



VALIDATION REPORT

“SUDOKWON LANDFILL GAS ELECTRICITY GENERATION PROJECT (50MW)” IN KOREA

REPORT No. 2007-0244

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DET NORSKE VERITAS



VALIDATION REPORT

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Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “Sudokwon Landfill Gas Electricity Generation Project (50MW)” in Korea on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV's opinion that the project, as described in the project design document of 22 December 2006, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved consolidated methodologies ACM0001 (Version 4) “Consolidated methodology for landfill gas project activities”. Hence, DNV requests the registration of the “Sudokwon Landfill Gas Electricity Generation Project (50MW)” as a CDM project activity.

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Report title: “Sudokwon Landfill Gas Electricity Generation Project (50MW)” in Korea							
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***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LFG	Landfill Gas
LPG	Liquefied Petroleum Gas
MHI	Mitsubishi Heavy Industry
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change



1 INTRODUCTION

Sudokwon Landfill Site Management Corporation (SLC) has commissioned Det Norske Veritas Certification Ltd. (DNV) to perform a validation of the “Sudokwon Landfill Gas Electricity Generation Project (50MW)” in Korea in the Incheon province, Republic of Korea (hereafter called “the project”). This validation report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

Mr Young-Keun Kim	DNV Certification Korea	Project Manager, GHG auditor
Ms Anu Chaudhary	DNV Certification India	CDM Validator
Mr K.V. Raman	DNV Certification India	Technical Reviewer (Applicant)
Mr. C. Kumaraswamy	DNV Certification India	Technical Reviewer
Mr Luis Filipe Tavares	DNV Certification Brazil	Sector Expert

1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0001 (Version 4) “Consolidated methodology for landfill gas project activities” /4/. ACM0002 (Version 6) “Consolidated methodology for grid-connected electricity generation from renewable sources” has been used for the determination of the grid emission factor /5/. The validation team has, based on the recommendations in the Validation and Verification Manual /3/ employed a risk-based approach, 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 project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

1.3 Description of Proposed CDM Project

The project is located in the Incheon province in the city of Seo-ku Geomdan-dong in the Republic of Korea. The objective of the project is to install a more efficient landfill gas (LFG) recovery system and use the recovered LFG for the generation of 50 MW power in a new power plant (steam turbine coupled to a generating set) and export. The excess landfill gas will be



flared. In the baseline, the collected landfill gas (at 42% collection efficiency) was partially (12%) used for electricity generation in two units of 6.5 and 3.38 MW capacities, and the rest was flared. The power generated in the project scenario will be exported to the Korean national grid. The landfill site consists of 4 cells, of which one cell has been filled and closed while filling of the second cell is in progress. Cells 3 and 4 are earmarked for the future filling of waste.

Emission reductions are claimed from the increased reduction of GHG emissions through systematic and more efficient LFG recovery system and from the displacement of electricity from the Korean national grid.

The project is estimated to reduce 1 210 342 tCO₂e (tonnes of carbon dioxide equivalent) per year for the duration of the project activity. A reduction of approximately 12 103 416 tCO₂e is forecast for the fixed 10-year crediting period starting from 1 April 2007. The project lifetime is estimated to be 30 years.

2 METHODOLOGY

The validation consists of the following three phases:

- I a desk review of the project design and the baseline and monitoring methodology
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /3/. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the “*Sudokwon Landfill Gas Electricity Generation Project (50MW)*” is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term Clarification may be used where additional information is needed to fully clarify an issue.



Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	Reference	Conclusion	Cross reference
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>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.</i>	<i>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.</i>	<i>This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). A request for Clarification (CL) is used when the validation team has identified a need for further clarification.</i>

Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<i>If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1 Validation protocol tables



2.1 Review of Documents

The PDD /1/ submitted by Sudokwon Landfill Site Management Corporation (version 02 dated 19 May 2006 and the final version 05 dated 22 December 2006) and additional background documents such as the financial calculation sheets and the emission reduction calculation sheets related to the project design and baseline were assessed during the validation.

2.2 Follow-up Interviews

In the period of 4-5 July 2006, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Sudokwon Landfill Site Management Corp., Eco-frontier and the Department of Environment were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Sudokwon Landfill Site Management Corp., Eco-frontier	<ul style="list-style-type: none"> - Provisions for training and maintenance for this project. - Procedures for project management, monitoring and recording, including day-to-day record handling - Construction/ operating permits - Baseline determination - Project technology - Additionality - Financial assessment - Monitoring plans - Emission reduction estimates - Environmental Impact Assessment - Minutes of meeting from the local stakeholder consultation - The feasibility study of the project and project lifetime - Date of commissioning for the project. - Letter of Approval (LoA) from the local DNA
Ministry of Environment	<ul style="list-style-type: none"> - Incentive for renewable energy project such as the proposed project - The process of Host Country Approval for CDM projects in Korea and the status for the current project - Sustainable development priorities of Korea - Common landfill gas capture and utilization practices - Environmental Impact Assessments for this type of projects - Compliance with existing and emerging Korean regulations - Stakeholder Consultation Process for this project - Potential impact from the project - Official government funding provided for this type of project - Letter of Approval



2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve any outstanding issues which need to be clarified for DNV's positive conclusion on the project design. The corrective action requests and requests for clarification raised by DNV Certification Ltd., presented to the project participants in DNV's draft validation report of 27-06-2006 (rev. 1) were resolved during communications between the client and DNV. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A.

Since modifications to the project design were necessary to resolve DNV's concerns, the client decided to revise the PDD and resubmitted the PDD version 05 on 22 December 2006. After reviewing the revised PDD, DNV issued this final validation report and opinion.

2.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

3.1 Participation Requirements

The sole project participant is Sudokwon Landfill Site Management Corporation (SLC). The host Party is the Republic of Korea. No Annex I Party has been identified yet. The host-Party Korea meets all the requirements to participate in the CDM. Letter of Approval from the DNA of the Republic of Korea, including authorization of the project participants and that the project assists in achieving sustainable development in Korea has been obtained /2/.

3.2 Project Design

The project objective is to enhance the collection efficiency of LFG in the Sudokwon landfill and utilize it for power generation (50MW) and flare any excess quantities of gas. The project thus avoids methane emissions to the atmosphere. The technology employed by the project will considerably improve the landfill gas collection efficiency, through the installation of new vertical pipes. For the electricity generation component, a new 50 MW boiler (generating set by Doosan Heavy Industry and steam turbine by MHI) will be installed.

The technology constitutes current good practice and is not likely to be replaced during the crediting period. The project is expected to have a collection efficiency of about 75% against 42% in the baseline. However, to be on the conservative side a collection efficiency of 70% has been chosen in the project scenario to account for the adjustment factor.



The project is expected to contribute towards sustainable development through improved local environment, reducing the possibility of explosion caused by LFG leakage and increase employment opportunities to the local communities.

The starting date of the project is 15-12-2006 and the lifetime of the project is expected to be 30 years.

3.3 Project Baseline

The proposed landfill gas capture and utilization project applies the approved consolidated methodologies ACM0001 (Version 4) “Consolidated methodology for landfill gas project activities” and the project fulfils the methodology applicability criteria.

The baseline scenario chosen for the proposed project activity is continuation of the current practice at Sudokwon landfill ie., inefficient collection of about 42.8% with flaring of landfill gas and pilot plant scale electricity generation using LFG in the 2 smaller units of 6.5 MW and 3.38 MW capacity respectively. The excess amount of methane emitted in the baseline is considered as the baseline emissions.

After implementation of the proposed project activity a collection efficiency of about 70% and an electricity generation capacity of ~ 50 MW is expected to be achieved. The difference in the collection efficiency between the baseline and the project scenario is considered as the emission reductions. Hence, an adjustment factor (AF) of 61.15% has been taken into account.

CO₂ emissions from the burning of LFG for electricity generation are considered carbon neutral and hence not considered as project emissions. However, LPG used as start-up fuel will be monitored and the same has been incorporated in the monitoring plan.

3.4 Additionality

The project’s additionality has been demonstrated with the help of the latest tool for additionality:

Step 0: Not Applicable.

Step 1: It was assessed during the follow up interviews that Republic of Korea has no legal requirement for landfill gas management; capture and flaring and that this situation is not likely to change in future.

Step 2: Investment analysis: Since the project activity generates revenue and all the identified alternatives are not feasible, a benchmark analysis has been applied to the project activity. The benchmark for projects in the republic of Korea is 5.21%, which is the rate of interest provided by the local banks. The benchmark has been confirmed during site interviews. It has been demonstrated that the project IRR without considering the CDM revenues is 0.898% lower than the benchmark) which improves to 5.904% considering projected CDM revenues.

The special incentive schemes provided by the Korean government, such as a higher price for electricity based on renewable energy sources, have been considered for the project financial calculations.

Step 3: Barrier analysis – has not been applied.



Step 4: It has been demonstrated and was verified during the follow up interviews that the collection and utilization of LFG for large scale electricity generation is not a commonly adopted practice in Korea. It has been confirmed that several small scale electricity generation projects based on LFG capture also are in the process of validation/registration as CDM projects.

Step 5: The registration of the proposed project as a CDM activity will make the project economically feasible for the investors. Thus, it can be concluded that any emission reductions as a consequence of the project will be additional to what would otherwise have occurred.

3.5 Monitoring Plan

The selected monitoring methodology is in line with the approved consolidated monitoring methodology ACM0001 (Version4) - "Consolidated baseline methodology for landfill gas project activities".

The following parameters will be monitored

- a) landfill gas captured – measured by flow meter
- b) landfill gas used for power generation – measured by flow meter
- c) landfill gas flared – measure by flow meter
- d) flare efficiency- operating hours and % methane- measured and calculated
- e) methane fraction in landfill gas – measured continuously
- f) temperature and pressure of landfill gas – measured
- g) electricity exported to the grid – measured.
- h) Electricity imported from the grid – measured.
- i) Grid emission factor – recalculated
- j) Operating hours of the power plant
- k) Regulatory requirements.
- l) Fossil fuel (LPG) - measured

All the monitored data will be archived for duration of two years after the crediting period.

The grid emission factor (CEF) is been estimated ex-ante at the start of the crediting period. The CEF for the electricity generated and supplied to the grid is calculated as a combined margin based on the operating margin (OM) and build margin (BM) as per the approved methodology ACM0002 (Version 6). Based on a 3-year vintage data from 2003-05, the value of OM is calculated as 0.7652, the BM as 0.3679 and the combined margin is 0.5666.

The actual emission reductions would be calculated ex-post based on the actual amount of methane captured and flared.

Procedures for training of monitoring personnel and calibration of equipment have been duly identified.

3.6 Calculation of GHG Emissions

The emissions associated with fugitive landfill gas emissions have been taken into account. It has been estimated that 70% of the LFG is captured and destroyed in the project scenario as compared to a 42.8% collection and combustion in the baseline scenario. Hence, an adjustment factor (AF) of 61.15% has been considered for the calculation of emission reductions generated through the proposed project activity. This is deemed conservative.



The project emissions from the burning of LFG for electricity generation are carbon neutral. The LPG used as a start-up fuel will be monitored and considered for the project emissions.

The first order decay model has been used to estimate the amount of landfill gas destroyed. The value of the decay constant (k) has been estimated to be 0.07427 and 0.1242 for the two dumpsites. This is based on past data of gas collection and the amount of accumulated waste. The methane generation potential (Lo) value has been calculated based on research and lab analysis. Capture and destruction efficiency of the collection and power generation system has been taken as 70% which is justified. Actual emission reductions will be monitored directly ex-post. This is considered conservative.

The project estimates to reduce 1 210 342 tonnes of carbon dioxide equivalent) per year for the duration of the project activity. A reduction of approximately 12 103 416 tCO₂e is forecast for the fixed 10-year crediting period. However, experiences with other landfills have shown that the methane generation and collection efficiency of the landfills projected by the first order decay model has an inherent uncertainty of almost 50% and hence the amount of CERs, which will be monitored ex-post, might vary from the projected amount.

3.7 Environmental Impacts

An EIA has been conducted in October 2003 and approved by the Korean government in December 2003. Appropriate mitigation measures have been taken to minimize the impacts identified due to the project. However, none of the impacts identified are considered significant environmental impacts.

3.8 Comments by Local Stakeholders

Local stakeholders were consulted as a requirement for the environmental impact assessment (EIA) conducted. The local stakeholders were also consulted through a public presentation of the EIA and a public hearing process. A summary of the comments received has been provided and due account taken.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 19 May 2006 (Version 2) was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 13 June 2006 to 12 July 2006.

No comments were received.



5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “Sudokwon Landfill Gas Electricity Generation Project (50 MW)” in Republic of Korea. The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host country is Republic of Korea. No Annex I Party has been identified yet. The host country fulfils the participation criteria and has approved the project and authorized the project participants. The DNA of the Republic of Korea has confirmed that the project assists in achieving sustainable development.

The project correctly applies ACM0001 (Version 4) “Consolidated methodology for landfill gas project activities” and ACM0002 (Version 6) “Consolidated methodology for grid-connected electricity generation from renewable sources”.

The proposed project activity emission reductions are claimed from reduction of GHG emissions through systematic and efficient LFG recovery system and from electricity generation and supply to the grid, thus replacing a certain amount of fossil fuel for electricity generation.

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 on average 1 210 342 tCO₂e per year over the selected 10 year crediting period. The emission reduction forecast has been checked and is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented.

In summary, it is DNV’s opinion that the “Sudokwon Landfill Gas Electricity Generation Project (50 MW)” in the Republic of Korea, as described in the PDD of 22 December 2006 meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0001 (Version 4) and ACM0002 (Version 6). DNV thus requests the registration of the project as a CDM project activity.



REFERENCES

Documents provided by the project proponent that relate directly to the project:

- /1/ Sudokwon Landfill Site Management: CDM-PDD of the “Sudokwon Landfill Gas Electricity Generation Project (50 MW)” Version 5 of 22 December, 2006.
- /2/ Host Country (Republic of Korea), letter of approval for the “Sudokwon Landfill Gas Electricity Generation Project (50 MW)” dated 7 November, 2006.

Background documents related to the design and/or methodologies employed in the design or other reference documents:

- /3/ International Emission Trading Association (IETA) & the World Bank’s Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /4/ ACM0001 (Version 4) “Consolidated methodology for landfill gas project activities”
- /5/ ACM0002 (Version 6) “Consolidated methodology for grid-connected electricity generation from renewable sources”

Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:

- /6/ Hak, Lee, General Manager, Resource Management Team, Sudokwon Landfill Site Management Corp.
- /7/ Moon Young, Choi, Director, Resource Recovery Department, Sudokwon Landfill Site Management Corp.
- /8/ Min Park, Climate Change Business Unit Head, Eco-Frontier
- /9/ Joon-Sik Song, Associate, Climate Change Business Unit, Eco-Frontier
- /10/ Myung-Soo Yoo, Senior Deputy Director, Resource Recirculation Policy Division/MoE
- /11/ Han up Park, Deputy Director, Municipal Waste Management Division/MoE

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APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirement for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	NA	No Annex-I Party has been identified yet.
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	CAR-1 OK	An approval from the Host country Republic of Korea is still pending Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	CAR-1 OK	LoA from the Korean DNA is to be submitted to the validator.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK	Table 2, Section B.2
7. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK	Public funding was not involved in the project.
8. Parties participating in the CDM shall designate a national	CDM Modalities and Procedures	OK	The CDM Review Committee, Office of the Prime Minister is the

Requirement	Reference	Conclusion	Cross Reference / Comment
authority for the CDM	§29		DNA of The Republic of Korea.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	The Republic of Korea ratified the Kyoto Protocol on 08-11-2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	Annex-I country has not been identified yet.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	OK	Annex-I country has not been identified yet.
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK	Table 2, Section F
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f	OK	Table 2, Section D
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	CDM Modalities and Procedures §40	OK	The PDD was up for comments from 13-06-2006 to 12-07-2006. in the website www.dnv.com/certification/climatechange/
17. A baseline shall be established on a project-specific basis, in a	CDM Modalities	OK	Table 2, Section B.2

Requirement	Reference	Conclusion	Cross Reference / Comment
transparent manner and taking into account relevant national and/or sectoral policies and circumstances	and Procedures §45c,d		
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	CAR-2 OK	The table in E.6 has to be aligned as per the guidelines.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	The project is situated in the Incheon province in the Republic of Korea.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	The project's system boundaries include the landfill gas collection system, the 50 MW electricity generation system and the KEPCO grid to which power is evacuated.		OK
A.2. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR I	The new LFG collection system (including installation of vertical pipes) and the electricity generation system (including a 50 MW boiler and steam turbine) reflect current good practices and good engineering technology.		OK
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR I	It has been confirmed during site visits that the project activity Korea.		OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	The project technology is not likely to be substituted within the crediting period.		OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/	DR	Sufficient procedures for training and maintenance have been identified.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Idem.		OK
A.3. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/	DR I	This will be confirmed after the host country approval is obtained.	CAR-1	OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR I	Same as in A.3.1.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR I	Same as in A.3.1.		OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR I	Yes, the project is expected to have other Sustainable development benefits such as: <ul style="list-style-type: none"> ▪ Increased employment opportunities in the area during construction; ▪ Use of clean technology for generation of power; ▪ Act as a clean technology demonstration project; ▪ Abate pollution and improve local environment. 		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/	DR	Yes, the project adopts the approved consolidated baseline methodology ACM0001 (Version 3) - "Consolidated baseline methodology for landfill gas project activities" and ACM0002 (Version 6) "Consolidated methodology for grid-connected electricity generation from renewable sources"		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	The methodology is applicable to the project since the project aims to increase the collection efficiency of landfill gas and destroy it in the power generation facility.		OK
B.2. Baseline Determination <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i>					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	DR I	The baseline has been selected as continuation of current situation, i.e. partial collection and destruction of LFG by flaring and power generation. However, the	CL1	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			amount of gas being collected and flared in the baseline needs to be clearly mentioned in the PDD.		
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	Refer B.2.1		OK
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR I	Yes		OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	During the site visit it was apparent that there are some special incentive schemes provided by the Korean government such as a higher price for electricity based on renewable energy sources. Such type of incentives or subsidies provided, need to be clearly mentioned in the PDD and also the impact they have on the proposed project.	CL-2	OK
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR	Yes.		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR I	Yes, the most likely scenario in the absence of the proposed project activity would be continuation of the current practice ie., inefficient collection and partial flaring of landfill gas.		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/	DR	The project proponent has selected cost analysis to demonstrate the additionality of the project. Documentary evidence is requested for the details of the investment and O&M costs. In calculating the IRR the power plant efficiency has been shown to be 53%. However during claiming CERS the same has become ~78%. Please align the two and modify either the IRR calculations or the CERS from power generation with	CAR-3	OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			proper justification.		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR I	There are no major risks associated with the selected baseline		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Yes.		OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/	DR	The starting date of the project is 01-10-2006 and the lifetime of the project is 30 years. However, according to the PDD, the landfill will stop receiving waste by 2022. Hence a lifetime of 30 years for the project does not seem viable. Please clarify.	GL-3	OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	The project selects a non-renewable crediting period of 10 years starting from 01-04-2007.		OK
D. Monitoring Plan <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i>					
D.1. Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/	DR	Yes, the project adopts the approved consolidated monitoring methodology		OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			ACM0001 (Version 4) - "Consolidated baseline methodology for landfill gas project activities" and ACM0002 (Version 6) "Consolidated methodology for grid-connected electricity generation from renewable sources"		
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR	Yes, the monitoring methodology is applicable to the proposed project activity as the baseline is the partial atmospheric release of the gas and the project activity involves destruction of the captured LFG in the power generation facility.		OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR	Yes, the monitoring methodology reflects good monitoring practices.		OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/	DR	Yes. All parameters have been adequately addressed.		OK
D.2. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	LPG is used as a fuel for start-up and LFG for normal operation. The project emission calculations do not take the lpg consumption into account. Justification needs to be provided for the same.	CL 4	OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	Same as in D.2.1.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Same as in D.2.1.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Same as in D.2.1.		OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.2.5. Will the indicators enable comparison of project data and performance over time?	/1/	DR	Same as in D.2.1.		
D.3. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	Leakage does not occur for the project. Also, according to ACM0001 and ACM0002 leakage calculation is not required for this project activity.		OK
D.4. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR I	Yes, the project chooses to directly monitor the emission reductions through the use of on site metering equipment to measure the amount of LFG captured and laboratory analysis at the landfill gas site. The collection and archiving of data is established according to the methodology.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	CH ₄ is the only baseline indicator that needs to be taken into account.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?			Yes.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	This will be confirmed after the host country approval is submitted.	GAR-1	OK
D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	/1/	DR	Same as in D.5.1.		OK
D.5.3. Will it be possible to monitor the specified sustainable development indicators?	/1/	DR	Same as in D.5.1.		OK
D.5.4. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	Same as in D.5.1.		OK
D.6. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR	SCL will be responsible for the project management.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	Yes.		OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR	Yes, training procedures have been identified.		OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	There are no cases of emergencies leading to unintended emissions.		OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	Yes, procedures for calibration of monitoring equipment have been identified.		OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	Yes.		OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Yes.		OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Yes.		OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	Yes.		OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	Yes.		OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	Yes.		OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR	Yes.		OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	Yes.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E. Calculation of GHG Emissions by Source <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
E.1. Project GHG Emissions <i>The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	LPG is used as a fuel for start-up and LFG for normal operation. The project emission calculations do not take the lpg consumption into account. Justification needs to be provided for the same.	CL4	OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Same as in E.1.1.		OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	Same as in E.1.1.		OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	Same as in E.1.1.		OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	Same as in E.1.1.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.2.Leakage <i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.</i>					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	There are no potential sources of leakage.		OK
E.3.Baseline Emissions <i>The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR	Yes, the emission associated with fugitive landfill gas emissions have been taken into account. It has been estimated that 65% of the LFG will be captured and destroyed in the project scenario as compared to a 40% collection and combustion in the baseline scenario.		OK
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	Yes.		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes, the actual amount of emission reductions will be based on direct monitoring of the LFG combusted and the net amount of electricity exported to the grid.		OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	The first order decay model is used to estimate the amount of methane destroyed. The k value has been estimated to be		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			0.07427 and 0.1242 for the two dump-sites based on past data on gas collection and amount of accumulated waste. This is deemed justified. The Lo value has been calculated based on research and lab analysis. This basic data and assumptions need to be provided to DNV. Capture and destruction efficiency of the collection and power generation system has been taken as 65% which is justified. Actual emission reductions will be monitored directly ex-post. This can be considered conservative. The figures in the calculation with MELF values (previously submitted) do not match with the values in Table A.4.4.1. Please correct. Please provide the basis of calorific value of methane used in the calculations. The calculations for power generation capacity use a heat consumption of 2199 Kcal/KWh. However the PDD says 2201 Kcal/Kwh. Please modify or provide some justification. The CEF for the grid has been taken as 0.6436 t CO ₂ /MWh in the calculations. The PDD says 0.6399 t CO ₂ /MWh. Please correct.	CL-5 CAR-4	
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	The estimates of the forecast methane generation potential are calculated based on the first order decay model, which itself contains a high uncertainty. Also with landfill gas projects there are lot of uncertainties relating to the generation (quality and quantity) and collection of landfill gas. This will also be reflected in the		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			power generation potential. As such, it is difficult to adjudge how the power plant will be able to operate at >75% of installed capacity. The project proponent is requested to provide some justification based on past experience on the basis of the electricity generation potential.		
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR	There are no emissions due to the project activity from anthropogenic sources of green house gases.		OK
E.4.Emission Reductions <i>Validation of ex-ante estimated emission reductions.</i>					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	The project will result in lesser emission than the baseline scenario. The actual reduction in emission will be confirmed after a clarification is received as pointed out in E.3.4.		OK
F. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/		Environmental impacts of the project have been described.		OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	An EIA is required for the project activity, which has been conducted in 2003.		
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	The project will not create any adverse environmental effects.		OK
F.1.4. Are transboundary environmental impacts	/1/	DR	There is no such impact.		OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
considered in the analysis?					
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	There are no adverse environmental impacts due to the project.		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR I	The project has all relevant licenses in place.		OK
G. Stakeholder Comments <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR I	Local stakeholders have been consulted during the EIA as per regulatory requirements.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	The local stakeholders have been consulted through a public presentation of the EIA and a public hearing process.		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	Stakeholder consultation is required for conducting the EIA and it has been completed accordingly.		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	A summary of the comments have been provided in the PDD.		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR I	Yes		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1: Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive confirmation by the DNA of Republic of Korea that the project assists it in achieving sustainable development. A written approval from the DNA of the participating parties is required.	Table 1	LoA was received on November 7 th and LoA was attached in PDD (annex).	The LoA has been received and the CAR is now closed. OK
CAR 2: The table E.6 in the PDD has to be aligned as per the guidelines	Table 1	The table E.6 in the PDD was modified according to PDD guideline	Required changes have been made to the PDD and the corrective action request has now been closed. OK
CAR 3: The project proponent has selected cost analysis to demonstrate the additionality of the project. Documentary evidence is requested for the details of the investment and O&M costs. In calculating the IRR the power plant efficiency has been shown to be 53%. However during claiming CERS the same has become ~78%. Please align the two and modify either the IRR calculations or the CERs from power generation with proper justification.	B.2.7	Documentary evidence of the investment and O&M costs was submitted. The power plant efficiency of the IRR calculations and the CERs from power generation is aligned.	The financial calculation sheets have been provided. The IRR and CER calculations have been synchronized. The CAR has now been closed. OK
CAR 4: The figures in the calculation with MELF values (previously submitted) do not match with the values in Table A.4.4.1. Please correct. Please provide the basis of calorific value of methane used in the calculations. The calculations for power generation	E.3.4	The figures in the calculation with MELF values matched with the values in Table A.4.4.1. Methane calorific value is standardized to 2,201Kcal/KWh. Electricity emission coefficient is	The corrective actions provided are deemed sufficient and the CAR has now been closed. OK

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
capacity use a heat consumption of 2199 Kcal/KWh, however the PDD says 2201 Kcal/Kwh. Please modify or provide some justification for this difference. The CEF for the grid has been taken as 0.6436 t CO ₂ /MWh in the calculations. The PDD says 0.6399 t CO ₂ /MWh. Please correct.		standardized to 0.5666 tCO ₂ /MWh (2003-2005 data is adopted)	
CL 1: The amount of gas being collected and flared in the baseline needs to be clearly mentioned in the PDD.	B.2.1	Information about site gas treatment statistics of Sudokwon landfill is provided in the section B of PDD (page 10 - 12)	The information provided in the PDD is deemed sufficient and the Clarification request has now been closed. OK
CL 2: During the site visit it was apparent that there are some special incentive schemes provided by the Korean government such as a higher price for electricity based on renewable energy sources. Such type of incentives or subsidies provided, need to be clearly mentioned in the PDD and also the impact they have on the proposed project.	B.2.4	The special price offered for electricity generated through landfill gas projects has now been considered for financial calculations and the corrected worksheets have been provided to DNV.	Corrected worksheets considering the actual price of electricity being offered for LFG projects, have been provided to DNV. The Clarification request has now been closed. OK
CL 3: The starting date of the project is 01-10-2006 and the lifetime of the project is 30 years. However, according to the PDD, the landfill will stop receiving waste by 2022. Hence a lifetime of 30 years for the project does not seem viable. Please clarify.	C.1.1	Upon consultation with a Sudokwon LF site expert, landfilling completion period is modified to 2013 but LFG is generated even after landfilling is completed, therefore makes it possible to operate LFG power station.	The justification provided is deemed sufficient and the Clarification Request has now been closed. OK
CL 4: LPG is used as a fuel for start-up and LFG for normal operation. The project emission calculations do not take the lpg consumption into account. Justification needs to be provided for the same.	D.2.1	LPG used for start-up is minimal but LPG usage amount is estimated by measuring weight before and after usage. Its monitoring is added to monitoring section of PDD.	The clarification required and changes incorporated in the monitoring plan are deemed sufficient and the clarification request has now been closed. OK

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CL-5: The L_0 value has been calculated based on research and lab analysis. This basic data and assumptions need to be provided to DNV.	E.3.4	L_0 was calculated by SLC research centre in 2004, 2005, 2006 and BMP (Biological Methane Potential) test was used for L_0 .	The attachments provided and the worksheets for CER calculations are deemed sufficient and the clarification request has now been closed. OK

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APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4 & 5		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0021	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	AM0023	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0024	Yes
ACM0004	Yes	AM0027	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0028, AM0034	Yes
ACM0007	Yes	AM0030	Yes
ACM0008	Yes	AM0031	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0032	Yes
AM0006, AM0016, AMS-III.D	Yes	AM0035	Yes
AM0009, AM0037	Yes	AM0038	Yes
AM0013, AM0022, AM0025, AM00379, AMS- III.H, AMS-III.I	Yes	AM0041	Yes
AM0014	Yes	AM0034	Yes
AM0017	Yes	AMS-II.A-F	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Filipe Tavares

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 9 & 13		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

Raman Venkata Kakaraparthi

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Young-Keun Kim

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	--	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

Anu Chaudhary

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director