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DRAFT FINAL  
DETERMINATION REPORT

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NYÍREGYHÁZA-OROS  
LANDFILL GAS PROJECT IN  
HUNGARY

REPORT No. 2005-0212

REVISION No. 02

DET NORSKE VERITAS



## DRAFT FINAL DETERMINATION REPORT

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Client: Exim Invest Biogaz Kft	Client ref.: Juhaz Andras

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### Summary:

Det Norske Veritas ( DNV) has performed a determination of the Nyíregyháza –Oros Landfill Gas Project ( hereafter called the project) in Hungary. This determination has been based on the UNFCCC criteria for the Joint Implementation mechanism as well as criteria given to provide consistent project operations, monitoring and reporting. The determination report summarises the findings of the determination.

The project activity involves extraction of landfill gas and using it in a 511 kW Jenbacher gas engine for generation of electricity. The electricity generated will be supplied to the regional grid.

The project is being developed by a syndicate formed by Exim-Invest Biogas Kft. and Varosuzemeltetesi Kht., the municipality owning the landfill of Nyíregyháza –Oros. The green power generated will be sold to the regional grid electricity utility TITASZ.

The project is estimated to reduce about 137 927 tCO<sub>2e</sub> during the period 2008-2012.

It is the determination team's opinion that the project is likely to meet the relevant UNFCCC and Hungarian requirements for JI projects. The project has not yet received the approval of the Hungarian and Austrian Focal Point, as the issuance of this determination report is a necessary requirement to start the approval process in Hungary. Once the approval letters are received by DNV, this draft final determination report will be updated to a final determination report.

Report No.: 2005-0212	Subject Group: Environment	<b>Indexing terms</b>	
Report title: Nyíregyháza –Oros Landfill Gas Project		Key words Climate Change Kyoto Protocol Validation Joint Implementation Mechanism	Service Area Verification
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Work carried out by: Magdolna Mate, Sven Stackx, Ramesh Ramachandran and Susanne Haefeli		<input checked="" type="checkbox"/> No distribution without permission from the client or responsible organisational unit <input type="checkbox"/> free distribution within DNV after 3 years <input type="checkbox"/> Strictly confidential <input type="checkbox"/> Unrestricted distribution	
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<i>Table of Content</i>		<i>Page</i>
1	INTRODUCTION .....	1
1.1	Objective	1
1.2	Scope	1
1.3	GHG Project Description	2
2	METHODOLOGY .....	2
2.1	Review of Documents	4
2.2	Follow-up Interviews	4
2.3	Resolution of Clarification and Corrective Action Requests	4
3	DETERMINATION FINDINGS .....	5
3.1	Project design	5
3.2	Baseline and Additionality	5
3.3	Monitoring Plan	7
3.4	Calculation of GHG Emissions	7
3.5	Environmental Impacts	7
4	COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS .....	8
5	DETERMINATION OPINION .....	9
6	REFERENCES.....	10
<a href="#">Appendix A JI Determination Protocol</a>		



### ***Abbreviations***

CAR	Corrective Action Request
CEF	Carbon Emission Factor
CH <sub>4</sub>	Methane
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide equivalent
DNV	Det Norske Veritas
EIA	Environmental Impact Assessment
ERU(s)	Emission Reduction Unit(s)
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N <sub>2</sub> O	Nitrous oxide
NGO	Non-governmental Organisation
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
GWP	Global Warming Potential



## 1 INTRODUCTION

Exim Invest Biogaz Kft, Hungary has commissioned Det Norske Veritas ( DNV) for a determination of the Nyíregyháza –Oros LFG project in Hungary ( hereafter called “the project”). This report summarises the preliminary findings of the determination of the project, performed on the basis of UNFCCC and host party criteria for Joint Implementation projects, as well as criteria given to provide for consistent, project operations, monitoring and reporting.

The determination team consisted of the following personnel:

Mr Sven Stackx,	DNV Rotterdam	Team Leader
Mrs Magdolna Mate,	DNV Budapest	GHG Auditor
Mr Tsuyoshi Nakao,	DNV Yokohama	Sector Expert
Mr Ramesh Ramachandran	DNV Chennai	GHG Auditor
Mrs Susanne Haefeli	DNV Oslo	JI Expert
Mr Einar Telnes	DNV Oslo	Internal Verifier
Mr Michael Lehmann	DNV Oslo	Internal Verifier

### 1.1 Objective

The purpose of the determination is to have an independent third party assessing the project design. In particular, the project’s baseline, the monitoring plan, and the project’s compliance with relevant UNFCCC and host Party criteria for Joint Implementation (JI) projects are validated in order to confirm that the project design as documented is sound and meets the identified criteria.

Determination is a requirement for JI projects following the verification procedures under the Article 6 supervisory committee and it is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of the emission reduction units (ERUs).

### 1.2 Scope

The determination scope is defined as an independent and objective review of the Project Design Document (PDD) and other relevant documents. The information contained in those documents is reviewed against the Kyoto Protocol requirements for JI projects, the guidelines for the implementation of Article 6 of the Kyoto Protocol (Decision 16/CP.7) as agreed in the Marrakech Accords, in particular the verification procedures under the Article 6 supervisory committee, and associated interpretations. DNV Certification has, based on the recommendations in the Validation and Verification Manual /6/ employed a risk-based approach in the determination process, focusing on the identification of significant risks for project implementation and the generation of ERUs.



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**DRAFT FINAL DETERMINATION REPORT**

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

### **1.3 GHG Project Description**

The project activity involves extraction of landfill gas and using it in a 511 kW Jenbacher gas engine for generation of electricity. The electricity generated will be supplied to the regional grid.

The project is being developed by a syndicate formed by Exim-Invest Biogas Kft. and Varosuzemeltetesi Kht., the municipality owning the landfill of Nyíregyháza –Oros. The green power generated will be sold to the regional grid electricity utility TITASZ.

## **2 METHODOLOGY**

In order to ensure transparency, a determination protocol was customised for the project, according to the Validation and Verification Manual /6/. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The determination protocol serves the following purposes:

- It organises, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent determination process in that DNV documents how a particular requirement has been validated and the result of the determination.

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

The completed determination protocol is enclosed in Appendix A to this report.



## DRAFT FINAL DETERMINATION REPORT

<b>Determination Protocol Table 1: Mandatory Requirements for Joint Implementation (JI) Project Activities</b>			
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>	<b>Cross reference</b>
The requirements the project must meet.	Gives reference to COP decision where the requirement is found.	This is acceptable based on evidence provided (OK), a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements or a request for <b>Clarification (CL)</b> where further clarifications are needed.	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 determination process.

<b>Determination Protocol Table 2: Requirement Checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
The various requirements in Table 1 are linked to checklist questions the project shall meet. The checklist is organised in six different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (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.	This is either acceptable based on evidence provided (OK), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). A request for <b>Clarification (CL)</b> is used when the independent entity has identified a need for further clarification. N/A means not applicable.

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

**Figure 1 Determination protocol tables**

Findings established during the determination can either be seen as a non-fulfilment of determination protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective Action Requests (CAR) are issued where mistakes have been made with a direct influence on project results;

- i) determination protocol requirements have not been met; or
- ii) there is a risk that the project would not be accepted as a JI project or that emission reductions will not be verifiable.



## DRAFT FINAL DETERMINATION REPORT

The determination team may also use requests for clarification, where additional information is needed to fully clarify an issue.

## 2.1 Review of Documents

The Project Design Document, Financial information, baseline data and the engine specifications submitted by the client were reviewed (/1/-/4/). Further, the IPCC Good Practice Guidance Manual, the EC Directive on landfill waste and the Dutch baseline documentation were consulted (/5/, /7/ and /8/).

## 2.2 Follow-up Interviews

During February 2005, DNV conducted interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarised in Table 1.

**Table 1 Interview topics**

Interviewed organisation	Interview topics
Hungarian Ministry of Environment, Waste Management Department Mr Csaba Madarasz	<ul style="list-style-type: none"> <li>➤ Hungarian waste management policies &amp; EU Directives</li> <li>➤ Processes for obtaining Letter of Approval</li> <li>➤ Requirement for an EIA</li> <li>➤ Hungarian energy policies</li> <li>➤ Incentives for waste to energy projects and green power</li> <li>➤ Waste collection &amp; disposal practices</li> </ul>
Exim Invest Biogas Kft & Varostizemeltetesi Kht Mr Andras Juhasz	<ul style="list-style-type: none"> <li>➤ Overview of technology and whether it represents good practice</li> <li>➤ Procedures for project management including O&amp;M, Resources, training needs, emergency planning, equipment calibration etc.</li> <li>➤ Financial information regarding IRR</li> <li>➤ Waste data &amp; characteristics</li> <li>➤ Waste management plan and landfill operating permits, relevant parts of the supervision report (Global 2000) to assess the landfill's compliance with the forthcoming legislation on waste pre-treatment, organic content reduction and on passive venting for safety reasons.</li> <li>➤ Baseline data and modelling</li> <li>➤ Monitoring requirements</li> </ul>

## 2.3 Resolution of Clarification and Corrective Action Requests

The determination has identified two corrective action requests (CAR) and one clarification request (CL) . Only CAR 1 is still open because the Hungarian and Austrian approval letters for the project have not yet been received. The concerns of CAR 2 and CL1 are summarised in Chapter 3 below and documented in the determination protocol.



### 3 DETERMINATION FINDINGS

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the determination protocol in Appendix A.

Where DNV had identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, has been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the determination protocol in Appendix A. As said earlier, the determination of the project resulted in two Corrective Action Requests and one Clarification Request.

The conclusions of the determination for individual project elements are presented below.

#### 3.1 Project design

The project is being developed by a syndicate between Exim-Invest Biogas Kft and Varosuzemeltetesi Kht., the operator of the landfill and a municipal organization. The electricity generator is provided and installed by the Austrian GE Jenbacher GmbH. GE Jenbacher also provides the initial training for project operation, monitoring and maintenance.

The technical design comprises 169 domes (out of which 16 are already in operation), four section pumps, a 511 kW capacity gas engine, various meter equipment and a connection station to the grid. The project design engineering reflects good practice. The renewable power generated will be sold to the regional grid electricity utility TITASZ. The project will generate credits during the first commitment period 2008 – 2012 and beyond.

The host country (Hungary) has issued a letter of endorsement for this project. A letter of approval will be issued after submission of the draft final determination report. The Austrian Focal point has not yet issued a letter of approval for the project.

#### 3.2 Baseline and Additionality

The baseline selection has been performed by a qualitative barrier analysis, based on technological, legal and economical circumstances in Hungary and the county where the project is located. Hungary needs to implement the EU landfill gas directive as part of its EU-accession obligations by 1 January 2009. In doing so, the Hungarian government has decided to divide between old and new landfill sites, and only to enforce the obligation to capture and utilize the landfill gas on new landfills. Old landfill sites are defined as those for which the construction permit has been issued before the decree has entered into force i.e. 18<sup>th</sup> October 2001. Hence, although the Nyíregyháza –Oros landfill site will continue to receive waste until 2010, it is considered being an old landfill (in operation since 1985) and hence will not face the obligation to capture and utilize the landfill gas. In Hungary roughly two thirds of all landfill sites do not meet the current and proposed standards. Hence, the enforcement of the sanitation program remains a big challenge for the authorities. In addition, the Eastern region of Hungary is amongst



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**DRAFT FINAL DETERMINATION REPORT**

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the poorest parts in the country and local taxes and waste collection fees do not cover the proper maintenance of landfills according to currently required standards.

The landfill has previously installed 30 domes for research and development reasons, of which 16 domes are still operational. The landfill gas capturing is sub-optimal and the gas is poorly utilised, used for onsite heating needs only. Thus the amount of methane captured and utilized is less than 1% of the project emissions and not considered in the calculations.

The electricity from the project can be sold to the regional grid for a favourable price. However, the amount of electricity generated is very small and a NPV analysis thus gives a very small positive outcome for this component. It can therefore reasonably be assumed that the baseline is the ongoing waste disposal (until 2010) without any LFG capturing. Hence, the project is likely to be additional to what would occur in its absence.

The site produces more landfill gas during the years 2008-2012 because of forced methane extraction. Therefore, the emission reductions are not directly measured from what has been captured and utilized, such as is being done for all currently approved landfill CDM methodologies. Rather, the emission reductions are calculated as the difference of the

**Baseline emissions:**

- methane generation potential of the landfill, assuming no soil top after the site is decommissioned at the end of 2010: *calculation*
- indirect emissions from the power plants delivering electricity to the grid: *ex-post grid-factor from official source*

minus the

**Project emissions:**

- emissions from the electricity generator (on-site use of natural gas): *direct measurement*
- fugitive emissions assuming 85% capture efficiency, based on the methane generation potential of the landfill with installation of capture equipment: *based on past experience.*

In the baseline scenario, the methane content of the landfill gas is assumed to be 42% (based on past measurements). For *ex-ante* emission reduction calculations, the methane content is assumed to be 50% based on current best-practice *ex-ante* estimations such as outlined in the IPCC 1996 revised guidelines for national inventories. The actual methane content will be measured *ex-post*.

The methane generation rate ( $k$ ) and methane generation potential ( $L_0$ ) of the First Order Decay Model are assumed to be 0,01 / year and 157 m<sup>3</sup> CH<sub>4</sub>/ton waste. The value for  $k$  is conservative, given that the IPCC Good Practice Guidance suggests values from 0,03 – 0,2 /5/. This low value has been deliberately chosen so as not to run the risk of overstating baseline emissions. The value for  $L_0$  is realistic due to the fact that the waste has been compacted by means of tractors and a compactor.

The actual amount of waste disposed will be monitored each year and the model calculations corrected accordingly.



### 3.3 Monitoring Plan

The waste land filled will be directly monitored. Further monitoring will occur at the following locations:

1. Flow measurement of LFG: continuously
2. The methane content of the LFG: continuously
3. The operating time of pumps: continuously
4. The operating time of the gas engines: continuously
5. The electricity produced: continuously
6. Natural gas co-fired: continuously

Natural gas is co-fired in order to stabilise the gas flow to the electricity generator. These emissions are calculated via the direct measurement of the fuel consumption and accounted for as project emissions.

The actual Hungarian grid coefficient, which is based on official ex-post data, will be used to calculate the CO<sub>2</sub> emissions reduced due to grid-electricity displacement. It is reasonable to assume data availability given the country's participation in the EU Emissions Trading Scheme.

The monitoring plan, measurement frequency and reporting procedures represent current good practice. Detailed operating, monitoring and reporting manuals have not yet been developed. These will be established before the start of the crediting period in order to guarantee the accurate monitoring and measurement of the actual emission reductions occurred.

During the interview with the project developer it has been confirmed that the project emissions from the energy used to run the capture equipment – although very small – will be discounted from the electricity sold to the grid. Hence, emission reduction units will only be claimed for the net electricity generation and supply to the grid. This discount for own electricity use is reflected in the final PDD version.

### 3.4 Calculation of GHG Emissions

The project developer has adjusted its calculations based on methane's Global Warming Potential from 23 to 21. These calculations are based on conservative assumptions i.e. a capture efficiency of 85 % and the grid CO<sub>2</sub> – coefficient based on the ERUPT guidelines, which assume that the Hungarian electricity grid will have a CO<sub>2</sub> coefficient equivalent to that of natural gas by 2025 /8/.

### 3.5 Environmental Impacts

For the project site, an Environmental supervision report has been conducted by an independent party. Based on the report, an operational permit has been issued (468-20/2004), valid until 2008. There is no evidence that could let one doubt that the permit is not going to be renewed on a regular basis after that date. The report shows that the site is in compliance with current landfill gas management regulation in Hungary. The project itself i.e. the installation of landfill gas



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**DRAFT FINAL DETERMINATION REPORT**

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capture and utilization equipment is not subject to a mandatory Environmental Impact Assessment. Negative environmental impacts can originate from noise during both:

- the construction phase (trucks delivering the equipment, the installation itself) and
- the operation phase (electricity generator).

These impacts are considered to be minor.

#### **4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS**

According to the modalities for the determination of JI projects, the validator shall make publicly available the project design document and receive, within 30 days, comments from Parties, stakeholders and UNFCCC accredited observers and make them publicly available.

DNV published the project document on its website on

<http://www.dnv.com/certification/climatechange/Projects/> and invited – via the climate-l list serve – comments from 20 December 2004 until 19 January 2005 by Parties, stakeholders and accredited observers. No comments were received.



## 5 DETERMINATION OPINION

*Det Norske Veritas Certification (DNV) has made a determination of Exim-Invest Biogaz' Nyíregyháza-Oros landfill gas Project in Hungary (hereafter called "the project"). The determination was performed on the basis of UNFCCC criteria for Joint Implementation projects, in particular the verification procedure under the Article 6 supervisory committee (JI track II) described in the Guidelines for the implementation of Article 6 of the Kyoto Protocol, as well as criteria given to provide for consistent project operations, monitoring and reporting.*

*The project involves extraction of landfill gas and using it in a 511 kW gas engine for generating electricity. The electricity generated will be supplied to the regional grid.*

*The project is being developed by a syndicate formed by Exim-Invest Biogas Kft. and Varosuzemeltetesi Kht., the municipality owning the landfill of Nyíregyháza –Oros. The renewable power generated will be sold to the regional grid electricity utility TITASZ.*

*An approval of the project by the Hungarian and Austrian Focal Point has not yet been received.*

*The baseline is the continuous passive venting of landfill gas until 2012 and the grid-electricity supply based on a mix of thermal and renewable energy sources. The project's additionality is determined by a technological, regulatory and financial barrier analysis. Hungary's effort to implement EU policies is directed at newly built landfills. Insufficient resources are available to upgrade existing landfills even to the currently applicable environmental standards.*

*The monitoring plan sufficiently specifies the monitoring requirements of the main project indicators and training of staff needs are also addressed. Detailed monitoring procedures will be implemented before the start of the crediting period.*

*Potential environmental impacts have been assessed for the landfill site, those in relation to the project are deemed to be minimal.*

*In summary, it is DNV Certification's opinion that, with the exception of the approval letters of the Parties involved, the Landfill gas mitigation through the Hungarian Nyíregyháza-Oros landfill gas Project meets all relevant UNFCCC requirements for the JI and all relevant host country criteria.*

*The determination is based on the information made available to us and the engagement conditions detailed in this report. DNV Certification can not guarantee the accuracy or correctness of this information. Hence, DNV Certification can not be held liable by any party for decisions made or not made based on the determination opinion.*



## 6 REFERENCES

### Category 1 Documents:

*Documents provided by the Project Participants that relate directly to the GHG components of the project, (i.e. the Project Design Document and written approval of voluntary participation from the national focal point). These have been used as direct sources of evidence for the determination conclusions, and are usually further checked through interviews with key personnel.*

- /1/ Exim-Invest, *Nyíregyháza –Oros landfill gas mitigation through the Hungarian Nyíregyháza –Oros landfill gas project*, Project Design Document, 2004 and Version March 2005.
- /2/ Exim-Invest, *Nyíregyháza –Oros landfill project – Financial information*, Appendix A to the project design document, 2004.
- /3/ Exim-Invest, *Baseline data*, excel file, 2004 and revised version 22 February 2005.
- /4/ Jenbacher, *Engine specifications*, received as a fax in February 2005

### Category 2 Documents:

*Background documents related to the design and/or methodologies employed in the design or other reference documents. Where applicable, Category 2 documents have been used to check project assumptions and confirm the validity of information given in the Category 1 documents and in follow-up interviews.*

- /5/ IPCC: *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, 2000
- /6/ IETA/PCF *Validation & Verification Manual*
- /7/ EC Directive 1999/31/EC
- /8/ Ministry of Economic Affairs of the Netherlands, *Operational Guidelines for Project Design Documents of Joint Implementation Projects*, Volume 1: General guidelines, Version 2.2, June 2003, at <http://www.senter.nl/asp/page.asp?id=i000008&alias=erupt> (accessed on March 16)

### Persons interviewed:

*Persons interviewed during the determination, or persons contributed with other information that are not included in the documents listed above.*

- /9/ Mr Csaba Madarasz, Hungarian Ministry of Environment, Waste Management Department
- /10/ Mr Andras Juhasz, Exim Invest Biogas Kft & Varostizemeltetesi Kht



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## APPENDIX A

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### JI DETERMINATION PROTOCOL

**Table 1 Mandatory Requirements for Joint Implementation (JI) Project Activities**

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
1. The project shall have the approval of the Parties involved	Kyoto Protocol Article 6.1 (a)	<b>CAR 1</b>	Formal approval to be received from Hungary and Austria.  The issuance of the determination report is necessary for the approval; a Letter of Endorsement was issued for the project by the Hungarian Focal Point.
2. Emission reductions, or an enhancement of removal by sinks, shall be additional to any that would otherwise occur	Kyoto Protocol Article 6.1 (b)	OK	Table 2, Section B.2
3. The sponsor Party shall not acquire emission reduction units if it is not in compliance with its obligations under Articles 5 & 7	Kyoto Protocol Article 6.1 (c)	OK	Austria has in place a national system for estimating GHG emissions and reported on 15 April 2004 its national GHG inventory for the years 1990 – 2002.
4. The acquisition of emission reduction units shall be supplemental to domestic actions for the purpose of meeting commitments under Article 3	Kyoto Protocol Article 6.1 (d)	OK	On the basis of the Kyoto Protocol and the EU's internal Burden Sharing Agreement, Austria is obliged to reduce its greenhouse gas emissions by 13 percent compared to the level of 1990. In order to achieve this goal through appropriate measures in the period 2008-2012 the federal government and the provinces have agreed upon joint climate strategy measures to reduce domestic GHG emissions.
5. Parties participating in JI shall designate national focal points for approving JI projects and have in place national guidelines and procedures for the approval of JI projects	Guidelines for the implementation of	OK	The Hungarian focal point is: Ministry for Environment of Hungary: Fö u. 44-50, 1011

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
	Art. 6 §20		<p>Budapest, Hungary</p> <p>Mr Tibor Faragó</p> <p>+36 1 457 3554 (tel)</p> <p>+36 1 201 1335 (fax)</p> <p>farago@mail.ktm.hu</p> <p>The Austrian focal point is: Federal Ministry for Agriculture, Forestry, Environment and Water Management: Stubenbastei 5 Vienna</p> <p>Mr. Helmut Hojesky, Head of Division</p> <p>+43 1 51 5220 helmut.hojesky@lebensministerium.at</p>
6. Parties participating in JI shall be a Party to the Kyoto Protocol	Guidelines for the implementation of Art. 6 §21a/24	OK	<p>Hungary has not yet ratified the KP, however is referred as "Accession". This status is the act whereby a state accepts the offer or the opportunity to become a party to a treaty already negotiated and signed by other states. It has the same legal effect as ratification. Accession usually occurs after the treaty has entered into force.</p> <p>Austria has ratified the KP 31/05/02.</p>
7. The participating Parties' assigned amount shall have been calculated and recorded	Guidelines for the implementation of	OK	Hungary's assigned amount is 94% of the base year emissions

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
	Art. 6 §21b/24		(avg. 1985-1987) Austria's assigned amount is 87% of the base year emissions (1990).
8. The sponsor Party shall have in place a national system for estimating GHG emissions and a national registry and has submitted annually its most recent inventory in accordance with Kyoto Protocol Article 5 and 7	Guidelines for the implementation of Art. 6 §21c,d,e,f	OK	Austria has developed a national inventory for reporting GHG emissions. The latest inventory report submitted in April 2004 can be retrieved at UNFCCC website.
9. The host Party shall have in place a national registry in accordance with	Guidelines for the implementation of Art. 6 §21d/24	OK	The national registry is currently being developed and will be constructed to comply both with UNFCCC criteria and EU ETS Directive.
10. Project participants shall submit to the independent entity a project design document that contains all information needed for the determination	Guidelines for the implementation of Art. 6 §31	OK	Submitted to DNV on 20 December 2004 and 8 of March 2005.
11. The project design document shall be made publicly available and Parties, stakeholders and UNFCCC accredited observers shall be invited to, within 30 days, provide comments	Guidelines for the implementation of Art. 6 §32	OK	The PDD has been published on <a href="http://www.dnv.com/certification/ClimateChange">http://www.dnv.com/certification/ClimateChange</a> and Parties, stakeholders and observers have been invited through the Climate-L mailing list to provide comments on the PDD during a period of 30 days from 20 December 2004 to 19 January 2005. During this period no comments were received.
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, in accordance with procedures as determined by the host Party shall be submitted, and, if those impacts are considered	Guidelines for the implementation of Art. 6 §33d	OK	Table 2, Section F

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
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			
13. The baseline for a JI project shall be the scenario that reasonably represents the GHG emissions or removal by sources that would occur in absence of the proposed project	Guidelines for the implementation of Art. 6, Appendix B	OK	Table 2, Section B.2
14. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Guidelines for the implementation of Art. 6, Appendix B	OK	Table 2, Section B.2
15. The baseline methodology shall exclude to earn EURs for decreases in activity levels outside the project activity or due to force majeure	Guidelines for the implementation of Art. 6, Appendix B	OK	Table 2, Section B.2
16. The project shall have an appropriate monitoring plan	Guidelines for the implementation of Art. 6 §33c	OK	Table 2, Section D

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<b>A. General Description of Project Activity</b> The project design is assessed.					
<b>A.1. Project Boundaries</b> Project boundaries are the limits and borders defining the GHG emission reduction project.					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR/I	The landfill site Nyíregyháza –Oros located in Szabolcs-Szatmar-Bereg County, East Hungary, confines the project's spatial boundaries. A map outlining the site and location of existing wells (domes) is provided.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	The components and facilities used to mitigate CO <sub>2</sub> emissions can be described as the capture of landfill gas and its use to produce electricity and heat for on-site use.		OK
<b>A.2. Technology to be employed</b> 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.					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR	Yes.		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	/1/	DR, I	The technology applied is in compliance with the permit issued by the local environmental authority (408-20/2004), valid until 2008.		OK

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technologies in the host country?					
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR,I	The Jenbacher turbine has been built in 2004, especially for the project. Jenbacher will also specifically adjust the software used. The heat rate of the gas engine is 38%, including some heat production, which – however – will not be taken into account for the emission reduction calculations.		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,I	The project documents describe education of employees. The responsible persons for the operation of the landfill have the necessary qualification in accordance with the legislation.  During the interview it was acknowledged that training will be provided by the supplier's specialists. This will be done at the latest before 1 of January 2008 i.e. the start of the crediting period.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR,I	The training in maintenance and monitoring will be provided by GE Jenbacher GmbH.		OK

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<b>B. Project Baseline</b> The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
<b>B.1. Baseline Methodology</b> It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the discussion and selection of the baseline methodology transparent?	/1/	DR	<p>Different baseline scenarios are qualitatively discussed: carried on disposal with no landfill gas utilisation and no intervention for gas production increase has been selected as the most probable one, based on an assessment of current and future European, Hungarian and local waste treatment and energy regulations.</p> <p>The Hungarian decree 22/2001 (X.10.) plans to enforce LFG capture on new emerging landfills from 1 January 2009 onwards. Among the current Landfills only about 15% have LFG capturing facilities. The only target for existing landfills is – from 1<sup>st</sup> of January 2009 onwards – to pre-treat the waste, to reduce the biodegradable organic content of the waste to 35% of the total amount by 2014 and to passively vent the landfill gas for safety reasons. The Nyíregyháza-Oros landfill already complies with these three obligations.</p>		OK

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B.1.2. Does the baseline methodology specify data sources and assumptions?	/1/ /2/	DR,I	<p>Yes.</p> <p><b>Baseline for Grid electricity displaced</b></p> <p>The Operational Guidelines for project design documents of Joint Implementation (ERUPT) projects developed by the Netherlands were used for determining a baseline emission factor for grid electricity displaced as a result of the possible electricity generation at Ny-O landfill /8/. This factor only serves the purpose to estimate ex-ante the potential emission reductions. The actual grid-CO<sub>2</sub> coefficient will be requested upon official statistical sources ex-post in order to calculate the displacement of electricity produced by thermal power plants.</p> <p><b>Baseline for methane capture and utilization</b></p> <p>During the interview it has been clarified that the CH<sub>4</sub> Global Warming Potential will be adjusted to from 23 (only to be used after 2012) to 21.</p> <p>The L0 is 157 m<sup>3</sup> CH<sub>4</sub>/ton waste and a methane content of 42% has been assumed.</p> <p>The project assumes a capture efficiency of 85% in the revised PDD version.</p> <p>A methane content of 42% is assumed for the baseline calculations.</p>		OK
B.1.3. Does the baseline methodology sufficiently describe the underlying rationale for the algorithm/formulae used to determine baseline emissions (e.g. marginal vs. average, etc.)	/1/ /2/	DR,I	Yes		OK

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B.1.4. Does the baseline methodology specify types of variables used (e.g. fuels used, fuel consumption rates, etc)?	/1/ /2/	DR	Yes		OK
B.1.5. Does the baseline methodology specify the spatial level of data (local, regional, national)?	/1/ /2/	DR	Site-specific values are used for the methane destruction component at the site. As for the calculation of the electricity-grid baseline emission, the specific CO <sub>2</sub> emission factor for the Hungarian grid as indicated in the Dutch ERU-PT guidelines is used ex-ante.		OK
<b>B.2. Baseline Determination</b> 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.					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	DR,I	The baseline methodology is based on a discussion of the current and forecast waste treatment and energy sector policies.		OK
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	Conservative assumptions are used both for the assessment of the electricity generation unit's potential to reduce emission reductions and to derive the national grid-CO <sub>2</sub> coefficient		OK
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	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,I	The baseline determination discusses and takes into account likely future developments and policies for both the waste and energy sector in Hungary.		OK

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B.2.5. Is the baseline determination compatible with the available data?	/1/	DR	Yes		OK
B.2.6. Does the selected baseline represent a likely scenario in the absence of the project?	/1/	DR	See B.2.1		
B.2.7. Is it demonstrated that the project activity itself is not a likely baseline scenario (e.g. through (a) a flow-chart or series of questions that lead to a narrowing of potential baseline options, (b) a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, (c) a qualitative or quantitative assessment of one or more barriers facing the proposed project activity or (d) an indication that the project type is not common practice in the proposed area of implementation, and not required by a Party's legislation/regulations)?	/1/	DR, I	<p>Several scenarios are discussed in terms of qualitative barriers.</p> <p>During the interviews it has been clarified that the existing domes are a left-over from an earlier research project, badly maintained and will not be included in the baseline emissions calculation because the currently captured methane is less than 1% of the project emissions and hence not material. Capture and utilization equipment is presently not current practice in Hungary. Currently, in Hungary, only two pilot sites are equipped with landfill gas utilization equipment and the landfill gas is either flared or used for warm water or heating of the buildings at the landfill.</p> <p>The financial barrier shows that the favourable price for renewable electricity production has a minor influence on the project financing because of the minor quantities of electricity produced i.e. about 4 GWh per year. The IRR seems to be quite high for Western European standards but the comparison with 10 year national bonds in Hungary i.e. currently about 9% interest, shows that the IRR of 12.8% is not very high, especially taking into account the sensitivity analyses in terms of uncertainties regarding the price for</p>		OK

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			<p>electricity:</p> <p>The feed-in quantities are guaranteed until 2010, but the price is adjusted every year. As an example, in 2004, the average price was 17.4forint /kWh, for 2005, the increase is forecasted to be less than the inflation rate. Due to the lack of experience, investors and debt providers are very cautious with this kind of projects.</p> <p>Further, IRR calculations do not take into account the size of the project i.e. if one looks at the NPV; one sees that the positive cash flows are small and remain small, even by adding back the depreciation costs, which have been subtracted. (Note, NPV analyses only consider cash flows.)</p> <p>The baseline scenario of no capturing and utilization of landfill gas until 2012 thus seems appropriate.</p>		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	<p>Yes. Risks include uncertainties about the produced gas volume and the price per kWh. With regard to the former, during the interview it has been clarified that the upcoming legislation to reduce the organic content in the waste will not have any major influence on the project site's methane generation potential as:</p> <ol style="list-style-type: none"> <li>1. The project site already has a biological waste content of only roughly 35% and</li> <li>2. Because the legislation is not foreseen to be effectively implemented/enforced during the next ten years.</li> </ol>		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Data and assumptions are taken from both own		OK

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			experiences from the past years' landfill operation and publicly available data. The data and assumptions are reasonable.		
<b>C. Duration of the Project/ Crediting Period</b> It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/	DR,I	An implementation plan is included in which implementation is foreseen during 2004. During the interview, the project contact Mr. Juhazs confirmed that the wells were constructed, and that the installation of the gas engine currently is in progress.		OK
C.1.2. Is the project's crediting time clearly defined?	/1/	DR	The crediting time lasts from 1.1.2008 – 31.12.2012		OK
<b>D. Monitoring Plan</b> The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
<b>D.1. Monitoring Methodology</b> It is assessed whether the project applies an appropriate baseline methodology.					
D.1.1. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR,I	DNV requested clarification on the monitoring points throughout the landfill gas capture and utilization process. The monitoring points have subsequently been clearly outlined, both in table	GL1	OK

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			3 of this protocol and in the revised PDD /1/.		
D.1.2. Is the selected monitoring methodology supported by the monitored and recorded data?	/1/	DR	<p>Yes for main parameters, see D.1.1.</p> <p>The project measures the following:</p> <p><b>Baseline emissions:</b></p> <ul style="list-style-type: none"> <li>- methane generation potential of the landfill, assuming no soil top after the site is decommissioned at the end of 2010: <i>calculation based on actual disposed waste, assuming <math>k = 0,01/\text{year}</math>, <math>L_0 = 157\text{m}^3/\text{tonne}</math> of waste disposed and methane content of 42%.</i></li> <li>- indirect emissions from the power plants delivering electricity to the grid: <i>ex-post grid-factor from official source</i></li> </ul> <p><b>Project emissions:</b></p> <ul style="list-style-type: none"> <li>- emissions from the electricity generator (on-site use of natural gas): <i>direct measurement of natural gas consumption</i></li> <li>- fugitive emissions: assuming the captured landfill gas constitutes 85% of the site's total generation capacity. <i>The measured captured landfill gas constitutes the basis to calculate 15% fugitive emissions.</i></li> </ul>		OK
D.1.3. Are the monitoring provisions in the monitoring methodology consistent with the project boundaries in the baseline study?	/1/	DR	Yes for main parameters (see above)		OK
D.1.4. Have any needs for monitoring outside the	/1/	DR	It is assumed that the monitoring of the grid CO <sub>2</sub>		OK

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project boundaries been evaluated and if so, included as applicable?			-coefficient will be done by an official source.		
D.1.5. Does the monitoring methodology allow for conservative, transparent, accurate and complete calculation of the ex post GHG emissions?	/1/	DR	DNV requested clarification on the monitoring points throughout the landfill gas capture and utilization process. The monitoring points have subsequently been clearly outlined, both in table 3 of this protocol and in the revised PDD /1/.	CL-1	OK
D.1.6. Is the monitoring methodology clear and user friendly?	/1/	DR	Yes.		OK
D.1.7. Does the methodology mitigate possible monitoring errors or uncertainties addressed?	/1/	DR	Errors can occur from the fact that the baseline emissions and fugitive project emissions are not directly measured but calculated based on the actual waste landfilled. The risk of overstating emission reductions is being countered by conservative assumptions in terms of methane generation rate, methane content and methane generation potential.  Official data is used to calculate the CO <sub>2</sub> emission reductions due to displaced grid electricity. Monitoring procedures are elaborated enough to guarantee a minimum of risk due to bad measurement.		OK
<b>D.2. Monitoring of Project Emissions</b> It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the	/1/	DR	Yes.		OK

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greenhouse gas emissions within the project boundary during the crediting period?					
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	Yes		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Yes		OK
D.2.4. Will the indicators enable comparison of project data and performance over time?	/1/	DR	Yes.		OK
<b>D.3. Monitoring of Leakage</b> It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	Electricity used by pumps, monitoring equipment, etc. is provided by the national grid and currently not deducted from the emission reductions because it is a minor emission source. During the interviews, the project developer has however agreed to deduct the electricity supply to the grid by the amount of electricity used to run the capture equipment. This is reflected in the updated PDD version.		OK
D.3.2. Have relevant indicators for GHG leakage been included?	/1/	DR	The electricity used to run the capture equipment can easily be aggregated from invoices.		OK
D.3.3. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	Yes		OK
D.3.4. Will it be possible to monitor the specified GHG leakage indicators?	/1/	DR	Yes, the same grid-CO <sub>2</sub> coefficient as for the electricity supply to the grid will be applied.		OK

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<b>D.4. Monitoring of Baseline Emissions</b> It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining the baseline emissions during the crediting period?	/1/	DR	The monitoring plan directly measures the methane emissions avoided by the project.		OK
<b>D.5. Monitoring of Environmental Impacts</b> It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.					
D.5.1. Does the monitoring plan provide for the collection and archiving of relevant data on environmental impacts?	/1/	DR,I	The project has no significant environmental impacts.		OK
<b>D.6. Project Management Planning</b> It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR/I	Exim-Invest Biogaz Kft. and Varosüzemeltetési Kht formed a syndicate for this project and are jointly responsible for the project management.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR,I	Varosüzemeltetési Kht will be responsible for registration, monitoring, measurement and reporting.		OK
D.6.3. Are procedures identified for training of	/1/	DR,I	The supplier's specialist will train the project's		OK

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monitoring personnel?			operator staff before the project starts to generate emission reductions.		
D.6.4. Are procedures identified for calibration of monitoring equipment?	/1/	DR	Procedures have been envisaged but are not yet formalised and written down in manuals.	<del>CAR-2</del>	OK
D.6.5. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	<i>idem</i>	<del>CAR-2</del>	OK
D.6.6. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	<i>idem</i>	<del>CAR-2</del>	OK
D.6.7. 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	<i>idem</i>	<del>CAR-2</del>	OK
D.6.8. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	<i>idem</i>	<del>CAR-2</del>	OK
D.6.9. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	<i>idem</i>	<del>CAR-2</del>	OK
D.6.10. Are procedures identified for project performance reviews?	/1/	DR	<i>idem</i>	<del>CAR-2</del>	OK
D.6.11. Are procedures identified for corrective actions?	/1/	DR	<i>idem</i>	<del>CAR-2</del>	OK

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<b>E. Calculation of GHG Emissions by Source</b> 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.					
<b>E.1. Predicted Project GHG Emissions</b> The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	The indirect emissions from purchased electricity will be included in the project design, based on discussions during the interview, see D.3.1.		OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Formulas, references to methodology etc. are missing and there are calculation errors in the project design documentation. However, for the purpose of the assessment of the material issues during a determination, enough information has been provided to get a realistic picture of the project developer's intentions.  The revised PDD contains the following corrections: <ul style="list-style-type: none"> <li>- GWP of methane: from 23 to 21</li> <li>- Capture efficiency from 100% to 85%</li> </ul>		OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR,I	Yes. See point B.1.2. and B.2.2. regarding the discussion on conservativeness		OK

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E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	Yes		OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	Yes. CH <sub>4</sub> and CO <sub>2</sub> is considered.		OK
<b>E.2. Leakage Effect Emissions</b> 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.					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	The project is not likely to result in significant leakage effects beyond the project boundaries. The electricity used to run the capture equipment will be deducted from the electricity supplied to the grid.		OK
<b>E.3. Baseline Emissions</b> The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR	Yes, conservative assumptions have been used.		OK

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<b>E.4.Emission Reductions</b> Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	Yes		OK
<b>F. Environmental Impacts</b> Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR,I	An EIA was performed in 2002. This identified no adverse effects. The Hungarian Environmental authority has issued an operational permit No 468-20-2004 based on this assessment.		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,I	Yes, the EIA has been approved.		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR,I	Negative environmental impacts can originate from noise during both: <ul style="list-style-type: none"> <li>- the construction phase (trucks delivering the equipment, the installation itself) and</li> <li>- the operation phase (electricity generator).</li> </ul> These impacts are considered to be minor.		OK
F.1.4. Are transboundary environmental impacts	/1/	DR,I	No major transboundary environmental impacts		OK

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considered in the analysis?			are foreseen.		
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR,I	No, because it is not deemed relevant.		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR,I	The landfill has the necessary permit issued by the local authority (468-20/2004) valid until 31 December 2008 for operating the landfill.		OK

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**Table 3 Resolution of Corrective Action and Clarification Requests**

<b>Draft report clarifications and corrective action requests</b>	<b>Ref. to Table 2</b>	<b>Summary of project owner response</b>	<b>Determination conclusion</b>
<p>CAR 1</p> <p>Formal approval of the parties Hungary and Austria has not been obtained</p> <p>Also, a contact person needs to be designated for GE Jenbacher GmbH, including phone and email.</p>	<p>Table 1, point 1</p>	<p>The availability of the determination report is necessary for the approval; Letter of Endorsement was issued for the project.</p>	<p>The response is deemed sufficient; however the formal approval will be required to complete the determination process.</p>
<p><del>CAR-2</del></p> <p>Procedures have been envisaged but not yet formalised and written down in manuals. This needs to be done at the latest before the project starts to generate emission reductions i.e. 1.1.2008.</p>	<p>D.6.4. – D.6.11.</p>	<p>This will be done</p>	<p>It is acceptable that the provisions for monitoring, verification and reporting are only further developed prior to the commencement of the start of the project.</p> <p>This CAR is therefore closed.</p>
<p><b>CL1</b></p> <p>DNV requests clarification on the monitoring points throughout the landfill gas capture and utilization process i.e. where is the flow, pressure and temperature measurement equipment installed in the process from capture until combustion?</p>	<p>D.1.5.</p>	<p>The waste land filled will be directly monitored. Further monitoring will occur at the following locations:</p> <ol style="list-style-type: none"> <li>1. Flow measurement of LFG: continuously</li> <li>2. The methane content of the LFG: continuously</li> <li>3. The operating time of pumps: continuously</li> <li>4. The operating time of the gas engines: continuously</li> <li>5. The electricity produced: continuously</li> <li>6. Natural gas co-fired: continuously</li> </ol>	<p>The monitoring practice as outlined here constitutes current good practice.</p> <p>This CAR is therefore closed.</p>

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