, as required by the approved methodology AMC0001 version 11 are:

- LFG1 -The project activity (capture of landfill gas and power generation) undertaken without being registered as a CDM project activity;
- LFG2 - Atmospheric release of the landfill gas (*continuation of the current situation*);
- LFG3 - Capture of landfill gas and its flare, without being registered as a CDM project activity;

As demonstrated it complies with regulations and contractual requirements for addressing safety and odor concerns.

In addition the following alternatives scenarios have been considered for the power generation

- P1 - Power generated from landfill gas undertaken without being registered as CDM project activity; and
- P6 - Existing and/or new grid-connected power plants (continuation of the current situation).

As discussed in the following section of this report, the baseline scenario for the project activity, as the most likely scenario in the absence of the proposed project activity, is therefore the total atmospheric release of the landfill gas (LFG2) and the electricity is obtained from an existing and/or new grid connected power plants (P6).

The project proponent has justified the selection of the baseline scenario in line with the applied methodology and RINA can confirm that the alternatives identified in the PDD are credible and complete.

### 3.6.3 Investment analysis

#### 3.6.3.1 Choice of approach

Applying the "Tool for the demonstration and assessment of additionality", Version 05.2 /10/, the PP has selected the investment analysis to demonstrate additionality and Option II (Investment Comparison Analysis) has been chosen for this project activity as the project activity will generate financial or economic benefits (from the sale of electricity) other then CDM related income.

NPV is the difference between the present value of cash inflows and the present value of cash outflows. NPV is often used in capital budgeting to analyze the profitability of an investment or project. All other things being equal, using internal rate of return (IRR) and net present value (NPV) measurements to evaluate projects often results in the same findings. However, there are a number of projects for which using IRR is not as effective as using NPV to discount cash flows. However NPV is more effective when there are complex cash flows. Since the project activity involves complex cash flows, the chosen indicator (NPV) is relevant for the project. Thus the NPV can be considered to be a suitable indicator as the project will generate revenue from the sale of electricity and the simple cost analysis is not suitable.

The additionality of the project activity, presented in the PDD version 3 of 01/07/2011 /1/, was based in an investment analysis (NPV indicator). The financial analysis was made comparing the Project Activity NPV (Net Present Value) with other two NPV Scenarios.

Project participants have considered a period of 26 years in the financial analysis, the first (2010) for the investments and another 25 years (until 2035) for the operation.

There is no salvage value for this project because the late investment is in 2019 with depreciation until 2028. No working capital was taken into account, and there is not its returning in the last year of the operation. The working capital should be considered not significant if compared with the total amount of investment, revenues and costs of the project.

#### 3.6.3.2 Discount Rate

In accordance to the "Guidelines on the assessment of investment analysis", version 04 of 03/06/2011 /45/, the approach of using a country risk free rate + a deemed risk is acceptable. In fact, several publications state that developing markets stock index are too volatile and may not reflect properly the risk involved. The project participants calculated the Discount Rate using the following elements: US-T Bonds for year 2010 (8.46%), less the US CPI (1.5%), plus the market risk premium (S&P 500 vs. UST Bond – 6.39%), plus country risk premium for Brazil (3%) and betas (0.49), all related to the US markets /29/. S&P 500 is considered as an appropriate market benchmark as it is representative of a large sample of companies across a large number of industries /56/.

The calculation resulted in (8.46%-1.5%)+6.39%x0.49+3% = 13.08%.

The calculation and supporting documents were provided to the audit team and it was concluded that the discount rate adopted is appropriate to the financial indicator. The basis adopted by the PP is hence accepted as appropriate and relevant at the time of decision making, by the Financial Expert and the Validation team. The discount rate applied is suitable for the type of financial indicator presented.

The discount rate parameters for the comparison analysis method are presented below:

| Discount Rate method / Discount Rate real terms | | |
|---|---|---|
| **A** | US-TBonds year 2010 | 8.46% |
| **B** | Country risk premium | 3.00% |
| **C** | Market Risk Premium (S&P 500 - T-Bonds) | 6.39% |
| **D** | Unlevered Beta (in lack of open companies with the same risk profile) | 0.49 |
| **E** | Expected inflation rate | 1.50% |
| **F = (A - E) + B + C x D** | Benchmark - Real Terms | **13.08%** |

#### 3.6.3.3 Input parameters

RINA has validated the input parameters used in the investment analysis and the following steps have been followed to assess the investment analysis:

*Step 1 – assessment of the sources used for input parameters*. All input parameters used in the financial analysis are taken from third-party and/or publicly available (independent) sources as described in the financial spreadsheets /23/ and in the Feasibility Study /16/ (details of the estimated investment, revenues and operation costs parameters), therefore all input parameters information can be considered as been provided by independent sources.

*Step 2 – confirmation that the values used in the PDD and in the investment analysis are fully consistent with the sources*. RINA compared the input parameters for the financial analysis included in the PDD /1/ with the parameters stated in the documented evidences, related to the discount rate used, and was able to confirm that the values applied are consistent with the values stated in the documents mentioned before.

*Step 3 – assessment of the validity and applicability of the input values used in the financial analysis at the time of the investment decision*. The investment decision to proceed with the project activity will be taken on 13/09/2011, which is the forecast date of the Brazilian DNA meeting and the input values used in the financial analysis were all available at the previous year as demonstrated in the below table related to the discount rate used. Thus it is reasonable to assume that those sources have been the basis before the decision to proceed with the investment in the project activity.

*Step 4 – cross check of the input parameters against the third-party and/or publicly available sources*. The input parameters used in the financial analysis were cross-checked and, as already explained, all the data was considered as been provided by independent sources.

For the investment (CapEx) input, project participants presented the quotations from suppliers Biotecnogas /54/) and Multiambiente /53/. The value is in line with the "*Project Development Handbook"* (EPA study – chapter 4) /41/ LFG electricity project technologies costs figures.

For the O&M costs input, project participants presented the estimative with headcount including wages, charges and benefits /55/. The value is consistent with the local market.

For the revenues input, project participants presented documents (site visit) with the negotiations with one of the largest electricity generation and distribution companies in Brazil. The value is in line with the CCEE auctions electricity average prices /57/ and found consistent with the local market.

### 3.6.3.4 Calculation and conclusion

For the alternative LFG 1 (The project activity (capture of landfill gas and power generation) undertaken without being registered as a CDM project activity, the NPV is R$ - 5,802,423.38, which confirms that in the absence of CDM benefits, the proposed project activity is not financially attractive. For the second alternative LFG2 (atmospheric release of the landfill gas), which is the continuation of the current practice, in compliance with all applicable regulations and policies, and deemed the most plausible alternative to the project activity, the NPV results in R$ 0. For the third alternative LFG3 (Capture of landfill gas and its flare, without being registered as a CDM project activity), the NPV is R$ - 7,204,047.37.

The results of NPV analysis shows that without the income from CER's sale, the proposed project activity is unlikely to be financially attractive. The main parameters of project activity were varied to achieve a NPV of 0.

The PP varied all input parameters (CapEx, O&M and Revenues breakeven points) to reach project's benchmark (Cash flow spreadsheet /50/) with the following results:

CapEx – Capital expenditures shall be reduced up to 47.3% to reach an NPV equal to zero;

O&M – Operation and maintenance costs shall be reduced up to 53.4% to reach an NPV equal to zero;

Revenues - Revenues shall be increased up to 37.9% to reach an NPV equal to zero.

RINA can confirm that all above options are very unlikely to happen and PP provided proper explanations in the PDD.

### 3.6.3.5 Sensitivity analysis

Project participants presented in PDD the sensitivity analysis with a table of results. In the financial analysis spreadsheet ("*CGR Guatapara CashFlow v2 2011 04 08 FES en.xls)*") /50/ it is clear how to perform the sensitivity analysis of investments, revenues and costs. All parameters contribute with more than 20% of the revenue/costs and there is no relevant parameter outside of the analysis.

The Guidance on assessment of investment analysis requires that the investment analysis should contain a sensitivity analyses that supports the robustness of the conclusion arrived at by varying the critical

assumptions to a reasonable variation (± 10%). The sensitivity analysis was performed varying the electricity tariff (revenues), the capital expenses (CapEx) and operational and maintenance costs (O&M) for the alternatives. All parameters ranging from -10% to +10%, as the result presented below:

| Parameter | Variation | NPV (R$) | | |
|---|---|---|---|---|
| | | Alternative LFG1 | Alternative LFG2 | Alternative LFG3 |
| CapEx | -10% | -4.576.493,90 | 0,00 | -6.884.471,00 |
| | 10% | -7.028.352,86 | 0,00 | -7.523.623,74 |
| Revenues | -10% | -7.568.661,93 | 0,00 | -7.204.047,37 |
| | 10% | -4.266.624,41 | 0,00 | -7.204.047,37 |
| O&M | -10% | -3.810.240,92 | 0,00 | -6.803.219,00 |
| | 10% | -8.371.637,04 | 0,00 | -7.604.875,74 |
| Base Case | 0% | -5.802.423,38 | 0,00 | -7.204.047,37 |

The result of NPV and sensitivity analysis shows that without the income from CER's sale, the proposed project activity is unlikely to be financially attractive. The sensitivity analysis, with the parameters chosen and the range of variations are reasonable and applicable to the project activity.

### 3.6.4 Common practice analysis

The project participant has selected host country Brazil as the geographical area to demonstrate common practice analysis and is considered appropriate for the assessment of common practice related to the project activity's technology type, capture and destruction / combustion of LFG.

The validation team verified the information presented in the PDD version 3 of 01/07/2011 /1/, which presents a list of 35 landfills projects implemented or underway under CDM (UNFCCC website links identified), out of which 25 are registered and 10 are under validation. Although not to be considered in the common practice analysis, this list already shows the amount of landfills with capture and/or methane destruction technology that are linked to CDM.

The argumentation regarding the Common Practice Analysis has been detailed and clarified accordingly in the sub-step 4a of the revised PDD version 3 of 01/07/2011 /1/ and is presented below:

Based on the documents below:

- The second Brazilian Greenhouse Gases Emissions Inventory Report (published in July 2010)

  It states that between 1990 and 2002 the total amount of recovered methane in Brazilian landfills were considered zero. Furthermore, from 2003 onwards, all flared/recovered methane considered in the Inventory came from CDM landfill projects in Brazil. /38/

- São Paulo State Greenhouse Gases Emissions Inventory Report in Waste Sector (published in April 2011)

  It states that between 1990 and 2002 the total amount of recovered methane in São Paulo State landfills were considered zero. Furthermore, from 2003 onwards, all recovered methane considered in the State Inventory came from the $CH_4$ reductions of the CDM landfill projects in the State of São Paulo. /39/

- Reducing the uncertainty of methane recovered (R) in greenhouse gas inventories from waste sector and of adjustment factor (AF) in landfill gas projects under the clean development mechanism (published in August 2010).

  It states that "all of Brazilian landfills with collection and destruction system (active system) are implemented projects under the CDM". /40/

According to the evidences provided by the PP about the Brazilian and municipality of São Paulo legislation, no similar activities like the proposed project activity in Brazil operating or underway without CDM benefits, since all

landfills which are implementing the capture and/or use of the LFG, are being developed as CDM project activities. The above mentioned information was assessed by RINA and deemed reasonable.

### 3.6.5 Conclusion

RINA can confirm that all data, rationales, assumptions, justifications and documentation provided by the project participants to support demonstration of additionality are credible and reliable.

By assessing the evidences presented and cross-checking the information contained in, RINA considers the reasoning for the proposed project additionality demonstration is credible and reasonable i.e. the proposed project has the ability to reduce anthropogenic emissions of greenhouse gases by sources below those that would have occurred in the absence of the registered CDM project activity.

## 3.7 Monitoring Plan

The approved baseline and monitoring methodology ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009 /5/ has been correctly applied.

The monitoring plan is in accordance with the monitoring methodology; the monitoring plan will give opportunity for real measurement of achieved emission reductions.

RINA has checked all the parameters presented in the monitoring plan against the requirements of the methodology; no deviations relevant to the project activity have been found in the plan.

RINA confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design, and the means of implementation of the monitoring plan are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported *ex post* and verified.

### 3.7.1 Parameters determined *ex-ante*

Following are the list of ex-ante parameters, determined at the start of the project activity and in accordance with the methodology and Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site, Tool to calculate baseline, project and/or leakage emissions from electricity consumption.

- **Regulatory requirements**: The information (recorded annually), is used for changes to the adjustment factor (**AF**) or directly $\mathbf{MD_{BL,y}}$ at renewal of the crediting period. An adjustment factor of 9.71% was calculated, rounded to 10% by PP/s, and deemed appropriate.
- φ: Model correction factor to account for model uncertainties (0.9) Source of data used: "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site" version 5.1.0, dated 03 June 2011 /11/;
- **OX**: Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste. The value of 0.1 was used, which corresponds to managed solid waste disposal sites that are covered with oxidizing material (natural soil), as observed during the on-site visit. Source of data used: 2006 IPCC Guidelines for National Greenhouse Gas Inventories /48/;
- **F**: Fraction of methane in the SWDS gas (volume fraction) The default value of 0.5 was used, as recommended by the IPCC /48/;
- $\mathbf{DOC_f}$: Fraction of degradable organic carbon (DOC) that can decompose. Value applied: 0.5. Source of data used: 2006 IPCC Guidelines for National Greenhouse Gas Inventories /48/;
- **MCF**: Methane correction factor. Value applied = 1. According to IPCC guidelines /48/, managed landfills should have controlled placement of waste, and a degree of control of both scavenging activities and fires. This was confirmed during the on-site visit through the operation of the landfill: waste disposal according to the cells and leachate collection system. In addition no scavenging activities were observed.
- $\mathbf{DOC_j}$: Fraction of degradable organic carbon (by weight) in the waste type j Values applied: default values of the IPCC 2006 Guidelines for National Greenhouse Gas Inventories on wet basis was used (adapted from Volume 5, Tables 2.4 and 2.5).
- $\mathbf{k_j}$: Decay rate for the waste type j . Values applied: Default values of IPCC 2006 Guidelines for National Greenhouse Gas Inventories on wet basis and tropical climate (T>20$^{o}$C) was used (from Volume 5, Table 3.3). The average temperature of 30 years in the city of Ribeirão Preto is 22,40$^{o}$C /49/;

- **Waste composition (%):** fraction of waste type j in the SWDS in the year x. The values are based on the site waste composition report presented into the Feasibility Study /16/.
- **$D_{CH4}$:** Methane density: At standard temperature and pressure (0 degree Celsius and 1.013 bar) the density of methane is 0.0007168 $tCH_4/m^3CH_4$. Source of data used:ACM0001"Consolidated baseline and monitoring methodology for landfill gas project activities" version 11 of 28/05/2009;/5/
- **$EF_{grid,y}$**: Emission factor. Data for the emission factor is public available by Brazilian DNA. PP presented the Brazilian emission factors according to determination of the Brazilian DNA. For the emission reduction estimation (*ex-ante*) the combined margin emission factor value of 0.1635 $tCO_2$/MWh was used as per the Brazilian DNA website /33/.

All these values taken for the calculations are as per the methodology or IPCC guidelines or default values as per the corresponding tools. The same are also transparently discussed in the PDD. Being conservative, the RINA validation team accepted these values.

### 3.7.2 Parameters monitored *ex-post*

The project is currently a green field and no activity is carried out at the site so far, the PP has proposed to monitor the following parameters according to the approved monitoring methodology, ACM0001"Consolidated baseline and monitoring methodology for landfill gas project activities" version 11 of 28/05/2009:

- **$EF_{grid,CM,y}$ -** Brazilian grid emission factor;
- **$EF_{grid,OM-DD,y}$ -** $CO_2$ Operating Margin emission factor of the grid, in a year *y*;
- **$EF_{grid,BM,y}$** - $CO_2$ Build Margin emission factor of the grid, in a year *y*;

  Measurement methods and procedures are specified.

  The combined margin emission factor ($EF_{grid,CM,y}$) will be calculated *ex-post* using the $CO_2$ emission factors for the build margin and the operational margin that are provided by the Brazilian DNA. $CO_2$ emission factors for the build margin and the operational margin for electricity generation in Brazil's National Interconnected System (SIN) are calculated, according to the dispatch analysis, from generation records of plants dispatched in a centralized manner by the National Electric System Operator (ONS).
- **$LFG_{flare.y}$ ($m^3$)** : Amount of landfill gas flared measured by a flow meter at normal temperature and pressure;
- **$LFG_{electricity,y}$ ($m^3$)** : Amount of landfill gas combusted in power plant measured by a flow meter at normal temperature and pressure;
- **$LFG_{total.y}$ ($m^3$)** : Total amount of landfill gas capture and burnt on-site measured by a flow meter at normal temperature and pressure;
- **$W_{CH4,y}$ ($m^3CH_4$ / $m^3LFG$)** : Methane fraction in the landfill gas with a continuous gas analyzer on dry basis;
- **$EL_{LFG,y}$ (MWh)** : Net amount of electricity generated using LFG with a continuous electricity meter;
- **Operation of the energy plant** (hours): Information will be monitored and reviewed on an annual basis;
- **$NCV_{diesel,y}$ (GJ/T):** Weighted average net calorific value of diesel in year y. Measurements will be undertaken in line with national or international fuel standards;
- **$EF_{CO2,i,y}$ ($tCO_2$/GJ):** Weighted average $CO_2$ emission factor of diesel in year y. Measurements will be undertaken in line with national or international fuel standards;
- **$EC_{PJ,j1,y}$ (MWh):** Quantity of electricity consumed from the grid by the project activity during the year y continuously with a sealed meter;
- **$EC_{PJ,j2,y}$ (MWh):** Quantity of electricity generated by diesel generator by the project activity during the year y continuously with a sealed meter;
- **$FC_{n,diesel,t}$ ($m^3$, T, or l):**Quantity of fossil fuel type i fired in the captive power plant n in the time period t;
- **$GWP_{CH4}$ ($tCO_2e/tCH_4$):** Global Warming Potential of methane. For the first commitment period is $21tCO_2e/tCH_4$ (default values as per IPCC guidelines 2006/48/);
- **f (%):** Fraction of methane captured at the SWDS and flared, combusted or used in another manner
- **Wx (T):** Total amount of organic waste prevented from disposal in year x. The weigh scale logs will be stored at the site and summarized on a yearly basis. During the site visit RINA has not identified any waste being disposed in a location other than the landfill;

- **$PE_{flare,y}$ (tCO2e)** : Project emissions from flaring of the residual gas stream in year y that is the amount of methane not combusted in the flaring unit. The parameters used for determining the project emissions from flaring of the residual gas stream in year y ($PE_{flare,y}$) will be calculated as per the "Tool to determine project emissions from flaring gases containing Methane";

The specific parameters regarding the flare efficiency according to the "Tool to determine project emissions from flaring gases containing Methane" are described below:

- **$t_{O2,h}$(%):** Volumetric fraction of O2 in the exhaust gas of the flare in the hour h. Measurements with a continuous gas analyzer;
- **$fv_{CH4,FG,h}$ ($mg/m^3$):** Concentration of methane in the exhaust gas of the flare in dry basis at normal conditions in the hour h. Measurements with a continuous gas analyzer;
- **$T_{flare}$ (º C)**: Temperature on the exhaust gas of the flare. Measure the temperature of the exhaust gas stream in the flare by a Type N thermocouple. A temperature above 500°C indicates that a significant amount of gases are still being burnt and that the flare is operating
- **$FV_{RG,h}$ ($m^3/h$):** Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h. Measurements by project participant using a flow meter. The residual gas flow rate is measured on wet basis. To convert it on dry basis will be used the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" /51/;
- **$fv_{i,,h}$ (%)** :Volumetric fraction component i of the residual gas in dry basis at normal conditions in the hour h, where i = $CH_4$ and $N_2$ . Measurements with a continuous gas analyzer;
- **$TDL_y$** : Average technical and distribution losses in the grid in year y - 6% according to the National Energy Balance 2006, page 21/24/;
- **$FC_{i,j,y}$**: (Mass or volume unit per year) Quantity of fuel type i (diesel) combusted in process j during year y.

xx

### 3.7.3 Management system and quality assurance

As per the PDD version 3 of 01/07/2011 /1/, the amount of landfill gas flared or combusted in the engine will be measured continuously by vortex flow meters (flare, engine and total flow). The data will be aggregated on a monthly and yearly basis using continuous monitoring average values in time intervals not greater than one hour. The data will be archived throughout the crediting period and two years thereafter. The methane fraction will be performed by a continuous gas quality analyzer. Data will be aggregated monthly and yearly, using an average value in a time interval not greater than an hour.

As per the PDD version 3 of 01/07/2011 /1/, electricity supplied to the grid will be monitored continuously using an electricity meter and the data will be archived throughout the crediting period and two years thereafter. The electricity supplied by the grid and diesel generators will be continuously measured by the PP electricity meters to define energy self consumption due to project activity.

At the time of site visit, the project did not start any equipment's installation or civil construction and procedures were not available. In the first verification it shall be checked if the monitoring arrangements described in the monitoring plan are feasible and if training courses were provided to the operational team and if data archiving and data collection procedures are properly described and implemented. This was identified as a FAR (**FAR 1**).

## 3.8 Estimation of GHG emissions

The validation team checked the Emission Reduction calculation sheet version 2 of 30/03/2011 /2/ and confirms that the equations used have been correctly applied and as per the selected methodology ACM0001"Consolidated baseline and monitoring methodology for landfill gas project activities" version 11 of 28/05/2009. The same was also cross checked with the PDD, version 3 of 01/07/2011 /1/ and found to be in order.

The emission reduction $ER_y$ by the proposed project activity during the crediting period is the difference between baseline emissions $BE_y$, project emissions $PE_y$ and emissions due to leakage $L_y$ as follows.

**Baseline Emissions**

The following formula was used:

$$BE_y = (MD_{project,y} - MD_{BL,y}) \times GWP_{CH4} + EL_{LFG,y} \times CEF_{elec,BL,y} \quad (1)$$

Where:

$BE_y$ = Baseline emissions in year *y* ($tCO_2e$);

$MD_{project,y}$ = The amount of methane that would have been destroyed/combusted during the year in project scenario; ($tCH_4$);

$MD_{BL,y}$ = The amount of methane that would have been destroyed/combusted during the year in the absence of the project due to regulatory and/or contractual requirement, ($tCH_4$);

$GWP_{CH4}$ = Global Warming Potential value for methane for the first commitment period is 21 $tCO_2e/tCH_4$;

$CEF_{elec,BL,y}$ = $CO_2$ emissions intensity of the baseline source of electricity displaced, ($tCO_2e/MWh$);

$EL_{LFG}$ = Net quantity of electricity produced using LFG which in the absence of the project activity would have been produced by power plants connected to the grid or by an on-site/off-site fossil fuel based captive power generation, during year *y*, (MWh);

Since there is no regulatory or national or local safety requirements, or legal regulations in Brazil specifying $MD_{BL}$, an "Adjustment Factor" (AF) is used:

$$MD_{BL} = MD_{project,y} \times AF \quad (2)$$

As for this project no regulatory or contractual requirements specify $MD_{BL,y}$ and no historic data exists for LFG captured and destroyed the "Adjustment Factor" (AF) was used and justified, taking into account the project context:

1. Percentage of methane vented through the passive system: the site operator has installed a simple passive venting system. The collection efficiency is 65% for the CGR Guatapara. As per the IPCC 2006, Volume 5, chapter 3, it was assumed an average of 50% of collection efficiency in the baseline scenario (passive venting system = landfill gas emmited to the atmosphere).

2. As by methodology ACM0001"Consolidated baseline and monitoring methodology for landfill gas project activities"version 11 of 28/05/2009 it was assumed 50% combustion efficiency for passive venting such as for open flaring equipment which is deemed reasonable, since is unlikely that the passive venting reach the 50% combustion efficiency normally attributed to engineered flaring equipment.

3. According to the landfill operator, the wells do not burn LFG constantly at the same time, which was confirmed on site.

The AF estimation resulted in a rounded value of AF = 10%.

And

$$MD_{project,y} = MD_{flared,y} + MD_{electricity,y} \quad (3)$$

Where:

$MD_{flared,y}$ = Quantity of methane destroyed by flaring ($tCH_4$);

$MD_{electricity,y}$ = Quantity of methane destroyed by generation of electricity ($tCH_4$);

And

$$MD_{flared,y} = (LFG_{flared,y} \times w_{CH4} \times D_{CH4}) - \frac{PE_{flare,y}}{GWP_{CH4}} \quad (4)$$

Where:

$LFG_{flare,y}$= Quantity of landfill gas fed to the flare(s) during the year measured in ($m^3$);

$w_{CH4}$ = Average methane fraction of the landfill gas as measured during the given time period t in time intervals of not greater than one hour in $m^3CH_4/m^3LFG$;

$D_{CH4}$ = Methane density, expressed in tonnes of methane per cubic meter of methane ($tCH_4/m^3CH_4$), and measured at STP (0 degree Celsius and 1.013 bar), that is 0.0007168 $tCH_4/m^3CH_4$ /5/

$PE_{flare,y}$ = Project emissions from flaring of the residual gas stream in year y ($tCO_2e$);

$$MD_{electricity,y} = LFG_{electricity,y} \times w_{CH4} \times D_{CH4} \quad (5)$$

Where:

$LFG_{electricity,y}$ = Quantity of landfill gas fed into electricity generator ($m^3$).The baseline emissions are calculated using the equation no.1 stated above:

Baseline emissions are estimated in 1,436,567 $tCO_2e$ as per the following information:

Landfill operations (filling) started in 2007 /16/,/47/;

The forecasted year of the landfill closure is 2022 /47/;

GWP for methane = 21 $tCO_2e/tCH_4$;

LFG collection efficiency = 65% (Feasibility Study /16/ and ER calculation spreadsheet /2/);

$PE_{EC,y}$ = Emissions from consumption of electricity in the project case ($tCO_2$); Methane concentration in LFG = 50% (Feasibility Study /16/ and ER calculation spreadsheet /16/);

Total accumulated waste from 2007 to 2009 operator/historical logs = 810,528 tonnes (Feasibility Study) /16/ The information was cross-checked with the on site records. The waste composition was based on the Feasibility Study /16/.

LFG plant load factor = 90% (Feasibility Study /16/);

Total installed capacity (up to 6 engines) = 5.47 MW (6 * 0.912 MW, as per the Feasibility Study /16/ and ER calculation spreadsheet /2/);

Data for the emission factor is public available by Brazilian DNA. PP presented the Brazilian emission factors according to determination of the Brazilian DNA. For the estimation of first crediting period the combined margin emission factor value is 0.1635 $tCO_2$/MWh (2009 - ER calculation spreadsheet) as by the Brazilian DNA website /33/. The build margin $CO_2$ emission factor and operating margin $CO_2$ emission factor will be calculated ex-post as well the combined margin $CO_2$ emission factor.

**Project Emissions**

The project emissions are estimated in 812 $tCO_2e$ and calculated as follow:

$PEy = PE_{EC,y} + PE_{FC,,y} + PE_{Flare,,y}$ (6),

As there is no consumption of heat by this project activity ($PE_{FC,j,y}$=0),

Where:

$PE_{ECy}$ = Emissions from consumption of electricity in the project case (tCO2) = $PE_{EC1,y} + PE_{EC2,y}$

$PE_{EC1,,y}$ = Electricity consumed from the grid ($tCO_2$);

$PE_{EC2,y}$ = Electricity consumed from diesel generator ($tCO_2$);

$PE_{Flare,,y}$ = Project emissions from flaring of the residual gas stream in year y

As by the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption":

$$PE_{EC1,y} = EC_{PJ,y} \times EF_{grid,CM,y} \times (1 + TDL_y) \quad (7)$$

Where:

$EC_{PJ,y}$ = quantity of electricity consumed (grid) the project activity during the year y (MWh);

$EF_{grid,CM,y}$ = the emission factor for the grid in year y ($tCO_2$/MWh) (*ex-ante* value = 0.1635 $tCO_2$/MWh);

As by the "Tool to calculate project of leakage $CO_2$ emissions from fossil fuel combustion:

$TDL_y$ = 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.

$$PE_{EC2,y} = EC_{PJ,j2,y} \times EF_{EL,j2,y} \times (1 + TDL_y) \quad (8)$$

Where:

$EC_{PJ,j2,y}$ = quantity of electricity generated by diesel generator in the project activity during the year y (MWh);

$EF_{EL,j2,y}$ = the emission factor from the diesel generator in year y ($tCO_2$/MWh);

$TDL_{j2,y}$ = average technical transmission and distribution losses in year y for the voltage level at which electricity is obtained from the diesel generator at the project site.

Since the diesel generator is located in the LFG plant and there are no technical transmission and distribution losses (TDLj2,y = 0). The formula used is:

$$PE_{EC2,y} = EC_{PJ,j2,y} \times EF_{EL,j2,y} \quad (9)$$

For the ex-ante calculation, $PE_{flared,y}$ is considered in $MD_{flared,y}$ According to ACM0001(equation 4)

For ex-post , $PE_{flared,}$ will be calculated as by the "Tool to determine project emissions from flaring gases containing methane" /13/:

$$PE_{flare,y} = \sum_{h=1}^{8760} TM_{RG,h} \times (1 - \eta_{flare,h}) \times \frac{GWP_{CH4}}{1000} \quad (11)$$

Where:

$TM_{RG,h}$ = Mass flow rate of methane in the residual gas in the hour *h* (kg/h);

$\eta_{flare,h}$ = Flare efficiency in hour *h.*

Project emissions are estimated based on the information listed below:

Flare efficiencies (%) operational data from flare manufacturer (99%) /22/. This information was assessed during the site visit and the flare efficiency was provided by Technical Minutes of Piaçaguera Landfill from Biotecnogas/Multiambiente, the technology providers, dated August/2007;

Electricity consumption from the grid due to the project activity (657MWh/year);

- Electricity consumption in the diesel generator (2MWh). RINA confirmed the values used in the calculation of electricity consumption from the grid as well the diesel generator electricity consumption by the assessment of the Feasibility Study - Capture and Use of Biogas in the CGR Guataparará Landfill, "*Estudo de Viabilidade Captura e Utilização de Biogás no Aterro Sanitário CGR Guatapará, Brasil*" of July 2010 from Destra Desenvolvimento e Tecnologia Ambiental Ltda /16/;
- The project activity includes a captive on-site diesel generator and therefore, the value of 0.8 $tCO_2$/MWh for the $CO_2$ emission coefficient of fossil fuel is used for *ex-ante* estimative.

Average technical transmission and distribution losses for providing electricity to source j in year y (6%), as by the National Energy Balance 2009 /24/;

According to the methodology ACM0001"Consolidated baseline and monitoring methodology for landfill gas project activities" version 11 of 28/05/2009, no leakage effects need to be accounted.

**Emission Reductions**

Based on the calculation sheets version 2 of 30/03/2011 /2/ and the PDD version 3 of 01/07/2011 /1/, the emissions reductions from the project activity have been determined to be 1,435,755 $tCO_2e$ per year over its 7 year renewable crediting period starting from 2012 to 2018. The validation team noted that all assumptions and data used by the PP in the PDD, version 3 cross checked with the references and the sources provided by the PP in the PDD and found them to be appropriate and conservative.

The emission reductions estimated can be replicated for data and parameter values provided in the PDD, version 3 of 01/07/2011 /1/ and supporting files submitted for registration.

The validation team concludes that the project emissions, baseline emissions, leakage and emission reductions stated in the PDD are appropriate and as per the methodology and the GHG calculations are complete and transparent, and their accuracy has been verified.

## 3.9 Environmental Impacts

An Environmental Impact Assess (EIA) is required to obtain the Operational License and it was submitted to CETESB – Environmental Agency of São Paulo state. During the site visit PP provided the Environmental Impact Study (EIA – Estudo de Impacto ambiental) dated 18/06/2010 /46/ in digital files accomplished by the company Adisan Engenharia e Projetos Ltda. The EIA concluded that the site presents the necessary conditions to the landfill installation without any significant changes on their actual environmental quality. The

environmental aspects of the project activity were analyzed by the environmental agency CETESB. The project obtained the following environmental license issued by CETESB and assessed by RINA: Operational License no. 52000232, issued on 22/03/2009 and valid until 22/03/2014 /26/.

The Brazilian DNA does not require the monitoring of social and environmental indicators.

### 3.10 Local stakeholders consultation

As required by the Interministerial Commission on Global Climate Change (CIMGC) and in accordance to the Resolution 7 of the Brazilian DNA (05 March 2008), /34/the project participant sent letters, inviting for comments, to the relevant stakeholders/City authorities. The information was verified during the on site visit through the assessment of the letters and ARs from the local stakeholders consultation dated 17/08/2010 to 27/08/2010 /25/. According to the Resolutions Number 1, 4 and 7 of the Brazilian Designed National Authority (CIMGC – Comissão Interministerial de Mudança Global do Clima / *Interministerial Commission on Global Climate Change*), project participants are not required to undertake stakeholders presentation meetings or present related evidences such as the presentation, photos, etc. No comments were received so far.

## 4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD version 1 of 16/08/2010 was made publicly available on the CDM UNFCCC website (http://cdm.unfccc.int/Projects/Validation/DB/TTHCJ77HG0RFG6KHL7ELPCESLGQD9X/view.html) and Parties, stakeholders and NGOs were invited to provide comments during a 30 days period from 22/09/2010 to 21/10/2010.

No comments were received during this period.

## 5 VALIDATION OPINION

RINA Services Spa (RINA) has performed validation of the project activity “CGR Guatapara Landfill Project” in Brazil, with regard to the relevant requirements for CDM activities.

The review of the project design document and the subsequent follow-up interviews have provided RINA with sufficient evidence to determine the fulfillment of the stated criteria.

The project correctly applies the approved baseline and monitoring methodology “ACM0001”, “Consolidated baseline and monitoring methodology for landfill gas project activities”, version 11 of 28/05/2009.

By collecting, flaring and generating power from LFG gas, the project results in reduction of $CH_4$ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total GHG emission reductions from the “CGR Guatapara Landfill Project” are estimated to be 1,435,755 $tCO_2e$ over the first 7 years crediting period, resulting in an annual average emission reductions of 205,108 $tCO_2e$ per year. The forecasted emission reductions have been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The monitoring plan sufficiently specifies the monitoring requirements for the monitoring of the project’s emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is RINA’s opinion that the project participants are able to implement the monitoring plan.

In conclusion, it is RINA’s opinion that the project activity “CGR Guatapara Landfill Project” in Brazil, as described in the PDD version 3 of 01/07/2011 meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0001, “Consolidated baseline and monitoring methodology for landfill gas project activities”, version 11 of 28/05/2009.

RINA thus requests the registration of the project as a CDM project activity.

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.

# APPENDIX A

# VALIDATION PROTOCOL

## TABLE 1 MANDATORY REQUIREMENTS

| Requirement | Reference | Conclusion |
|---|---|---|
| 1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reductions commitment under Art. 3. | Kyoto Protocol Art.12.2 | --- |
| 2. The project shall assist non Annex I Parties contributing to the ultimate objective of the UNFCCC. | Kyoto Protocol Art.12.2 | **OK** |
| 3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved. | Kyoto Protocol Art.12.5a<br>CDM Modalities and Procedures §40a | --- |
| 4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof. | Kyoto Protocol Art.12.2<br>CDM Modalities and Procedure §40 | --- |
| 5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance (ODA) and is separate from and is not counted towards the financial obligations of these Parties. | Decision 17/CP.7<br>CDM Modalities and Procedures Appendix B §2 | **OK** |
| 6. Parties participating in the CDM shall designate a national authority for the CDM. | CDM Modalities and Procedures §29 | **OK** |
| 7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol. | CDM Modalities and Procedures §30/31a | **OK** |
| 8. The participating Annex I Party's assigned amount shall have been calculated and recorded. | CDM Modalities and Procedure §31b | --- |
| 9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7. | CDM Modalities and Procedure §31b | --- |
| 10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity. | CDM Modalities and Procedure §43 | **OK** |
| 11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change. | Kyoto Protocol Art.12.5b | **OK** |
| 12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out. | CDM Modalities and Procedures §37c | **OK** |
| 13. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received. | CDM Modalities and Procedures §37b | **OK** |
| 14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to | CDM Modalities and Procedures §40 | **OK** |

| Requirement | Reference | Conclusion |
|---|---|---|
| comment on the validation requirements for minimum 30/45 days, and the project design document and comments have been made publicly available. | | |
| 15. Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel. | CDM Modalities and Procedures §37e | **OK** |
| 16. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances. | CDM Modalities and Procedures §47 | **OK** |
| 17. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords, and relevant decisions of the COP/MOP. | CDM Modalities and Procedures §37f | **OK** |

## TABLE 2 REQUIREMENTS CHECKLIST

| Checklist Question | | Ref. | MoV 1 | Comments | Draft Conclusion | Final Conclusion |
|---|---|---|---|---|---|---|
| **A. General Description of Project Activity** | | | | | | |
| **A.1.** | **Title of the project activity** | | | | | |
| A.1.1. | Title of the project activity, version number and date of the PDD (section A.1). | /1/ | DR | The title of project activity is "CGR Guatapara Landfill Project", as per the published PDD version 1 of 16/08/2010. | | **OK** |
| A.1.2. | Does the project comply with the applicable requirements for completing the PDDs? | /1/ /7/ | DR | Yes. The published PDD is in accordance with the "Guidelines for completing the simplified Project Design Document (CDM - PDD) and the proposed new baseline and monitoring methodologies (CDM - NM)". | | **OK** |
| **A.2.** | **Description of the proposed project activity** | | | | | |
| A.2.1. | Does the PDD contain an accurate description of the project activity and provide the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation?<br>How was the design of the project assessed? | /1/ /16/ | DR<br>CC | As per the published PDD (version 1), the purpose of the proposed project activity is to capture and flare and produce electricity through the biogas captured in the CGR landfill. The project activity implementation will be carried out in two phases. The first phase aims to replace the existing passive venting system with an active gas collection and flare the LFG and the second phase aims to install a power generation facility using captured LFG as fuel, which is yet to be confirmed. During the second phase the flare is expected to operate whenever there is LFG excess or during periods when electricity is not produced. The LFG collection system will consist of a LFG collection system, centrifugal blower(s), and all other supporting mechanical and electrical subsystems and appurtenances necessary to collect the LFG. The power generation facility will be comprised of LFG engine generator sets of high performance standards.<br>There is the possibility of increasing the waste disposal area, however this possibility will be analyzed in the future and the installed capacity | | **OK** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | is expected to change during the project lifetime. As per the published PDD (version 1 of 16/08/2010)/1/and the ER calculation spreadsheet, version 1 of 13/08/2010/2/, the total expected installed capacity of the project is 5.47 MW (6 engines * 0.912 MW) and the electricity power plant is forecasted to start its operation on 2013 (with 4 engines) and achieve the total installed capacity (6 engines) in 2019. As per the Feasibility Study /16/, the power plant will have a load factor of 90% and is expected to operate 7,884 hours per year (365*24*90%).During the second phase of the project, the flare will be kept in operation, due to LFG excess or periods when electricity is not produced or other operational reasons. The LFG collection system will consist of a LFG collection system, centrifugal blower(s), and all other supporting mechanical and electrical subsystems and appurtenances necessary to collect the LFG. The power generation facility will be comprised of LFG engine generator sets of high performance standards.<br>At the time of the site visit, "Centro de Gerenciamento de Resíduos (CGR) de Guatapará" had not started any equipment's installation nor the civil construction.<br>The implementation status of the project was verified through the physical site inspection, where it was confirmed that the project had not started and the nature of the project activity and the technical aspects of its forecasted implementation by reviewing the Feasibility Study /16/ provided by the PP and the landfill design assessed at the site visit. | | |
| A.2.2. | Does the project activity involve alteration of existing installations?<br>If yes, have the differences between pre-project and post-project activity been clearly described in the PDD? | /1/ | DR<br>CC | It was confirmed during site visit that the project activity is a Greenfield project. | | **OK** |
| **A.3.** | **Project participants** | | | | | |

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| A.3.1. | Have the Parties and project participants involved in the project been listed in tabular form in Section A.3 and are they consistent with the information detailed in Annex 1 of the PDD? | /1/<br>/17/<br>/26/ | DR<br>CC | The contact information is properly provided using the proper table (tabular format).<br>As per the published PDD, the project participant is CGR Guatapará – Centro de Gerenciamento de Resíduos from Brazil and is a private company formed by two companies: Estre Ambiental S.A. and Geo Vision Soluções Ambientais e Energia Ltda., as by Contract between Estre Ambiental S.A. and Geo Vision Soluções Ambientais e Energia Ltda, dated 10/03/2009/17/. The project participant is correctly listed in table A.3 of the PDD and the information is consistent with the contact details provided in Annex 1 of the PDD. | | |
| A.3.2. | Do all participating Parties fulfill the participation requirements as follows:<br>(a) Party has ratified the Kyoto Protocol;<br>(b) Party has a Designated National Authority;<br>(c) The assigned amount has been determined. | /1/ | DR | The project's host Party, Brazil, fulfills the requirements to participate in the CDM.<br>Brazil ratified the Kyoto Protocol on 23/08/2002 and established, as its Brazilian Designated National Authority for the CDM, the "Comissão Interministerial de Mudança Global do Clima" (CIMGC). | | **OK** |
| A.3.3. | Have the letters of approval been issued? | /1/ | --- | 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. | **---** | |
| A.3.4. | Do the letter/s of approval (LoA/s) confirm the following requirements?<br>(a) The Party has ratified the Kyoto Protocol;<br>(b) The participation is voluntary;<br>(c) In the case of the host Party, the project contributes to the sustainable development of the country;<br>(d) It refers to the precise project activity title in the PDD;<br>(e) Has been issued by the respective Party's designated national authority (DNA). | /1/ | --- | Please refer to section A.3.3 | **---** | |

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| | Indicate whether the LoA/s were received from the project participants or directly from the DNA.<br>In case of doubt regarding the authenticity of the LoA/s, describe how it was assessed the authenticity of the LoA/s. | | | | | |
| A.3.5. | Have all private/public project participants been authorized by a Party to the Kyoto Protocol? | /1/ | --- | Please refer to section A.3.3 | --- | |
| **A.4.** | **Technical description of the project** | | | | | |
| A.4.1. | Is the project location clearly defined? | /1/ | DR<br>CC | Yes. The proposed project activity is located aside the margins of the Highway SP-253 in "Fazenda Figueira", Guatapará city, São Paulo state. The Geographical Coordinates are: Latitude: 21º 23' 45" S and Longitude: 47º 57' 18" W., and were confirmed through Google Earth. | | **OK** |
| A.4.2. | Does the project design engineering reflect current good practices?<br>Would the technology result in a significantly better performance than any commonly used technologies in the host Country? Is any transfer of technology from any Annex I Party involved? | /1/ | DR | The project design engineering reflects current good practices in Brazil. This kind of technology is still not widely applied in Brazil. Very few landfills have already installed equipment for the collection and flare of LFG, according to "Sistema Nacional de Informações sobre Saneamento: diagnóstico do manejo de resíduos sólidos urbanos – 2007" - National System of Sanitation Information: Diagnose of urban solid waste management - 2007 (http://www.pmss.gov.br/snis/PaginaCarrega.php?EWRErterterTERTer=80)<br>The technology and equipments utilized in the project activity is developed and manufactured part in Brazil and part in United States, Canada and Europe. Basically, the biogas collection system compounded by the horizontal, vertical drainage of high density polyethylene (HDPE) pipes and headstocks and the final cover of HDPE or similar blanket are Brazilian technology. The LFG combustion system (flare and engines) should come from abroad, mainly from United States, Canada and Europe. Therefore, the company will need engineers and other specialists with experience in this area to advice the company while implementing the project. | | **OK** |

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| | | | | These professionals will also train local operators and engineers on operations and maintenance of the facilities. Hence, there will be some transfer of technology from Annex I Parties. | | |
| A.4.3. | If public funding from Parties included in Annex I is used for the project activity, have these Parties provided an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties? | /1/ | DR | No public funding from Parties included in Annex I is provided for the "CGR Guatapara Landfill Project".<br><br>PP is requested to provide evidence to demonstrate that there is no public funding for this project.<br><br>No Annex I party has yet been identified. | ~~CL 14~~ | **OK** |
| **B. Application of a baseline and monitoring methodology** | | | | | | |
| **B.1.** | **Methodology applied** | | | | | |
| B.1.1. | Does the project activity apply an approved methodology and the correct version? | /1/<br>/5/ | DR | The project applies the current approved consolidated baseline and monitoring methodology for selected large scale CDM project activity: ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009. | | **OK** |
| **B.2.** | **Applicability criteria of the methodology/tools** | | | | | |
| B.2.1. | How was it validated that the project activity complies with the applicability criteria? | /1/<br>/5/<br>/10/<br>/11/<br>/12/<br>/13/<br>/14/<br>/15/ | DR | As described in the PDD version 1, the methodology ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009 is applicable for the following scenarios:<br>(a) The captured gas will be flared; and/or<br>(b) The captured gas will be used to produce electricity energy.<br>No distribution network will exist in the project activity.<br><br>In the first phase, the LFG will be only flared and during the second phase power generators are to be installed. So, the methodology ACM0001 was deemed appropriate. | | **OK** |

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| | | | | In addition, the following tools are being used and deemed justified:<br>- "Tool for demonstration and assessment of additionality": is applicable to the project activity, as it is mentioned in the ACM0001 methodology;<br>- "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site": is applicable as the solid waste disposal site is clearly identified, there are no hazardous wastes and this is not a stockpile case;<br>- "Tool to calculate baseline, project and/or leakage emissions from electricity consumption": is also applicable to the project activity because some electricity could be consumed from the grid;<br>- "Tool to determine project emissions from flaring gases containing methane" is applicable to this project activity because: 1) The residual gas stream to be flared contains no other combustible gases than methane, carbon monoxide and hydrogen; b) The residual gas stream to be flared is obtained from decomposition of organic material (through landfill);<br>- "Tool to calculate the emission factor for an electricity system": is applicable as this project will supply electricity to the grid;<br>- "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion": is applicable to the project activity because electricity could be occasionally generated using a standby generator to be located on site.<br><br>PP is requested to clarify whether the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" will be used to convert the residual gas flow rate from wet basis into dry | **~~CAR 1~~** | |

<table>
<tr><td></td><td></td><td></td><td></td><td>basis and relate it into the PDD, if necessary.</td><td></td><td></td></tr>
<tr><td>B.2.2.</td><td>Is the selected baseline one of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?</td><td>/1/</td><td>DR</td><td>See section B.2.1</td><td></td><td>OK</td></tr>
<tr><td>B.3.</td><td>Project boundary</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>B.3.1.</td><td>Is the project boundary clearly defined and in accordance with the applied methodology?</td><td>/1/<br>/5/</td><td>DR</td><td>As per the methodology ACM0001, version 11 of 28/05/2009, the project boundary is the site of the project activity where the gas is captured and destroyed/used and, as the electricity for project activity is sourced from grid or will be generated in the future using the LFG captured, the project boundary shall also include all the power generation sources connected to the grid to which the project activity is connected.<br>Therefore, the project boundary will encompass the project area where the landfill (production and collection), the gas flared and/or used for electricity production, including all the power generation sources connected to the grid to which the project activity is connected.<br><br>PP is requested to explain what means the "Electricity Consumption" and the "End Use" out of the boundary in Figure 10 – Flow diagram project boundary of the PDD.</td><td>~~CL 1~~</td><td>OK</td></tr>
<tr><td>B.3.2.</td><td>What are the project's system boundaries (components and facilities used to mitigate GHGs)?</td><td>/1/<br>/5/</td><td>DR</td><td>See B.3.1</td><td></td><td>OK</td></tr>
<tr><td>B.3.3.</td><td>Which sources are identified for the project?<br>Does the identified project boundary cover all possible sources linked to the project activity?</td><td>/1/<br>/5/</td><td>DR</td><td>The following emissions sources were included in or excluded from the project boundary:<br>Baseline emissions
<table>
<tr><th>Source</th><th>Gas</th><th>Included ?</th><th>Justification / Explanation</th></tr>
<tr><td rowspan="2">Emissions from Decomposition of waste at the landfill site</td><td>$CH_4$</td><td>Yes</td><td>Major source of emissions in the baseline</td></tr>
<tr><td>$N_2O$</td><td>No</td><td>$N_2O$ emissions are small</td></tr>
</table></td><td></td><td>OK</td></tr>
</table>

| | | | |
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| | | | CH4 emissions from landfills. Exclusion of this gas is conservative. |
| | $CO_2$ | No | CO2 emissions from the decomposition of organic waste are not accounted. |
| Source | Gas | Included ? | Justification / Explanation |
| Emissions from electricity consumption | $CO_2$ | Yes | Electricity may be consumed from the grid or generated onsite/offsite in the baseline scenario |
| | $CH_4$ | No | Excluded for simplification. This is conservative. |
| | $N_2O$ | No | Excluded for simplification. This is conservative. |

**Project Activity Emissions**

| Source | Gas | Included ? | Justification / Explanation |
|---|---|---|---|
| On-site fossil fuel consumption due to the project activity other than for | $CO_2$ | No | There is no on-site fossil fuel consumption due to the project activity other than for electricity |

~~CL 15~~

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| | | | | electricity generation | | | neglected since There is a diesel generator consumption, which will be around 2 MWh/year, as stated in the PDD | | |
| | | | | | $CH_4$ | No | Excluded for simplification. This emission source is assumed | | |
| | | | | | $N_2O$ | No | Excluded for simplification. This emission source is assumed to be very small | | |
| | | | | Source | Gas | Included? | Justification / Explanation | | |
| | | | | Emissions from on-site electricity use | $CO_2$ | Yes | May be an important emission source<br>PP is requested to clarify why it will "may be" an important source since in the first phase all the electricity is imported and in the second phase it seems that it will be consumed by the biogas generators | ~~CL 16~~ | |
| | | | | | $CH_4$ | No | Excluded for simplification. This emission source is assumed to be very small | | |
| | | | | | $N_2O$ | No | Excluded for simplification. This emission source is assumed to be very small | | |
| B.3.4. | Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology?<br>Do these sources contribute by more than 1% to the estimated emission reductions of the project? | /1/ /5/ | DR | No. GHG emissions occurring within the proposed CDM project activity boundary (not addressed by the applied methodology), as a result of project's implementation, are expected to contribute more than 1% of the overall expected average annual emissions reductions. | | | | | **OK** |

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| | | | | During the site visit it did not identify any other emission source not foreseen by the methodology. | | |
| **B.4.** | **Baseline scenario identification** | | | | | |
| B.4.1. | Which baseline scenarios have been identified?<br>Is the list of the baseline scenarios complete? | /1/<br>/5/<br>/10/<br>/18/ | DR<br>CC | The baseline scenario for the project activity was identified according to "Step 1: Identification of alternative scenarios" of the "Tool for demonstration and assessment of additionality", as described in ACM0001 - "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009.<br>As per the published PDD, five realistic and credible alternative scenarios to the project activity were identified:<br>• LFG1 -The project activity (capture of landfill gas and power generation) undertaken without being registered as a CDM project activity;<br>• LFG2 - Atmospheric release of the landfill gas (*continuation of the current situation*);<br>• LFG3 - Capture of landfill gas and its flare, without being registered as a CDM project activity;<br>• P1 - Power generated from landfill gas undertaken without being registered as CDM project activity; and<br>• P6 - Existing and/or new grid-connected power plants (*continuation of the current situation*).<br>ACM0001 power alternatives P2 + P3 are not applicable to the project activity, because there is no alternative to use heat inside the landfill and there is no consumer nearby the project activity, and P4 + P5 are not applicable because there is no need for power at the landfill site .<br>There will be no heat generation at CGR landfill.<br><br>As per ACM0001, version 11 - step 1, national and/or sectoral policies and circumstances must be taken into account in the following ways: 1) In | ~~**CAR 2**~~ | **OK** |

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| | | | | Sub-step 1b of the "Tool for the demonstration and assessment of additionality"; 2) Via the adjustment factor AF in the baseline emissions project participant must take into account that some of the methane generated in the baseline may be captured and destroyed to comply with regulations or contractual requirements; 3) The project participant must monitor all relevant policies and circumstances at the beginning of each crediting period and adjust the baseline accordingly. PP shall include the discussion about the AF in the baseline emissions (item 2) in PDD's section B.5 – sub-step 1b. | | |
| B.4.2. | How have the other baseline scenarios been eliminated in order to determine the baseline? | /1/ /5/ /10/ /18/ | DR CC | Alternatives LFG1, LFG3 and P1 comply with the Brazilian laws and regulations. In Brazil, there is no regulation or policy requesting the LFG capture and flare. Alternatives LFG2 and P6, a continuation of the current situation (partial or total release of LFG to the atmosphere) represents the business as usual practice for the project site as well as for most of the landfills in Brazil, according to Brazilian Information System about Sanitation – Diagnose of Urban Solid Waste Management, 2007. | | **OK** |
| B.4.3. | What is the baseline scenario?<br>Is the determination of the baseline scenario in accordance with the guidance in the methodology? | /1/ /5/ /10/ | DR | The baseline scenario is identified as the atmospheric release of LFG with electricity supplied from grid connected power plants and is in accordance to the ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009. | | **OK** |
| B.4.4. | Has the baseline scenario been determined using conservative assumptions?<br>Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations? | /1/ /5/ /10/ | DR | Please, refer to item B.4.1 | ~~**CAR 2**~~ | **OK** |
| **B.5.** | **Additionality determination** | | | | | |
| B.5.1. | What tool does the project use to assess additionality? Is this in line with the methodology? | /1/ /10/ | DR | Project participant used the "Tool for the demonstration and assessment of additionality", version 5.2, dated 26 August 2008. in line with | | **OK** |

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| | | | | the applied methodology. | | |
| B.5.2. | What is the project additionality mainly based on? | /1/ /10/ | DR | The additionality of the project activity, presented in the PDD version 1, was mainly based in an investment analysis (NPV indicator). | | **OK** |
| **B.5.3.** | **Prior consideration of CDM** | | | | | |
| B.5.3.1. | What is the starting date of the proposed project activity? | /1/ /9/ /10/ | DR CC | The project's starting date was defined as 29/10/2010 in the published PDD version 1 of 16/08/2010, based in the implementation start of the project activity after receiving the Brazilian Letter of Approval.<br><br>PP is requested to provide the evidence for the starting date of the project activity in accordance to the latest version of the "Glossary of CDM terms". Moreover, the link of the MCT (footnote 20) can not be accessed and PP should update the PDD with a valid link. | ~~**CAR 3**~~ | **OK** |
| B.5.3.2. | What is the evidence for serious consideration of CDM prior to the time of decision to proceed with the project activity? | /1/ /8/ | DR | The project's activity starting date is after 02/08/2008. As defined in the published PDD version 1 of 16/08/2010, the project starting date is 29/10/2010 and the PDD has been published for global stakeholder consultation on 22/09/2010, so before the project starting date.<br>Therefore, the notification to the UNFCCC secretariat and the Host Party DNA is not necessary, as the PP was already aware and considered the CDM in the decision to implement the project activity, prior to the project activity start date. | | **OK** |
| B.5.3.3. | What initiatives were taken by the project participants from the starting date of the project activity to the start of validation in parallel with the physical implementation of the project activity? | /1/ /8/ | DR | Please see B.5.3.2. | | **OK** |
| B.5.3.4. | Does the timeline of the project confirm that continuous actions in parallel with the implementation were taken to secure CDM status? | /1/ | DR | PDD version 1 presents an implementation timeline of the project (Table 1) to also state some CDM benefits consideration dates. However, the estimated dates for issuing the | ~~**CL 2**~~ | **OK** |

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| | | | | Draft Validation Report, purchasing equipments and construction works shall be updated and justified (explained / supported by means of proper assumptions / evidences). | | |
| **B.5.4.** | **Investment analysis** | | | | | |
| B.5.4.1. | What is the analysis method used to determine whether the proposed project activity is not<br>(a) the most economically or financially attractive; or<br>(b) economically or financially feasible, without the revenue from the sale of certified emission reductions? | /1/<br>/23/ | DR<br>CC | Project participant presented in the PDD version 1 that the chosen analysis method was the option III - Benchmark Analysis, however the financial analysis was made comparing the Project Activity NPV (Net Present Value) with other two NPV Scenarios. Project participant should clarify in the PDD which is the chosen analysis method (option II – Comparison Analysis or III – Benchmark Analysis) and should revise texts and calculations accordingly. | ~~**CAR 4**~~ | **OK** |
| B.5.4.2. | What financial indicator is used? | /1/<br>/23/<br>/27/<br>/28/<br>/29/<br>/30/<br>/31/<br>/32/ | DR<br>CC | Project participant used as benchmark (or Discount Rate / analysis method option II), an index composed by 4 different indexes. These indexes are from different markets (Countries) and have different ranges of time and can not be interrelated. The Beta used from USA Electricity Companies should not be considered representative for a small Brazilian company that generates electricity from biogas flaring. Project participant should revise the Benchmark (or Discount Rate) calculation with acceptable indexes and that reflect the characteristics of project activity.<br><br>In the Benchmark calculation (or Discount Rate) presented by project participant it is being considered the inflation rate. To compare the project cash flow with the benchmark it is necessary that both have the same assumptions. Project participant should revise the financial analysis to be aligned with the same assumptions (in this case the inflation rate) of the presented benchmark. | ~~**CAR 5**~~<br><br>~~**CAR 6**~~ | **OK** |
| B.5.4.3. | Does the income tax calculation take depreciation into account? | /1/<br>/23/ | DR<br>CC | Project participant did not considered the sales tax (PIS/COFINS) in the Financial Analysis. | ~~**CAR 7**~~ | **OK** |

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| | Is the depreciation year in accordance with normal accounting practice in the Host Country? | | | Project participant should revise the taxes calculations including all applicable taxes.<br><br>Project participant used in the Financial Analysis the Assumed Profit Tax System. This tax system has been used by a large number of small electricity generation companies in Brazil, however the company classification chosen by project participant, that defines the calculation basis of Income Tax (IRPJ and CSLL), does not represent the project activity characteristics. This has a great impact on the project profitability and project participant should justify and clarify the chosen classification or should revise the Financial Analysis. | ~~**CAR 8**~~ | |
| B.5.4.4. | Is the time period of the investment analysis and operating time of the project realistic?<br>Has salvage value been taken into account?<br>Is the working capital returned in the last year of the operation? | /1/<br>/23/ | DR<br>CC | In the PDD, PP defined in "table 5 – Main assumptions" that the "Asset's Life time" in the "Cash Flow Spreadsheet" is 25 years. For all scenarios it is being considered the same end year (2035), however in the "Cash Flow Spreadsheet" it is defined for all scenarios a period different of 25 years. Project participant should revise the period of investment analysis to match with PDD prioritizing the scenario of the proposed project activity (scenario 1) and aligning other scenarios as possible to the same period.<br><br>There is no salvage value been taken into account; however the period of the investment analysis should be considered appropriate to depreciate all project investment. The working capital is not being considered in the financial analysis and the amount should be ignored. | ~~**CAR 9**~~ | **OK** |
| B.5.4.5. | Cross-check of main parameters used in the financial analysis: electricity generation, electricity tariff, investment costs, operating and maintenance costs, taxes, other costs.<br>The main parameters can be changed for the different project categories. | /1/<br>/23/ | DR<br>CC | Project participant should provide evidences about the main parameters (inputs and their respective sources) of the Financial Analysis (such as Energy Price, O&M Costs, Investments, etc). Contracts, annual financial reports, estimates and/or market references shall be also | ~~**CL 3**~~ | **OK** |

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| | | | | submitted. | | |
| B.5.4.6. | Sensitivity analysis: have the key parameters contributing more than 20% of the revenue/costs during operating or implementation been identified? | /1/ /23/ | DR CC | Project participant presented the sensitivity analysis of scenario 1 and compare it with the NPV = 0. Initially a variation of 10% in all main parameters (CapEx, Revenues and O&M).<br><br>Project participant should clarify in the PDD (once defined which is the chosen analysis method, II or III), if the Scenario 1 is being (to be) compared to another scenario or a benchmark. | ~~CL 4~~ | **OK** |
| B.5.4.7. | Sensitivity analysis: the range of variations is reasonable in the project activity?<br>The main parameters can be changed for the different project categories. | /1/ /23/ | DR CC | The range of variations is reasonable in the project activity. | | **OK** |
| B.5.4.8. | Have the key parameters been varied to reach the benchmark and the likelihood of this happening been justified? | /1/ /23/ | DR CC | Since this analysis doesn't present a positive NPV, project participant prepared an analysis varying the parameters until the NPV value reach the benchmark (NPV = 0), the likelihood of these scenarios was discussed in the PDD.<br>Please, see B.5.4.1<br><br>Project participant presented in the PDD version 1 that the chosen analysis method was the option III - Benchmark Analysis, however the financial analysis was made comparing the Project Activity NPV (Net Present Value) with other two NPV Scenarios. Project participant should clarify in the PDD which is the chosen analysis method (option II – Comparison Analysis or III – Benchmark Analysis) and should revise texts and calculations accordingly. | ~~CAR 4~~ | **OK** |
| **B.5.5.** | **Barrier analysis** | | | | | |
| B.5.5.1. | Are the barriers identified complimentary to a potential investment analysis? | /1/ /10/ | DR | Step 3 of the "Tool for the demonstration and assessment of additionality" is not used, since in Step 2 PP already concluded that the project activity is unlikely to be the most financially attractive scenario. | | **OK** |
| B.5.5.2. | How were the investment barriers assessed to be real? How does CDM alleviate the investment | /1/ | DR | Not applicable. Please, refer to B.5.5.1 | | **OK** |

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| | barriers? | | | | | |
| B.5.5.3. | Is the project activity prevented by the investment barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances? | /1/ | DR | Not applicable. Please, refer to B.5.5.1 | | **OK** |
| B.5.5.4. | How were the technological barriers assessed to be real?<br>How does CDM alleviate the technological barriers? | /1/ | DR | Not applicable. Please, refer to B.5.5.1 | | **OK** |
| B.5.5.5. | Is the project activity prevented by the technological barriers and is at least one of the possible alternatives to the project activity is feasible under the same circumstances? | /1/ | DR | Not applicable. Please, refer to B.5.5.1 | | **OK** |
| B.5.5.6. | How were the barriers due to prevailing practice assessed to be real?<br>How does CDM alleviate the barriers due to prevailing practice? | /1/ | DR | Not applicable. Please, refer to B.5.5.1 | | **OK** |
| B.5.5.7. | Is the project activity prevented by the barriers due to prevailing practice and is at least one of the possible alternatives to the project activity is feasible under the same circumstances? | /1/ | DR | Not applicable. Please, refer to B.5.5.1 | | **OK** |
| B.5.5.8. | How were the other barriers assessed to be real?<br>How does CDM alleviate the other barriers? | /1/ | DR | Not applicable. Please, refer to B.5.5.1 | | **OK** |
| B.5.5.9. | Is the project activity prevented by the other barriers and is at least one of the possible alternatives to the project activity is feasible under the same circumstances? | /1/ | DR | Not applicable. Please, refer to B.5.5.1 | | **OK** |
| **B.5.6.** | **Common practice analysis** | | | | | |
| B.5.6.1. | What are the geographical scope and scope of technology of the common practice analysis? | /1/ | DR | The defined region is Brazil (the host country) and is considered appropriate for the assessment of common practice related to the project activity's technology type, capture and destruction / combustion of LFG. | | **OK** |
| B.5.6.2. | Besides CDM project activities, to what extent similar and operational projects (e.g. using similar technology or practice) have been undertaken in the defined region? | /1/ | DR | The published PDD presents a list of 35 landfills projects implemented or underway under CDM (UNFCCC website links identified), out of which 25 are registered and 10 are under validation. Although not to be considered in the common | | **OK** |

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| | | | | practice analysis, this list already shows the amount of landfills with capture and/or methane destruction technology that are linked to CDM.<br><br>While acknowledging that current information about landfills are not easily obtained, RINA requests the PP to further elaborate this section (PDD common practice analysis) in order to better (clearly) support the assertion (where relevant, with quantitative information) that there are no similar plants (similar technology or practice), like the proposed project activity, operating or underway without CDM benefits in the defined region. | ~~CAR 17~~ | |
| B.5.6.3. | How were possible essential distinctions between the project activity and similar activities assessed? | /1/ | DR | Please see B.5.6.2. | ~~CAR 17~~ | **OK** |
| B.5.6.4. | What is the data source(s) used for the common practice analysis? | /1/<br>/18/<br>/19/<br>/20/<br>/21/ | DR<br>CC | Basically PP uses the following sources:<br>- SNIS (2007) - Brazilian Information System about Sanitation, Ministry of the Cities (http://www.pmss.gov.br/snis/PaginaCarrega.php?EWRErterterTERTer=80);<br>- Brazilian Greenhouse Gases Emissions Inventory Report for Waste Sector, Ministry of Science and Technology (http://www.mct.gov.br/index.php/content/view/21465.html);<br>- Brazilian Country Profile for waste sector by Methane to Markets Methane to Markets (http://www.methanetomarkets.org/documents/landfills_cap_brazil.pdf); and<br>- Understanding methane emissions from passive systems in landfills in Brazil (http://homologa.ambiente.sp.gov.br/biogas/docs/artigos_dissertacoes/magalhaes_alves_santofilho_costa_kelson.pdf). | | **OK** |
| **B.5.7.** | **Conclusion on the additionality assessment** | | | | | |
| B.5.7.1. | What is the conclusion with regard to the additionality of the project activity? | /1/ /8/<br>/9/ /10/ | DR | Please, refer to items B.5.3.1 to B.5.4.8. | ~~CAR 3 CAR 4~~<br>~~CAR 5 CAR 6~~ | **OK** |

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| | | /23/ | | | **CAR 7 ~~CAR 8 CAR 9 CL 2 CL 3 CL 4~~** | |
| **B.6.** | **Calculation of GHG emission reductions** | | | | | |
| **B.6.1.** | **Baseline emissions** | | | | | |
| B.6.1.1. | Are the calculations documented according to the approved methodology and in a complete and transparent manner? | /1/ /2/ /5/ /11/ /12/ /13/ /14/ /15/ | DR | Baseline emission reductions have been properly explained on the PDD as per the methodology ACM0001, "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009. The following formula was used:<br>$BE_y = (MD_{project,y} - MD_{BL,y}) \times GWP_{CH4} + EL_{LFG,y} \times CEF_{elec,BL,y}$<br>Where:<br>$BE_y$ = Baseline emissions in year *y* ($tCO_2e$);<br>$MD_{project,y}$ = The amount of methane that would have been destroyed/combusted during the year in project scenario; ($tCH_4$);<br>$MD_{BL,y}$ = The amount of methane that would have been destroyed/combusted during the year in the absence of the project due to regulatory and/or contractual requirement, ($tCH_4$);<br>$GWP_{CH4}$ = Global Warming Potential value for methane for the first commitment period is 21 $tCO_2e/tCH_4$;<br>$CEF_{elec,BL,y}$ = $CO_2$ emissions intensity of the baseline source of electricity displaced, ($tCO_2e/MWh$);<br>$EL_{LFG}$ = Net quantity of electricity produced using LFG which in the absence of the project activity would have been produced by power plants connected to the grid or by an on-site/off-site fossil fuel based captive power generation, during year *y*, (MWh);<br>Since there is no regulatory or national or local safety requirements, or legal regulations in Brazil specifying $MD_{BL}$, an "Adjustment Factor" (AF) is used:<br>$MD_{BL} = MD_{project,y} \times AF$ | | **OK** |

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| | | | | And<br>$MD_{project,y} = MD_{flared,y} + MD_{electricity,y}$<br>Where:<br>$MD_{flared,y}$ = Quantity of methane destroyed by flaring ($tCH_4$);<br>$MD_{electricity,y}$ = Quantity of methane destroyed by generation of electricity ($tCH_4$);<br>And<br>$MD_{flared,y} = (LFG_{flared,y} \times w_{CH4} \times D_{CH4}) - \frac{PE_{flare,y}}{GWP_{CH4}}$<br>Where:<br>$LFG_{flare,y}$= Quantity of landfill gas fed to the flare(s) during the year measured in ($m^3$);<br>$w_{CH4}$ = Average methane fraction of the landfill gas as measured during the given time period t in time intervals of not greater than one hour in $m^3CH_4/m^3LFG$;<br>$D_{CH4}$ = Methane density, expressed in tonnes of methane per cubic meter of methane ($tCH_4/m^3CH_4$), and measured at STP (0 degree Celsius and 1.013 bar), that is 0.0007168 $tCH_4/m^3CH_4$;<br>$PE_{flare,y}$ = Project emissions from flaring of the residual gas stream in year y ($tCO_2e$);<br>$MD_{electricity,y} = LFG_{electricity,y} \times w_{CH4} \times D_{CH4}$<br>Where:<br>$LFG_{electricity,y}$ = Quantity of landfill gas fed into electricity generator ($m^3$). | | |
| B.6.1.2. | Have conservative assumptions been used when calculating the baseline emissions and are the uncertainty estimates properly addressed? | /1/<br>/2/<br>/5/<br>/11/<br>/12/<br>/13/<br>/14/ | DR<br>CC | Baseline emissions are estimated by the following information:<br>- Landfill operations (filling) started in 2007;<br>- The forecasted year of the landfill closure is 2022;<br>- GWP for methane = 21 $tCO_2e/tCH_4$;<br>- Methane concentration in LFG = 50% | | **OK** |

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| | | /15/<br>/16/<br>/33/ | | (Feasibility Study /16/ and ER calculation spreadsheet);<br>- LFG collection efficiency = 65% (Feasibility Study and ER calculation spreadsheet);<br>- Total accumulated waste from 2007 to 2009 operator/historical logs = 810,528 T (Feasibility Study);<br>- Load factor = 90% (Feasibility Study);<br>- Total installed capacity (up to 6 engines) = 5.47 MW (6 * 0.912 MW, as per the Feasibility Study and ER calculation spreadsheet);<br>Data for the emission factor is public available by Brazilian DNA. PP presented the Brazilian emission factors according to determination of the Brazilian DNA. For the first crediting period the combined margin emission factor value is 0.1635 $tCO_2$/MWh (2009 - ER calculation spreadsheet) as by the Brazilian DNA website: http://www.mct.gov.br/index.php/content/view/303076.html#ancora /33/<br><br>The published PDD describes that the climate data was provided from Instituto Nacional de Metereologia (INMET). However, the ER calculation spreadsheet / source shows the following link to address the average temperature: http://www.bdclima.cnpm.embrapa.br/resultados/balanco.php?UF=&COD=440, but this link could not be accessed. PP is requested to clarify the correct source used for the temperature average and update the ER calculation spreadsheet and the PDD accordingly. | ~~CL 5~~ | |
| **B.6.2.** | **Project emissions** | | | | | |
| B.6.2.1. | Are the calculations documented according to the approved methodology and in a complete and transparent manner? | /1/<br>/2/<br>/5/<br>/11/ | DR | The project emissions are calculated as follow:<br>$PEy = PE_{EC,y} + PE_{FC,,y} + PE_{Flare,,y}$<br>Where:<br>$PE_{EC,y}$ = Emissions from consumption of | | **OK** |

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| | | /12/<br>/13/<br>/14/<br>/15/ | | electricity in the project case (tCO2);<br>$PE_{FC,,y}$ = $CO_2$ emissions from fossil fuel combustion in process j during the year y ($tCO_2$/yr);<br>$PE_{Flare,,y}$ = Project emissions from flaring of the residual gas stream in year y<br>As by the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption":<br>$PE_{EC,y} = EC_{PJ,y} \times EF_{grid,CM,y} \times (1 + TDL_y)$<br>Where:<br>$EC_{PJ,y}$ = quantity of electricity consumed by the project activity during the year y (MWh);<br>$EF_{grid,CM,y}$ = the emission factor for the grid in year y ($tCO_2$/MWh);<br>$TDL_y$ = 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.<br>As by the "Tool to calculate project of leakage $CO_2$ emissions from fossil fuel combustion":<br>$PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$<br>Where:<br>$FC_{i,j,y}$ = quantity of fuel type i combusted in process j during year y (mass or volume unit/yr); and<br>$COEF_{i,y}$ = $CO_2$ emission coefficient of fuel type i in year y ($tCO_2$/mass or volume unit).<br>PP used option A and B to calculate COEFi,y:<br>Option A:<br>$COEF_{j,y} = w_{C,i,y} \times 44/12$<br>Where:<br>$w_{C,i,y}$ = weighted average mass fraction of fuel type I ($tCO_2$/mass unit).<br>Option B:<br>$COEF_{j,y} = NCV_{i,y} \times EF_{CO2,i,y}$ | | |

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| | | | | And described that option B will be used in the event that $w_{c,i,y}$ is not obtainable.<br><br>PP should clarify which "event" is that where $w_{c,i,y}$ is not obtainable and the possibility that to occurs. Moreover, the formula COEFi,y presented above match with $tCO_2$/mass unit and not "or volume" as stated in the PDD. PP should correct the unit of the formula. In addition, PP should justify the use of the default value of $0.8TCO_2$/MWh for the $CO_2$ emission coefficient of fossil fuel, as by ACM0001, version 11, in the ER calculation spreadsheet.<br><br>As by the "Tool to determine project emissions from flaring gases containing methane":<br>$PE_{flare,y} = \sum_{h=1}^{8760} TM_{RG,h} \times (1-\eta_{flare,h}) \times \frac{GWP_{CH4}}{1000}$<br>Where:<br>$TM_{RG,h}$ = Mass flow rate of methane in the residual gas in the hour *h* (kg/h);<br>$\eta_{flare,h}$ = Flare efficiency in hour *h*;<br><br>Although that $PE_{FC,y}$ and $PE_{flare,y}$ formulas are included in the PDD, those project emissions are not included in the total project emission ($PE_y$) formula. PP should update the PDD including those project emissions in the $PE_y$ formula. Moreover, PP should state clearly in the PDD where the description of $PE_{Flare,,y}$ begins. | ~~**CAR 10**~~<br><br>~~**CAR 11**~~ | |
| B.6.2.2. | Have conservative assumptions been used when calculating the project emissions and are the uncertainty estimates properly addressed? | /1/<br>/2/<br>/5/<br>/16/<br>/22/<br>/23/<br>/24/ | DR<br>CC | Project emissions are estimated based on the information listed below:<br>- Flare efficiencies (%) operational data from flare manufacturer (99%);<br>- Electricity consumption from the grid due to the project activity (657MWh/year);<br>- Electricity consumption in the diesel generator (2MWh); | | **OK** |

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| | | | | - Average technical transmission and distribution losses for providing electricity to source j in year y (6%), as by the National Energy Balance 2009.<br><br>PP is requested to justify the estimated electricity consumption from grid of 657 MWh/y as well the diesel generator consumption of around 2 MWh/y. Moreover, PP should clarify which is the correct year version of the National Energy Balance used in the PDD. | ~~CL 6~~ | |
| **B.6.3.** | **Leakage** | | | | | |
| B.6.3.1. | Are the calculations documented according to the approved methodology and in a complete and transparent manner? | /1/<br>/5/ | DR | In accordance with the ACM0001 version 11, no leakage effects need to be accounted | | **OK** |
| B.6.3.2. | Have conservative assumptions been used when calculating the leakage and are the uncertainty estimates properly addressed? | /1/<br>/5/ | DR | Please, refer to the item B.6.3.1 | | **OK** |
| **B.6.4.** | **Emission reductions** | | | | | |
| B.6.4.1. | Has the methodology been correctly applied to calculate the emission reductions and can this be replicated by the data provided in the PDD and supporting files to be submitted for registration? | /1/ /2/<br>/5/ /11/<br>/12//14/<br>/15//16/ | DR<br>CC | Please, refer to B.6.1.2 B.6.2.1 | ~~CL 5CAR 10~~<br>~~CAR 11~~ | **OK** |
| **B.6.5.** | **Data and parameters that are available at validation and that are not monitored** | | | | | |
| B.6.5.1. | How were the parameters available at validation verified? | /1//5/<br>/11/<br>/12/<br>/13/<br>/14/<br>/15/<br>/16/<br>/19/ | DR<br>CC | According to the published PDD, the following parameters are available at validation:<br>- **Regulatory requirements**: The information (recorded annually), is used for changes to the adjustment factor (**AF**) or directly $\mathbf{MD_{BL,y}}$ at renewal of the crediting period. An adjustment factor of 9.71% was calculated, rounded to 10% by PP/s, and deemed appropriate.<br><br>PP is requested to clarify the value of 16% for the adjustment factor used in the calculation | ~~CAR 12~~ | **OK** |

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| | | | | spreadsheet. Moreover, as described into the PDD, changes to regulation should be converted to the amount of methane that would have been destroyed/combusted during the year in the absence of the project activity ($MD_{BL,y}$). Project participant shall explain how these changes to regulation will be translated into that amount of gas. Moreover, the link for the source of data http://www.ibam.org.br/publique/media/01-girs.pdf, could not be accessed.<br><br>- $\varphi$: Model correction factor to account for model uncertainties (0.9) Source of data used: "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site";<br>- **OX**: Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste. The value of 0.1 was used, which corresponds to managed solid waste disposal sites that are covered with oxidizing material (soil), as observed during the on-site visit. Source of data used: 2006 IPCC Guidelines for National Greenhouse Gas Inventories;<br>- **F**: Fraction of methane in the SWDS gas (volume fraction) The default value of 0.5 was used, as recommended by the IPCC;<br>- **$DOC_f$**: Fraction of degradable organic carbon (DOC) that can decompose. Value applied: 0.5. Source of data used: 2006 IPCC Guidelines for National Greenhouse Gas Inventories;<br>- **MCF**: Methane correction factor. Value applied = 1. According to IPCC guidelines, managed landfills should have controlled placement of waste, and a degree of control of both scavenging activities and fires. This was confirmed during the on-site visit through the operation of the landfill: waste disposal | | |

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| | | | | according to the cells and leachate collection system. In addition no scavenging activities were observed.<br>- **$DOC_j$**: Fraction of degradable organic carbon (by weight) in the waste type j Values applied: default values of the IPCC 2006 Guidelines for National Greenhouse Gas Inventories on wet basis was used (adapted from Volume 5, Tables 2.4 and 2.5).<br>- **$k_j$**: Decay rate for the waste type j . Values applied: Default values of IPCC 2006 Guidelines for National Greenhouse Gas Inventories on wet basis and tropical climate (T>20°C) was used (from Volume 5, Table 3.3);<br>- **Waste composition (%):** fraction of waste type j in the SWDS in the year x. The value are based on the site waste composition report presented into the Feasibility Study.<br>- **$D_{CH4}$:** Methane density: At standard temperature and pressure (0 degree Celsius and 1.013 bar) the density of methane is 0.0007168 $tCH_4/m^3CH_4$. Source of data used:ACM0001"Consolidated baseline and monitoring methodology for landfill gas project activities" version 11 of 28/05/2009;<br>- **$EF_{grid,y}$**: Emission factor. Data for the emission factor is public available by Brazilian DNA. PP presented the Brazilian emission factors according to determination of the Brazilian DNA. For the first crediting period the combined margin emission factor value is 0.1635tCO2/MWh as by the Brazilian DNA website /33/.<br><br>PP is requested to provide evidences of the disposed waste quantity from 2007 to 2022, indicated in the Feasibility Study. For the years after 2010, PP should justify the forecasted waste. | ~~CL 7~~ | |

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| **B.7.** | **Monitoring plan** | | | | | |
| **B.7.1.** | **Data and parameters monitored** | | | | | |
| B.7.1.1. | Does the monitoring plan described in the PDD comply with the requirements of the methodology? | /1/ /5/ /11/ /12/ /13/ /14/ /15/ | DR | Yes. The project correctly applies the approved consolidated baseline methodology ACM0001"Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 of 28/05/2009 and the related Tools. | | **OK** |
| B.7.1.2. | Does the monitoring plan contain all necessary parameters and are they clearly described? | /1/ /5/ /11/ /12/ /13/ /14/ /15/ /51/ | DR CC | According to the published PDD, the parameters to be monitored *ex-post* are:<br>- **$EF_{grid,CM,y}$** - Brazilian grid emission factor;<br>- **$EF_{grid,OM-DD,y}$** - $CO_2$ Operating Margin emission factor of the grid, in a year *y*;<br>- **$EF_{grid,BM,y}$** - $CO_2$ Build Margin emission factor of the grid, in a year *y*;<br>Measurement methods and procedures are specified.<br>***Ex-post* calculation of emission reductions**<br>The combined margin emission factor ($EF_{grid,CM,y}$) will be calculated *ex-post* using the $CO_2$ emission factors for the build margin and the operational margin that are provided by the Brazilian DNA. $CO_2$ emission factors for the build margin and the operational margin for electricity generation in Brazil's National Interconnected System (SIN) are calculated, according to the dispatch analysis, from generation records of plants dispatched in a centralized manner by the National Electric System Operator (ONS).<br>- **$LFG_{flare.y}$ ($m^3$)** : Amount of landfill gas flared measured by a flow meter at normal temperature and pressure;<br>- **$LFG_{electricity,y}$ ($m^3$)** : Amount of landfill gas combusted in power plant measured by a flow meter at normal temperature and pressure;<br>- **$LFG_{total.y}$ ($m^3$)** : Total amount of landfill gas capture and burnt on-site measured by a flow meter at normal temperature and pressure; | | |

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| | | | | - **$W_{CH4,y}$ ($m^3CH_4$ / $m^3$LFG)** : Methane fraction in the landfill gas with a continuous gas analyzer;<br><br>PP is requested to clarify if the methane fraction ($W_{CH4,y}$) will be measured in wet of in dry basis.<br><br>- **$PE_{flare,y}$ (tCO2e)** : Project emissions from flaring of the residual gas stream in year y that is the amount of methane not combusted in the flaring unit. The parameters used for determining the project emissions from flaring of the residual gas stream in year y ($PE_{flare,y}$) will be calculated as per the "Tool to determine project emissions from flaring gases containing Methane";<br>  - **$EL_{LFG,y}$ (MWh)** : Net amount of electricity generated using LFG;<br><br>PP is requested to clarify whether the on-site consumption of electricity provided by the grid and attributable to the project activity will be monitored and update the PDD accordingly.<br><br>- **Operation of the energy plant** (hours): Information will be monitored and reviewed on an annual basis;<br>- **$NCV_{diesel,y}$ (GJ/T):** Weighted average net calorific value of diesel in year y;<br>- **$EF_{CO2,i,y}$ ($tCO_2$/GJ):** Weighted average $CO_2$ emission factor of diesel in year y<br>- **$PE_{EC,y}$ ($tCO_2$):** Project emissions from electricity consumption by the project activity will be calculated as per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" version 1;<br>- **$PE_{FCj,y}$($tCO_2$):** Project emissions from diesel combustion in process. This parameter will be recorded via purchase receipts from the product distributor in accordance with the | ~~CL 17~~<br><br>~~CL 8~~ | |

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| | | | | "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" version 2.<br>- **f (%):** Fraction of methane captured at the SWDS and flared, combusted or used in another manner;<br><br>PP is requested to clarify how **f (%):** *"Fraction of methane captured at the SWDS and flared, combusted or used in another* manner" will be monitored, in accordance with the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 4, as described into the PDD page 29. Moreover, this Tool version shall be corrected in this mentioned page and other places in the published PDD, where version 4 is also mentioned.<br><br>- **Wx (T):** Total amount of organic waste prevented from disposal in year x. The weigh scale logs will be stored at the site and summarized on a yearly basis;<br><br>PP is requested to clarify whether the parameters $GWP_{CH4}$ : *Global Warming Potential*, $p_{n,j,x}$: *Weight fraction of the waste type j in the sample n collected during the year x*, and z: *Number of samples collected during the year x* will be monitored as required by the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" latest version (5).<br>The specific parameters regarding the flare efficiency according to the "Tool to determine project emissions from flaring gases containing Methane" /51/ are described bellow:<br>- **$t_{O2,h}$(%):** Volumetric fraction of $O_2$ in the exhaust gas of the flare in the hour h. Measurements with a continuous gas | ~~CL 9~~<br><br>~~CL 10~~ | |

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| | | | | analyzer;<br>- **$fv_{CH4,FG,h}$** ($mg/m^3$): Concentration of methane in the exhaust gas of the flare in dry basis at normal conditions in the hour h. Measurements with a continuous gas analyzer;<br>- **$T_{flare}$ (º C)**: Temperature on the exhaust gas of the flare. Measure the temperature of the exhaust gas stream in the flare by a Type S thermocouple. A temperature above 500°C indicates that a significant amount of gases are still being burnt and that the flare is operating.<br>- **$FV_{RG,h}$ ($m^3/h$):** Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h. Measurements by project participant using a flow meter. The residual gas flow rate is measured on wet basis. To convert it on dry basis will be used the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" /51/.<br>- **$fv_{i,,h}$ (%)** :Volumetric fraction component i of the residual gas in dry basis at normal conditions in the hour h, where i = $CH_4$ and $N_2$ . Measurements with a continuous gas analyzer;<br>- **$TDL_y$** : Average technical and distribution losses in the grid in year y - 6% according to the National Energy Balance 2006, page 21;<br>- **$FC_{i,j,y}$**: (Mass or volume unit per year) Quantity of fuel type i combusted in process j during year y. | | |
| B.7.1.3. | Is the measurement equipment described?<br>Is the accuracy of the measurement equipment addressed and deemed appropriate?<br>Are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? | /1/<br>/15/ | DR | As per the published PDD's Monitoring Plan, the amount of landfill gas flared or combusted in the engine will be measured continuously by vortex flow meters (flare, engine and total flow). The data will be aggregated on a monthly and yearly basis using continuous monitoring average values in time intervals not greater than one hour. The data will be archived throughout the crediting | | **OK** |

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| | | | | period and two years thereafter.<br><br>The methane fraction will be performed by a continuous gas quality analyzer. Data will be aggregated monthly and yearly, using an average value in a time interval not greater than an hour.<br><br>PP is requested to provide the specifications of the flow meters and gas analyzer and to address the accuracy as well the calibration frequency of the all monitoring equipments.<br><br>As per the published PDD, electricity supplied to the grid will be monitored continuously using an electricity meter and the data will be archived throughout the crediting period and two years thereafter.<br><br>PP is requested to clarify how the electricity for self-consumption attributable to the project activity will be monitored and if the counters (electricity export and import) will be managed by the power company for commercial purposes. Moreover, PP should provide the calibration frequency of the electricity meters for electricity supplied to the grid and for self-consumption.<br><br>As per the Monitoring Plan in the PDD, the quantities of diesel used for the standby generator will be recorded via receipts and additional information will be delivered from the fuel company. In the event they cannot produce this information IPCC guidelines will be used. Recorded via purchase receipts from the product distributor in accordance with the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" version 2./15/<br><br>PP is requested to clarify (PDD page 59):<br>- how receipts for <u>purchased</u> diesel will allow the | ~~CAR 13~~<br><br>~~CAR 14~~<br><br>~~CL 11~~ | |

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| | | | | calculation of project emissions ($PE_{FCj,y}$) from used (combusted) diesel;<br>- what additional information will be delivered from the fuel company;<br>- what information from IPCC guidelines will be used in case information can not be produced. | | |
| B.7.1.4. | Is the monitoring frequency adequate for all monitoring parameters?<br>Is it in line with the monitoring methodology? | /1/ | DR<br>CC | Please refer to section B.7.1.2 and B.7.1.3 | ~~CAR 13~~<br>~~CAR 14~~<br>~~CL 11~~ | **OK** |
| B.7.1.5. | Is the recording frequency adequate for all monitoring parameters?<br>Is it in line with the monitoring methodology? | /1/ | DR<br>CC | Please refer to section B.7.1.2 and B.7.1.3 | ~~CAR 13~~<br>~~CAR 14~~<br>~~CL 11~~ | **OK** |
| **B.7.2.** | **Monitoring of sustainable development indicators/ environmental impacts** | | | | | |
| B.7.2.1. | Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country? | /1/ | DR | The Brazilian DNA does not require the monitoring of social and environmental indicators. | | **OK** |
| B.7.2.2. | Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts? | /1/ | DR | Please, refer to item B.7.2.1 | | **OK** |
| B.7.2.3. | Are the sustainable development indicators in line with stated national priorities in the host country? | /1/ | DR | Please, refer to item B.7.2.1 | | **OK** |
| **B.7.3.** | **Management, quality assurance and quality control** | | | | | |
| B.7.3.1. | How it has been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design? | /1/<br>/5/<br>/11/<br>/12/<br>/13/<br>/14/<br>/15/ | DR | At the time of site visit, the project did not start any equipment's installation or civil construction and procedures were not available. In the first verification it shall be checked if the monitoring arrangements described in the monitoring plan are feasible and if training courses were provided to the operational team and if data archiving and data collection procedures are properly described and implemented.<br><br>Please, refer to items B.7.1.2 and B.7.1.3 | ~~FAR 1~~<br><br>~~CAR 13~~<br>~~CAR 14~~<br>~~CL 8 CL 9~~<br>~~CL 10 CL 11~~ | **OK** |
| B.7.3.2. | Are procedures identified for day-to-day records | /1/ | DR | Data collected from each of the parameter | | **OK** |

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| | handling (including what records to keep, storage area of records and how to process performance documentation)? | | | sensors is transmitted directly to an electronic database. Backup of the electronic data is conducted frequently.<br><br>PP is requested to clarify how the file will be converted/transferred into a spreadsheet to be used for the verification report/CER calculation and how frequently the electronic data backup will be conducted. Moreover PP should explain how data that is not automatically recorded will be aggregated and kept on-site. PP is requested to describe the data archiving and data collection procedures into the PDD. | ~~CAR 15~~ | |
| B.7.3.3. | Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported *ex post* and verified? | /1/ /5/ /11/ /12/ /13/ /14/ /15/ | DR | Please refer to section B.7.3.1 and B.7.3.2 | ~~FAR 1~~ ~~CAR 13~~ ~~CAR 14~~ ~~CAR 15~~ ~~CL 8~~ ~~CL 9~~ ~~CL 10~~ ~~CL 11~~ | **OK** |
| B.7.3.4. | Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later? | /1/ /5/ /11/ /12/ /13/ /14/ /15/ | DR | As per the published PDD, data will be archived throughout the crediting period and two years thereafter. Nevertheless, as per the "Guidelines for completing the simplified Project Design Document (CDM - PDD) and the proposed new baseline and monitoring methodologies (CDM - NM)", data monitored and required for verification and issuance are to be kept for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. PP is requested to revise PDD accordingly. | ~~CL 13~~ | **OK** |
| **C. Duration of the project activity and crediting period** | | | | | | |
| **C.1. Start date of project activity** | | | | | | |
| C.1.1. | What is the expected project's starting date of the project activity and how it has been determined? When was the first construction activity? | /1/ /9/ /10/ | DR | The project's starting date was defined as 29/10/2010 in the published PDD version 1 of 16/08/2010, based in the implementation start of the project activity after receiving the Brazilian Letter of Approval. Construction activities did not started yet. | | **OK** |

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| | | | | PP is requested to provide the evidence for the starting date of the project activity in accordance to the latest version of the "Glossary of CDM terms". Moreover, the link of the MCT (footnote 20) can not be accessed and PP should update the PDD with a valid link. | ~~CAR 3~~ | |
| C.1.2. | What is the expected operational lifetime of the project activity?<br>Is it deemed reasonable? | /1/ | DR | The expected operational lifetime of the project was defined in the published PDD as 25 years (0 months), and deemed reasonable, according to the manufacturer's information's; since the expected operational lifetime of the engines and flare are widely recognized as up to or more than 25 years (equipments are still to be bought) and thus regarded to be appropriate for such project activity. | | **OK** |
| **C.2.** | **Start date of crediting period** | | | | | |
| C.2.1. | What is the expected crediting period starting date of the proposed project activity? | /1/ | DR | According to the published PDD, the expected crediting period starting date of the proposed project activity is 01/07/2011, or the date of registration, whichever is later. | | **OK** |
| C.2.2. | What is the length of the crediting period?<br>Is it clearly defined and deemed reasonable? | /1/ | DR | According to the published PDD, a renewable crediting period of 7 years has been chosen, starting from 01/07/2011, or the date of registration, whichever is later. The crediting period is clearly defined and deemed reasonable. | | **OK** |
| **D.** | **Environmental Impact** | | | | | |
| D.1.1. | Has an analysis of the environment impacts of the project activity been undertaken?<br>Is it clearly and sufficiently described in the PDD? | /1/<br>/26/ | DR | An Environmental Impact Assess (EIA) was submitted to CETESB – Environmental Agency of São Paulo state. PP provided this document where it was concluded that the site presents the necessary conditions to the landfill installation without any significant changes on their actual environmental quality.<br>The environmental aspects of the project activity were analyzed by the environmental agency CETESB – Companhia Ambiental do Estado de São Paulo.<br>The project obtained the following CETESB | | **OK** |

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| | | | | environmental license, assessed by RINA:<br>Operational License no. 52000232, issued on 22/03/2009 and valid until 22/03/2014. | | |
| D.1.2. | Will the project create any adverse environmental effects?<br>Are transboundary environmental impacts considered in the analysis? | /1/ | DR | No adverse environmental effects or transboundary environmental impacts are expected.<br>See section D.1.1 | | **OK** |
| D.1.3. | Is the analysis of the environmental impacts required by the legislation of the host Country?<br>If yes, has the EIA has been approved by local Government?<br>Does the approval contain any conditions that need monitoring? | /1/ | DR | An EIA (Environmental Impacts Study) is required in Brazil to obtain the operational license.<br>Please, refer to item D.1.1 | | **OK** |
| D.1.4. | Is it the project in line with the current environmental legislation in the host Country? | /1/ | DR | Please, refer to item D.1.3 | | **OK** |
| **E. Local stakeholder consultation** | | | | | | |
| E.1.1. | Were the local stakeholders invited by the PP prior to the publication of the PDD in the UNFCCC website? | /1/<br>/25/<br>/34// | DR<br>CC | Yes. The PDD version 1 of 16/08/2010 was made publicly available in the CDM UNFCCC website on 22/09/2010: (http://cdm.unfccc.int/Projects/Validation/DB/TTHCJ77HG0RFG6KHL7ELPCESLGQD9X/view.html).<br>As per Brazilian Resolution number 7, the invitations to the local stakeholder consultation shall be sent 15 days in advance of the validation process. | | **OK** |
| E.1.2. | Have relevant stakeholders been adequately consulted / invited for comments (addresses provided / available)? | /1/<br>/25/ | DR<br>CC | As required by the Interministerial Commission on Global Climate Change (CIMGC) and in accordance to the Resolution 7 of the Brazilian DNA (05 March 2008), the project participant sent letters, inviting for comments, to the following relevant stakeholders/City authorities:<br>**Stakeholders** \| **ARs**<br>Associação dos moradores do Bairro Mombuca (Guatapará) - *Local Community Association* \| 27/08/2010 | | **OK** |

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| | | | | CETESB – Cia de Tecnologia de Saneamento Ambiental (SP) - *Environment agency SP - São Paulo* | 20/08/2010 | | |
| | | | | Câmara Municipal de Guatapará - *Guatapará City Council* | 25/08/2010 | | |
| | | | | Forum Brasileiro de ONG's e Movimentos Sociais para o Meio Ambiente (Brasília) - *Brazilian Forum of NGOs and Environmental and Development Social Movements* | 01/09/2010 | | |
| | | | | Rotary Club (Guatapará) | 03/09/2010 | | |
| | | | | 4ª Câmara de Coordenação e Revisão-Meio Ambiente Brasília - *Federal Attorney Office 4th Chamber* | 23/08/2010 | | |
| | | | | Secretaria Municipal de Agricultura de Guatapará - *Municipal Agriculture Secretary of Guatapará* | 25/08/2010 | | |
| | | | | Associação Agro-cultural e Esportiva de Guatapará - *Guatapará Agro-cultural and Sport Association* | 23/08/2010 | | |
| | | | | Centro de Apoio Operacional de Urbanismo e Meio Ambiente (SP) - *Public Ministry of São Paulo State* | 20/08/2010 | | |
| | | | | Prefeitura Municipal de Guatapará - *Guatapará City Hall* | 20/08/2010 | | |
| | | | | Associação de moradores do bairro Jardim Maria Luiza (Guatapará) - *Local Community Association* | 20/08/2010 | | |
| E.1.3. | Is the summary of the comments received from the stakeholders provided in the PDD (provided / available), complete? | /1/ /25/ | DR CC | PP is requested to provide the minutes of meeting from the stakeholders presentation and related evidences such as the presentation, | | ~~CL 12~~ | **OK** |

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| | | | | photos, etc. | | |
| E.1.4. | Has due account been taken by the project participants of any stakeholder comments received? | /1/ /25/ | DR CC | Please, refer to item E.1.3. | ~~CL 12~~ | **OK** |
| E.1.5. | If a stakeholder consultation process is required by regulations/laws in the host Country, has the stakeholder consultation process been carried out in accordance with such regulations/laws? | /1/ /25/ /34// | DR CC | It was verified that the local stakeholders' consultation followed the Brazilian DNA Resolution nº 7 requirements.<br>Letters were sent in Portuguese and PDD was made publicly available, in Portuguese. | | **OK** |

## TABLE 3 RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
|---|---|---|---|
| ~~**CAR 1**~~<br>PP is requested to clarify whether the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" will be used to convert the residual gas flow rate from wet basis into dry basis and relate it into the PDD, if necessary. | B.2.1 | The referred Tool will be used to convert the residual gas flow rate from wet basis into dry basis and has already been related in the $FV_{RG,\ h}$ Data/Parameter description in section B.7.1. as well as in section B.7.2 of the PDD – version 1.<br><br>In addition, the *"Tool to determine the mass flow of a greenhouse gas in a gaseous stream"* was included in Section B.1 of the PDD version 2 dated of 08/04/2011, as requested. | PP explained that the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" will be used and included it into the PDD.<br><br>CAR 1 is closed. |
| ~~**CAR 2**~~<br>As per ACM0001, version 11 - step 1, national and/or sectoral policies and circumstances must be taken into account in the following ways: 1) In Sub-step 1b of the "Tool for the demonstration and assessment of additionality"; 2) Via the adjustment factor AF in the baseline emissions project participant must take into account that some of the methane generated in the baseline may be captured and destroyed to comply with regulations or contractual requirements; 3) The project participant must monitor all relevant policies and circumstances at the beginning of each crediting period and adjust the baseline accordingly. PP shall include the discussion about the AF in the baseline emissions (item 2) in PDD's section B.5 – sub-step 1b. | B.4.1 | In Section B.5 of the PDD version 2 dated of 08/04/2011 was discussed that in Brazil there is no regulation or policy that obliges the landfill operator to burn the LFG generated in the landfill. According to Brazil's New National Solid Waste Policy (NSWP), ratified by the President on 02/08/2010 after 19 years under discussion, does not request the LFG capture and/or flare and there is not forecast to approve any regulation or policy in the next years.<br><br>The PPs will monitor all relevant policies and circumstances at the beginning of each crediting period and adjust the baseline (i.e. the adjustment factor - AF) accordingly and if any changes were found. .Even if there is no regulation or policy requiring to burn the LFG generated, the PPs adopted a conservative approach and considered AF = 10%, as shown in Section B.6.1. | PP explained accordingly and the information (National Solid Waste Policy - PNRS) was assessed AT http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2010/lei/l12305.htm.<br>The PP is being conservative, using an Adjustment Factor of 10%. In addition PP updated section B.5 – sub-step 1b of the PDD with the discussion about the AF and deemed reasonable.<br><br>CAR 2 is closed. |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
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| | | Documentation Provided as Evidence by Project Participant:<br>• *Lei - Política Nacional de Resíduos Sólidos.pdf* | |
| ~~**CAR 3**~~<br>PP is requested to provide the evidence for the starting date of the project activity in accordance to the latest version of the "Glossary of CDM terms". Moreover, the link of the MCT (footnote 20) can not be accessed and PP should update the PDD with a valid link. | B.5.3.1<br>B.5.7.1<br>C.1.1 | The date for the starting date of the project activity as well as its reference has been amended in PDD version 2 dated of 08/04/2011 in accordance to the latest version of the "Glossary of CDM terms" that states:<br><br>*"The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins."*<br><br>The schedule of the CDM project including the purchase of the equipments for Phase I and II was made available to DOE on 09/03/2011.<br><br>Documentation Provided as Evidence by Project Participant:<br>6 *Cronograma Implantação Biogás.pdf* | The starting date was changed from 29/10/2010 to 13/09/2011. PP provided as evidence the implementation chronogram dated 01/03/2011, stating that the real action for the implementation of the project activity is the approval of the Brazilian Government previewed to happen on 13/09/2011, according to the schedule of the Brazilian DNA - "Comissão Interministerial de Mudança Global do Clima" (CIMGC).<br><br>CAR 3 is closed. |
| ~~**CAR 4**~~<br>Project participant presented in the PDD version 1 that the chosen analysis method was the option III - Benchmark Analysis, however the financial analysis was made comparing the Project Activity NPV (Net Present Value) with other two NPV Scenarios. Project participant should clarify in the PDD which is the chosen analysis method (option II – Comparison Analysis or III – Benchmark Analysis) and should revise texts and calculations accordingly. | B.5.4.1<br>B.5.7.1 | The analysis method chosen was option II – Comparison Analysis. The PDD version 2 dated of 08/04/2011 was corrected in accordance with this method. | Project participants rectified the PDD accordingly.<br><br>This CAR is closed. |
| ~~**CAR 5**~~<br>Project participant used as benchmark (or | B.5.4.2<br>B.5.7.1 | In accordance with the CDM rules (guidelines on the assessment of | The PP updated the benchmark discount rate accordingly. The recalculated value |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
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| Discount Rate / analysis method option II), an index composed by 4 different indexes. These indexes are from different markets (Countries) and have different ranges of time and can not be interrelated. The Beta used from USA Electricity Companies should not be considered representative for a small Brazilian company that generates electricity from biogas flaring. Project participant should revise the Benchmark (or Discount Rate) calculation with acceptable indexes and that reflect the characteristics of project activity. | | investment analysis – version 3.1), the approach of using a country risk free rate + a deemed risk is acceptable. In fact, several publications states that developing markets stock index are too volatile and may not reflect properly the risk involved. The project participants, in order to get this project validated and to speed up the process, decided to calculate the Discount Rate using the following elements: US-Tbonds for year 2010 (8.46%), less the US CPI (1.5%), plus the market risk premium (S&P 500 vs USTbond – 6.39%), plus country risk premium for Brazil (3%) and betas (0.49), all related to the US markets.<br>The calculation resulted in (8.46%-1.5%)+6.39%x0.49+3% = 13.08%<br><br>The calculation and supporting documents were provided to the audit team.<br><br>In addition, in the PDD version 2 dated of 08/04/2011 was modified the name "Benchmark" to "Discount Rate", as requested. | of the discount rate resulted in 13.08%, higher than the previous of 10.64%, however much less than similar Brazilian projects. This is deemed conservative.<br><br>CAR 5 is closed. |
| ~~**CAR 6**~~<br>In the Benchmark calculation (or Discount Rate) presented by project participant it is being considered the inflation rate. To compare the project cash flow with the benchmark it is necessary that both have the same assumptions. Project participant should revise the financial analysis to be aligned with the same assumptions (in this case the inflation rate) of the presented benchmark. | B.5.4.2<br>B.5.7.1 | Despite inflation data have been presented in the Cash Flow, the financial indicator chosen in the investment analysis did not consider this information. Thus, the PPs removed information about inflation from PDD version 2 dated of 08/04/2011 and from the benchmark spreadsheet in order to avoid further misunderstandings. | Project participants excluded the information about inflation from PDD and spreadsheets.<br><br>This CAR is closed. |
| **CAR 7**<br>Project participant did not considered the sales | B.5.4.3<br>B.5.7.1 | Taxes calculations were revised and the PPs included sales tax (PIS/COFINS) in the Financial Analysis as requested by the | For the Real Profit Tax Regime, the sales tax (PIS/COFINS) were included |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
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| tax (PIS/COFINS) in the Financial Analysis. Project participant should revise the taxes calculations including all applicable taxes. | | DOE. | accordingly.<br><br>This CAR is closed. |
| ~~**CAR 8**~~<br>Project participant used in the Financial Analysis the Assumed Profit Tax System. This tax system has been used by a large number of small electricity generation companies in Brazil, however the company classification chosen by project participant, that defines the calculation basis of Income Tax (IRPJ and CSLL), does not represent the project activity characteristics. This has a great impact on the project profitability and project participant should justify and clarify the chosen classification or should revise the Financial Analysis. | B.5.4.3<br>B.5.7.1 | The Financial Analysis was revised and real profit tax approach was applied (Please refer to the revised Cash Flow).<br><br>The Real Profit Tax Regime is the regime used by CGR Guatapará.<br><br><u>Documentation Provided as Evidence by Project Participant:</u><br>• DIPJ 2010 Guatapara.pdf<br>• Recibo DIPJ 2010 CGR GUATAPARA.pdf<br>• RECIBO DCTF JUN-10 GUATAPARA.pdf<br>• Balancete CGR GUATAPARA dez-10.pdf<br>• DCTF JUN-10.pdf | All documentation provided by project participants justifies the use of Real Profit Tax Regime.<br><br>This CAR is closed. |
| ~~**CAR 9**~~<br>In the PDD, PP defined in "table 5 – Main assumptions" that the "Asset's Life time" in the "Cash Flow Spreadsheet" is 25 years. For all scenarios it is being considered the same end year (2035), however in the "Cash Flow Spreadsheet" it is defined for all scenarios a period different of 25 years. Project participant should revise the period of investment analysis to match with PDD prioritizing the scenario of the proposed project activity (scenario 1) and aligning other scenarios as possible to the same period. | B.5.4.4<br>B.5.7.1 | As requested, the depreciation and its effects in the cash Flow analysis were taken into account. The PDD version 2 dated of 08/04/2011 was also amended to include these modifications. There is no salvage value because the depreciation is up to 2028.<br><br>The amended PDD version 2 dated of 08/04/2011 and cash flow spreadsheet were sent to DOE. | The depreciation and its effects in the cash flow analysis were taken into account.<br><br>This CAR is closed. |
| ~~**CAR 10**~~<br>PP should clarify which "event" is that where $w_{c,i,y}$ is not obtainable and the possibility that to occurs. Moreover, the formula COEFi,y presented above | B.6.2.1<br>B.6.4.1 | <u>Part 1</u><br><br>There was a mistake in the PDD – version 1. | PP corrected the PDD accordingly.<br>The value of $0.8TCO_2/MWh$ for the $CO_2$ emission coefficient of fossil fuel was justified and deemed reasonable. |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
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| match with $tCO_2$/mass unit and not "or volume" as stated in the PDD. PP should correct the unit of the formula. In addition, PP should justify the use of the default value of $0.8TCO_2$/MWh for the $CO_2$ emission coefficient of fossil fuel, as by ACM0001, version 11, in the ER calculation spreadsheet. | | According to ACM0001 – version 11, page 12, for the estimation of project emissions from electricity consumption ($PE_{EC,y}$), the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" should be used. However, in the PDD – version 1, it was used the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion". This latter Tool is only applicable to project emissions from heat consumption and this is not the project activity case as explain in section B.6.1 of the PDD - version.<br><br>In corrected Tool, there is no COEFi,y parameter.<br><br><u>Part 2</u><br><br>The ACM0001 states in page 11 that:<br><br>*"In case the baseline is electricity generated by an* ***on-site/off-site fossil fuel fired captive power plant*** *in the baseline, project proponents may use a default value of 0.8 $tCO_2$/MWh or estimate the emission factor".*<br><br>The project activity includes a captive on-site diesel generator and therefore, the value of 0.8 $tCO_2$/MWh must be used for ex-ante estimative. Further under CDM perspective this value is considered conservative. | CAR 10 is closed. |
| ~~**CAR 11**~~<br>Although that $PE_{FC,y}$ and $PE_{flare,y}$ formulas are included in the PDD, those project emissions are not included in the total project emission ($PE_y$) | B.6.2.1<br>B.6.4.1 | According to ACM0001 – version 11 in page 12, the project emission definition is:<br><br>$PEy = PE_{EC,y} + PE_{FC,j,y}$ | PP has explained and updated the PDD regarding the $PE_{EC,y}$ Emissions from consumption of electricity in the project case, as well regarding the $PE_{flare,y}$ which |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
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| formula. PP should update the PDD including those project emissions in the $PE_y$ formula. Moreover, PP should state clearly in the PDD where the description of $PE_{Flare,,y}$ begins. | | Where:<br><br>$PE_y$ — Project emissions in year *y*<br>$PE_{EC,y}$ — Emissions from consumption of electricity in the project case.<br>$PE_{FC,j,y}$ — Emissions from consumption of heat in the project case.<br><br>As explained in PDD – version 1 for GSP, there is not any consumption of heat by this project activity ($PE_{FC,j,y}$=0).<br><br>Thus, $PE_y = PE_{EC,y}$<br><br>The project emission from electricity consumption have already considered in the PDD (Section B.6.3 and B.7.1) since version 1 and in the CERs estimative spreadsheet (sheet "Emission reduction", column G) since version 1<br><br>Regarding to $PE_{flare,y}$, this parameter must be considered to calculate $MD_{flared,y}$. (, please refer to ACM0001, version 11, page 9). The parameter $PE_{flare,y}$. was considered in Section B.6.1. and B.7.1 of the PDD version 1 and also in the CERs estimate spreadsheet (sheet "Baseline emissions", line 327). Moreover, it was included in Section B.6.1 of the PDD version 2 dated of 08/04/2011 that according to ACM0001, $PE_{flared,y}$ is considered in $MD_{flared,y}$.<br><br>Therefore, PPs believe there is no opened issues related to $PE_y$ and $PE_{flare,y}$ and CAR 11 should be closed or placed properly. | is considered in $MD_{flared,y}$.<br><br>CAR 11 is closed. |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
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| ~~**CAR 12**~~<br>PP is requested to clarify the value of 16% for the adjustment factor used in the calculation spreadsheet. Moreover, as described into the PDD, changes to regulation should be converted to the amount of methane that would have been destroyed/combusted during the year in the absence of the project activity ($MD_{BL,y}$). Project participant shall explain how these changes to regulation will be translated into that amount of gas. Moreover, the link for the source of data http://www.ibam.org.br/publique/media/01-girs.pdf, could not be accessed. | B.6.5.1 | Part 1<br><br>There was a typo in calculation spreadsheet regarding adjustment factor value. The corrected value is 10% according to PDD – version 1. The mistake was corrected in calculation spreadsheet.<br><br>Part 2<br>In Section B.6.2, other (and better) evidence was included in PDD version 2 dated of 08/04/2011 (Brazil's New National Solid Waste Policy - NSWP) instead of SNIS/2007. The link of the new source is: http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2010/lei/l12305.htm. Moreover, the document (document) was sent to DOE.<br><br>Documentation Provided as Evidence by Project Participant:<br>*Lei - Política Nacional de Resíduos Sólidos.pdf* | PP corrected the PDD accordingly and provided evidence.<br><br>CAR 12 is closed. |
| ~~**CAR 13**~~<br>PP is requested to provide the specifications of the flow meters and gas analyzer and to address the accuracy as well the calibration frequency of the all monitoring equipments. | B.7.1.3<br>B.7.3.3 | As explain in the PDD – version 1 (section B.5 and C.1.1) and at the validation visit, the PP will decide to implement the project activity after receiving the Brazilian Letter of Approval. Currently, there is no definition about which equipments will be installed in the project activity. Therefore, the PP cannot provide the specifications of the flow meters, gas analyzer and the accuracy as well as the calibration frequency of all monitoring equipments.<br><br>The PP has experience in others 4 CDM landfill projects and the evolution in short term of the equipments technology is well | PP explained that no flow meters and gas analyzer specifications are available because the project is still not implemented.<br><br>CAR 13 is closed. |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
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| | | known. | |
| ~~**CAR 14**~~<br>PP is requested to clarify how the electricity for self-consumption attributable to the project activity will be monitored and if the counters (electricity export and import) will be managed by the power company for commercial purposes. Moreover, PP should provide the calibration frequency of the electricity meters for electricity supplied to the grid and for self-consumption. | B.7.1.3<br>B.7.3.3 | Information regarding the electricity for self-consumption has been included in section B.7.2. item 2.4 of the PDD version 2 dated of 08/04/2011.<br><br>Concerning the information about calibration frequency and electricity meters, please see response to CAR 13. | PP complemented the PDD regarding the electricity self-consumption accordingly.<br><br>CAR 14 is closed. |
| ~~**CAR 15**~~<br>PP is requested to clarify how the file will be converted/transferred into a spreadsheet to be used for the verification report/CER calculation and how frequently the electronic data backup will be conducted. Moreover PP should explain how data that is not automatically recorded will be aggregated and kept on-site. PP is requested to describe the data archiving and data collection procedures into the PDD. | B.7.3.2<br>B.7.3.3 | The following procedure "*Procedimento para o desenvolvimento do relatório de monitoramento do projeto de gás de aterro cgr guatapará*" developed by ESTRE and Econergy clarifies how the file will be converted/transferred into a spreadsheet to be used for the verification report/CERs calculation. (the procedure was sent to DOE).<br><br>Regarding the description of data archiving and data collection procedures will be defined at the project implementation moment.<br><br>In the item d.1 and d.2 of this procedure, the Root Sum Square method results in total error (errors + uncertainties). If it is the baseline emission, the total error is discounted and if it is project emission, the total error is added in the final result. In others words, the baseline emission are reduced and project emissions are increased. Consequently, a conservative approach.<br><br>The procedure was translated to | PP provided the procedure of data recording and archiving as well the procedure to data transferring to be used in the CERs calculation spreadsheet.<br><br>CAR 15 is closed. |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
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| | | Portuguese.<br><br>Documentation Provided as Evidence by Project Participant:<br>• Portuguese version: *CGR Guatapara - Procedimento para o MR v 1 _2011.02.09_FES.pdf*<br>• *English version: CGR Guatapara - Procedimento para o MR v 1 _2011.02.09_FES en .pdf* | |
| ~~**CAR 16**~~<br>PP is requested to confirm (or revise) the project participant name as the Operational License /24/ and the provided Contract /16/ mention CGR Guatapará – Centro de Gerenciamento de Resíduos Ltda. | A.3.1 | The project participant name has been amended in the revised PDD – version 2. | PP corrected project participant name accordingly.<br><br>CAR 16 is closed. |
| ~~**CAR 17**~~<br>While acknowledging that current information about landfills are not easily obtained, RINA requests the PP to further elaborate this section (PDD common practice analysis) in order to better (clearly) support the assertion (where relevant, with quantitative information) that there are no similar plants (similar technology or practice), like the proposed project activity, operating or underway without CDM benefits in the defined region. | B.5.6.2 B.5.6.3 | The argumentation regarding the Common Practice Analysis has been detailed and clarified accordingly in the sub-step 4a of the revised PDD version 2 dated of 08/04/2011 and is presented below:<br><br>Based on the documents below:<br><br>• The second Brazilian Greenhouse Gases Emissions Inventory Report (published in July 2010)<br><br>It states that between 1990-2002 the total amount of recovered methane in Brazilian landfills were considered zero. Furthermore, from 2003 onwards, all flared/recovered methane considered in the Inventory came from CDM landfill projects in Brazil. | PP provided the evidences according to the Brazilian and municipality of São Paulo legislation./38/ /39/ /40/.<br><br>CAR 17 is closed. |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
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| | | • São Paulo State Greenhouse Gases Emissions Inventory Report in Waste Sector (published in April 2011)<br><br>It states that between 1990-2002 the total amount of recovered methane in São Paulo State landfills were considered zero. Furthermore, from 2003 onwards, all recovered methane considered in the State Inventory came from the $CH_4$ reductions of the CDM landfill projects in the State of São Paulo.<br><br>• Reducing the uncertainty of methane recovered (R) in greenhouse gas inventories from waste sector and of adjustment factor (AF) in landfill gas projects under the clean development mechanism (published in August 2010).<br><br>It states that "all of Brazilian landfills with collection and destruction system (active system) are implemented projects under the CDM".<br><br>Therefore, there are no similar activities like the proposed project activity in Brazil operating or underway without CDM benefits, because all of the landfills that are developing capture and/or use of the LFG, are being developed as CDM project activities. | |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
|---|---|---|---|
| ~~**CL 1**~~<br>PP is requested to explain what means the "Electricity Consumption" and the "End Use" out of the boundary in Figure 10 – Flow diagram project boundary of the PDD. | B.3.1 | The Flow diagram project boundary has been amended in the Figure 10 of the revised PDD version 2 dated of 08/04/2011. | The Flow diagram project boundary has been amended correctly in the Figure 10.<br><br>CL 1 is closed. |
| ~~**CL 2**~~<br>PDD version 1 presents an implementation timeline of the project (Table 1) to also state some CDM benefits consideration dates. However, the estimated dates for issuing the Draft Validation Report, purchasing equipments and construction works shall be updated and justified (explained / supported by means of proper assumptions / evidences). | B.5.3.4<br>B.5.7.1 | The implementation timeline has been updated accordingly in the revised PDD version 2 dated of 08/04/2011.<br><br>Documentation Provided as Evidence by Project Participant:<br>• *Cronograma Implantação Biogás.pdf* | PP updated the PDD accordingly.<br><br>CL 2 is closed. |
| ~~**CL 3**~~<br>Project participant should provide evidences about the main parameters (inputs and their respective sources) of the Financial Analysis (such as Energy Price, O&M Costs, Investments, etc). Contracts, annual financial reports, estimates and/or market references shall be also submitted. | B.5.4.5<br>B.5.7.1 | The feasibility study of the CGR Guatapara Landfill Project was made available to DOE in validation visit on 04/11/2010 and this document evidences the main Financial Analysis of the project activity, such as:<br>• Electricity price;<br>• O&M Costs;<br>• CapEx;<br>• Installed capacity;<br>• Load factor;<br>• Exchange rate (R$->EUR);<br>• Asset's Life time<br><br>The PPs provided quotations to DOE for all assumptions in feasibility study.<br><br>In addition and in order to prove financial data consistency, the PPs conducted a comparison between the Proposed CDM Project and another credible reference (EPA study called *"Project Development Handbook" published in 2010).* The results | The feasibility study presented by project participants, with the provided quotations, allowed the verification of the main parameters of the project. Project participants included in the PDD the evidences regarding investments (equipments and civil works).<br><br>CL3 is closed. |

<table>
<tr><th>Corrective action and/ or clarification requests</th><th>Reference to Table 2</th><th>Response by project participants</th><th>Validation Conclusion</th></tr>
<tr><td></td><td></td><td>are presented in Excel spreadsheet:<br><table><tr><th></th><th>EPA study (USD)</th><th>CGR Guatapara CDM Project (USD)</th></tr><tr><td>Capex - Electricity (USD/kW)</td><td>1,700</td><td>1,389</td></tr><tr><td>Capex - LFG collection and transport system (USD/project)</td><td>3,451,346</td><td>1,813,026</td></tr><tr><td>Annual O&M costs - Eletrcity</td><td>180</td><td>174</td></tr><tr><td>Annual O&M costs - LFG collection and transport system</td><td>578,127</td><td>308,833</td></tr></table><br>As can be noted, in the CGR Guatapara CDM Project all the costs are lower than EPA study. Therefore, in accordance with CDM View the financial data can be considered conservative.<br><br><u>Documentation Provided as Evidence by Project Participant:</u><br>• Feasibility study with quotations;<br>• EPA Study: http://www.epa.gov/lmop/publications-tools/handbook.html, Chapter 4.<br>• Comparison between CDM Project and EPA study.xlsx</td><td></td></tr>
<tr><td><s>CL 4</s><br>Project participant should clarify in the PDD (once defined which is the chosen analysis method, II or III), if the Scenario 1 is being (to be) compared to another scenario or a benchmark.</td><td>B.5.4.5<br>B.5.7.1</td><td>The analysis method chosen was option II – Comparison Analysis. The PDD version 2 dated of 08/04/2011 has been amended in accordance with this method.</td><td>The investment comparison analysis (option II) was chosen by project participants and properly included in the revised PDD.<br><br>This CL is closed.</td></tr>
<tr><td><s>CL 5</s><br>The published PDD describes that the climate data was provided from Instituto Nacional de Metereologia (INMET). However, the ER calculation spreadsheet / source shows the following link to address the average temperature: http://www.bdclima.cnpm.embrapa.br/resultados/</td><td>B.6.1.2<br>B.6.4.1</td><td>The climate data has been amended in the PDD version 2 dated of 08/04/2011 and also in the ER calculation spreadsheet. The source is "Instituto Agronômico de Campinas" (IAC.)<br>The web source previously provided (http://www.bdclima.cnpm.embrapa.br/result</td><td>PP amended the PDD accordingly and provided the available link.<br><br>CL 5 is closed.</td></tr>
</table>

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
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| balanco.php?UF=&COD=440, but this link could not be accessed. PP is requested to clarify the correct source used for the temperature average and update the ER calculation spreadsheet and the PDD accordingly. | | ados/balanco.php?UF=&COD=440) is totally functional and last accessed on 10/02/2011.<br><br>However, PP sent to DOE a document with this data.<br><br>Documentation Provided as Evidence by Project Participant:<br>• Dados Climáticos - Ribeirao Preto.pdf | |
| ~~CL 6~~<br>PP is requested to justify the estimated electricity consumption from grid of 657 MWh/y as well the diesel generator consumption of around 2 MWh/y. Moreover, PP should clarify which is the correct year version of the National Energy Balance used in the PDD. | B.6.2.2 | The PP sent to DOE a document about the estimated electricity consumption from the grid and diesel generator.<br><br>Documentation Provided as Evidence by Project Participant:<br>• Consumo de Energia - CGR Guatapará.xlsx<br>• Especificação Aspirador.pdf<br>• Especificação do compressor.pdf<br>• Especificações - Ar condicionado.pdf | PP justified the consumption from the grid accordingly to the evidences sent.<br><br>CL 6 is closed. |
| ~~CL 7~~<br>PP is requested to provide evidences of the disposed waste quantity from 2007 to 2022, indicated in the Feasibility Study. For the years after 2010, PP should justify the forecasted waste. | B.6.5.1 | The PP sent to DOE evidences proving the disposed waste quantity.<br><br>Documentation Provided as Evidence by Project Participant:<br>• *Estimativa no recebimento de Resíduos.pdf* | PP justified the waste quantity accordingly.<br><br>CL 7 is closed. |
| ~~CL 8~~<br>PP is requested to clarify whether the on-site consumption of electricity provided by the grid and attributable to the project activity will be monitored and update the PDD accordingly. | B.7.1.2<br>B.7.3.3 | Information regarding the on-site consumption of electricity provided by the grid has been included in section B.7.2. item 2.4 of the PDD version 2 dated of 08/04/2011. | PP corrected PDD accordingly.<br><br>CL 8 is closed. |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
|---|---|---|---|
| ~~**CL 9**~~<br>PP is requested to clarify how **f (%)**: "*Fraction of methane captured at the SWDS and flared, combusted or used in another manner*" will be monitored, in accordance with the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 4, as described into the PDD page 29. Moreover, this Tool version shall be corrected in this mentioned page and other places in the published PDD, where version 4 is also mentioned. | B.7.1.2<br>B.7.3.3 | ACM0001 v11, page 10 states that: *"The tool estimates methane generation adjusted for, using adjustment factor (f) any landfill gas in the baseline that would have been captured and destroyed to comply with relevant regulations or contractual requirements, or to address safety and odor concerns. As this is already accounted for in equation 2, "f" in the tool shall be assigned a value 0".*<br><br>As described above, there is no need on monitoring this parameter. However, it has been included in section B.7.1. (containing the parameters monitored) to line up with the methodology. The respective corrections regarding the Tool version have been amended in the PDD. | The parameter is required to be monitored, for example, in case that the legislation changes. Nevertheless, PP added the parameter (f) to be monitored.<br><br>CL 9 is closed. |
| ~~**CL 10**~~<br>PP is requested to clarify whether the parameters $GWP_{CH4}$ : *Global Warming Potential*, $p_{n,j,x}$: *Weight fraction of the waste type j in the sample n collected during the year x*, and z: *Number of samples collected during the year x* will be monitored as required by the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" latest version (5). | B.7.1.2<br>B.7.3.3 | As stated in the "*Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site*", $GWP_{CH4}$ is considered a monitored parameter and has been amended accordingly in section B.7.1. of the PDD version 2 dated of 08/04/2011. Regarding $p_{n,j,x}$ , according to the *"Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site " – version 5*, the parameter comment table states that "*This parameter only needs to be monitored if the waste prevented from disposal includes several waste categories j, as categorized in the tables for DOCj and kj*", however, in the project activity case, the waste is disposed in the landfill and not prevented from it. Thus, the parameter is not applicable and do not need to be monitored. | PP included the parameter GWPCH4 to be monitored.<br><br>CL 10 is closed. |
| ~~**CL 11**~~ | B.7.1.3 | There was a mistake in the PDD – version | PP amended the PDD accordingly. |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
|---|---|---|---|
| PP is requested to clarify (PDD page 59):<br>- how receipts for purchased diesel will allow the calculation of project emissions ($PE_{FCj,y}$) from used (combusted) diesel;<br>- what additional information will be delivered from the fuel company;<br>- what information from IPCC guidelines will be used in case information can not be produced. | B.7.3.3 | 1.<br>According to ACM0001 – version 11, page 12, for the estimation of project emissions from electricity consumption (PEEC,y), the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" should be used. However, in the PDD – version 1, it was used the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion". This latter Tool is only applicable to project emissions from heat consumption and this is not the project activity case as explain in section B.6.1 of the PDD – version 1.<br><br>However, according to option B1) from "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" it is necessary to monitor the electricity generated by diesel generators. The monitored parameters are: diesel and electricity consumption as well as NCV and emission factor from diesel.<br><br>In Brazil, the diesel suppliers do not provide information about NCV and emission factor. Therefore, national data (such as Brazilian National Balance) will be used in the monitoring process and, in absence of such information, it will be used IPCC data.<br><br>The PDD version 2 dated of 08/04/2011 was amended in Section B.6.1 and B.7.2. | CL 11 is closed. |
| ~~**CL 12**~~<br>PP is requested to provide the minutes of meeting from the stakeholders presentation and related evidences such as the presentation, photos, etc. | E.1.3<br>E.1.4<br>E.1.5 | According to the Resolutions Number 1, 4 and 7 of the Brazilian Designed National Authority (CIMGC – Comissão Interministerial de Mudança Global do Clima / *Interministerial Commission on* | PP justified accordingly.<br><br>CL 12 is closed. |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
|---|---|---|---|
| | | *Global Climate Change*), project participants are not required to undertake stakeholders presentation meetings or present related evidences such as the presentation, photos, etc. The same Resolutions states that Project Participants shall send letters to local stakeholders 15 days before the start of the validation period, in order to receive comments. No comments were received so far. | |
| ~~**CL 13**~~<br>As per the published PDD, data will be archived throughout the crediting period and two years thereafter. Nevertheless, as per the "Guidelines for completing the simplified Project Design Document (CDM - PDD) and the proposed new baseline and monitoring methodologies (CDM - NM)", data monitored and required for verification and issuance are to be kept for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. PP is requested to revise PDD accordingly. | B.7.3.4 | The PDD version 2 dated of 08/04/2011 has been revised accordingly. | PP amended the PDD accordingly.<br><br>CL 13 is closed. |
| ~~**CL 14**~~<br>PP is requested to provide evidence to demonstrate that there is no public funding for this project. | A.4.3 | The PP sent to DOE a document proving that there is no public funding for this project.<br><br>Documentation Provided as Evidence by Project Participant:<br>• *Declaração de fundo ODA.pdf* | PP provided the letter of CGR-Guatapará confirming that there is no public funding involved.<br><br>CL 14 is closed. |
| ~~**CL 15**~~<br>PP is requested to clarify why this source was neglected since There is a diesel generator consumption, which will be around 2 MWh/year, as stated in the PDD | B.3.3 | This source has not been neglected. In Table 9 of Section B.6.3 of the PDD – version 1 as well as in the CERs spreadsheet (sheet "project emissions") this source (emission from diesel generator) has been considered. | PP clarified about the diesel generation source.<br><br>CL 15 is closed. |
| ~~**CL 16**~~ | B.3.3 | In the first phase, there will not be electricity | PP clarified accordingly about the |

| Corrective action and/ or clarification requests | Reference to Table 2 | Response by project participants | Validation Conclusion |
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| PP is requested to clarify why it will "may be" an important source since in the first phase all the electricity is imported and in the second phase it seems that it will be consumed by the biogas generators | | generation in the CDM Project, consequently, the electricity will be purchased from the grid.<br><br>In the second phase, electricity will be generated in the CDM Project. However, the biogas power plant is subjected to interruptions due to special events, for example, overhaul times, downtimes of equipment, exchange of equipment. For such cases, electricity will be purchased from the grid. And in the absence of electricity purchase from the grid (e.g. lack of electricity), electricity will be generated by diesel generator.<br><br>However, the $CO_2$ may be an important emission source because if considered that the power plant generates electricity during all the time, electricity from the grid would only be purchased in the first year of the project activity. | electricity generation and purchase from the grid.<br><br>CL 16 is closed. |
| ~~**CL 17**~~<br>PP is requested to clarify if the methane fraction ($W_{CH4,y}$) will be measured in wet of in dry basis. | B.7.1.2 | The methane will be measured in dry basis.<br><br>The PP included this statement in Section B.7.1 of the PDD version 2 dated of 08/04/2011. | PP updated the PDD accordingly.<br><br>CL 17 is closed. |

## TABLE 4 FORWARD ACTION REQUESTS

| Forward action request | Reference to Table 2 | Response by project participants | Validation Conclusion |
|---|---|---|---|
| **FAR 1**<br>At the time of site visit, the project did not start any equipment's installation or civil construction and procedures were not available. In the first verification it shall be checked if the monitoring arrangements described in the monitoring plan are feasible and if training courses were provided to the operational team and if data archiving and data collection procedures are properly described and implemented. | B.7.2.1<br>B.7.3.3 | | |