

# VALIDATION REPORT

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## ECOSECURITIES INTERNATIONAL LTD.

### New England Landfill Gas to Energy Project

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**SGS Climate Change Programme**

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<b>Date of Issue:</b>		<b>Project Number:</b>	
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<b>Project Title:</b>			
New England Landfill Gas to Energy Project			
<b>Organisation:</b>		<b>Client:</b>	
SGS United Kingdom Limited		EcoSecurities International Ltd.	
<b>Publication of PDD for Stakeholders Consultation</b>			
<b>Commenting Period:</b>		17 <sup>th</sup> March 2009 to 15 <sup>th</sup> April 2009	
First PDD Version and Date:		Version 01 dated 13/03/2009	
Final PDD Version and Date:		Version 04 Dated 20/01/2011	
<b>Summary:</b>			
<p>EcoSecurities International Ltd has commissioned SGS to perform the validation of the project: New England Landfill Gas to Energy Project</p> <p>Methodology Used: ACM0001</p> <p>Version and Date: Version 11 Valid from 11 June 09 onwards</p> <p>The scope of the validation is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and applicable CDM requirements.</p> <p>The report is based on the assessment of the project design document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews, follow up actions (e.g. site visit, telephone or e-mail interviews) and also the review of the applicable approved methodology and underlying formulae and calculations.</p> <p>The report and the annexed validation describes a total of 11 CARs/CLs findings which include:</p> <ul style="list-style-type: none"> <li>• 10 Corrective Action Requests (CARs);</li> <li>• 01 Clarification Requests (CLs);</li> <li>• 0 Forward Action Requests (FARs);</li> </ul> <p>This project will be recommended to the CDM Executive Board with a request for registration.</p>			
<b>Subject:</b>		<b>Document Distribution</b>	
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## Abbreviations

CAR	Corrective Action Request
CDM EB	Clean Development Mechanism Executive Board
CDM	CDM Executive Board
CER	Certified Emission Reduction
CL	Clarification Request
DOE	Designated Operational Entity
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
HCA	Host Country Approval
IPCC	Intergovernmental Panel on Climate Change
LFG	Landfill Gas
LoA	Letter of Approval
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

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## 1. Validation Opinion

SGS United Kingdom Ltd has been contracted by EcoSecurities International Ltd to perform a validation of the project: New England Landfill Gas to Energy Project.

The Validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism (CDM), Validation and Verification Manual version 1.2 and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

By implementing New England Landfill Gas to Energy Project which is a combination of landfill gas (LFG) collection and utilisation system, the project activity will result in reductions of greenhouse gas (GHG) emissions that are real, measurable and give long-term benefits to the mitigation of climate change. The project activity will consist of two distinct stages. In the first stage, LFG will be captured and destroyed by using a LFG flare, while in the second stage the captured LFG will be fed to the LFG flare and a modular electricity generation plant. The purpose of flaring is to destruct the methane recovered by using high efficient gas collection system as well as flaring equipment. The generator will combust the methane in the LFG to produce electricity for export to a local power purchaser.

In our opinion, the project meets all relevant UNFCCC, CDM criteria and all relevant host country criteria. The project correctly applies methodology ACM0001 version 11. 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 emission reductions from the project are estimated to be **357,366** tCO<sub>2</sub>e over a seven year crediting period during 01/01/2010 to 31/12/2016, averaging **51,052** tCO<sub>2</sub>e annually. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not change.

The project will hence be recommended by SGS for registration with the UNFCCC.

### Signed on Behalf of the Validation Body by Authorized Signatory



Signature:

Name: Siddharth Yadav

Date: 25<sup>th</sup> January 2011

## 2. Introduction

### 2.1 Objective

EcoSecurities International Ltd has commissioned SGS to perform the validation of the project: New England Landfill Gas to Energy Project with regard to the relevant requirements for Clean Development Mechanism (CDM) project activities. The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan (MP) and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reduction (CER). UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities and related decisions by the COP/MOP and the CDM Executive Board.

### 2.2 Scope

The scope of the validation is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. SGS has employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

### 2.3 GHG Project Description

The proposed project activity is a combination of landfill gas (LFG) collection and utilisation system. The project activity will consist of two distinct stages. In the first stage, LFG will be captured and destroyed by using a LFG flare, while in the second stage the captured LFG will be fed to the LFG flare and a modular electricity generation plant. The purpose of flaring is to destruct the methane recovered by using high efficient gas collection system as well as flaring equipment. The generator will combust the methane in the LFG to produce electricity for export to a local power purchaser. Therefore, this is expected that the project activity will reduce the GHG emission.

### 2.4 The Names and Roles of the Validation Team Members

Assessment Team	Role
Kunal Sharma	Lead Assessor
Cornelius Van Den Berg	Local Assessor
Gaurav R. Lunawat	Sectoral Expert Scope 13
Abhishek Mahawar	Expert (Financial)

Technical Review Team	Role
Kaviraj Singh	Technical Reviewer/ Sectoral Expert Scope 13

### 3. Methodology

#### 3.1 Review of CDM-PDD and Additional Documentation

The validation is performed primarily as a document review of the publicly available project document version 01 dated 13/03/2009 and the subsequent version 02 dated 15/05/2009, version 03 dated 17/08/2010 and version 04 dated 20/01/2011 (final version). The assessment is performed by trained assessors using a validation protocol attached as Annex 2, table 2.

The site visit was performed by Kamesh Iyer and Cornelius Van Den Berg from 13/04/2009 to 15/04/2009. The lead assessor and local assessor on the site visit discussed the baseline, PDD related documents, CDM consideration, additionality and applicability criteria. The local assessor was involved in verifying all necessary documents on site and also confirmed other statements in the PDD through review of documents direct contacts with key stakeholders. A few key stakeholders were interviewed and various environmental laws, sustainability issues, energy statistics and all relevant data were cross checked.

#### 3.2 Use of the Validation Protocol

The validation protocol used for the assessment is designed in accordance with the Validation and Verification Manual, Version 1.2 dated 30 July 2010. It serves the following purposes:

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation (reporting).

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	Ref ID	Means of Verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	Lists any references and sources used in the validation process. Full details are provided in the table at the bottom of the checklist.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (Y), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification Request (CL) is used when the validation team has identified a need for further clarification.

The completed validation protocol for this project is attached as Annex A.1 to this report

#### 3.3 Findings

As an outcome of the validation process, the team can raise different types of findings

**A Clarification Request (CL)** is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met

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

- 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;

III. There is a risk that emission reductions cannot be monitored or calculated.

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

**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.

Corrective Action Requests and Clarification Requests are raised in the draft validation protocol and detailed in a separate form (Annex A.3). In this form, the Project Developer is given the opportunity to "close" outstanding CARs and respond to CLs and FARs.

### **3.4 Internal Quality Control**

Following the completion of the assessment process and a recommendation by the Assessment team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team. Findings can be raised at this stage and client must address them within agreed timeline.



## 4. Validation Findings

### 4.1 Approval

**CAR #1** was raised asking to submit the HCA issued by South African DNA. In response, the proponent has submitted the Host Country Letter of Approval issued by the DNA (South Africa) dated 02/10/2009. DOE has noted that the ER figures mentioned in the final PDD and the issued LoA is different; however, an addendum to the LoA has been issued by DNA which confirms that the original LoA was issued to the same project activity hence **CAR #1** was closed.

**CAR #2** was raised asking to submit the Letter of Approval from United Kingdom of Great Britain and Northern Ireland. In response, the Letter of Approval from United Kingdom of Great Britain and Northern Ireland; reference no. ESInt/28/2009 dated 15/10/2009 has been submitted to the DOE by the proponent; hence, **CAR #2** was closed out.

The authenticity of the Host Country Approval letter issued by the South African DNA has been cross checked with an email confirmation from the Department: Energy, Republic of South Africa acting as DNA of South Africa dated 13/04/2010<sup>/36/</sup>.

The authenticity of the UK LOA has been checked with the list of projects with UK approval of participation available online on the Department of Energy & Climate Change website<sup>/37/</sup>.

The title of the project "New England Landfill Gas to Energy Project" is in compliance with the Para 49 VVM (EB 44 Annex 3) and each letter confirms:

- The Party is a Party to the Kyoto Protocol;
- Participation is voluntary;
- In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country;
- It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.

### 4.2 Participation Requirements

The Parties that are identified are South Africa and United Kingdom of Great Britain & Northern Ireland. The Host Party (South Africa) has ratified the Kyoto Protocol on 31<sup>st</sup> July 2002 and is allowed to participate in the CDM project activity which can be cross verified from <http://maindb.unfccc.int/public/country.pl?country=ZA>. The Annex I Party (United Kingdom of Great Britain and Northern Ireland) has ratified the Kyoto Protocol on 31<sup>st</sup> May 2002 and has been verified from <http://maindb.unfccc.int/public/country.pl?country=GB>. The Project will assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment. The project activity is likely to contribute to sustainable development of the non-Annex I Party, South Africa.

### 4.3 Project Design Document including Project Description

The project activity is titled "New England Landfill Gas to Energy Project" and clearly identifies the CDM project activity in terms of uniqueness and distinguishes the project activity and satisfies the criterion for CDM projects. The project activity is to capture and destruct the landfill gas (LFG) during the first phase and to generate power by utilizing the landfill gas in the second phase.

The PDD version 04 of this project is in compliance with the format of "PROJECT DESIGN DOCUMENT FORM (CDM PDD) - Version 03.1." The PDD version 04 was completed according to the "Guidelines for completing the project design document (CDM-PDD)" and other relevant CDM guidance.

In the existing scenario, the methane generated by the landfill was released in the atmosphere without any capture or utilization. The PDD covers all the relevant details about the CDM project activity that can be considered essential for a clear and transparent overview. The technology has been described as mentioned in the PDD Version 04 and details the description and the design of the respective project equipments (gas engines). This has been validated from the first Purchase Order dated 09/04/2009<sup>/07/</sup> and found OK. Hence, it can be concluded that the project description as provided in the PDD version 04 is

complete and accurate as crosschecked thorough site visit, document reviews and interviews with stakeholders as stated above.

The project activity is a landfill project which is to capture and flare LFG and in future course generate electricity using captured landfill gas. The information provided in the PDD Version 04 allows a clear indication of the site along with its geographical co-ordinates. These were checked on site and are as follows -

Geographic coordinates are 29°36'22.92" South, 30°25'08.84" East

The project participants are in possession of all ownership licenses and documents to operate on site. An assignment of contract rights and site permits<sup>/10/</sup> is in place between the project developer and the Msunduzi Municipality.

During the site visit, it was also validated that the project activity doesn't involve any alteration or modification of the existing system. The project is a green field project where a new system is being installed to recover and utilize the landfill gas for power generation. In the pre project scenario, the methane generated from the landfill was being released in the open atmosphere in the absence of the project activity. This has also been validated and confirmed that the project activity will not receive any public funding from an Annex-1 country by receiving a declaration from the project proponent dated 09/04/2009<sup>/09/</sup>. No diversion of ODA has been observed since the finance is through private parties.

**CAR #3 was raised** as the PDD was not clear on the total proposed capacity of the energy generating unit and details on the methane generation capacity of the site including description of the site in terms of area and volume. The technology description did not match with the ER spreadsheet information and was not clear on the capacity that would be installed. In response, the proponent submitted the revised PDD where the expected installed capacity for electricity generation is clearly mentioned as 2.3 MW and with a current area used for land filling of approximately 3800m<sup>2</sup>, an active landfill footprint of approximately 2500m<sup>2</sup> and approximately 3.7 million m<sup>3</sup> of solid waste is currently deposited on the site<sup>/08/</sup>. This was validated and found OK. Hence, **CAR #3 was closed out**.

#### **4.4 Applicability of selected methodology to the project activity**

The large scale methodology ACM 0001 version 11, adopted at EB 47, "Consolidated baseline and monitoring methodology for landfill gas project activities" has been used in the project activity and as discussed above, the project activity is a combination of two complementary activities, methane recovery/collection and destruction through flaring and/or utilization through combustion for electricity generation. This is inline to the applicability conditions (a) & (b) stated in the applied methodology. However, this has been noted that version 10 of ACM0001 has expired during the completeness check; therefore, the PP has revised the PDD version 04 in line with version 11 of ACM0001.

The baseline scenario is the total atmospheric release of LFG which satisfies the specific applicability requirement of the methodology ACM0001 version 11 and has been validated from the New England landfill site permit (permit no. 16/2/7/U203/D3/Z1/P64) issued by Department of Water Affairs and Forestry.<sup>10</sup>

The aforesaid was checked and validated during the validation site visit (13 to 15 April 2009). The desk review of project related documents in particular /7/, /8/, /10/, /12/ and /23/ and the subsequent follow-up interviews have provided sufficient evidence to confirm that project activity meets all the applicability criteria of the methodology in accordance with the CDM requirements.

The assessment team also confirms that there are no sources of emissions involve in the project activity that contribute to more than 1% of the total annual emission reductions by the project activity and are not being addressed by the methodology applied<sup>/3/</sup>.

The proposed project activity satisfies the applicability conditions of following applicable tools which have been discussed in detail in other sections of the report:

a) "Tool to determine project emission from flaring gases containing methane" (Version 1, adopted at EB 28)

- b) "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" Version 04, adopted at EB 41.
- c) "Tool to calculate project or leakage CO<sub>2</sub> Emissions' from fossil fuel combustion"; Version 02, adopted at EB 41.
- d) "Tool to calculate baseline, project and/or leakage emissions from electricity consumption"; Version 01
- e) "Tool to calculate the emission factor for an electricity system", Version 2.0

#### 4.5 Project Boundary

Project boundary has been validated during site visit and confirmed that it is in line with the requirement of the methodology ACM0001 version 11. The project activity is capture and flaring /usage of LFG gas and hence "The project boundary is the site of the project activity where the gas is captured and destroyed/used".

The summary of the source of the gases is within the project boundary, and the justification/explanation of where the gases and sources are included or not; have been discussed in the PDD version 04. The PDD clearly depicts flow diagram indicating all possible elements/components of the project activity.<sup>02</sup>

Also since the electricity for project activity is sourced from grid or electricity generated by the LFG captured would have been generated by power generation sources connected to the grid, the project boundary includes all the power generation sources connected to the South African National Grid to which the project activity is connected. The PDD Version 04 has accounted Methane gas as emissions from the decomposition of waste at the landfill site & Carbon di Oxide gas as emissions from electricity consumption in the baseline and this has been verified.

The project is yet to be commissioned and electricity generation stage will be achieved during the last stage of the project. The project is in the initial phases and hence no PPA is available.

**CAR #4 was raised** because the information regarding the relevant grid is not mentioned under section B.3 of the PDD v01 and the project under consideration is a grid connected electricity project activity. The electricity generated from the project activity will displace the predominant fossil fuel based grid electricity. Therefore, information with regards to the relevant grid was incorporated in the PDD v02 i.e. South African National Grid. Hence, **CAR #4 was closed out**

#### 4.6 Baseline Selection and Additionality

The project activity is based on the following methodology ACM0001 version 11, which also refers to "Tool for the demonstration and assessment of additionality", to identify the realistic and credible baseline alternatives.

The proponent has identified alternatives for the disposal/treatment of the waste in the absence of the project activity, i.e. the scenario relevant for estimating baseline methane emissions, has been analyzed and has included the following scenarios as mandated by the methodology ACM0001 Version 11 for LFG & Power generation *inter alia*<sup>03</sup>:

LFG1: The project activity (i.e. capture of landfill gas and its flaring and/or its use) undertaken without being registered as a CDM project activity;

LFG2: Atmospheric release of the landfill gas or partial capture of landfill gas and destruction to comply with regulations or contractual requirements, or to address safety and odor concerns.

The above mentioned alternatives have been considered by the project proponent to determine the baseline scenario for the project activity. The proposed project activity is the installation of a landfill gas project on a landfill where there is no system existing to capture and destroy the LFG gas as discussed above in the section 4.4 of the report. LFG1 is not the most attractive course of action in the absence of project activity as analysed and validated in the section 4.6.4 (investment analysis) of the report, hence, this alternative is not considered to be the most plausible baseline scenario. . Therefore, LFG 2 (atmospheric release of the

landfill gas) which represents the business as usual scenario has been considered as the most plausible baseline scenario.

For Phase 2, generation of electricity is also considered from the LFG recovered and accordingly the proponent has discussed the realistic and credible alternatives for power generation as per the methodology requirement which may include<sup>03</sup>:

- P1: Power generated from landfill gas undertaken without being registered as CDM project activity;
- P2: Existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant;
- P3: Existing or construction of a new on-site or off-site renewable based cogeneration plant;
- P4: Existing or construction of a new on-site or off-site fossil fuel fired captive power plant;
- P5: Existing or construction of a new on-site or off-site renewable based captive power plant;
- P6: Existing and/or new grid-connected power plants.

PP has identified following two plausible baseline alternatives for the power generation i.e. P1 and P6:

**P1:** Power generated from landfill gas undertaken without being registered as CDM project activity which represents the project activity. However, **P1** corresponds to **LFG 1** which is not the most attractive course of action in the absence of project activity as explained in the investment in section 4.6.4 below

**P6:** Power plants connected to the grid.

Alternatives P2 and P3 were eliminated as the project does not aim at producing thermal energy (heat) and concentrates on production of electricity and supplying it to South Africa National Grid. Since, power will be generated by combusting LFG recovered in gas engines; therefore renewable sources other than LFG are not economically feasible for the project activity as no other renewable energy options available at site. Hence, P3 and P5 can not be the plausible alternative scenarios. Since, in the pre-project scenario, electricity is being imported in the landfill site (dump site) to manage the site. Therefore, alternatives P3 and P5 have been discarded for further consideration.

P4 and P5 were also ruled out because the grid connection already exists on the landfill site as discussed above. Therefore, construction of a new on-site or off-site fossil fuel fired and/or renewable based captive power plant is not plausible if compared with power purchase from the grid.

These alternatives were discussed on site and through interviews it could be concluded that the scenarios undertaken are valid scenarios.

The baseline scenario for the proposed project activity has been validated and can be concluded as mentioned below:

1. LFG 2 (Landfill Gas): The atmospheric release of the landfill gas. There is no active gas collection system but only a passive venting system in place at New England Landfill.
2. P6 (Power Generation): Power plants connected to the grid. The project site is currently importing electricity by the grid.

#### 4.6.1 Additionality

The additionality of the proposed project activity is demonstrated as per ACM0001 version 11 which refers to the latest version of the "Tool for the demonstration and assessment of additionality" Version 5.2 for the assessment of the additionality. The proponent satisfied all the requirements as per additionality tool i.e. steps and sub-steps to be followed as per the additionality tool and other guidelines related to the CDM consideration which has been discussed in detail hereafter in the sections given below.

#### 4.6.2 Prior Consideration of the Clean Development Mechanism

As per EB 41 Annex 46, the project activity falls under the category of new project activity, since; the project activity's start date is 09/04/2009<sup>07/</sup> (the date on which the project developer has ordered the landfill gas to electricity generator for the project activity). The PDD Version 01 was web-hosted on the UNFCCC website from 17/03/09 to 15/04/09 for global stakeholder consultation.<sup>11/</sup>

So, as per the guidelines, notification to the Host Party DNA and UNFCCC secretariat is not necessary in this case. Thus, it proves the serious CDM consideration for the proposed project activity as the PDD is already webhosted prior to the project activity start date<sup>11</sup>.

The start date considered as the real action taken towards the project activity as per the “Glossary of CDM terms” which is in line with the guidelines given in EB 41 Para 67 “the earliest date at which either the implementation or construction or real action of a project activity begins”. The real action is the purchase order placed by the project proponent for 1.15 MW biogas genset dated 09/04/2009.<sup>07</sup> PP has discussed several milestones achieved during their approach for the CDM project and few of the major milestones are as mentioned below:<sup>12, 13 & 14</sup>

1. Final Lease & Gas Rights Agreement Signed by Ener-G Systems Msunduzi (Pty) Ltd and the Msunduzi Municipality dated 26 Sept’ 2007 to develop the proposed project under CDM: The agreement in its section Recital, mentions that ENER-G Systems Msunduzi intends to enter into ERPA for the sale and purchase of CERs arising from the combustion of Landfill Gas by ENER-G Systems Msunduzi.<sup>12</sup>
2. ERPA signed between the project developer and EcoSecurities dated 07 Jan’08: The signing of ERPA before the start date of the project activity further substantiates the seriousness of CDM consideration by the Project Developer.<sup>13</sup>
3. Validation Work Order Signed with DOE dated 16 March’09.<sup>14</sup>

**CAR #5 was raised** to submit any objective evidence for the awareness towards the CDM project activity prior to the start date and to submit supportive for the serious CDM consideration as per EB 41 annex 46. In response to CAR #5 the proponent revised the PDD with the start date 09/04/2009 as the date on which the project developer has ordered the landfill gas to electricity generator for the project activity. This is inline with EB41 para 67 guidance whereas the earlier start date was considered as the date of signing of the Lease & Gas Rights Agreement with the Msunduzi Municipality. However this signing had no impact on financials as this was more procedural. This was validated by examining the Lease & Gas Right Agreement where there are no financial commitments from any parties. It has also been clarified that the PDD was uploaded for public stakeholder consultation on the UNFCCC website on the 17/03/2009 and the start date of the project activity is 09/04/2009 which is after submission of the project for validation to DOE. Hence **CAR #5 has been closed out.**

After assessing the documents, this has been validated that the proposed CDM project activity complies with the requirements of EB 41 Annex 46 and CDM was seriously considered.

#### 4.6.3 Identification of alternatives

The identification of the alternative scenarios for the proposed project activity has been carried out as per ACM0001 version 11 which refers to the “Tool for the demonstration and assessment of additionality” Version 5.2 and follows the subsequent steps:

##### **Step 1: Identification of alternatives to the project activity consistent with current laws and regulations**

Sub-step 1a: Defines alternative to the project activity:

1) As described above in the section 4.6, two alternatives have been discussed by the project proponent for the proposed project activity:

- **LFG 1:** The project activity (i.e. capture of landfill gas and its flaring and/or its use) undertaken without being registered as a CDM project activity.
- **LFG 2:** Atmospheric release of the landfill gas or partial capture of landfill gas and destruction to comply with regulations or contractual requirements, or to address safety and odour concerns.

LFG1 was analysed in the section 4.6.1 (investment analysis) to be not the most attractive course of action in the absence of project activity and not the most plausible baseline scenario as well.

Project may also include the electricity generation in future, realistic and credible alternatives may include P1 to P6. However, other alternatives except P1 and P6 have been discarded for further consideration as described above in the section 4.6.

Heat generation is not a part of the project activity, that is why, not considered in the absence of the project activity.



LFG 2, and P6 have finally been considered as the most plausible baseline alternatives for the project activity:

1. LFG 2 (Landfill Gas): The atmospheric release of the landfill gas. There is no active gas collection system but only a passive venting system in place at New England Landfill.
2. P6 (Power Generation): power plants connected to the grid. The project site is currently importing electricity by the grid.

Sub step 1b: Consistency with mandatory laws and regulations.

2) LFG2, atmospheric release of the landfill gas. There is no active gas collection system but only a passive venting system in place at New England Landfill which is business as usual scenario. The proponent has demonstrated that the identified alternative scenarios complies with South Africa's local and national laws and to justify the same PP has submitted draft 'Minimum Requirements for Waste Disposal by Landfill' published by Department of water affairs and forestry, 2005 constituting the most recent legislation on landfill site management available in South Africa<sup>/15/</sup>. The legislations/regulations do not include mandatory landfill gas capture or destruction requirements because of safety issues or local environmental regulations. P6, Power plants connected to the grid. The project site is currently importing electricity by the grid and complies with all applicable laws and regulations as per Electricity Act, 2006<sup>/16/</sup>.

#### **4.6.4 Investment analysis**

Step 2 (Investment analysis) has been demonstrated by the project proponent to determine whether the project activity is not:

- (a) The most economically or financially attractive; or
- (b) Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs).

##### ***Sub-step 2a: Determine appropriate analysis method***

As per the "Tool for the demonstration and assessment of additionality", version 5.2 option III, the benchmark analysis has been applied.

##### ***Sub-step 2 b: Option III. Apply benchmark analysis***

The project proponent has evaluated "Equity IRR" as a financial indicator and compared with the equity rates of return as benchmark available in the host country.

The depreciation has been added back to the cash flow as per Annex 58 of EB 51 Guidance Para 5. All Input values used in the Investment Analysis were checked with the supportive evidence. The PP has submitted all the versions of spread sheet for Investment analysis; same were checked by financial expert with their assumptions, links and formula used in the IRR spread sheet and found readable and all relevant cells are viewable and unprotected. It was ensured by validation team that calculation of IRR was transparent to such extent that the reader can reproduce the result as per Annex 58 of EB 51 Guidance Para 8. The PP has taken equity IRR in the investment analysis calculation which complies with the Guidance of EB 51 Annex 58 Para 09. Return on equity has been used as benchmark to compare the equity IRR which is in line with Para 12 EB 51 Annex 58. The benchmark has been based on publically available data which has been verified by validation team as per Annex 58 of EB 51 Guidance Para 12 & 13.

All the input values used in the calculation are applicable to the time of the investment decision taken by the project participant. This is 21/09/2007 when the resolution of the directors of Ener-G Systems (Pty) Ltd was passed to sign the Gas Rights Agreement with the Msunduzi Municipality for the development of the New England Landfill Gas to Electricity CDM Project.<sup>17</sup> The BID conditions are not considered here as a Tender doesn't constitute a binding agreement to go ahead with the project. Furthermore, the time gap between the investment decision and the referred sources is small enough to result in any material change in the values of input parameters. Also, as per VVM 1.2 para 111 (VVM 1.1, para 110), the input values have been referred to from third party sources.

##### **Project cost:**

The investment will be incurred in the project activity has been validated as 22,663,026.41 Rands from the below mentioned sources: <sup>18</sup>

Table: 1

S. No.	Project Investment	Unit Price	Total	Means of validation
1.	Power Generation equipment	R 6,657,349	R 13,314,698 (2 units of 1.15MW each)	Quote from Ener-G Natural Power dated 18/08/2007 <sup>/19/</sup>
2.	Electrical connection	R 1,500,000	R 1,500,000	Plantech Associates (August 2006) and Cato Ridge Electrical Construction (3 September 2007) Quotes <sup>/20/</sup>
3.	Civil Works	R 3,311,718	R 3,311,718	Quote from Ubuntu Transport Logistics (Pty) Ltd (4 September 2007) <sup>/21/</sup>
4.	Gas collection system	R 2,040,079	R 2,040,079	Quote breakdown from Megapile (17 September 2007) <sup>/22/</sup>
5.	Flaring system and monitoring equipment	R 2,496,532	R 2,496,532	Quote from Biogas Technology (5 September 2007) <sup>/23/</sup>
Total			R 22,663,026	

Ener-G Systems (PTY) Ltd. is a group company of the ENER-G Holdings Plc, a UK based Project Consulting firm. ENER-G designs, develops and finances energy efficient, sustainable and renewable solutions on a business-to-business basis globally (<http://www.energ.co.uk/contact-energ>). Ener-G Systems (PTY) Ltd. is a partnership between ENER-G Group and General Energy Systems who have finalised a joint venture to finance, design, build, and operate landfill gas to energy projects in South Africa (<http://www.cipro.co.za/cc/EntDet.asp?T1=%DD%44%25%85%54%C0%1D%BD%15%BC%3B%8D%BF%AE%21&T2=ENERG%20SYSTEMS>). ENER-G has extensive experience in both providing gas collection networks and use of the collected gas to produce renewable energy.

The total civil works cost (ZAR 3,311,718.00) in the project activity has been referred from the quotation from Ubuntu Transport Logistics (UTL) dated 04/09/2007 for civil works in the New England Landfill Gas to Energy project activity. The quotation gives a breakup of the scope of civil works and associated costs.

In the financial analysis, the aforesaid total civil work cost has been distributed over the life cycle of the project due to the dynamic nature of the project involving civil works at regular intervals. The project site is an active landfill open until year 2016 and therefore handles regular influx of waste. This regular waste influx shall result in an increase in height of the gas wells as well as increase the landfill gas availability (e.g. additional generator in year 2). The distribution of the total civil works costs over the project lifetime is based on project developer's experience in dealing with periodic maintenance required in these conditions.

The total civil work cost however, remains the same as obtained from UTL quotation. This has been validated that this is more conservative (results in relatively higher IRR) as compared to a scenario where the complete civil work cost is considered in the first year of project implementation.

The initial civil cost (year 2) is attributable to installation of the second generator and for raising the wells that have been installed earlier as the waste depth shall increase in these years due to addition of new layers of waste on top of older layers. The site is developed in such a manner that the waste is placed in

layers across the whole site and not in cells. Every two or three years the site is raised by another layer of waste that is placed across the whole site. The well height needs to be increased in order to maintain the gas collection system from the wells to the gas mains. The subsequent civil cost (year 6) accounts for further raising the wells as the waste depth increases and redoing some of the falls on the gas collection mains as the slopes for the site shall change and would cause condensation problems in pipes with dips.

After year 6 the landfill site will be closed (the site closure scheduled in 2016, no further waste will be added thereafter) as validated from the letter issued by WILSON and PASS Inc dated 15/11/2007<sup>/34/</sup> and subsequent civil works cost shall cover periodic maintenance of capping, profiling and well repairs as a result of differential settlement of the waste.

After the main civil works at the start of the project, the site will need to be improved in phases. This actually means that civil works will have to be re-done periodically. As the waste height is increased, associated periodic civil costs are estimated at ZAR 250,000 conservatively. In period 2, the second generator shall be installed increasing the cost to o ZAR 750,000 due to extra civil works related to the installation of this extra generator. Thus, in accordance with the dynamic nature of the project, requiring significant civil works at various stages, it is deemed appropriate to distribute the entire civil works cost, over the project lifetime.

Thus, it can be concluded that the approach used to distribute the total civil works costs over the lifetime of the project as per expected works is suitable and conservative. This has also been validated that there is no double counting of civil works cost as the total civil works cost used in financial analysis has been crosschecked with the UTL quotation as mentioned above<sup>/21/</sup>.

The project activity will only generate revenue by the sale of electricity generated from the project activity to the grid. The expected maximum installed capacity for electricity generation is 2.3 MW and is dependent on the LFG that will be captured from the landfill although the exact gas yield of the landfill site can only be confirmed once the project is operational as mentioned in the PDD section A.2 of the PDD. Also, the landfill gas production will fluctuate and it is evident from the baseline emission calculation sheet, the trend of quantity LFG captured will be at higher side till 2016 and after that it starts decreasing. That is why the power generation is varying from beginning till 7<sup>th</sup> year of the crediting period. The generators have a turn down ratio which allows the gensets to operate at a minimum load of 40% as validated from letter and email from Graham Brownlow, Engineering Department Manager, Ener-G Natural Power which is also accounted in the calculations and is a conservative approach overall.

### **Operation and Maintenance cost:**

Opex (O&M cost) has been verified to be 4,256,221 from the letter New England Landfill Gas to Energy CDM Project by Ener-G Systems<sup>/24/</sup>. This has been validated that the complete O&M cost (including project support cost i.e. 5.72% of CAPEX) for the project activity is estimated as 18.78% of the total investment.

The O&M cost for power generation was established by ENER-G Natural Power Limited UK since the generators used in the project activity were built in the UK and ENER-G Natural Power Limited has extensive experience in operation and maintenance<sup>/24/</sup>. Thus, ENER-G Natural Power Limited provided the guidance to Ener-G systems (PTY) Ltd. for estimating the O&M cost for power generation. This guidance on O&M cost, for power generation, was also available at the time of investment decision in line with EB 51, annex 58, para 6 as validated by the DoE<sup>/24/</sup>. Further, the O&M costs for Flare and Gas collection systems and project support costs were budgeted by the project developer based on their past experience and were valid at the time of investment decision.

The O&M cost applied in the project activity has been validated as follows:

Table: 2

Description	Value	Comment
O&M cost - power generation	R 2,334,221	Established according to sector experience by Ener-G UK (see letter New England CDM Project by Ener-G Systems)
O&M - gas collection	R 250,000	Budgeted by Project Developer. This is based on a 2 year average.
O&M cost - flare	R 375,000	Budgeted by Project Developer



Project support costs	R 1,297,000	Budgeted by Project Developer
Grand Total	R 4,256,221	

This has been further validated that the Project support cost (ZAR 1,297,000) included in the financial analysis, were budgeted by the project developer as 5.72% of the total Capital Expenditure (ZAR 22,663,026.41). A breakdown of the project support cost attributable to the project activity has been validated from the letter issued by ENER-G Systems for the financial year 2008-2009<sup>/32/</sup> and it clearly describes the scope of services covered under site project support costs. The breakdown of the project support cost is as following:

Table: 3

	Cost to Company per annum		Days Allocated to Site	Total	
<b>Administration</b>					
Financial Manager	R	576,000.00	28.00	R	61,090.91
Accountant	R	440,000.00	36.00	R	60,000.00
Administrators (2 off)	R	440,000.00	36.00	R	60,000.00
Director operations	R	500,000.00	24.00	R	45,454.55
Operations Manager	R	400,000.00	26.00	R	39,393.94
Design Engineer	R	450,000.00	36.00	R	61,363.64
Projects Manager	R	375,000.00	26.00	R	36,931.82
Electrical engineer	R	385,000.00	26.00	R	37,916.67
General Manager	R	600,000.00	36.00	R	81,818.18
Non Executive Directors Remuneration	R	1,200,000.00	22.00	R	100,000.00
<b>Overheads</b>					
Rent	R	250,000.00	36.00	R	34,090.91
Office equipment	R	72,000.00	36.00	R	9,818.18
Telephone	R	72,000.00	36.00	R	9,818.18
Lights and Water	R	43,200.00	36.00	R	5,890.91
Stationary	R	65,000.00	36.00	R	8,863.64
Software and Payroll costs	R	28,000.00	36.00	R	3,818.18
Fuel and Maintenance and Travel	R	600,000.00	36.00	R	81,818.18
Vehicle, equipment	R	750,000.00	36.00	R	102,272.73
Consultation (Legal and Auditing)	R	475,000.00	36.00	R	64,772.73
<b>Total</b>	<b>R</b>	<b>7,721,200.00</b>		<b>R</b>	<b>905,133.33</b>
<b>Other Site Costs</b>					
Workbook Calculations	R	55,000.00	36.00	R	7,500.00
Archiving	R	60,000.00	26.00	R	5,909.09
Senior Data Manager	R	500,000.00	36.00	R	68,181.82
Data Manager	R	450,000.00	26.00	R	44,318.18
Monitoring Reports	R	400,000.00	26.00	R	39,393.94
Travel	R	90,000.00	36.00	R	12,272.73
<b>Total</b>	<b>R</b>	<b>1,735,000.00</b>		<b>R</b>	<b>177,575.76</b>

<b>Other Project Overheads</b>					
Senior HSE representative	R	380,000.00	26.00	R	37,424.24
HSE representative	R	340,000.00	26.00	R	33,484.85
Training/Protective equipment	R	600,000.00	26.00	R	59,090.91
Work Instructions	R	450,000.00	26.00	R	44,318.18
Procedure documents	R	350,000.00	26.00	R	34,469.70
Travel	R	60,000.00	26.00	R	5,909.09
<b>Total</b>	<b>R</b>	<b>2,180,000.00</b>		<b>R</b>	<b>214,696.97</b>
<b>Grand Total</b>	<b>R</b>	<b>11,636,200.00</b>		<b>R</b>	<b>1,297,406.06</b>

Other companies also outsource Ener-G Systems to provide similar support services to external projects. Also, this has been cross validated from the invoice for Chloorkop Landfill Project Support Costs to substantiate the appropriateness and suitability of the budgeted value for New England Landfill project as a third party invoice available. Chloorkop is a similar size landfill site located in the Johannesburg area which is being managed by Enviroserve Waste Management. As explained above, Ener-G System delivers site specific project support services to this site. The Invoice referred has been raised by Ener-G systems to EnviroServe Waste management Services (Pty) Ltd against support services. As evident from the Annexure 2B, the support costs for the month of February 2008 for Chloorkop is ZAR 100,347.51. These support cost are similar and comparable to the monthly support cost estimated for New England (ZAR 110,000) in the financial analysis. The New England Landfill project support costs are a slightly higher than that of Chloorkop as Chloorkop has only gas collection and flaring system whereas New England support cost also includes support costs attributable to the power generation component of the project activity besides gas collection and flaring components (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1171370021.04/view>). Also, the CDM data collection cost which was considered earlier in the project support cost has been removed from the total project support cost because it will not be attributable to the project activity without CDM.

Furthermore, it was validated that the project support cost is a part of the total O&M cost considered in the financial analysis and the similar projects compared below (refer table 4) also included the project support cost in their total O&M cost. A comparative analysis for the O&M cost has been explained in table 4 below.

Also, the assumptions used in the IRR calculation have been mentioned in the table B.5.2 of PDD v04 along with the source which are found in line with the requirements of the guidelines.

It has been validated that the project activity has not yet been commissioned and currently the equipment is being installed. Thus, actual invoices of all costs could not be obtained. However, it can be confirmed that the actual costs that would be incurred shall be higher than that available at the time of investment decision as the costs have been increasing over the years due to inflation. Please refer Sub Step 2d for more details. However, in line with VVM 1.2 para 111(b), the suitability of investment cost and O&M costs assumed in the project activity have been cross checked using publically available sources. For a realistic comparison, nine other landfill projects were selected for comparison and appropriateness of the O&M costs. The details of comparison from these nine projects are given below:

Table: 4

Project	UNFC CC Ref	Country	Investment Cost (USD)	Average Annual O&M Cost (USD) over crediting period	O&M cost as a Percent age of Investment Cost %	Notes for O&M Cost Values	Comment
Durango - EcoMethane Landfill Gas to Energy Project	1307	Mexico	194,804.00	56,512.10	29.01	From PDD \$565,121 over 10 year crediting period	Includes flaring and electricity generation (2.0 MW)
Aguascalientes - EcoMethane Landfill Gas to Energy Project	0425	Mexico	386,229.00	56,683.00	14.68	From PDD	Includes flaring and electricity generation (2.0 – 4.0 MW)

Ecatepec - EcoMethane Landfill Gas to Energy Project	0523	Mexico	No information provided in PDD				Includes flaring and electricity generation (4-5 MW)
Ancon - EcoMethane Landfill Gas Project	1104	Peru	1,450,363.00	304,912.00	21.02	From PDD \$2,134,385 over 7 year crediting period	
Tultitlan - EcoMethane Landfill Gas to Energy Project	1242	Mexico	2,182,617.00	501,140	22.96	Values taken from Financial Analysis in Annex 3 - Average Annual O&M & project support cost is average of sum over 10 year crediting period (5011407/10 = \$501140)	Includes flaring and electricity generation (1.3 MW)
Kunming - Wuhua Landfill Gas to Energy Project	1661	China	4,269,210.00	765,600.00	17.93	From PDD \$29/MWh (Average O&M cost) * 3.3MW * 8000hrs/yr = \$765,600/yr	Includes flaring and electricity generation (3.3 MW)
Nanning Landfill Gas to Energy Project	1505	China	4,364,466.00	739,200.00	16.94	From PDD \$24/MWh (Average O&M cost) * 3.85MW * 8000hrs/yr = \$739,200/yr	Includes flaring and electricity generation (3.85 MW)
Brazil Marca Landfill Gas to Energy Project	0137	Brazil	No information provided in PDD				Includes flaring and electricity generation.
Tecamec - Ecomethane Landfill Gas to Energy Project	2271	Mexico	3,211,220.00	455,457.00	14.18	From PDD Annex 3 Financial Analysis Total O&M over crediting period \$4554577/10 = \$455457 Annual O&M cost	Includes flaring and electricity generation (1.95 MW)

Furthermore, it was validated that the aforesaid projects were selected for comparison for O&M costs for the following reasons:

1. All these were being implemented and operated by Ecomethane – a joint venture between Biogas technology Limited and Project Developer's group company (ENRG Systems). Being implemented and operated by Ecomethane, these projects have comparable characteristics in terms of design, technology and operation.
2. Both project components in the New England landfill Gas to Energy project i.e. gas flaring as well as electricity generation were also present in these projects.
3. The electricity generation capacity of these projects was also comparable to the New England Landfill Gas to Energy project i.e. 1.3 to 5 MW which is indirectly indicative of scale of the landfill sites in terms of waste influx and biogas generation.

As demonstrated above, the O&M cost for the proposed project activity (19%) was validated within the range of O&M cost of other similar projects expressed as a % of investment (14% to 29%). Furthermore, a comparison of the investment cost of the proposed project with these projects also revealed it to be in the range of investment made into these referred projects as follows:

- Project investment cost: **R 22,663,026 ~ USD 3,021,736** (using an exchange rate of 7.5 ZAR/USD)
- Investment Range of similar projects compared above: **~194,804 USD - 4,364,466 USD**

Also, these projects have been compared in terms of their power generation capacity and it was found that the investment cost per MW of the proposed project activity was almost the same as of the above mentioned projects.

Furthermore, the below mentioned CDM registered project activities in South Africa have been used to analyse the O&M and investment cost:

Table: 5

Project	UNFC CC Ref	Country	Investment Cost (ZAR)	Average Annual O&M Cost (USD) over crediting period	O&M cost as a Percentage of Investment Cost %	Notes for O&M Cost Values	Comment
Alton Landfill Gas to Energy Project	2549	South Africa	4,550,054	561,100	12.33	From PDD, R561,100 per year	Includes flaring and electricity generation (0.4 MW)
EnviroServ Chloorkop Landfill Gas Recovery Project.	925	South Africa	No information available in the PDD				Includes flaring only

- It has been validated that the Alton Landfill Gas to Energy Project is a small scale project activity having maximum installed capacity of 0.4 MW; so it would not be appropriate to compare it with the proposed project activity.
- EnviroServ Chloorkop Landfill Gas Recovery Project includes flaring of the landfill gas and hence, this project is not comparable with the proposed project activity.

Thus, the investment cost and O&M costs assumed in the financial analysis of the project activity are found to be appropriate in light with VVM para 110, 111 and EB51, Annex 58, para 6.

#### **Electricity price (ZAR/MWh):**

The electricity tariff in South Africa is regulated by Eskom. Eskom is a state run agency that generates, transmits and distributes electricity to consumers and redistributors, as well as purchase and sale of electricity from and to Southern African Development Community (SADC) countries. Eskom is regulated under licences granted by the National Electricity Regulator of South Africa (NERSA) in terms of the Electricity Act, 41 of 1987 and the National Nuclear Regulator in terms of the National Nuclear Regulatory Act, 47 of 1999.

Eskom publishes tariff rates every year in their year books. The electricity tariff rates as published by Eskom during the project conceptualisation stage are as follows:

Table 6:

Sl. No.	Tariff	Source	Applicability	Comment
1	262.15 ZAR/MWh  (peak)  112.30 ZAR/MWh (standard)	Eskom Tariff book 2005 <a href="http://www.eskom.co.za/content/2005TariffBook.pdf">http://www.eskom.co.za/content/2005TariffBook.pdf</a>	Jan 2005 – March 2006	The tariff has been calculated as the Weighted average of high demand season tariff (June - August ) and low demand season tariff (September – May) assigning weights as per number of months.
2	276.5 ZAR/MWh  (peak)  118.02 ZAR/MWh (standard)	Eskom Tariff book 2006 <a href="http://www.eskom.co.za/content/20067TariffBook29_0806clr.pdf">http://www.eskom.co.za/content/20067TariffBook29_0806clr.pdf</a>	From April 2006 – March 2007	The tariff has been calculated as the Weighted average of high demand season tariff (June - August ) and low demand season tariff (September – May) assigning weights as per number of months
3	291.77 ZAR/MWh  (peak)  124.92 ZAR/MWh (standard)	Eskom Tariff book , April 2007 <a href="http://www.eskom.co.za/content/Tariffguide_14May07_lowres.pdf">http://www.eskom.co.za/content/Tariffguide_14May07_lowres.pdf</a>	From April 2007 – March 2008	The tariff has been calculated as the Weighted average of high demand season tariff (June - August ) and low demand season tariff (September – May) assigning weights as per number of months

Furthermore, it was validated that based on the historic data on the tariffs released by Eskom the average annual increase in tariff during the period 1997-2007 was only 5.15% (Eskom Tariff book, April 2007, [www.eskom.co.za](http://www.eskom.co.za)). Thus, it was validated that even applying the highest tariff published by Eskom (291.77 ZAR/MWh – peak) during the project conceptualisation stage along with an escalation rate calculated from historic data the IRR comes out be negative (-0.72%). It was also validated that the peak tariff has been applied for the entire period, even though the peak tariff is applicable only for a very small period in the year where peak demands exist.

As the prevalent tariff was not favourable to the project activity, ENER-G systems contacted Eskom Pty Limited requesting to secure the power price at higher rates for fast tracking its projects which did not materialise. This is substantiated by the fact that the project has not been able to secure a PPA until now.

In May 2008, the power starved Eskom released another schedule of terms for Medium term power purchase program. As Eskom was power starved and intended to increase the capacity of its generation mix, the tariff price path was sculpted to provide incentive for early start-ups by providing incentivised tariff in the initial years (clearly stated in the Schedule of Eskom Medium Term Power Purchase Program base tariff, Appendix H) as follows:

Table: 7

Year	Tariff (ZAR/MWh)
2009-2013	650.00
2014	600.00
2015	500.00
2016	400.00
2017-2018	350.00
2019 -2030	350.00

Available from

(<http://www.eskom.co.za/content/MTPPP%20RFT%20rev%201%2013%20May%202008%5B1%5D.doc>)

The tariff schedule was incentivised towards earlier years (650 ZAR/MWh) subsequently leading to non-incentivised tariff (350 Z AR/MWh) in later years to encourage independent power producers to set up electricity projects and secure power purchase agreement with Eskom as soon as possible. The decrease in tariff over the years as mentioned in the MTPPA above is on account of streamlining the tariff in later years with the marginal cost of power production by Eskom.

Also, it was found to be appropriate to apply the aforesaid tariff in the financial analysis for the following reasons:

1. The Eskom Tariff books (2005, 2006 and 2007) provided the tariff applicable for a period of one year only whereas the Schedule of the Eskom Medium Term Power Purchase Program base tariff, Appendix H provided projections covering significant lifetime of the project. As it was difficult to predict the direction in which the tariffs would have evolved later, the projection provided by Eskom was deemed reliable to use in absence of any other data available to the project developer.
2. The timing of the tariff coincided with the planned commissioning of the project (which has delayed now) and the tariff was more appropriate to use in terms of vintage.
3. As the tariffs in the initial years were incentivised, application of the same for calculation of project IRR to demonstrate additionality was considered conservative.

Although the tariff were incentivized for initial years and were much higher than the prevalent tariff (refer table 6 above), an escalation of 5.24 % every year was still applied to the tariff in the investment analysis on account of any possible future increments in the tariff. An escalation only to the revenue stream of the financial calculations (no escalation has been applied to the cost stream) was too conservative. Thus, the actual tariff applied in the financial analysis is as follows:

Table: 8

Year	Tariff as per MTPPA	Applied tariff in Financial Analysis
	(ZAR/MWh)	(ZAR/MWh)
2009	650.00	650.00
2010	650.00	684.06
2011	650.00	719.90
2012	650.00	757.63
2013	650.00	797.33
2014	600.00	774.56
2015	500.00	679.29
2016	400.00	571.91
2017	350.00	526.64
2018	350.00	554.24
2019	350.00	583.28
2020	350.00	613.84



2021	350.00	646.01
2022	350.00	679.86
2023	350.00	715.48
2024	350.00	752.98
2025	350.00	792.43
2026	350.00	833.95
2027	350.00	877.65
2028	350.00	923.64
2029	350.00	972.04
2030	350.00	1022.98

It can be observed that the tariff actually applied is much higher than the tariff provided in MTPPA which was already incentivised in the favour of project developer. Even with such high tariff, the project IRR is only 9.61% much lesser than the benchmark.

Thus, in light of above, the tariff applied in the project activity is much more conservative than what the project might actually accrue. Thus, the tariff applied in the project activity is deemed appropriate in light with VVM 1.2 para 110 and 111.

#### **Depreciation:**

A standard value of the depreciation has been considered as 10%. This is found to be conservative.

#### **VAT on electricity**

The PP has considered 14% Vat on electricity which has been validated from <http://www.sars.gov.za/home.asp?pid=289#Income%20tax>. This has been accepted and is therefore found to be appropriate.

#### **Income tax:**

The income tax used as 29% in the financial calculation has been validated from the Guide for Tax Rates, pg 5. For historical corporate income tax rates <http://www.sars.gov.za/home.asp?pid=4589>. This is found to be appropriate as validated from publicly available source.

#### **Risk free rate (Rfr):**

The risk free rate has been used as 8.67% applicable at the time of decision making as validated from [http://www.reservebank.co.za/internet/Publication.nsf/LADV/0D4A989F8AC9AD014225735B003217BF/\\$File/AER2007.pdf](http://www.reservebank.co.za/internet/Publication.nsf/LADV/0D4A989F8AC9AD014225735B003217BF/$File/AER2007.pdf).

#### **Equity Country Premium:**

The risk premium has been calculated as 8.31%. To establish the risk premium, the project participant established the average return of the market over the previous 10 years (17.5%) and subtracted the average return (9.2%) on a risk free asset (government bonds) over the same time span (1998-2007). The PP has used FTSE/JSE index which consists of all stocks traded on a South African Stock Exchange. The result of this calculation is a long term average for the risk premium of 8.31%. The screenshot available does not provide returns during 1999 through 2002. This is because no securities were issued during that time by the host country. It has been found that for simplification, the return in 1998 has been assumed as return on riskless assets in these years. Also, due to the lack of information, this procedure seems reasonable as an assumption of a lower return during those years would result in a less conservative benchmark.

#### **Beta:**

The Beta value used as 0.546 in the benchmark analysis and the value has been validated from the IPSA Plc (sharecode: IPS) - Beta value (Bloomberg Professional Service, Bloomberg Finance L.P.). The project proponent has provided the screenshots of the IPSA Plc from Bloomberg. IPSA Group PLC is a company which has been established to develop, own and manage power generation plants in southern Africa. The company's main country of operation is South Africa and it has the same nature of business and a very



similar business risk profile (i.e. power generation) as the proposed CDM project activity. As such the beta value of IPSA Group PLC can be considered suitable to apply in the benchmark for the project activity. The adjusted Beta for the company has also been validated as 0.697 and the value used (Raw Beta i.e. 0.546) in the financial analysis is more conservative and was found to be acceptable.

The equity return benchmark has been established according to the CAPM model and has been verified to be 13.21 % i.e. risk free rate + beta \* equity country premium. As discussed above, the risk free rate taken up as 8.67% was found in line with the requirement which is equivalent to government bond yields for South Africa (verified from the graph given in the excel sheet). The risk premium has been calculated as 8.31% which was found OK. Beta value applied here is 0.546 (the beta value of IPSA Group PLC can be considered suitable to apply in the benchmark for the project activity). The equity internal rate of return finally evaluated by the project proponent has been validated to be 9.61% which is well below the benchmark taken as 13.21%.<sup>18</sup> By considering the analysis, this can be concluded the project activity is unlikely to be the most financially/economically attractive.

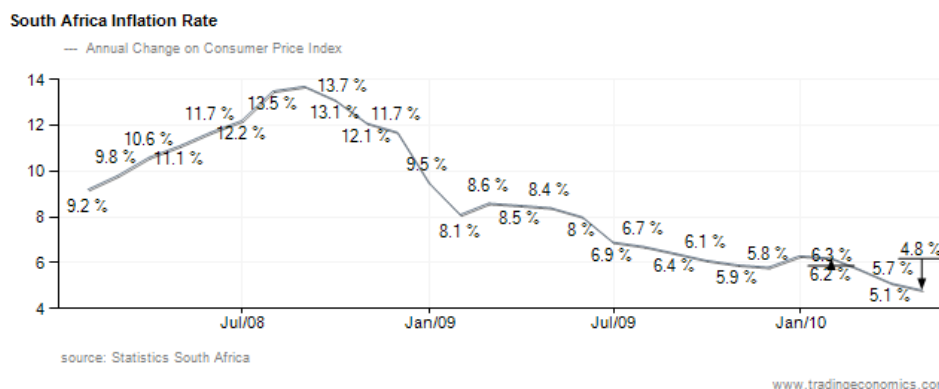
### Sub-step 2d: Sensitivity analysis

Sensitivity analysis has been further demonstrated in the PDD with reduction in investment cost, reduction in O&M cost and electricity revenue/generation escalation. It has been analysed that up to an extent of 18.36% and 18.39% reduction in investment cost and O&M is required to cross the benchmark which is very unlikely to happen<sup>18</sup> An escalation of 11.95% electricity revenue/generation will take the IRR up to the level of benchmark which is also unlikely to happen as tariff has already been adjusted with an annual escalation of 5.24% as verified from the power purchase programme issued by ESKOM dated 13<sup>th</sup> May 2008.<sup>25</sup> The sensitivity analysis satisfies the latest guidance as per EB51 Annex 58 for investment analysis for equity IRR is being followed.

The investment costs related to the generators and flare in the project activity are subject to inflation and are not likely to decrease during the course of project. The quotes received from the suppliers for generators (447,102.00 GBP equivalent to ZAR 6,657,349.00) and flare (167,665.00 GBP) from Ener-G Natural Power dated 18/08/2007 and Biogas dated 5/09/2007 respectively were validated to check the input values in the project activity applicable at the time of invest decision.

A more recent quote for the same generator capacity from Ener-G Natural Power dated 10/10/2008<sup>/35/</sup> showing a cost of GBP 487,400.00 (ZAR 7,257,386.00 equivalent, using the same historical average exchange rate) clearly indicates a significant increase in investment costs over time. Considering the aforesaid it is highly unlikely that investment costs will decrease by more than 10%.

The appropriateness of O&M costs (civil works and project support costs) in the project activity have been already substantiated through actual invoices of a similar project called Chloorkop as well as third party quotations and are found to be comparable to that estimated for the New England project. Moreover, generally speaking, considering local South African economic climate with inflation rates typically between 5-10% per annum, project costs have the tendency to increase and are not likely to decrease to the extent of 25%.



<http://www.tradingeconomics.com/Economics/Inflation-CPI.aspx?symbol=ZAR>

Considering the above documents dated before the start date of the project and estimates based on past experience are conservative and well representative for the time of decision making.

**CAR #6 was raised** asking the proponent to provide evidences for the various assumptions used in the IRR calculation and should be in line with EB 51 Annex 58: The evidences asked were particularly concerning the following: Objective evidence for the assumptions used in the IRR calculation i.e. total investment cost (wells, equipment & machinery, civil works), O&M cost for all categories, The electricity tariff rate given in the IRR sheet, reference web link provided for beta value was not verifiable. Also, the CERs given in the IRR sheet for the year 2010 are not in line with the PDD. In the worksheet "Investment & cost", power generation equipment's capacity was mentioned as 2.6 MW (2 units of 1.1 MW & 1 unit of 500 KW) but as per the PDD, installed capacity was expected to be approximately 2 MW.

In response the proponent provided objective evidence for the assumptions used in the IRR calculation have been submitted by the PP and verified to be inline with the requirement. The electricity tariff rate given in the IRR sheet was taken with an annual escalation of 5.24% as verified from the power purchase programme issued by ESKOM dated 13<sup>th</sup> May 2008. This was validated from the Power purchase programme and found OK. The Beta value was corrected and found to be Ok and conservative. The PDD was revised to incorporate the corrected CERs figures which was validated and found OK. The expected installed capacity in version 2 of the PDD has been amended to 2.3 MW although the exact gas yield of the landfill site can only be confirmed once the project is operational. This is now consistent with the expected installed capacity which Ener-G plans to install in the 'Investment & Cost' tab of the financial analysis and the expected installed capacity in the CER calculator. On satisfactory verification of all evidences and assumptions **CAR #6 was closed out.**

#### 4.6.5 Barrier analysis

Barrier analysis has not been demonstrated as after evaluating the sensitivity analysis it is concluded that: (1) the proposed CDM project activity is unlikely to be financially/economically attractive (as per Step 2c Para 11b) and has proceeded to Step 4 (Common practice analysis).

#### 4.6.6 Common practice analysis

##### ***Sub-step 4a: Analyse other activities similar to the proposed project activity***

This has been validated from Minimum requirements for waste disposal by landfill, Department of Water Affairs and Forestry, 2005 that landfill gas management in southern Africa is currently limited to passive venting of gas only and there has been limited development of LFG projects in South Africa. In the PDD, all landfill sites have been analysed which are designed to partially collect and flare/or utilise the generated LFG. However, all the landfill sites similar to the proposed project activity analysed are developed under CDM projects (registered and/or under validation) and which are verified from the project list given in the pipeline of UNFCCC.<sup>26</sup>

Therefore, discussion for common practice analysis excludes all projects similar to the proposed project activity which are developed under the CDM and left with none of the project developed to partially collect and flare/or utilise the generated LFG.

##### ***Sub-step 4b: Discuss any similar options that are occurring***

As mentioned in the PDD, "since the only landfills which have active landfill gas capture and flaring are CDM projects or in the process of applying for CDM, the project does not have any similar options which do not consider CDM.

Therefore, this satisfies the requirement of the common practice analysis (Sub-steps 4a and 4b) i.e. (ii) similar activities are observed, but essential distinctions between the project activity and similar activities can reasonably be explained, then the proposed project activity is additional)".

## 4.7 Application of Baseline Methodology and Calculation of Emission Factors

The proposed CDM project activity is the landfill gas recovery and uses baseline methodology as described in ACM 0001 version 11. The determination of emission reduction is as per the methodology ACM 0001 version 11 and the applicable "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site".

The description towards the methodological choice towards the project activity with reference to ACM 0001 version 11 has been checked as follows:<sup>03</sup>

- The equations for GHG emission reductions calculation and explanation towards the same as provided in section B.6.1 “explanation of methodological choices” in the PDD version 04 has been checked and in line with the methodology.
- The description provided for calculation of  $MD_{project, y}$  “The amount of methane that would have been destroyed/combusted during the year, in the project scenario” in the section B.6.1 has been checked and found in line with ACM 0001 version 11.
- All the assumptions for the parameters used in the calculations of  $BE_{CH_4, SWDS, y}$  “Methane emissions avoided during the year y from preventing waste disposal at the solid waste disposal site (SWDS) during the period from the start of the project activity to the end of the year y” are found in line with the requirement of ACM 0001 version 11 and the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”.
- The project proponent has submitted the study conducted by Wilson and Pass Inc. dated 15/11/2007 for the landfill site which clearly says that 250 000m<sup>3</sup> of waste being deposited annually. Also, the input data for the projections have been validated from the letter issued by Msunduzi Municipality dated 21/04/2009 indicating the composition of waste being dumped at New England road Landfill which are inline with the requirement.
- The Decay rate for the waste type j,  $k_j$  has been checked and validated the MAT – mean annual temperature, MAP – Mean annual precipitation. The values applied are for Boreal & temperature ( $MAT < 20^\circ C$ ) and dry ( $MAP < 1000mm$ ) conditions. This has been validated from <http://www.weathersa.co.za/Climat/Climstats/PietermaritzburgStats.jsp><sup>31</sup>
- The degassing efficiency of the landfill site has been used as 70% as referred in the PDD version 04 according to the Biogas Technology Group Ltd expertise. The same can be acceptable since the US EPA provides the 75% default value for gas recovery efficiency used by the US. This has been validated from the section 2.4.4.2 in <http://www.epa.gov/ttn/chief/ap42/ch02/final/c02s04.pdf>, from the AP-42 guidelines for US EPA - part of the comprehensive U.S. national air quality regulatory program. The collection efficiency value seems to be justified well enough and can be consider because the landfill site is properly managed with lining as well as the capping material (mix of clay and sand) is used to cover the waste.
- MCF (Methane correction factor) has been applied as 1.0 and can be used for anaerobic managed solid waste disposal sites if the site must have controlled placement of waste. This has been validated that the Landfill site is properly managed with lining as well as the capping material (mix of clay and sand) which is used to cover the waste.
- Since, there are no regulatory and/or contractual requirements to capture and/ or to destroy/combust methane as described in the section 4.6,  $MDBL, y$  has been taken up as zero.
- The project emissions from electricity consumption  $PEEC, y$  will be calculated following the latest version of “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”. Scenario A (option A1) has been used for Project emissions from electricity consumption. Average technical transmission and distribution losses,  $TDL_{j, y}$  will be taken from the South African national electricity utility, Eskom, at 8%.<sup>27</sup> Project emissions from fossil fuel consumption are also calculated as per “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”. As per option B3 of the aforesaid tool, the “Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion” shall be followed to determine the project or leakage emissions. The project may use a fossil fuel generator on-site to generate electricity in case there is a failure of grid electricity and emission factor is calculated using option B of the tool.
- Emission factor has been calculated for an electricity system of the project activity as the baseline is electricity generated by plants connected to the grid, the emissions factor  $CEF_{elec, BL, y}$ , for the relevant grid is calculated according to the requirements of the “Tool to calculate the emission factor for an electricity system”. National Grid of South Africa has been identified as the relevant electric power system.

- Simple operating margin has been used ex-ante to calculate EF<sub>grid,OM,y</sub>. The description towards the basis of calculation of CO<sub>2</sub> emission factor for baseline electricity generation (combined margin) as provided in section B.6.1 “explanation of methodological choice” of the PDD version 04 has been checked and found justified.
- The project proponent has provided calculation worksheet with traceable references for CO<sub>2</sub> emission factor. The traceability of the figures has been cross checked with the reference of NERSA electricity supply statistics for South Africa and Escom website mentioned in Annex 3 of the PDD v04.<sup>28</sup>
- NERSA electricity supply statistics for South Africa and Escom website: [www.eskom.co.za/live/content.php?Item\\_ID=4226](http://www.eskom.co.za/live/content.php?Item_ID=4226) is updated by ESKOM regularly to reflect the most recent information available. At the time of start of validation the most recent data made available by ESKOM was only till the 2005 and this was validated from the website during validation. The snapshot of the website taken during validation with emission factor data (2002 - 2005) has also been incorporated in Annex 3 of the PDD. Hence, it was evident from the snapshot that information only till 2005 was available at the time of commencement of validation. This was also confirmed from another project activity (UNFCCC Ref no. 3677) validated by SGS where the data used in the calculation of the emission factor (2003-2005) was the latest data available at the time of the commencement of validation (October 2008).

**CAR #7 was raised** to provide supportive to justify the assumptions used for the domestic waste portion and types of waste stream mentioned in the worksheet “waste composition” and “input data” in the CER calculation sheet. Also, the waste characterization report for the landfill site was asked to be presented. The proponent in response clarified that the municipality has assessed the waste stream and the composition of the waste going into the landfill. PP has submitted the ‘Waste Composition at the New England Road Landfill from the Msunduzi Municipality dated 21/04/2009 to justify the waste composition used in the ex-ante calculation of methane avoided in year Y. The PDD and the CER calculation sheet was also updated accordingly using the aforesaid reference. This was verified and found OK. Hence, **CAR #7 was closed out.**

**CAR #8 was raised** because of the below mentioned queries related to the monitoring methodological choice:

1. The fossil fuel consumption under the project boundary by using back-up fossil fuel generators is not explicitly described in the PDD. The PP needs to follow the applicable tool to calculate the project emission “Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion” Please clarify.
2. The PP also needs to demonstrate that which components will be included under the project emission from electricity consumption within the project activity “PE<sub>EC,y</sub>”.

In response the proponent revised the PDD with the following actions as below

1. Project Emissions from Fossil Fuel Consumption through the use of back-up fossil fuel generators has been included in version 2 of the PDD according to the ‘Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion’.
2. A monitoring table for the parameter PE<sub>FC,y</sub> has been added to the section B7.1 of version 2 of the PDD. As such this distinguishes project emissions from electricity consumption and project emissions from fossil fuel combustion.

This was validated and found in line with the monitoring requirements and hence **CAR #8 was closed.**

**CAR #9 was raised** to provide supportive for the data used to calculate the grid EF of the South African electricity grid for the project activity as the data provided under Annex 3 is not retraceable. In response the proponent had provided the entire data source as required in the PDD version 03. This was validated and found OK. Hence, **CAR #9 was closed out** satisfactorily.

#### 4.8 Application of Monitoring Methodology and Monitoring Plan

The present CDM project activity uses monitoring methodology as described in ACM 001 version 11. The following tools have been used as specified by ACM0001 version 11 and their monitoring parameters have been clearly indicated:

- a) "Tool to determine project emission from flaring gases containing methane" (Version 1, adopted at EB 28)
- b) "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" Version 04, adopted at EB 41.
- c) "Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion"; Version 02, adopted at EB 41.
- d) "Tool to calculate baseline, project and/or leakage emissions from electricity consumption"; Version 01
- e) "Tool to calculate the emission factor for an electricity system", Version 2.0

The methodological choice towards project emission calculation from flaring from LFG as provide in the PDD version 04 has been checked and found in line with ACM 0001 version 11 and "Tool to determine project emissions from flaring gases containing methane". The ex-ante calculation procedure has been checked and is in line with ACM 001 version 11 requirements. The emission factor values for the electricity system of the project activity is in line with the requirements of methodology and its relevant tool.

The description towards the ex-ante parameters available at validation in the section B.6.2 of the PDD version 04 has been checked and is in accordance with the project scenario.

The project proponent has also provided the clear description towards the data and parameter required to be monitored at the ex-post scenario in the PDD version 04, which has been cross checked and found complete and in line with ACM 0001 version 11.

PP has described the monitoring plan in the section B.7.2 of the PDD version 04 and has been validated and found in line in terms methodological and project scenario's requirement:

- Data collection and record keeping arrangements
- Data Quality Control and Quality Assurance
- Maintenance and Calibration of monitoring equipment
- Staff training
- CDM monitoring organisation and management

However, **CAR #10 was raised** because the monitoring plan as given in the PDD is not clear. Please clarify the below mentioned points:

1. Parameter " $PE_{FC,j,y}$ " project emission from fossil fuel consumption in process was not included in the monitoring plan
2. Parameter " $MG_{PR,y}$ " Amount of methane generated from the project activity was not been described in the monitoring plan.
3. It was also required to justify that justify why the monitoring plan had not included the monitoring of parameters in line with the Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site, in particular the  $W_x$  (Total amount of organic waste prevented from disposal in year  $x$ ),  $Pn_{j,x}$  (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  $x$ ) as this is an open landfill.

PP has clarified to the points raised under CAR#10 as given below:

1. Parameter  $PE_{FC,j,y}$  is included in version 04 of the PDD
2.  $MG_{PR,y}$  does not apply to the project as  $MDBL_y$  is set as zero. Therefore steps 1,2 and 3 on estimating the Adjustment Factor (AF) in ACM0001 version 11 do not apply to the project. Thus,  $MG_{PR,y}$  has not been included in the monitoring plan.
3. Parameters  $W_x$ ,  $Pn_{j,x}$  have been incorporated in the relevant sections of the PDD.

This was verified and the above information was found satisfactory and hence **CAR #10 was closed out**.



#### 4.9 Environmental Impacts

It is mandatory that a professional body conducts the Environmental Impact Assessment (EIA) which needs to be submitted to the Kwazulu Natal Department of Agriculture & Environmental Affairs (DAEA). The EIA Scoping Report was submitted to DAEA on the 18<sup>th</sup> of November 2008. It was found that the project in its overall sense contributed to positive impacts with the prevailing conditions of the landfill in South Africa. It was validated through the EIA reports submitted by the PP.

It was also found that the project impact is positive and on the local and national environment as a whole.

**CAR #11 was raised** as the EIA final approval was pending and PP was asked to submit the Environment clearances. In response the proponent submitted the Record of Decision (RoD) which states that the EIA was cleared. As per the document the Kwazulu Natal Department of Agriculture and Environment Affairs has authorised the extraction of landfill gas and generation of electricity at New England Landfill site.<sup>29</sup> The EIA is therefore approved. Hence **CAR #11** was closed out.

#### 4.10 Local Stakeholder Comments

A Scoping report was prepared as part of the scoping phase of the Environmental Impact Assessment (EIA) Process as Geomeasure Group (Pty) Ltd was appointed by Ener G Systems (Pty) Ltd to carry out the environmental scoping for the development of the New England landfill site into a CDM Project. The Scoping report and stakeholder consultation clearly specified that the project would be designed under the CDM. This has been validated that the report was prepared as specified by Section 26 of the Environmental Conservation Act (Act 73 of 1989) and following authorities have been advised of the proposed development:<sup>30</sup>

- KwaZulu-Natal Department of Agriculture & Environmental Affairs
- Msunduzi Municipality
- Department of Water Affairs and Forestry

As mentioned in the PDD version 04, interested parties were identified by placing official notices of the EIA process as validated to be correct and inline with the requirement. Table-2 under section 4.3 of the scoping report was cross checked to validate the comments received during the process i.e. summary of Public and Authority Involvement to date. There are few issues/comments raised by the Authorities and I&APs (Interested & Affected Parties) but as clarified by the project proponent the raised concerns were related to temporary phases of the project relating to construction of the project activity but not post implementation.

This is also validated from the scoping report that the project is environmentally and socially acceptable provided that the mitigation measures are implemented.<sup>30</sup>

## 5. Comments by Parties, Stakeholders and NGOs

In accordance with sub-paragraphs 40 (b) and (c) of the CDM modalities and procedures, the project design document of a proposed CDM project activity shall be made publicly available and the DOE shall invite comments on the validation requirements from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available. This chapter describes this process for this project.

### 5.1 Description of how and when the PDD was made publicly available

The Project Design Document for this project was made available on the UNFCCC website <http://cdm.unfccc.int/Projects/Validation/DB/FY2W9KBAXUJ46CWIIPMULRMO94N82B/view.html> and was open for comments from 17 Mar 09 until 15 Apr 09. Comments were invited through the UNFCCC CDM homepage

### 5.2 Compilation of all comments received

Comment Number	Date Received	Submitter	Comment
No comments	NIL	NIL	NIL

### 5.3 Explanation of how comments have been taken into account

No comments received.

## 6. List of Persons Interviewed

Date	Name	Position	Short Description of Subject Discussed
13/04/2009 to 15/04/2009	David Cornish	General Manager, Ener.G Systems	Motivation for project as CDM Municipal by laws and EIAs.
	Jennifer Orr	Senior Project Manger – Ecosecurities	Project development and PDD development including baseline identification, additionality and monitoring plan
	Xaver Kitzinger	Senior Project Manager	Technical design and layout of extraction infrastructure.
	Sean Buchannan	Project Manger	Technical details on the flares and gas engines.



## 7. Document References

Category 1 Documents (documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority):

- /1/ PDD version 01 dated 13/03/2009 and PDD version 02 15/05/2009, PDD version 03 dated 17/08/2010
- /2/ PDD version 04 dated 20/01/2011
- /3/ Approved methodology ACM 0001 version 10 and version 11
- /4/ HCA (South Africa) dated 02/10/2009
- /5/ LOA from United Kingdom of Great Britain and Northern Ireland dated 15/10/2009
- /6/ MoC dated 07/04/2009

Category 2 Documents (background documents used to check project assumptions and confirm the validity of information given in the Category 1 documents and in validation interviews):

- /7/ Gas generators purchase order dated 09/04/2009
- /8/ Landfill site specifications, "community services and social equity community development" dated 04/05/2009
- /9/ Declaration given by the PP for no public funding involved in the project activity dated 09/04/2009
- /10/ England landfill site permit (permit no. 16/2/7/U203/D3/Z1/P64) issued by Department of Water Affairs and Forestry.
- /11/ PDD web-hosted on UNFCCC website from 17 Mar 09 - 15 Apr 09: <http://cdm.unfccc.int/Projects/Validation/DB/FY2W9KBAXUJ46CWIIIPMULRMO94N82B/view.html>
- /12/ Final Lease & Gas Rights Agreement Signed by EcoSecurities International Ltd and the Msunduzi Municipality dated 26 Sept' 2007 to develop the proposed project under CDM.
- /13/ ERPA signed between the project developer and EcoSecurities dated 07 Jan'08
- /14/ Validation Work Order Signed with DOE dated 16 March'09
- /15/ draft 'Minimum Requirements for Waste Disposal by Landfill' published by Department of water affairs and forestry, 2005
- /16/ Electricity Regulation Act, 2006: Government gazette, Republic of South Africa, Vol 493 No. 28992, Clause 8 (l) (a).
- /17/ Resolution of the directors of Ener.G systems (PTY) Ltd. Dated 21 Sept 2007.
- /18/ Financial calculation sheet with validated and justified assumption dated 15/05/2009
- /19/ Quotation from ENER.G natural Power dated 18/08/2007
- /20/ Quotes for Electrical connection: Plantech Associates (August 2006) and Cato Ridge Electrical Construction (3<sup>rd</sup> September 2007) Quotes
- /21/ Civil Works: quote from Ubuntu Transport Logistics (Pty) Ltd (4<sup>th</sup> September 2007)
- /22/ Gas collection system: quote breakdown from Megapile (17<sup>th</sup> September 2007)
- /23/ Flaring system and monitoring equipment: quote from Biogas Technology dated 5<sup>th</sup> Sept 2007
- /24/ Letter for New England CDM Project's O&M cost for the generators dated 21/09/2007 by Ener-G Systems, O&M flare cost and O&M cost for Gas Collection costs from Eco methane projects
- /25/ The power purchase programme issued by ESKOM dated 13<sup>th</sup> May 2008.
- /26/ Project activities mentioned on UNFCCC websites. <http://cdm.unfccc.int/Projects/projsearch.html>.

- /27/ Eskom 2008 Annual Report. Available from:  
[http://financialresults.co.za/eskom\\_ar2008/ar\\_2008/con\\_directors\\_report\\_02.htm](http://financialresults.co.za/eskom_ar2008/ar_2008/con_directors_report_02.htm)
- /28/ NERSA electricity supply statistics for South Africa and Escom website:  
[www.eskom.co.za/live/content.php?Item\\_ID=4226](http://www.eskom.co.za/live/content.php?Item_ID=4226)
- /29/ The Kwazulu Natal Department of Agriculture and Environment Affairs issued Authorization and record of Decision dated 20/04.2009
- /30/ New England road landfill CDM scoping report, ref. no.: 2006/275, date: 21<sup>st</sup> November 2007
- /31/ The south African Weather conditions  
<http://www.weathersa.co.za/Climat/Climstats/PietermaritzburgStats.jsp>
- /32/ Letter issued by ENER-G Systems (PTY) Ltd. for the allocation of overheads (project support cost) between projects for the financial year 2008-2009.
- /33/ Invoice raised by ENER-G Systems to Enviroserve waste management (Pty) Ltd. dated 25/01/2008. `
- /34/ WILSON and PASS Inc, Consulting Geotechnical and Environmental Civil Engineers dated 15/11/2007
- /35/ Quotation from ENER-G Natural Power for a 1.15 MW gas generating unit dated 10/10/2008.
- /36/ Email communication with the Department: Energy, Republic of South Africa acting as DNA of South Africa dated 13/04/2010 regarding the authenticity of the HCA letter issued.
- /37/ Authenticity has been cross checked with the online document available on Department of Energy & Climate Change website: List of projects with UK approval of participation.  
[http://www.decc.gov.uk/assets/decc/what%20we%20do/global%20climate%20change%20and%20energy/tackling%20climate%20change/intl\\_strategy/mechanisms/clean\\_dev/1\\_20100527094605\\_e\\_@@\\_cdmukapprovedprojects.pdf](http://www.decc.gov.uk/assets/decc/what%20we%20do/global%20climate%20change%20and%20energy/tackling%20climate%20change/intl_strategy/mechanisms/clean_dev/1_20100527094605_e_@@_cdmukapprovedprojects.pdf)
- /38/ Eskom Tariff books 2005 <http://www.eskom.co.za/content/2005TariffBook.pdf>  
Eskom Tariff books 2006 [http://www.eskom.co.za/content/2006\\_7TariffBook29\\_08\\_06clr.pdf](http://www.eskom.co.za/content/2006_7TariffBook29_08_06clr.pdf)  
Eskom Tariff books 2007 [http://www.eskom.co.za/content/Tariff\\_guide\\_14May07\\_lowres.pdf](http://www.eskom.co.za/content/Tariff_guide_14May07_lowres.pdf)

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## A.1 Annex 1: Local Assessment

This checklist is designed to provide confirmation of in-country data and information provided in the Project Design Document for New England Landfill Project. It serves as a “**reality check**” on the project that is completed by a local assessor from SGS South Africa.

Issue	Findings	Source/Mean of Verification	Further Action / Clarification / Information Required?
The location and actual situation of the project activity needs to be physically checked during site visit.	The project is a green field project and the location and actual situation is reported correctly	Document Review, Site visit and discussion with CDM project team	NA
The appropriate project ownership and requisite approval/ license required for establishment of the project activity at the mentioned geographical location needs to be checked.	New England landfill site permit (permit no. 16/2/7/U203/D3/Z1/P64) issued by Department of Water Affairs and Forestry	Document Review, Site visit and discussion with CDM project team	NA
The Purchase Orders along with technical specification of the respective project equipments installed/ to be procured for this proposed project activity needs to be checked during site visit.	Purchase orders have been verified OK	Document Review, Site visit and discussion with CDM project team	NA
Proper documentation for the operational life time of the project technology and the implemented technology will not be changed during the project period needs to be checked during site visit.	Confirmation from project proponent	Document Review, Site visit and discussion with CDM project team	NA
The compliance of the mentioned information with actual situation or planning needs to be checked during the site visit.	Confirmed and found OK	Document Review, Site visit and discussion with CDM project team	NA

Issue	Findings	Source/Mean of Verification	Further Action / Clarification / Information Required?
Requirement of initial extensive training programme planned/ conducted for the project personnel needs to be checked during site visit.	Ener-G systems have training programs	Document Review, Site visit and discussion with CDM project team	NA
Project's spatial boundaries and the system boundaries needs to be cross checked.	Checked on site and found OK	Document Review, Site visit and discussion with CDM project team	NA
The information on public funding involvement for the project activity financing needs to be checked during the site visit and PP should provide proper substantiation for the same.	The funding is through equity	Document Review, Site visit and discussion with CDM project team	NA
The PP should provide details about the methane generation capacity of the site along with the description of the site in terms of area and volume in the PDD. Also, please categorize the landfill site being used for the landfill gas recovery i.e. GLB <sup>-</sup> or GLB <sup>+</sup>	GLB <sup>+</sup> verified from permit and its conditions	Document Review, Site visit and discussion with CDM project team	NA
The project doesn't involve any alteration or modification of the existing system. The project is a green field project where a new system is being installed to recover and utilize the landfill gas for power generation. In the pre project scenario, the methane generated from the landfill was being released in the open atmosphere. The same will be verified during the site visit.	The project is a green field project	Document Review, Site visit and discussion with CDM project team	NA

Issue	Findings	Source/Mean of Verification	Further Action / Clarification / Information Required?
PP needs to provide the following supportive in regard of the baseline establishment of the project activity: 1. Renewable sources or alternative waste disposal other than LFG are not economically feasible for the project site. 2. Landfill site has the legal mandate to dispose of solid waste. 3. There are no regulations and/or contractual requirements requiring active landfill gas extraction and flaring to reduce landfill gas emissions applicable in South Africa. 4. Power plants connected to the grid, complies with all the applicable laws and regulations.	Confirmed	Document Review, Site visit and discussion with CDM project team	NA
The additionality of the project activity has been demonstrated and assessed using the "Tool for the demonstration and assessment of additionality 5.2". However, it is not mentioned which version of the tool has been used by the PP in several sections of the PDD. The PP should use the latest version of the tool. The same will be discussed during site visit.	Reviewed	Document Review, Site visit and discussion with CDM project team	CAR05 raised and Closed
PP is requested to justify the statement "To date there has been limited development of LFG projects in South Africa (host country). Only a few landfills in the Host Country have been designed to partially collect and flare/or utilise the generated LFG."	Reviewed	Document Review, Site visit and discussion with CDM project team	CAR05 raised and Closed
PP needs to provide the Schedule for the further activities of the project. Also please discuss the current status of the project activity in the PDD.	The PP has provided a Project Managemnet Schedule on site and is found OK	Document Review, Site visit and discussion with CDM project team	NA

Issue	Findings	Source/Mean of Verification	Further Action / Clarification / Information Required?
The environmental impact of the project activity and the compliance with Host Country environmental legislative requirements needs to be checked during site visit.	Reviewed	Document Review, Site visit and discussion with CDM project team	CAR11 is raised and closed out.
The entire procedure followed for inviting local stakeholder comments and supporting documentation needs to be cross checked during site visit.	MoM available and found OK	Document Review, Site visit and discussion with CDM project team	NA
Documentary evidence (e.g. MoM, attendance list) of the LSC process carried out under CDM modalities has to be obtained from the PP during site visit.	MoM available and found OK	Document Review, Site visit and discussion with CDM project team	NA
Identified local stakeholders needs to be interviewed during the site visit.	MoM available and found OK	Document Review, Site visit and discussion with CDM project team	NA
The local stakeholders' feedback regarding the project activity needs to be cross checked during the site visit.	MoM available and found OK	Document Review, Site visit and discussion with CDM project team	NA

## A.2 Annex 2: Validation Checklist

**Table 1 Participation Requirements for Clean Development Mechanism (CDM) Project Activities (Ref PDD, Letters of Approval and UNFCCC website)**

Requirement	Reference	Comments	Conclusion/C ARs/ CLs
<p>1. All Parties involved have approved the project activity</p> <p>1.1. Has the DNA of each Party involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval which confirms</p> <p>1.1.1. The country is a Party to the Kyoto Protocol</p> <p>1.1.2. Participation is Voluntary</p> <p>1.1.3. The Host Party confirming that the proposed CDM project activity contributes to sustainable development of the country Non-Annex 1 Party shall submit a letter of approval</p> <p>1.1.4. It refers to the precise proposed CDM project activity title in the PDD being submitted for registration</p>	<p>Annex 3, Clean Development Mechanism, Validation and Verification Manual, Version 01 (from this point forwarded referenced as VVM) - 49a-d /54a-b/125</p> <p>Paragraph 37 CDM Modalities and procedures</p>	<p>The Host party (South Africa) has ratified the Koto Protocol on 31st July 2002 and is allowed to participate in the CDM project activity. The web link is <a href="http://maindb.unfccc.int/public/country.pl?country=ZA">http://maindb.unfccc.int/public/country.pl?country=ZA</a></p> <p>Annex I Parties (United Kingdom of Great Britain and Northern Ireland) are involved in the proposed CDM project activity at the stage of Registration as per the PDD submitted by the PP.</p> <p>The Project will assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment.</p> <p>The project activity is likely to contribute to sustainable development of the non-Annex I Party, South Africa</p> <p>Letter of approval issued by Host Country's (South Africa) Designated National Authority (DNA) to be submitted by the project proponent.</p>	<p>CAR 01 Closed out</p>

Requirement	Reference	Comments	Conclusion/C ARs/ CLs
1.2. The letter/s of approval are unconditional with respect to 1.1.1 to 1.1.4 above	VVM Para. 49/54	Letter of approval is to be issued from the South African (host country) DNA. However, pending due to CAR 01.	Closed out
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof, and be entered into voluntarily	VVM Para. 54  Marrakech Accords, CDM Modalities §29 and §30  Kyoto Protocol Art. 12.2, Marrakech Accords, CDM Modalities §40a	Letter of Approval from United Kingdom of Great Britain and Northern Ireland is also required to be submitted to the DOE.	CAR 02 Closed out
3. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for a minimum of 30 days, and the project design document and comments have been made publicly available	VVM Para. 128  Marrakech Accords, CDM Modalities, §40	The PDD has been web-hosted in the UNFCCC website for invitation of comments on the project activity as the global stakeholder consultation process:  Website: <a href="http://cdm.unfccc.int/Projects/Validation/DB/FY2W9KBAXUJ46CWIIIPMULRMO94N82B/view.html">http://cdm.unfccc.int/Projects/Validation/DB/FY2W9KBAXUJ46CWIIIPMULRMO94N82B/view.html</a>  Start date: 17 Mar 09 Close date: 15 Apr 09 Number of comments received: Nil (till 27 <sup>th</sup> March'08)	Y



Requirement	Reference	Comments	Conclusion/CARs/CLs
4. The project design document is in accordance with the applicable CDM requirements for completing PDDs.	VVM Para. 57  Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	The project has used the PDD format correctly in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website.	Y

**Table 2 PDD**

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
<b>A. General Description of Project Activity</b>				
<b>A.1. Project Title</b>				
A.1.1. Does the used project title clearly enable the reader to identify the unique CDM activity?	VVM Para.56 Guidelines for completing a CDM-PDD (PDD) section A.1	DR	The project title used in the PDD version 04 is clearly enabling to identify the unique CDM project activity.	Y
A.1.2. Is there an indication of a revision number and the date of the revision?	VVM Para.56 PDD section A.1	DR	The current PDD indicates the version number 04 and date of the version 17/08/2010 under section A.1.	Y
<b>A.2. Description of the Project Activity</b>				
A.2.1. Does the description of the proposed CDM project activity as contained in the PDD sufficiently cover all	VVM Para.59 PDD section A.2 see also A.4, A.4.3	DR	Yes, the project activity covers all criteria of CDM and the project activity is all about to recover and destruct the landfill gases in the first phase and generate power by utilizing the landfill gases in the second phase. In the existing scenario, the methane generated by the landfill was freely released in the atmosphere.	CAR 03  CAR 03 was

\* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
relevant elements accurately?	and B.3		However, the section does not throw any light on the total proposed capacity of the energy generating unit. The PP should provide details about the methane generation capacity of the site along with the description of the site in terms of area and volume.	closed out satisfactorily
A.2.2. Does the information provide the reader with a clear understanding of the proposed CDM activity?	VVM Para.60 PDD section A.2 see also A.4, A.4.3 and B.3	DR	Yes. The section covers all the relevant details about the CDM project activity that can be considered essential for a clear understanding. The technology has been described in detail along with the description of the equipments. The project activity is able to reduce the CO2 emission @ 51052 tCO2/Year.	Y
A.2.3. Is all information provided consistent and in compliance with the actual situation or planning?	VVM Para.64 PDD section A.2 see also A.4, A.4.3 and B.3	DR	The design specification of horizontal and vertical wells installed at site, flares being used in the project activity and the gas engine generators for electricity generation will be checked during site visit	Pending site visit Closed out
A.2.4. Is all information provided consistent with details provided in further chapters of the PDD?	VVM Para.64 PDD section A.2	DR	All information towards description of project activity provided is consistent with the details provided in further chapters of the current version of the PDD.  Pending for closure of CAR's & CL's	Pending  Closed out
<b>A.3. Project Participants</b>				
A.3.1. Is the table required for the indication of project participants correctly applied?	VVM Para. 51 PDD section A.3	DR	The table under section A.3 of the PDD version 04 required for the indication of project participants has been applied correctly. South Africa is the host party for the proposed project activity. The other parties in the project are United Kingdom of Great Britain and Northern Ireland.	Y
A.3.2. Is all information provided in consistency with details provided by further chapters of the PDD (in	VVM Para. 51 PDD section A.3	DR	Yes, all the information provided is consistent with the details provided in later chapters.	Y

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
particular Annex 1)?				
<b>A.4. Technical Description of the Project Activity</b>				
A.4.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)? Are the latitude and longitude of the site indicated (decimal points)	VVM Para.64 PDD section A.4	DR	The project is located in Pietermaritzburg, Province of KwaZulu-Natal (KZN), South Africa. The precise coordinates of the project are 29° 36'22.92"S and 30° 25' 08.84"E.  The location of the proposed project activity site has needs to be further validated during validation site visit.	Pending site visit  Closed out
A.4.2. Does the proposed CDM project activity involve the alteration of existing installations or process?	VVM Para.64 PDD section A.4	DR	The project doesn't involve any alteration or modification of the existing system. The project is a green field project where a new system is being installed to recover and utilize the landfill gas for power generation. In the pre project scenario, the methane generated from the landfill was being released in the open atmosphere.  The same will be verified during the site visit.	Pending Site visit  Closed out
A.4.3. Do the project participants possess ownership or licenses which will allow the implementation of the project at that site / those sites?	VVM Para.64 PDD section A.4	DR	The applicable ownership documents or licenses which allow the project participant to implement the project at that mentioned site needs to be checked during site visit.	Pending site visit  Closed out
A.4.4. Is the category(ies) of the project activity correctly identified?	VVM Para.64 PDD section A.4	DR	The project correctly applies the category of the project activity as Scope 13 (Waste handling and disposal).	Y
A.4.5. Is all information provided in compliance with actual situation or planning as	VVM Para.64 PDD section A.4	DR	The actual situation of the project activity needs to be checked during site visit.	Pending site visit

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
available by the project participants?				Closed out
A.4.6. Is the table required for the indication of projected emission reductions correctly applied?	VVM Para.64 PDD section A.4	DR	The table under Section A.4.4 of the PDD required for indication of the projected emission reductions has been correctly applied. Annual average emission reduction would be 53,652 t CO <sub>2</sub> e/year (crediting period from 2010 to 2017)	Y
<b>A.5. Public Funding</b>				
A.5.1. Does the information on public funding provided conform to the actual situation or planning as presented by the project participants?	PDD section A.4.5	DR	As per the PDD, there has been no aid, assistance or subsidy been provided from public sources. PP needs to provide an undertaking mentioning no public funding and ODA is involved in the project activity.	Pending Closed out
A.5.2. Is all information provided consistent with details provided by further chapters of the PDD (in particular annex 2)?	PDD section A.4.5	DR	All information regarding Public Funding provided in the PDD is consistent with details provided by further chapters of the PDD.	Y
A.5.3. In case of public funding from Annex I Parties is it confirmed that such funding does not result in a diversion of official development assistance	PDD section A.4.5	DR	As per the PDD, no public funding has been identified from Annexe 1 Parties for the project. Please refer section A.5.2.	Y
<b>B. Baseline and Monitoring Methodology</b>				
<b>B.1. Choice and Applicability</b>				
B.1.1. Is the baseline methodology previously	VVM Para.68	DR	The PDD under the section B.1 refers to the Approved large scale methodology ACM0001, Version 11 Valid from 11 Jun 09 onwards.	Y

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
approved by the CDM Methodology Panel?	PDD section B.1			
B.1.2. Has the methodology (incl. the tools) been altered from the original version as referenced in the PDD?	VVM Para.69 PDD section B (B.1-B.2)	DR	The project correctly applies the latest methodology version i.e. version 11 (including all tools applicable under the methodology ACM0001 version 11)	Y
B.1.3. Is the selected approved methodology applicable to the project activity in the PDD?	VVM Para.75/66a/68/73 PDD section B (B.1-B.2)	DR	The chosen methodology and the version is applicable to the project due to the following reasons: 1) The baseline scenario for the project is total release of the gas in the atmosphere. 2) In the first phase, project activity would be flaring of gas 3) In the second phase, collected gas will be utilized to produce electricity.  As per the PDD, all the applicability conditions of the methodology are met by the project.	Y
B.1.4. Is the discussion in the PDD in conformance with all applicability criteria of the applied methodology?	VVM Para.75/66b/68 PDD section B (B.1-B.2)	DR	All the information provided in the PDD is in conformance with the applicability criteria of the methodology.	Y
<b>B.2. Project Boundary</b>				
B.2.1. Are all emission sources and gases related to the baseline scenario, project scenario and leakage clearly identified and described in a complete and transparent manner? Is there information on	VVM Para.79/76 /67a PDD section B.3	DR	Yes, in Table B3.1, all emission sources and gases related to the baseline scenario and project scenario have been identified in a transparent manner.	Y

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
GHG emissions in proposed CDM project activity boundary as a result of the implementation of the proposed CDM project activity which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology.				
B.2.2. In case of grid connected electricity projects: Is the relevant grid correctly identified in accordance with the tool to calculate emission factor of electricity system (wherever applicable) and the underlying methodology?	VVM Para.79 PDD section B.3	DR	The project under consideration is a grid connected electricity project activity. The electricity generated from the project activity will displace the coal based grid electricity. The information regarding the relevant grid is not mentioned under section B.3 of the PDD. Please clarify	CAR 04  CAR 04 was closed out
B.2.3. Does the project boundary include the physical delineation of the proposed CDM project activity?	VVM Para.78/79 PDD section B.3 also see section A.4.3	DR	Yes, the project boundary includes the physical components of the project activity which is described under section B.3 of the PDD version 04.	Y
B.2.4. Are the project's geographical boundaries and the project's system	VVM Para.76/79 PDD section B.3	DR	Yes, the project boundaries and system boundaries are clearly defined in the diagram in section B.3.	Y

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
boundaries (components and facilities used to mitigate GHGs) clearly defined?	also see section A.4.3			
<b>B.3. Identification of the Baseline Scenario</b>				
B.3.1. Does the PDD discuss the identification of the most likely baseline scenario? Does the PDD follow the steps to determine the baseline scenario required by the methodology and is the application of the methodology and the discussion and determination of the chosen baseline transparent?	VVM Para.67b.80/82/86  PDD Section B.4/B.5	DR	<p>All the steps required for establishing baseline have been properly followed in a transparent manner.</p> <p>The PP has been transparent in showing that the most credible baseline scenario for the project is atmospheric release of the landfill gas, which also represents the business as usual scenario. The following options for plausible baselines alternatives for project activity are selected</p> <ul style="list-style-type: none"> <li><b>LFG 2:</b> Atmospheric release of the landfill gas, which represents the business as usual scenario.</li> <li><b>P6:</b> Power plants connected to the grid</li> </ul> <p>Please provide supportive document for the following points for baseline establishment:</p> <ul style="list-style-type: none"> <li>Renewable sources or alternative waste disposal other than LFG are not economically feasible for the project site.</li> <li>Landfill site has the legal mandate to dispose off solid waste.</li> <li>There are no regulations and/or contractual requirements requiring active landfill gas extraction and flaring to reduce landfill gas emissions applicable in South Africa.</li> <li>Power plants connected to the grid, complies with all the applicable laws and regulations.</li> </ul> <p>All the queries have been discussed and closed out</p>	<p>Pending site visit</p> <p>Pendency closed out</p>



Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
B.3.2. Are all tools/procedures in the methodology correctly applied to identify the most reasonable baseline scenario? This includes all potential realistic and credible baseline scenarios in the discussion taking into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	VVM Para.81/82/86a-d/83/84 PDD Section B.4/B.5	DR	Yes, ACM 0001 version 11 and additionality tool 5.2 have been used to select the alternative baseline scenarios. All the alternative baseline scenarios have been described in the PDD version 04. However pending closure of CAR 05. please refer section B.3.2	Pending closure of CAR 05  Pending closed out
B.3.3. Is the choice of the baseline compatible with the available data?	VVM Para.86b-c/95 PDD Section B.4/B.5		The choice of the baseline compatibility with the available data will be verified during site visit. However please provide supportive for the following points: <ul style="list-style-type: none"> <li>Quantity of the LFG available for the project activity</li> <li>Anticipated site lifespan of landfill site.</li> </ul>	Pending site visit  Pendency closed out
B.3.4. Is conservativeness addressed in the way of identifying the baseline?	VVM Para.90 PDD Section B.4/B.5		Yes, the calculations performed by the PP can be considered conservative as per the EB guidelines.	Y
B.3.5. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	VVM Para.90/91 PDD Section B.4/B.5	DR	All the possible scenarios have been discussed in detail by the PP. The selected baseline has been properly established by comparing it with other scenarios. Pending closure of CAR05.	Pending closure CAR05  Pendency closed out
B.3.6. Is there a verifiable description of the baseline	VVM Para.86e/85	DR	The description of the technology employed and the activities has been covered in section A.4.3. However pending closure of CAR 05 and CL 06	Pending closure of

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
scenario? Does this include a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity?	PDD Section B.4/B.5			CAR 05 and CL 06  Pendency closed out
<b>B.4. Additionality</b>				
B.4.1. Does the PDD clearly demonstrate the additionality using the approach as specified in the methodology and by following all the required steps?	VVM Para.67d/95 PDD Section B.1/B.4/B.5	DR	The additionality of the project activity has been demonstrated and assessed using the "Tool for the demonstration and assessment of additionality 5.2". However, it is not mentioned which version of the tool has been used by the PP. The PP should use the latest version of the tool. The same will be discussed during site visit.	Pending site visit  Pendency closed out
B.4.2. In case of using the additionality tool: Is the 'Additionality Tool' used in the PDD latest version? If an earlier version has been used, do the changes impact the discussion in the PDD? Are all steps followed in a transparent manner?	PDD Section B.1/B.4/B.5	DR	The latest version of the additionality tool version 5.2 has been used.	Y
B.4.3. Has all information been backed up with references, sources and certification? Is the data	VVM Para.93/91 PDD Section B	DR	No, all the references would be checked on-site. Whereas CARs and CLs have been raised for critical information. However pending closure of CAR 06.	Pending  Pendency closed out

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
presented credible and reliable with complete transparency to all available data and documentation?				
B.4.4. Is the discussion on additionality and the evidence provided consistent with the starting date of the project? If the project activity start date is prior to the validation is it discussed how the CDM was taken into account in the decision to go ahead with the project activity	VVM Para.102b PDD Section B.5	DR	<p>The project is an existing project since its start date is prior to August 02, 2008 and the start date is prior to the publication of PDD for global stakeholder consultation. AS per the PDD, the tender notice issued proposed to implement the project under CDM. If verified, the document would be sufficient to demonstrate the prior awareness about CDM before the start date of the project. The ERPA was signed within 4 months of the project start date which would demonstrate the continued and real actions to secure the CDM status for the project.</p> <p>PP should submit the reference document for the awareness towards the CDM project activity prior to the start date and to submit supportive for the serious CDM consideration as per EB 41 annex 46 given under sub step 4b in the PDD (table B.5.6).</p>	CAR 05  Closed out
B.4.5. If an investment analysis has been used, has it been shown that the proposed project activity is economically or financially less attractive than at least one other alternative without the revenue from the sale of CERs?	VVM Para. 106, 107, 109 112a-c PDD Section B.5		<p>Yes, it has been shown in a transparent manner that the proposed project activity is economically less attractive than the benchmark.</p> <p>Please provide supportive for the assumptions used in the IRR calculation:</p> <ol style="list-style-type: none"> <li>1. Please provide objective evidence for the assumptions used in the IRR calculation i.e. total investment cost (wells, equipment &amp; machinery, civil works), O&amp;M cost for all categories,</li> <li>2. The electricity tariff rate given in the IRR sheet is not inline with the document provided by PP (power purchase programme). Please clarify</li> <li>3. Reference web link provided for beta value does not verify the value used in the calculation. Instead of it, the beta value of "Independent power producers and energy traders" given in the same weblink can be used for beta value. Please clarify</li> <li>4. The CERs given in the IRR sheet for the year 2010 are not in line with the</li> </ol>	CAR 06  Closed out

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			PDD. Please clarify 5. In the worksheet "Investment & cost", power generation equipment's capacity is mentioned as 2.6 MW (2 units of 1.1 MW & 1 unit of 500 KW) but as per the PDD, installed capacity is expected to be approximately 2 MW. Also, the total generation capacity used to calculate the electricity generation is from 1 to 2.3 MW. Please clarify.	
B.4.6. If a benchmark is used, is it ensured that it is selected in accordance with the requirements of the tool /methodology and it represents standard returns in the market (not linked to the subjective profitability expectation or risk profile of a particular project developer).	VVM Para. 110 PDD Section B.5		Since the project will lead to revenue generation with an initial investment, the PP has correctly used IRR based investment analysis. The benchmark used has been calculated from the standard returns of the market.	Y
B.4.7. If a barrier analysis has been used, has it been shown that the proposed project activity faces barriers that prevent the implementation of this type of proposed project activity but would not have prevented the implementation of at least one of the alternatives?	VVM Para. 114 115a-b/116 PDD Section B.5	DR	Barrier Analysis is not used for additionality for the project as the CDM project activity is unlikely to be financially/economically attractive (as per Step 2c Para 11b). However, the same has not been explicitly mentioned in the PDD. PP should explicitly mention in the PDD that the barrier analysis is not used in the PDD.	Pending site visit  Closed out
B.4.8. Is the discussion on additionality consistent	VVM Para.	DR	Yes, the discussion on additionality is consistent with the identification of all plausible and credible baseline scenarios.	Y

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
with the identification of all plausible and credible baseline scenarios?	105 PDD Section B.5			
B.4.9. Do the identified baseline scenarios include technologies and practices that include outputs or services comparable with the proposed CDM project activity? Do they also abide by the same applicable laws and legislations?	VVM Para. 105 PDD Section A.4.3/B.5	DR	PDD has referred to "Minimum Requirements for waste disposal by landfill" which provides guidelines set by the government regarding landfills. However pending closure of CAR 05	Pending closure of CAR05  Closed out
B.4.10. Has it been shown that the project is not common practice?	VVM Para. 119a/b PDD Section B.5	DR	PP has mentioned in the PDD that all the landfill gas projects after 2005 have been implemented under CDM. Hence, the project activity cannot be considered as a common practice in the region. The supporting documents need to be verified during site visit. To date there has been limited development of LFG projects in South Africa (host country). Only a few landfills in the Host Country have been designed to partially collect and flare/or utilise the generated LFG.	Pending site visit  Closed out
B.4.11. What are the key distinctions between the project activity and any similar projects that are widely used as common practice?	VVM Para. 118, 119c/d PDD Section B.5	DR	The common practice is free release of methane gas in the atmosphere. The similar projects which have been implemented in the region have been implemented under CDM. The claim needs to be verified during site visit.	Pending closure of CLs  Closed out

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
<b>B.5. Application of the Baseline Methodology</b>				
B.5.1. Has the approved methodology been applied correctly for determining <b>baseline emissions</b> ?	VVM Para. 91d PDD Section B (B.6.1 -B.71)	DR	The PDD has explicitly mentioned each and every equation that is used in the calculation and it has been verified that the equations used are as per the methodology used. 1. But, PP needs to provide supportive to justify the assumptions used for the domestic waste portion and types of waste stream given in the worksheet "waste composition" and "input data" in the CER calculation sheet.	CAR 07 Closed out
B.5.2. Has the approved methodology been applied correctly for determining <b>project emissions</b> ?	VVM Para. 90/91d PDD Section B (B.6.2-B.71)	DR	The methodology has been applied to the project as per its definition. 3. But, the fossil fuel consumption under the project boundary by using back-up fossil fuel generators is not explicitly described in the PDD. PP needs to follow the applicable tool to calculate the project emission "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" Please clarify. 4. Please also demonstrate that which components will be included under the project emission from electricity consumption within the project activity "PE <sub>EC, y</sub> ".	CAR08 Closed out
B.5.3. Has the approved methodology been applied correctly for determining <b>leakage</b> ?	VVM Para. 91d PDD Section B (B.6.2 -B.71)	DR	Yes, the ACM0001 version 11 has been applied and no leakage effects need to be accounted under the methodology.	Y
B.5.4. Where applicable, has the approved methodology been applied correctly for the <b>direct calculation of emission reductions</b> ?	VVM Para 88/91d PDD Section B (B.6.2 -B.71)	DR	Yes the ACM 0001 version 11 has been applied for the calculation of emission reduction. However pending closure of CAR 12.	Y

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
B.5.5. Where there is an option between different equations or parameters, has the methodological choices for the project been explained, have they been properly justified and are they correct?	VVM Para.89/90/91 PDD Section B (B.6.2 -B.71)	DR	The reason for the choice of value has been properly explained in the PDD. All the default values used for the project activity are explained very clearly in the PDD.	Y
B.5.6. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	PDD Sections B.5-C	DR	Assumptions have been discussed in a transparent manner. PP has included all the uncertainties that would be faced in the GHG emission calculations.	Y
<b>B.6. Ex-ante Data and Parameters Used</b>				
B.6.1. Are the data provided in compliance with the methodology?	VVM Para. 91/67c PDD Section B.6.3B.6.4	DR	Yes, the data provided is in compliance with the methodology	Y
B.6.2. Is all the data derived from official data sources or replicable records and have these been correctly	VVM Para. 91a/b PDD Section	DR	Please provide any supportive for the data used to calculate the grid EF of the South African electricity grid for the project activity as the data provided under Annex 3 is not retraceable.	CL 09 Closed out



Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
quoted?	B.6.3/B.6.4			
B.6.3. Is the vintage of the baseline data correct?	PDD Section B.6.3/B.6.4	DR	Please refer section B.6.2	Pending Pendency closed out
B.6.4. Is all the data appropriate and correctly applied to the CDM project activity?	VVM Para. 91c PDD Section B.6.3/B.6.4	DR	Please refer section B.6.2. Pending closure of CL14	Pending Pendency closed out
B.6.5. Are data and parameters that are not being monitored and remained fixed throughout the crediting period appropriately assessed, correct, and will they result in conservative estimates?	VVM Para. 90 PDD Section B.6.3/B.6.4	DR	Yes the data and parameters that are not being monitored and remained fixed throughout the crediting period are appropriately assessed Additionally are the estimated parameters set out in the PDD are considered reasonable.	Y
<b>B.7. Calculation of Emissions Reductions</b>				
B.7.1. Has the approved methodology been applied correctly for determining <b>emission reductions</b> ?	VVM Para. 91d PDD Section A.4.4/B.6	DR	Yes, the approved methodology has been applied correctly for determining emission reductions.	Y
B.7.2. Are the emission reduction calculations documented in a complete and transparent manner?	VVM Para. 91e PDD Section B.6	DR	Yes, the emission reduction calculation is documented in a complete and transparent manner.	Y
B.7.3. Is the projection based on	PDD Section B.6	DR	Projection based on same procedures as used for later monitoring or acceptable alter	Y

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
same procedures as used for later monitoring or acceptable alternative models?			native models	
B.7.4. Is the calculation of the emission reduction correct?	VVM Para. 91e PDD Section B.6	DR	Pending closure of CL 12 and CAR 13.	Pending  Pendency closed out
<b>B.8. Emission Reductions</b>				
B.8.1. Is the form/table required for the indication of projected emission reductions correctly applied?	PDD Section A.4.4/ Section B.6	DR	Yes, the form/table required for the indication of projected emission reductions is correctly applied	Y
B.8.2. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	PDD Section A.4.4/ Section B.6	DR	PP needs to provide the Schedule for the further activities of the project is required. Also please discuss the current status of the project activity in the PDD.	Pending site visit  Pendency closed out
<b>B.9. Monitoring Methodology</b>				
B.9.1. Does the monitoring methodology provide a consistent approach in the context of all parameters to be monitored and further information provided by the PDD?	VVM Para. 67e PDD Section B.7- B.8 see also Annex 4	DR	The monitoring methodology demonstrated in the PDD is not clear. However, pending closure of CL 13	Pending  Pendency closed out

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
Are all parameters and data that are available at validation consistent with the approved methodology. Has this data been interpreted and applied correctly?				
B.9.2. Does the monitoring methodology apply consistently the choice of the option selected for monitoring both of project and baseline emissions?	PDD Sections B and C	DR	Yes, the monitoring methodology apply consistently the choice of the option selected for monitoring both of project and baseline emissions.	Y
<b>B.10. Data and Parameters Monitored</b>				
B.10.1. Does the monitoring plan in the PDD comply with the approved methodology provided for the collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period?	VVM Para. 91a/91d/121/79 PDD Section B.7-B.7.2		The monitoring plan as given in the PDD is not clear. Please clarify the below mentioned points: 4. Parameter “PE <sub>FC,i,y</sub> ” project emission from fossil fuel consumption in process is not included in the monitoring plan 5. Parameter “MG <sub>PR,y</sub> ” has not been described in the monitoring plan.	CAR 10 Closed out
B.10.2. Are the choices of project GHG indicators reasonable and in	PDD Section B.7-B.7.2/B.6.2	DR	Yes, the project GHG indicators are reasonably defined and are in conformance with the methodology	Y

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
conformance with the requirements set by the approved methodology applied?				
B.10.3. Will it be possible to determine the specified project GHG indicators?	PDD Section B.6.2-B.8	DR	According to the description towards the monitoring plan provided under PDD, the GHG indicators will be possible to determine. However the project specific description towards the monitoring plan for the project activity is fully transparent.	Y
B.10.4. Is the information given for each monitoring variable by the presented table sufficient to ensure the verification of a proper implementation of the monitoring plan?	PDD Section B.6.2-B.7.1	DR	The metering equipment details have clearly been discussed in the section B.7.2 of the PDD which includes types of metering equipment or analyzing methods also.	Y
B.10.5. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high quality data free of potential for biases or intended or unintended changes in data records?	PDD Section B.6.2-B.7.1	DR	The data recording and archiving procedures are clearly identified and PP ensures the delivery of high quality data.	Y
B.10.6. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	PDD Section B.5-B.7.2	DR	In monitoring plan, PP has mentioned that the metering equipment will be calibrated frequently as per the requirement for the reliability of the data.	Y
B.10.7. Are all formulae used to determine project	PDD Section	DR	Project emission calculation is clear as per the methodology ACM0001 version 11. all formulae are based to determine project emission clearly indicated and in compliance	Y

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
emission clearly indicated and in compliance with the monitoring methodology.	B.6.2-B.7.1		with the monitoring methodology	
<b>B.11. Quality Control (QC) and Quality Assurance (QA) Procedures</b>				
B.11.1. Is the selection of data undergoing quality control and quality assurance procedures complete?	VVM Para. 121 Refer to all data within the PDD Inc. B.6.2-B.7.1	DR	QA/QC procedures have been defined properly in the PDD for the parameters which will be monitored	Y
B.11.2. Is the belonging determination of uncertainty levels done correctly for each ID in a correct and reliable manner?	Refer to all data within the PDD Inc. B.4/B.7.2/Annex 4	DR	Uncertainty level is done correctly for each ID in a reliable manner.	Y
B.11.3. Are quality control procedures and quality assurance procedures sufficiently described to ensure the delivery of high quality data?	VVM Para 121	DR	QA/QC procedures have been assured to ensure the delivery of quality data. The quality control and quality analysis procedures have been properly incorporated in the project monitoring plan.	Y
B.11.4. Is it ensured that data will be bound to national or internal reference standards?	VVM Para. 86d		PP has made a good procedure of its own where all the roles and responsibilities are discussed and will be referred as an internal standard.	Y
B.11.5. Is it ensured that data provisions will be free of potential conflicts of interests resulting in a tendency of	VVM Para. 19	DR	Please refer B.11.3 above.	Pending  Pendency closed out

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
overestimating emission reductions?				
<b>B.12. Operational and Management Structure</b>				
B.12.1. Is the authority and responsibility of project management clearly described?	PDD Section B.8/Annex 1	DR	Yes, the authority and responsibility of the project management clearly described.	Y
B.12.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD Section B.8/Annex 1	DR	Authority and responsibility for registration, monitoring, measurement and reporting is clearly described.	Y
B.12.3. Are procedures identified for training of monitoring personnel?	PDD Section B.8/Annex 1	DR	The training procedures are identified and mentioned in the section B.7.2	Y
<b>B.13. Monitoring Plan (Annex 4)</b>				
B.13.1. Is the monitoring plan developed in a project specific manner clearly addressing the unique features of the CDM activity?	VVM Para. 122a	DR	Section B.7 clearly specify the monitoring plan addressing the key features of CDM activity	Y
B.13.2. Does the monitoring plan completely describe all measures to be implemented for monitoring all parameter required, including	VVM Para. 122b	DR	The data quality will be ensured at different cross check of data generation and archiving.	Y

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
measures to be implemented for ensuring data quality?				
B.13.3. Does the monitoring plan provide information on monitoring equipment and respective positioning in order to safeguard a proper installation?	VVM Para. 122b	DR	The data quality will be ensured at different cross check of data generation and archiving.	Y
B.13.4. Are procedures identified for calibration of monitoring equipment?	VVM Para. 122a-c	DR	The calibration procedures corresponding to the monitoring parameters are identified in PDD	Y
B.13.5. Are procedures identified for maintenance of monitoring equipment and installations?	VVM Para. 122a-c	DR	Procedures for maintenance of monitoring equipment are identified in PDD.	Y
B.13.6. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	VVM Para. 122a-c	DR	Yes, the procedures are identified for day-to-day records handling (including what records to keep, storage area of records	Y
B.13.7. Are procedures identified for dealing with possible monitoring data adjustments and missing data allowing redundant reconstruction of data in case of monitoring problems?	VVM Para. 122a-c	DR	Yes, procedures are identified for dealing with possible monitoring data adjustments and missing data allowing redundant reconstruction of data in case of monitoring problems	Y



Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
B.13.8. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	VVM Para.122a-c		Yes, the procedures are identified for internal audits of GHG project compliance with operational requirements where applicable	Y
B.13.9. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	VVM Para. 122a-c	DR	Yes, the procedures are identified for project performance reviews before data is submitted for verification, internally or externally	Y
B.13.10. Describe the ability of the project participants to implement the monitoring plan.	VVM Para. 122c	DR	The project proponent is able to monitor the parameters mentioned in the monitoring plan.	Y
<b>B.14. Baseline Details</b>				
B.14.1. Is there any indication of a date when determining the baseline?	PDD Section B.8/Annex 3	DR	The date of completion of the application of the baseline study as 13/03/2009 has been provided under Section B.8 of the PDD version 04.	Pending  Pendency closed out
B.14.2. Is this consistent with the time line of the PDD history?	Also see revision history of the PDD	DR	To be check that the baseline establishment is consistence	Pending  Pendency closed out
B.14.3. Is all data required provided in a complete manner by annex 3 of the PDD?	PDD Annex 3	DR	This is to be checked at site	Pending  Pendency closed out

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
<b>C. Duration of the Project / Crediting Period</b>				
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	VVM Para. 102a-c PDD Section C.1.1/C.1.2	DR	The expected operational life time of the project activity is state in the PDD as 20 years, the basis for the same needs to be checked during site visit PP needs to submit an objective evidence for the start date of the project activity as per EB 41 Annex 67.	Pending site visit  Pendency closed out
C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)?	VVM Para. 102a PDD Section C.2/C.2.1/C.2.2	DR	Yes the project crediting period will be started as when the project will be registered. Crediting period for the project will be 7 years as identified by PP	Y
C.1.3. Does the project's operational lifetime exceed the crediting period	VVM Para. 102a PDD Section C.1.2/C.2.1.1/C.2.1.2	DR	Yes the operational life time which is 25-30 years is exceeding the crediting period.	Y
C.1.4. Does the start date indicate whether this is a new project activity or a pre-existing project activity?	VVM Para. 102a/ 98 PDD Section C.1.1/C.2.1.1	DR	The project activity is the new project activity. Pending closure of CAR 08	Pending  Pending closed out
<b>D. Environmental Impacts</b>				
D.1.1. Does the project comply with environmental legislation in the host country?	VVM Para. 131 PDD section D	DR	Yes the project complies with the regulations in the host country.	Y

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
D.1.2. Has an analysis of the environmental impacts of the project activity been sufficiently described?	VVM Para. 131 PDD section D	DR	In relation to the baseline scenario no negative environmental impacts will arise as a result of the project activity	Y
D.1.3. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	VVM Para. 131 PDD section D	DR	The EIA needs to be submitted to the Kwazulu Natal Department of Agriculture & Environmental Affairs (DAEA). The EIA Scoping Report was submitted to DAEA on the 18 <sup>th</sup> of November 2008. No significant negative environmental impacts arisen from the project activity.	CAR 11  Closed out
D.1.4. Will the project create any adverse environmental effects?	VVM Para. 131 PDD section D	DR	Project will not create any adverse environmental effect as per the PDD.	Y
D.1.5. Are trans-boundary environmental impacts considered in the analysis?	VVM Para. 131 PDD section D	DR	No transboundary environmental impacts considered in the analysis	Y
D.1.6. Have identified environmental impacts been addressed in the project design?	VVM Para. 131 PDD section D	DR	Yes the PDD defines about the environmental impacts and mitigation measures.	Y
<b>E. Stakeholder Comments</b>				
E.1.1. Have relevant stakeholders been consulted?	VVM Para. 128a PDD Section E.1	DR	The identified stakeholders are: <ul style="list-style-type: none"> <li>KwaZulu-Natal Department of Agriculture &amp; Environmental Affairs</li> <li>uMsunduzi Municipality</li> <li>Department of Water Affairs and Forestry</li> </ul> However, this will be discussed during site visit	Pending  Pendency closed out
E.1.2. Have appropriate media been used to invite	VVM Para.	DR	Interested & Affected Parties (I&APs) were identified by placing official notices of the EIA process for the proposed development in the Echo and Natal Witness on 16	Pending

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
comments by local stakeholders?	128a PDD Section E.1		August 2007, will be discussed during site visit	Pendency closed out
E.1.3. Is the undertaken stakeholder process described in a complete and transparent manner?	VVM Para. 128b PDD Section E.1	DR	The Scoping report and stakeholder consultation clearly specified that the project would be designed under the CDM. A Scoping report was prepared as part of the scoping phase of the Environmental Impact Assessment (EIA) Process as specified by Section 26 of the Environmental Conservation Act (Act 73 of 1989).	Y
E.1.4. Is a summary of the stakeholder comments received provided?	VVM Para. 128b PDD Section E.2	DR	Yes the stakeholder process described in a complete and transparent manner in the section E.1 of the PDD	Y
E.1.5. Has due account been taken of any stakeholder comments received?	VVM Para. 128b PDD Section E.3	DR	The concerns and comments received from the local stakeholders have been described in the section E.2 of version 04 of the PDD.	Y
E.1.6.		DR	No adverse comment identified in the PDD.	Y

## References

Reference ID	Title / Description	Reference No	Comments
1.	PDD version 04, Dated 20/01/2011	Table 2 sections A,B,C.,D,E.	The PDD has been checked to complete the desk top review of the project description and further details for CDM project activity configuration.
2.	ACM 0001 version 11	Table 2 section B.	This has been referred to validate the applicability of the project activity, project boundary, baseline and monitoring methodological choices.
3.	UNFCCC website ( <a href="http://cdm.unfccc.int/index.html">http://cdm.unfccc.int/index.html</a> )	Table 1 section B	UNFCCC website has been referred to check the international stakeholder consultation procedure.
4	Guidelines for completing CDM-PDD.	Table 1.5	This has been referred to validate the completeness of the PDD

### A.3 Annex 3: Overview of Findings

#### Findings Overview Summary

	CARs	CLs	FARs
<b>Total Number raised</b>	10	01	0

Date:	22/04/2009		
Type:	CAR	Number:	01
		Reference:	Table 1 (section 1)
<b>Lead Assessor Comment:</b>			
Letter of approval issued by Host Country's (South Africa) Designated National Authority (DNA) to be submitted by the project proponent.			
<b>Project Participant Response:</b>		<b>Date:</b> 15/05/2009	
<i>The Host Country Letter of Approval was applied for on 20/04/2009. Please see attached document 'Acknowledgement of receipt of application' from the South African DNA. As stated in the document the LoA from DNA – Republic of South Africa is pending subject to submission of signed draft validation report The LoA will be provided as soon as it is received from the Host country DNA after the submission of signed validation report.</i>			
<b>Documentation Provided by Project Participant:</b>			
<i>CAR 1 'Acknowledgement of receipt of application' is provided.</i>			
<b>Information Verified by Lead Assessor:</b>			
CAR stands open			
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>		<b>Date:</b> 21/05/09	
LoA not provided			
<b>Acceptance and Close out by Lead Assessor:</b>		<b>Date:</b> 21/05/09	
<i>Not closed CAR01 stands open</i>			
<b>Project Participant Response:</b>		<b>Date:</b> 16/10/2009	
<i>The Host Country Letter of Approval is submitted</i>			
<b>Documentation Provided by Project Participant:</b>			
<i>HCA, South Africa</i>			
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>		<b>Date:</b> 25/10/2009	
HCA, South Africa has been submitted by the proponent. closed out			
<b>Acceptance and Close out by Lead Assessor:</b>		<b>Date:</b> 25/10/2009	

Date:	22/04/2009				
Type:	CAR	Number:	02	Reference:	Table 1 (section 2)
Lead Assessor Comment:					
Letter of Approval from United Kingdom of Great Britain and Northern Ireland is also required to be submitted to the DOE					
Project Participant Response:				Date: 15/05/2009	
The Host Country Letter of Approval is a prerequisite for application for the LoA - United Kingdom of Great Britain and Northern Ireland. The LoA from United Kingdom of Great Britain and Northern Ireland shall be applied for as soon as the Host Country LoA is received. Thereafter, the same shall be provided as and when it is received from the DNA of United Kingdom of Great Britain.					
Documentation Provided by Project Participant:					

<i>[Note to PP: Please provide evidence to the Response above, clearly reference the documentation and indicate documentation name/version and date here- for soft copies, exact names of electronic files and if applicable, active links to the web page; reference to the section(s) and text within the documentation including page number(s) should be provided for easy reference and transparency]</i>	
<b>Information Verified by Lead Assessor:</b>	
Not Available	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	<b>Date:</b> 21/05/09
CAR02 stands open	
<b>Project Participant Response:</b>	<b>Date:</b> 16/10/09
LoA - United Kingdom of Great Britain and Northern Ireland is attached	
<b>Documentation Provided by Project Participant:</b>	
LoA - United Kingdom of Great Britain and Northern Ireland	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	<b>Date:</b> 25/10/2009
LoA - United Kingdom of Great Britain and Northern Ireland has been submitted by the proponent. Closed out	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 25/10/2009

Date:	22/04/2009				
Type:	CAR	Number:	03	Reference:	A.2.1
<b>Lead Assessor Comment:</b>					
The section does not throw any light on the total proposed capacity of the energy generating unit. The PP should provide details about the methane generation capacity of the site along with the description of the site in terms of area and volume.					
The technology description does not match with the spreadsheet info and is not clear on the capacity that would be installed.					
<b>Project Participant Response:</b>				<b>Date:</b> 15/05/2009	
<i>The expected installed capacity for electricity generation in the project activity (PDD version 02) has been amended to 2.3 MW although the exact gas yield of the landfill site can only be confirmed once the project is operational. This is now consistent with the expected installed capacity in the CER and FA spreadsheets. Further, the methane generation capacity of the site has been determined using the “Tool to determine the methane emissions avoided from disposal of waste at a solid waste disposal site”. The same has been used to determine the ex ante emission reduction achieved by the project activity and subsequently CDM revenues in the project activity in the CER calculator and the FA respectively. A description of the site in terms of area and volume is provided in version 2 of the PDD.</i>					
<b>Documentation Provided by Project Participant:</b>					
See Version 2 of PDD					
See ‘CAR 3 Letter GD Naidoo Msunduzi Municipality’ for description of site’.					
<b>Information Verified by Lead Assessor:</b>					
PDD version 2 & Letter from Msunduzi Municipality were verified and the capacity that would be installed would be 2.3 MW					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>				<b>Date:</b> 02/06/2009	
CAR03 has been closed based on the corrections in PDD version 2					
<b>Acceptance and Close out by Lead Assessor:</b>				<b>Date:</b> 02/06/2009	

Date:	22/04/2009				
Type:	CAR	Number:	04	Reference:	B.2.2
<b>Lead Assessor Comment:</b>					



The project under consideration is a grid connected electricity project activity. The electricity generated from the project activity will displace the coal based grid electricity. The information regarding the relevant grid is not mentioned under section B.3 of the PDD. Please clarify	
<b>Project Participant Response:</b>	<b>Date:</b> 15/05/2009
<i>The project is connected to the South African National Grid. The required information is added in version 2 of the PDD.</i>	
<b>Documentation Provided by Project Participant:</b>	
<i>PDD version 2 is provided.</i>	
<b>Information Verified by Lead Assessor:</b>	
PDD version 2 has been verified and found OK	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	<b>Date:</b> 01/06/2009
The South African National Grid has been considered and has been found OK. CAR04 closed	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 01/06/2009

Date:	22/04/2009				
Type:	CAR	Number:	05	Reference:	B.4.4
<b>Lead Assessor Comment:</b>					
PP needs to submit any objective evidence for the awareness towards the CDM project activity prior to the start date and to submit supportive for the serious CDM consideration as per EB 41 annex 46. Also the start date has to be clarified in line with the CDM glossary of terms					
<b>Project Participant Response:</b>				<b>Date:</b> 15/05/2009	
<i>In version 2 of the PDD the start date has been amended. The revised start date of the CDM project activity is 09/04/2009 as the date on which the project developer has ordered the landfill gas to electricity generator for the project activity.</i>					
<i>The start date is in line with the EB clarification (EB 41 para 67) and refers to the definition of start date as per Glossary of CDM terms version 04. The start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. This, for example, can be the date on which contracts have been signed for equipment or construction/operation services required for the project activity. Minor pre-project expenses, e.g. the contracting of services /payment of fees for feasibility studies or preliminary surveys, should not be considered in the determination of the start date as they do not necessarily indicate the commencement of implementation of the project.</i>					
<i>The project has not started construction and the expected start date of construction of the project activity is October 2009. However, the purchase order for 1.15 MW biogas genset has been raised for the project activity. Thus the start date of the project activity has been taken as the date on which the purchase order was raised as representing the time project developer committed to major expenditures related to the implementation of the project and is earlier of construction / implementation for the project activity. Further, the start date of project activity in earlier version of the PDD was taken as the date of Lease &amp; Gas Rights Agreement Signed by Ener-G Systems Msunduzi (Pty) Ltd and the Msunduzi Municipality. This however, does not represent the true and accurate starting date of the project activity in light of the definition provided by CDM glossary of terms and has therefore been amended.</i>					
<i>According to EB regulations CDM consideration does not need to be proven if the validation activities start prior to the start date of the project activity. The PDD was uploaded for public stakeholder consultation on the UNFCCC website on the 17/03/2009 and the start date of the project activity is 09/04/2009 which is after submission of the project for validation to DOE. This itself substantiates that the project activity has been implemented with a consideration of CDM revenues. Therefore CDM consideration is not required for this project activity, nevertheless for completeness and conservativeness reasons, suitable evidence regarding the prior consideration of CDM is provided in the PDD and supportive documents referenced in the PDD are provided to the DoE.</i>					
<b>Documentation Provided by Project Participant:</b>					

See 'CAR 5.1 Purchase Order LFG Genset' for the purchase order for the landfill gas to electricity generator

See 'CAR 5.2 Msunduzi Municipality Tender Notice' for the Tender Notice published by Msunduzi Municipality to develop New England Landfill under CDM, published in The Witness, Thursday September 29, 2005.

See 'CAR 5.3 Lease & Gas Rights Agreement' for the Lease and Gas Rights Agreement Signed by Ener-G Systems Msunduzi (Pty) Ltd and the Msunduzi Municipality to develop the proposed project under CDM, 26 September 2007.

See 'CAR 5.4 ERPA signature date' for ERPA signed between Ecosecurities and Ener-G Systems Msunduzi, 7 January 2008.

**Information Verified by Lead Assessor:**

The purchase order has been verified and has been found to be in order. The chronology has been verified and represents that serious CDM consideration has been effected in line with EB41 Annex 46.

**Reasoning for not Acceptance or Acceptance and Close Out:**

**Date:** 01/06/09

CAR05 closed out

**Acceptance and Close out by Lead Assessor:**

**Date:** 01/06/09

Date:	22/04/2009				
Type:	CAR	Number:	06	Reference:	B.4.5
<b>Lead Assessor Comment:</b>					
<p>Please provide supportive for the assumptions used in the IRR calculation: Please justify in light of EB 41 Annex 45 how the data complies with guidance 6. On site the supporting submitted are after the start date for the cost. Please also explain why the BID conditions where the initial assumptions were considered are not considered for the IRR as the BID exclusively calls for projects to be developed under CDM.</p> <ol style="list-style-type: none"> <li>1. Please provide objective evidence for the assumptions used in the IRR calculation i.e. total investment cost (wells, equipment &amp; machinery, civil works), O&amp;M cost for all categories,</li> <li>2. The electricity tariff rate given in the IRR sheet is not inline with the document provided by PP (power purchase programme). Please clarify</li> <li>3. Reference web link provided for beta value does not verify the value used in the calculation. Instead of it, the beta value of "Independent power producers and energy traders" given in the same weblink can be used for beta value. Please clarify</li> <li>4. The CERs given in the IRR sheet for the year 2010 are not in line with the PDD. Please clarify</li> <li>5. In the worksheet "Investment &amp; cost", power generation equipment's capacity is mentioned as 2.6 MW (2 units of 1.1 MW &amp; 1 unit of 500 KW) but as per the PDD, installed capacity is expected to be approximately 2 MW. Also, the total generation capacity used to calculate the electricity generation is from 1 to 2.3 MW. Please clarify.</li> </ol>					
<b>Project Participant Response:</b>				<b>Date:</b> 15/05/2009	

According to EB41 Annex 45 the input values used in the investment analysis are applicable to the time of the investment decision taken by the project participant. This is September 2007 when the resolution of the directors of Ener-G Systems (Pty) Ltd was passed to sign the Gas Rights Agreement with the Msunduzi Municipality for the development of the New England Landfill Gas to Electricity CDM Project. The BID conditions are not considered here as a Tender doesn't constitute a binding agreement to go ahead with the project. As such the input factors are applicable to the time when the decision was made to sign the Gas Rights Agreement with the Msunduzi Municipality.

1. Objective evidence for the input parameters power generation, flaring system and gas collection system used in the IRR calculation is provided to the DoE. The IRR calculation spreadsheet references the sources. The O&M costs and project support costs are established according to sector experience by Ener-G Natural Power (UK). The O&M costs for the generators represent the majority of the O&M costs at 7.96% of total Capex (see CAR6.1.7 letter by Ener-G Systems for O&M cost breakdown for the generators). The O&M Flare cost is budgeted internally but only represents 1.65% of total Capex, and similarly the O&M cost for Gas Collection represents 1.1% of Capex. Project support costs have been internally budgeted and represent approximately 5.82% of the total Capex. Total O&M costs (including flare, gensets, gas collection and project support costs) represent 16.54% of the Total Investment Costs. An analysis of all registered Ecomethane Landfill gas to Energy CDM projects (Ecomethane is an unincorporated joint venture between Biogas Technology (Ltd) and Ener-G Group PLC who finance, construct operate landfill gas projects; as well as EcoSecurities who develop the projects under CDM) is provided in order to establish the average percentage of O&M costs compared to total investment costs for projects with similar technologies. This analysis shows O&M costs range between 14.18% and 29.01% of total Investment Costs for similar projects. As such, the O&M and project support costs of 16.54% of Total Investment Costs for the proposed CDM Project are in line with those for similar projects. The Civil cost category is based on the quote by Ubuntu Transport Logistics 4 September 2007. The Electrical Connection cost category, is internally budgeted and constitutes 6.6% of total Capex. This value is based on previous project experience and is substantiated by 2 quotes from previous projects requiring electrical connections to the National grid. The Quote from Cato Ridge Electrical Construction (Pty) Ltd - 3 September 2007 estimates an amount of R1,543,735 which is in line with the amount of R1,500,000 budgeted for this cost category. Similarly, the Cost Estimate by Plantech Associates- August 2006 for a total amount of R2962000 (excluding R1197000 for additional cabling) leads to an amount of R1,765,000 which is in line with the amount of R1,500,000 budgeted for the cost category.
2. The electricity tariff of the MTPPP has been included in the Financial Analysis with an annual increase of 5.2% (The Average Annual Eskom Base Tariff increase 1997-2008) since the tariffs quoted in the MTPPP are in 2008 terms. At time of decision making the tariff structure of the power purchase programme (MTPPP) was not available in South Africa yet. An available tariff at the time of decision making is the Eskom Megaflex consumer Tariff of 2007. The Megaflex tariff is the rate charged to urban consumers and ranged between R74.3/MWh for offpeak times and R168.9/MWh for peak times ([http://www.eskom.co.za/live/content.php?Item\\_ID=253&Revision=en/5](http://www.eskom.co.za/live/content.php?Item_ID=253&Revision=en/5)). It is therefore conservative to use the tariff structure of the MTPPP for assessing the additionality of the project as it is considerably higher than the tariff available at decision making and thus results in a conservative estimate of IRR.

### Continued response to CAR 6

3. *The source of the initial Beta value has been updated and the category which we referred to is no longer considered. As such we have used the Beta value for IPSA Group PLC, which is a company that has been established to develop, own and manage power generation plants in southern Africa. The company's main country of operation is South Africa and it has the same nature of business and a very similar business risk profile (i.e. power generation) as the proposed CDM project activity. As such the beta value of IPSA Group PLC (Bloomberg Professional Service, Bloomberg Finance L.P.) can be considered suitable to apply in the benchmark for the project activity. Bloomberg is an independent financial markets specialist who provides market information to the investor community. Data from such services are widely used in the financial world and can be accepted as relevant and credible market information to estimate financial indicators. This is also taken at the same time as decision making and is substantially more conservative than the original beta value. The screenshot has been included in Annex 3 of the PDD.*
4. *The CER estimation in the PDD considered a 6 month period according to the estimated start date of the crediting period 01/06/2010. The start date of the crediting period has been amended to 2010/01/01 and as such the CER estimates are for full calendar years. The CER values have been amended in the updated version of the financial analysis and the CER calculator and are consistent with version 2 of the PDD.*
5. *The expected installed capacity in version 2 of the PDD has been amended to 2.3 MW although the exact gas yield of the landfill site can only be confirmed once the project is operational. This is now consistent with the expected installed capacity which Ener-G plans to install in the 'Investment & Cost' tab of the Financial analysis and the expected installed capacity in the CER calculator. The 1.15MW generators have turn down ratios which allow the gensets to operate at a minimum load of 40% (see letter and email from Graham Brownlow, Engineering Department Manager, Ener-G Natural feskorn)*

- Please justify the use of Adjusted Beta value over raw Beta with appropriate justifications.

*The Adjusted Beta was used since it is a measure of the expected future systematic risk of a particular sector. The raw Beta is a measure of the historical systematic risk and would be inappropriate in the consideration of a future investment.*

*The application of an adjusted beta is justified by empiric evidence that suggests that most betas tend to move to the average beta over time (see <http://pages.stern.nyu.edu/~adamodar/pdfiles/valn2ed/ch8.pdf>). Such an approach to the average can be explained by a 'maturing' industry over time, scale effects or portfolio diversification.*

*However, to ensure conservativeness, the raw beta of the reference firm (0.546) is applied in the benchmark calculation.*

- The sensitivity analysis has to be arrived out as required in EB 41 Annex 45. Please also include the necessary variations as per guidance

*EB41 Annex 45 requires the consideration of sufficient variation in the input parameters to ensure that the additionality of a project is robust. This guidance suggests that variation of at least 10% in either direction should be considered where appropriate. We tested the sensitivity of the project's additionality by increasing revenues (+) and decreasing (-) costs, both capital and operational, and as a stopping point we used the values that rendered the project IRR equal to the benchmark. Decreasing revenues and increasing costs would not be reasonable as this would further decrease the financial attractiveness of the project i.e. would make the project even more additional. An explanation was then given regarding the probability of obtaining such additional revenue or reducing the expenditure to such a degree. The range we tested was in fact far larger than +/-10% and thus the Guidance of EB41 Annex 45 was adhered to in full.*

*The clarification on the method is also included in the last version of the PDD*

- Please justify why the risk free return has been averaged and also please explain the appropriateness with respect to the term. The screenshot does not provide the data that has been taken into account

*The project participant recognizes that applying an average risk free rate is not fully correct and wished to modify its approach. In the updated financial analysis, the applicable risk free rate (8.67%) (see [http://www.reservebank.co.za/internet/Publication.nsf/LADV/0D4A989F8AC9AD014225735B003217BF/\\$File/AER2007.pdf](http://www.reservebank.co.za/internet/Publication.nsf/LADV/0D4A989F8AC9AD014225735B003217BF/$File/AER2007.pdf)) at the time of decision making has been applied.*



To establish the risk premium, the project participant established the average return of the market over the previous 10 years (17.5%) and subtracted the average return (9.2%) on a risk free asset (government bonds) over the same time span (1998-2007) As return on government securities in 2007, an applicable

value of 8% has been assumed (during 2007, government bonds yielded between 7.5% and 8.7% return). The result of this calculation is a long term average for the risk premium of 8.31%.

The screenshot available does not provide returns during 1999 through 2002. This is because no securities were issued during that time by the host country. For simplification, the return in 1998 has been assumed as return on riskless assets in these years. Due to the lack of information, this procedure seems reasonable as an assumption of a lower return during those years would result in a less conservative benchmark. Excluding the years of 1999-2002 from the calculation of the average risk premium would even result in an average risk free rate of 8.35% and hence in a higher benchmark.

#### Documentation Provided by Project Participant:

- See the 'CAR 6 Board Resolution Timing input factors' for Resolution of the directors of Ener-G Systems (Pty) Ltd on 21 September 2007.
1. See the 0850 New England Landfill Gas to Energy Project Financial Analysis to SGS v2 (15.05.2009) spreadsheet tab: Project Cost Split Up and Investment & Costs. See 'CAR 6.1.1 EnerG Genset Quote' for Quotation for landfill gas generating units (18 August 2007) by Ener-G Natural Power. See 'CAR 6.1.2 Megapile Gas Well Quote' for Quotation by Megapile for Gas Well Installation at various dump sites (17 September 2007). See 'CAR 6.1.3 Biogas Flare Quote' for Quotation by Biogas Technology Limited for Flare System (5 September 2007). See 'CAR 6.1.4 Ubuntu Transport Logistics for Civil Cost' for Quotation from Ubuntu Transport Logistics (Pty) Ltd (4 September 2007) for substantiation of Civil Costs. See 'CAR 6.1.5 Cato Ridge Electrical Construction Electrical Connect Cost' for Quotation from Cato Ridge Electrical Construction (Pty) Ltd (3 September 2007) and 'CAR 6.1.6 Plantech Cost Estimates for Electrical Connect Cost' for Plantech Associates Cost Estimate (August 2006) for substantiation of Electrical Connection Cost. See 'CAR 6.1.7 EnerG O&M costs Genset' for O&M Gensets costs and 'CAR 6.1.8 O&M Costs Ecomethane projects' for substantiation of O&M costs as a percentage of Total Investment costs for similar projects.
  2. See the 0850 New England Landfill Gas to Energy Project Financial Analysis to SGS v2 (15.05.2009) spreadsheet tab: Investments & Costs.
  3. See the 0850 New England Landfill Gas to Energy Project Financial Analysis to SGS v2 (15.05.2009) spreadsheet tab 'Beta'
  4. See the 0850 New England Landfill Gas to Energy Project Financial Analysis to SGS v2 (15.05.2009) spreadsheet tab 'Financial Analysis with CDM'
  5. See the 0850 New England Landfill Gas to Energy Project Financial Analysis to SGS v2 (15.05.2009) spreadsheet tab 'Investment & Costs', 0850 New England Landfill Gas to Energy Project CER Calculator to SGS v2 (15.05.2009) and PDD Version 2. See 'CAR6.5.1 EnerG Natural Power turn down ratio email' and 'CAR6.5.2 EnerG Natural Power turn down ratio letter' for justification of the turn down ratios achievable on the gensets.

#### Information Verified by Lead Assessor:

All above mentioned Docs have been verified and found Ok except the appropriateness on the benchmarking

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**Reasoning for not Acceptance or Acceptance and Close Out:**

**Date:** 02/06/2009

<p>CAR06 is open for the following points</p> <ul style="list-style-type: none"> <li>Please justify the use of Adjusted Beta value over raw Beta with appropriate justifications.</li> <li>The sensitivity analysis has to be arrived out as required in EB 41 Annex 45. Please also include the necessary variations as per guidance</li> <li>Please justify why the risk free return has been averaged and also please explain the appropriateness with respect to the term. The screenshot does not provide the data that has been taken into account</li> </ul> <p>The benchmark has to be justified as per EB41 Annex 45</p>			
<p><b>Documentation Provided by Project Participant:</b></p> <p>See '0850 New England Landfill Gas to Energy Project Financial Analysis to SGS v2 (15.05.2009) updated'</p> <p>See PDD Version 2 updated</p>			
<p><b>Reasoning for not Acceptance or Acceptance and Close Out:</b></p> <ul style="list-style-type: none"> <li>The assumptions taken up for Beta value by the project proponent have been well justified.</li> <li>Sensitivity analysis has been done by the project proponent as per EB 41 Annex 45.</li> <li>Assumptions used to arrive benchmark for the project activity have been validated to be correct.</li> </ul> <p>CAR 06 is Closed out.</p>			
<p><b>Acceptance and Close out by Lead Assessor:</b></p>		<p><b>Date:</b> 04/06/2009</p>	

Date:	22/04/2009				
Type:	CAR	Number:	07	Reference:	B.5.1.
<p><b>Lead Assessor Comment:</b></p> <p>PP needs to provide supportive to justify the assumptions used for the domestic waste portion and types of waste stream mentioned in the worksheet "waste composition" and "input data" in the CER calculation sheet. Also, provide the waste characterization report for the landfill site.</p> <p>Also, partial data used is an extract from a thesis of a Student where the reproducibility of the data is questionable in view of a potential partial interpretation and seriousness.</p> <p>The Landfill closure is not correctly mentioned which also impacts economics. Please justify how the closure has been accorded.</p>					
<p><b>Project Participant Response:</b></p>			<p><b>Date:</b> 15/05/2009</p>		
<p>The municipality has assessed the waste stream and the composition of the waste going into the landfill. See 'Waste Composition at the New England Road Landfill' from the Msunduzi Municipality.</p> <p>The PDD and the CER calculation sheet have been updated accordingly using the aforesaid reference. We have received new information regarding the remaining lifetime of the landfill:</p> <p>The municipality has a permit to fill the landfill up to an elevation of 654m and since there is no other landfill available, the municipality is planning to make use of the full airspace permitted. In November 2007 it was estimated that the landfill has a remaining lifetime of +/- 9 years until the available airspace is exhausted. The landfill is therefore expected to be operational until Nov 2016. See report by Willson &amp; Pass 'Pietermaritzburg Landfill Site: Further Preliminary Future Available Volume Estimates'</p> <p>The PDD and CER calculation spreadsheet have been amended to reflect the lifetime of 2016.</p>					
<p><b>Documentation Provided by Project Participant:</b></p> <p>See 'CAR 7.1 Waste Composition at the New England Road Landfill'</p> <p>See 'CAR 7.2 Wilson and Pass Landfill Closure Date' for Willson &amp; Pass Pietermaritzburg Landfill Site: Further Preliminary Future Available Volume Estimates. 15 November 2007.</p>					
<p><b>Information Verified by Lead Assessor:</b></p> <p>Waste composition, the estimate document has been verified and found OK</p>					
<p><b>Reasoning for not Acceptance or Acceptance and Close Out:</b></p> <p>CAR07 has been closed</p>			<p><b>Date:</b> 01/06/2009</p>		
<p><b>Acceptance and Close out by Lead Assessor:</b></p>			<p><b>Date:</b> 01/06/2009</p>		

Date:	22/04/2009				
Type:	CAR	Number:	08	Reference:	B.5.2.
<b>Lead Assessor Comment:</b>					
The methodology has been applied to the project as per its definition.					
5. But, the fossil fuel consumption under the project boundary by using back-up fossil fuel generators is not explicitly described in the PDD. PP needs to follow the applicable tool to calculate the project emission “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” Please clarify.					
6. Please also demonstrate that which components will be included under the project emission from electricity consumption within the project activity “PE <sub>EC,y</sub> ”.					
<b>Project Participant Response:</b>				<b>Date:</b> 15/05/2009	
3. <i>Project Emissions from Fossil Fuel Consumption through the use of back-up fossil fuel generators has been included in version 2 of the PDD according to the ‘Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion’.</i>					
4. <i>A monitoring table for the parameter PE<sub>FC,y</sub> has been added to the section B7.1 of version 2 of the PDD. As such this distinguishes project emissions from electricity consumption and project emissions from fossil fuel combustion.</i>					
<b>Documentation Provided by Project Participant:</b>					
See PDD version 2					
<b>Information Verified by Lead Assessor:</b>					
PDD Version 2					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>				<b>Date:</b> 01/06/2009	
CAR08 is closed					
<b>Acceptance and Close out by Lead Assessor:</b>				<b>Date:</b> 01/06/2008	

Date:	22/04/2009				
Type:	CL	Number:	09	Reference:	B.6.2.
<b>Lead Assessor Comment:</b>					
Please provide supportive for the data used to calculate the grid EF of the South African electricity grid for the project activity as the data provided under Annex 3 is not retraceable.					
<b>Project Participant Response:</b>				<b>Date:</b> 15/05/2009	
The grid EF calculation sheet was sent to SGS. All data sources are clearly referenced in the calculations spreadsheet.					
<b>Documentation Provided by Project Participant:</b>					
See 'CAR 9 CEF South Africa to SGS'					
<b>Information Verified by Lead Assessor:</b>					
Spreadsheet has all relevant information					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>				<b>Date:</b> 02/06/2009	
CL 09 closed out					
<b>Acceptance and Close out by Lead Assessor:</b>				<b>Date:</b> 02/06/2009	

Date:	22/04/2009				
Type:	CAR	Number:	10	Reference:	B.10.1
<b>Lead Assessor Comment:</b>					



The monitoring plan as given in the PDD is not clear. Please clarify the below mentioned points:

6. Parameter "PE<sub>FC,j,y</sub>" project emission from fossil fuel consumption in process is not included in the monitoring plan
7. Parameter "MG<sub>PR,y</sub>" Amount of methane generated from the project activity has not been described in the monitoring plan.

Please justify why the monitoring plan has not included the monitoring of parameters in line with the Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site, in particular the W<sub>x</sub> (Total amount of organic waste prevented from disposal in year x), P<sub>n,j,x</sub> (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) as this is an open landfill.

Please also justify why how the MCF values and recovery rate are assumed with proper justification.

**Project Participant Response:**

**Date:** 15/05/2009

1. Parameter  $PE_{FC,j,y}$  is included in version 2 of the PDD
  2. Parameter  $MG_{PR,y}$  has not been included in the monitoring plan for the following reasons. As per ACM0001 version 10,  $MG_{PR,y}$  is the amount of methane generated during the project year  $y$  which needs to be estimated as per the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site". However, in the tool the same has been designated as  $BE_{CH4,SWDS,y}$  - The amount of methane that would in the absence of the project activity be generated from disposal of waste at the solid waste disposal site. Hence referring to the tool, the same designation  $BE_{CH4,SWDS,y}$  has been used in the PDD and ACM0001 v10 lists  $BE_{CH4,SWDS,y}$  as a parameter that is not monitored. ACM0001 v10 refers to the tool for ex-ante estimations of methane emissions and not for monitoring purposes. The ex-post monitoring methodology in ACM0001 v10 is based on direct measurements of the amount of landfill gas captured and destroyed and does not follow the first order decay based estimation. In addition,  $MG_{PR,y}$  does not apply to the project as  $MD_{BL,y}$  is set as zero. Therefore steps 1,2 and 3 on estimating the Adjustment Factor (AF) in ACM0001 version 10 do not apply to the project. Thus,  $MG_{PR,y}$  has not been included in the monitoring plan.
- $W_x$  (Total amount of organic waste prevented from disposal in year  $x$ ) and  $P_{n,j,x}$  (Weight fraction of the waste type  $j$  in the sample  $n$  collected during the year  $x$ ) have been included in the list of "Data and parameters available at validation" as they are both determined only once ex ante for the purpose of estimating emission reductions. These are included in version 2 of the PDD.
  - $z$  (Number of samples collected during the year) were not included in the monitoring plan as version 10 of ACM0001 version 10 page 7 states: "Sampling to determine the different waste types is not necessary. The waste composition can be obtained from previous studies". The proposed project is using data provided by the municipality managing the landfill site to determine the different waste types. (see CAR 7). For clarification purposes, version 2 of the PDD includes an explanation in Section B.7.1 on why  $z$  doesn't need to be monitored.

The 'Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site' was designed for biomass projects which avoid land filling of biomass residues and ACM0001 version 10 has diverted its use. In order to be able to use the tool, ACM VERSION 100001 includes guidance on how to use the tool (see page 7) and the guidance in the methodology should be taken in this context.

MCF value is used as per 'Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site'. A value of 1 corresponds to anaerobic managed solid waste disposal site which must have: controlled placement of waste and will include at least one of the following: i) cover material, ii) compacting; or iii) levelling of the waste. As observed at the site visit, the New England Landfill site meets these criteria and therefore a MCF value of 1 is used. This is further justified by the conditions in the New England Road Landfill Permit (No. 16/2/7/U203/D3/Z1/P64) which states as a General Operational measure (point 4.3.1 pg 4) that waste disposed at the site must be compacted and covered at the end of each day with a minimum of 150mm of soil.

The recovery rate of 70% is used as the project will make use of both horizontal and vertical wells and as such gas collection is increased. See letter from Ener-G Systems (Pty) Ltd 'Collection efficiency assumptions for New England'

#### Documentation Provided by Project Participant:

See 'CAR 10 EnerG collection efficiency' for letter from Ener-G Systems (Pty) Ltd 'Collection efficiency assumptions for New England'

#### Information Verified by Lead Assessor:

The justification for MCF value being used as 1 is inadequate and just quoted text. Evidence for acceptance is required

Reasoning for not Acceptance or Acceptance and Close Out:

Date: 02/06/2009

Not closed

#### Documentation Provided by Project Participant:

See 'CAR 10.2 New England Road Landfill Site Permit' for General Operational Measures of Landfill Permit.

<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	<b>Date:</b> 04/06/2009
The landfill site permit (permit no. 16/2/7/U203/D3/Z1/P64) issued by Department of Water Affairs and Forestry has been cross checked to validate that the site is well managed. Hence closed out	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 04/06/2009

<b>Date:</b>	22/04/2009			
<b>Type:</b>	CAR	<b>Number:</b>	11	<b>Reference:</b>
<b>Lead Assessor Comment:</b>				
The EIA final approval is pending, please submit the Environment clearances				
<b>Project Participant Response:</b>				<b>Date:</b> 15/05/2009
The record of decision (RoD) of the EIA was received. As per the document the Kwazulu Natal Department of Agriculture and Environment Affairs has authorised the extraction of landfill gas and generation of electricity at New England Landfill site. The EIA is therefore approved.				
<b>Documentation Provided by Project Participant:</b>				
See 'CAR 11 RoD & Approval' for the KZN Agriculture and Environmental Affairs: Record of decision and approval for the New England Road Landfill gas to electricity project. 20/4/2009. Durban South Africa.				
<b>Information Verified by Lead Assessor:</b>				
The record of decision (RoD) of the EIA submitted by the project proponent				
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>				<b>Date:</b> 01/06/2009
CAR11 is closed out.				
<b>Acceptance and Close out by Lead Assessor:</b>				<b>Date:</b> 01/06/2009

## A.4 Annex 4: Team Members Statements of Competency

### Statement of Competence

Name: Sharma, Kunal

#### Status

- Lead Assessor	<input checked="" type="checkbox"/>	- Expert	<input checked="" type="checkbox"/>
- Assessor	<input checked="" type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input checked="" type="checkbox"/>	- Technical Reviewer	<input type="checkbox"/>

#### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>2. Energy Distribution</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>3. Energy Demand</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>4. Manufacturing</b>	<input checked="" type="checkbox"/>
<i>Sub scope(s): Lime Production and Use</i>	
<b>5. Chemical Industry</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>6. Construction</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>7. Transport</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>8. Mining/Mineral Production</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>9. Metal Production</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>12. Solvent Use</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>13. Waste Handling and Disposal</b>	<input checked="" type="checkbox"/>
<i>Sub scope(s): Wastewater and sludge treatment</i>	
<b>14. Afforestation and Reforestation</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>15. Agriculture</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	

Approved Member of Staff by:

Siddharth Yadav

Date:

28/10/2009

## Statement of Competence

Name: Van den Berg, Cornelis

### Status

- Lead Assessor	x	- Expert	
- Assessor	x	- Financial Expert	
- Local Assessor	South Africa	- Technical Reviewer	

### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	
<i>Sub scope(s):</i>	
<b>2. Energy Distribution</b>	
<i>Sub scope(s):</i>	
<b>3. Energy Demand</b>	
<i>Sub scope(s):</i>	
<b>4. Manufacturing</b>	
<i>Sub scope(s):</i>	
<b>5. Chemical Industry</b>	
<i>Sub scope(s):</i>	
<b>6. Construction</b>	
<i>Sub scope(s):</i>	
<b>7. Transport</b>	
<i>Sub scope(s):</i>	
<b>8. Mining/Mineral Production</b>	
<i>Sub scope(s):</i>	
<b>9. Metal Production</b>	
<i>Sub scope(s):</i>	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	
<i>Sub scope(s):</i>	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	
<i>Sub scope(s):</i>	
<b>12. Solvent Use</b>	
<i>Sub scope(s):</i>	
<b>13. Waste Handling and Disposal</b>	
<i>Sub scope(s):</i>	
<b>14. Afforestation and Reforestation</b>	
<i>Sub scope(s):</i>	
<b>15. Agriculture</b>	
<i>Sub scope(s):</i>	

Approved Member of Staff by: Siddharth Yadav Date: 23 November 2009

## Statement of Competence

Name: Mahawar, Abhishek

### Status

-	Lead Assessor	<input type="checkbox"/>	-	Expert	<input type="checkbox"/>
-	Assessor	<input checked="" type="checkbox"/>	-	Financial Expert	<input checked="" type="checkbox"/>
-	Local Assessor	<input checked="" type="checkbox"/>	-	Technical Reviewer	<input type="checkbox"/>

### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>2. Energy Distribution</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>3. Energy Demand</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>4. Manufacturing</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>5. Chemical Industry</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>6. Construction</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>7. Transport</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>8. Mining/Mineral Production</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>9. Metal Production</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>12. Solvent Use</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>13. Waste Handling and Disposal</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>14. Afforestation and Reforestation</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>15. Agriculture</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	

Approved Member of Staff by:

Siddharth Yadav

Date:

12/11/2009

## Statement of Competence

Name: Gaurav  
Rakesh  
Lunawat

### Status

- Lead Assessor		- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	Indi a	- Technical Reviewer	

### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	
<i>Sub scope(s):</i>	
<b>2. Energy Distribution</b>	
<i>Sub scope(s):</i>	
<b>3. Energy Demand</b>	
<i>Sub scope(s):</i>	
<b>4. Manufacturing</b>	
<i>Sub scope(s):</i>	
<b>5. Chemical Industry</b>	
<i>Sub scope(s):</i>	
<b>6. Construction</b>	
<i>Sub scope(s):</i>	
<b>7. Transport</b>	
<i>Sub scope(s):</i>	
<b>8. Mining/Mineral Production</b>	
<i>Sub scope(s):</i>	
<b>9. Metal Production</b>	
<i>Sub scope(s):</i>	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	
<i>Sub scope(s):</i>	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	
<i>Sub scope(s):</i>	
<b>12. Solvent Use</b>	
<i>Sub scope(s):</i>	
<b>13. Waste Handling and Disposal</b>	x
<i>Sub scope(s): Landfill gas</i>	
<b>14. Afforestation and Reforestation</b>	
<i>Sub scope(s):</i>	
<b>15. Agriculture</b>	
<i>Sub scope(s):</i>	

Approved Member of Staff by: Siddharth Yadav Date: 09.04.2010

## Statement of Competence

Name: Singh, Kaviraj

### Status

- Lead Assessor	<input checked="" type="checkbox"/>	- Expert	<input checked="" type="checkbox"/>
- Assessor	<input type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input type="checkbox"/>	- Technical Reviewer	<input checked="" type="checkbox"/>

### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>2. Energy Distribution</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>3. Energy Demand</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>4. Manufacturing</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>5. Chemical Industry</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>6. Construction</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>7. Transport</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>8. Mining/Mineral Production</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>9. Metal Production</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>12. Solvent Use</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>13. Waste Handling and Disposal</b>	<input checked="" type="checkbox"/>
<i>Sub scope(s): Landfill gas, Wastewater and sludge treatment, Composting</i>	
<b>14. Afforestation and Reforestation</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	
<b>15. Agriculture</b>	<input type="checkbox"/>
<i>Sub scope(s):</i>	

Approved Member of Staff by:

Siddharth Yadav

Date:

16/12/2009