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# VERIFICATION REPORT

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## PÁLHALMA BIOGAS PROJECT IN HUNGARY

Verification Period:

1 October 2008 - 31 December 2008

REPORT No. 2009-9165

REVISION No. 5

DET NORSKE VERITAS



## VERIFICATION REPORT

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Approved by: Michael Lehmann Technical Director	Organisational unit: Climate Change Services
Client: Pálhalmai Agrospeciál Ltd.	Client ref.: Mr Tamás Kovács managing director

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**Summary:**  
Pálhalmai Agrospeciál Ltd. has commissioned Det Norske Veritas Certification AS (DNV) to perform verification of the emission reductions reported for the Pálhalma Biogas Project in Hungary (UNFCCC project ID HU1000010) for the period October 1, 2008 - December 31, 2008. This report summarises the findings of this verification.

The verification was carried out by reviewing the project's Project Design Document /1/, Baseline Study /4/ and Monitoring Plan /2/, /3/. During the verification the project site was visited on 20 February of 2009. On-site inspections and interviews with the staff of the biogas plant were carried out during the visit.

It has been verified that the project reduced **3931 t** carbon dioxide emission reduction from 1 October 2008 until 31 December of 2008.

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Report title: Pálhalma Biogas Project in Hungary		
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**Table of Content****Page**

1	INTRODUCTION .....	1
1.1	Objective	1
1.2	Scope	1
1.3	Description of the Project Activity	3
2	METHODOLOGY .....	4
2.1	Review of Documentation	5
2.2	Site Visits	6
2.3	Assessment	6
2.4	Reporting of Findings	7
3	VERIFICATION FINDINGS .....	7
3.3.	Project Implementation and Operation	9
3.4.	Completeness of Monitoring	11
3.5.	Accuracy of Emission Reduction Calculations	11
3.6.	Quality of Evidence to Determine Emission Reductions	13
3.7.	Management System and Quality Assurance	13
4.	VERIFICATION STATEMENT .....	15
5.	REFERENCES .....	16

Appendix A Periodic Verification Checklist



## *Abbreviations*

BAU	Business As Usual
BS	Baseline Study
CAR	Corrective Action Request
CR	Clarification Request
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CH <sub>4</sub>	Methane
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
ERPA	Emission Reduction Purchase Agreement
ERU	Emission Reduction Units(s)
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IETA/PCF	International Emission Trading Association / Prototype Carbon Found
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
N <sub>2</sub> O	Nitrous oxide
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change



## 1 INTRODUCTION

Pálhalmai Agrospeciál Ltd. has commissioned Det Norske Veritas Certification AS (DNV) to perform an independent verification of the emission reduction reported for the Pálhalma Biogas Project in Hungary for the period 1 October 2008 – 31 December 2008. This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria for Joint Implementation (JI) projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The site visit connected to the verification of the emission reduction produced by the project was performed on 20 February of 2009.

### 1.1 Objective

The objective of the verification of the Pálhalma Biogas Project was to verify that:

- Monitoring and reporting system are in place and fully functional to ensure the data for determination of the emission reduction reached by the project
- Reviewing the data collected for the period October – December of 2008 /7/
- Confirming monitoring report /7/ content provided from Pálhalmai Agrospeciál Ltd. in relation of the monitoring practice and plan

### 1.2 Scope

The periodical verification has addressed the following aspects:

- Implementation and operation of the monitoring plan
- Internal data resources, uncertainty of the data
- External data resources, uncertainty of the data
- Appropriateness of the calculation method used for the emission reduction
- Environmental and social indicators
- Management and operational system
- Assessment of the emission reduction produced by the project



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**VERIFICATION REPORT**

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The verification shall ensure that reported emission reductions are complete and accurate. The verification team has, based on the recommendations in the Validation and Verification Manual /8/, employed a risk-based approach, focusing on the identification of significant reporting risks and verifying the mitigation measures for these.

### **1.3 Description of the Project Activity**

Project Parties: Pálhalmai Agrospeciál Ltd. (host)  
Austrian Federal Ministry of Agriculture, Forestry,  
Environment and Water Management (inventor)

Title of project activity: Pálhalma Biogas Project

Location of the project activity: Pálhalma, Hungary

The Pálhalma Biogas Project is registered as a Joint Implementation project between Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management and Pálhalmai Agrospeciál Ltd. and includes the installation of a biogas plant. The project has LoE and LoA issued by the Hungarian Focal Point in compliance with the Track 1 procedure /11/, /12/, the details are given in the Internet homepage of Hungarian Ministry of Environment and Water Management. ([www.klima.kvvm.hu](http://www.klima.kvvm.hu)). This verification was carried out in accordance with requirements of National Guidelines and Procedures /11/ as Initial and first periodical verification /6/.

The feedstocks are fermented in a mesophilic (about 38 °C) biogas process. A two-stage fermenting process (primary and secondary digester) provides the full fermentation of the substrate and maximizes the biogas generation. The biogas is combusted in two biogas engines (combines heat and power engines), where electricity and heat is generated. The electricity is fed into the public Hungarian electricity grid, biogas heat is delivered to the laundry, where natural gas is replaced.

Biogas flow is corrected to 22 degrees Celsius, 982 hPa (source: Höntzsch VA40 1603 E flow censor: range -20 ±100 degrees Celsius) and result is recorded in % of volume as all parameters in excel sheet for calculation.

As leakage is calculated 3% from the digested substrate storage in lagoons only how is stated in PDD /1/.



The digested substrates are stored in sealed storages. The liquid effluent of the biogas plant contains nutrients in a high quality state. Pálhalmi Agrospeciál Ltd. uses the effluent to fertilize its field and thus is able to reduce its chemical fertilizer demand.

The project generates carbon dioxide emission reduction originating from

- Avoiding methane emission from the natural decomposition of the organic waste
- Substituting fossil fuels for electricity and heat generation
- Decreasing the consumption of artificial fertilizers using the fermented substrate
- However the project proposed heating from biogas plant for using in laundry in the PDD /1/, this process is not implemented in the reviewed period and thus there are no emission reductions for this part in the monitoring report /7/.

## 2 METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project.

These include:

- i) requirements the Hungarian Focal Point in compliance with the Track 1 procedure /11/, /12/
- ii) all factors defined in the relevant decree /1/ and
- iii) issues that constitute the basis for emission reductions from the project, including the review of the calculations of the emission reduction from connected heat and electricity generation of the biogas plant.




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 VERIFICATION REPORT
 

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**Verification team****Verification team****Type of involvement**

<b>Role/Qualification</b>	<b>Last Name</b>	<b>First Name</b>	<b>Country</b>	Desk review	Site visit	Reporting	Supervision of work	Technical review	Expert input
JI verifier / Technical team leader	Vöröš	Mario	Slovak republic			✓	✓		
GHG auditor	Andrtová	Zuzana	Czech republic	✓		✓			
GHG auditor Technical reviewer	Máté Rama- chandran	Magdolna Ramesh	Hungary India	✓	✓	✓		✓	

**Duration of verification**

Preparations: 2009-02-19

On-site verification: 2009-02-20

Reporting: 2009-02-22 to 2009-05-04

**2.1 Review of Documentation**

The key documents of the emission reduction project, the Project Design Document /1/, the Monitoring Plan /2/, /3/, Baseline Study /4/, Determination Report /5/ and the Verification Report for the previous monitoring period /6/ by were reviewed. During the site visit the operation of the monitoring activities were reviewed and compared with the requirements of the Monitoring Plan /2/, /3/ and the requirements of the Hungarian Focal Point in compliance with the Track 1 procedure /11/.

The PDD /1/ was sourced from UNFCCC websites. The Determination Report /5/ refers to a PDD of 3 August 2004 (PDD from UNFCCC website is dated 30 June 2004). This inconsistency was due to an omission to change the date on the cover page of the PDD.



In compliance with the relating rules the structure and operation of the monitoring system, the suitability of the data management system and accuracy and liability of the monitoring data (including of the operation and metrological status of the measuring equipment, the sampling and results of the laboratorial examinations) were assessed considering the all sources. The additionality and the emission factors used during the calculation of the emissions were reviewed. The risks of the verification also were assessed. The Monitoring Report for 2008 /7/ containing the calculation of emission reduction in Excel tables presented by the Pálhalmai Agrospeciál Ltd. was reviewed.

## 2.2 Site Visits

On 20 February 2009 site visit was carried out in Pálhalma. During this visit the actual implementation of the project and the monitoring and reporting data used for the estimation of emission reduction were reviewed and verified.

The list of the persons interviewed during the verification audit is given in the annex. The topics of the interviews covered the next:

- Operation of the biogas plant
- Data collection for the calculation of the emission reduction achieved by the project
- Operation of the monitoring system
- Control of the operation
- Calculation of the emission reduction (formulas, data sources)
- The annual monitoring report

## 2.3 Assessment

The different means of verification were used including

- The review of the project documentation
- The on-site inspections, review of the performance records, interviews with the project's participants, collection of raw data for the calculation of the emission reduction, observation of the established practices and testing of the accuracy of the monitoring equipment



- The review of the monitoring results and verification of the correct application of the monitoring methodologies
- The determination of the reductions in GHG emissions.

## **2.4 Reporting of Findings**

Findings established during the verification may as follows:

A corrective action request (CAR) is issued, where:

- i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- ii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- iii. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

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

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

## **3 VERIFICATION FINDINGS**

This section summarises the findings from the verification of the emission reductions reported for the project for the period 1 October 2008 to 31 December 2008. The findings of the verification are documented in more detail in the verification checklist given in Appendix A.

### **3.1 Remaining Issues, CARs, FARs from Previous Validation or Verification**



## VERIFICATION REPORT

N° of CAR, CL or FAR	Description of the findings	Conclusion
FAR1	<p>As a work instruction the set of the calibration plan but for the measuring equipment is preferable considering the recommendations of the equipment's producers.</p> <p>To improve the use of the documents the set of the technological and relevant work instructions is recommended considering each defined jobs.</p>	The calibration plan of the measuring equipment was prepared, but the set up of the controlling procedures, documents are preferable. (see under 3.6. Management System and Quality Assurance)
FAR2	<p>The operation of the biogas plant is monitored and controlled by a computer system. (ACRON program) The main data of the operation of the biogas plant including the key parameters for calculation of the emission reduction is printed out every day by the computer system. The data saving procedure should be done clear in the frame the using of the computer.</p> <p>The clarification of documented procedures for data handling and archiving is required too</p>	See FAR2 from this verification period

### 3.2 CARs, FARs from this Verification period

Six FARs were identified during the monitoring period 1 October 2008 to 31 December 2008.

<i>FAR</i>	<i>Description of the FAR, CL</i>
FAR1	The emergency plan for case of technological problems is not included in documented procedures. See chapter 3.2
FAR2	To improve the use of the documents the set of the relevant work instructions is recommended to be made available for each defined job
FAR3	The integration of the biogas plant operation into the quality management system is recommended. (planning of the self inspections, execution of the corrective actions, handling of documents)
FAR4	In consequence of the change in the staff the necessary trainings of the new employee should be planned.



FAR5	The monitoring plan should be improved for better transparency, i.e. the excel sheet should be updated with text.
FAR6	The first internal inspection was planned at the end of this year; only the internal audit was executed. The internal inspection is required.

### 3.3. Project Implementation and Operation

The project consisting the installation of a biogas plant to generate electricity and heat is operated. The heat produced by the gas engines is used now for several heating steps of the technology, does not substitute natural gas consumption in laundry. It is considered in calculation of the emission reduction achieved by the project, there is no emission reduction from the natural gas substitution.

Some technological problems were arised in the operation last October. The digestion of the manure, the biogas generating ability decreased in digester I in consequence of the straw component of the supplied manure. The digester was emptied from 13 November of 2008. The digested liquid content of the digester after some examinations was loaded in the lagoon; the solid, undigested parts were replaced into the storage place. The technology of this procedure as an emergency plan was not given by the project developer. The experiences of these activities shall be documented. (see FAR 1)

During the verification visit the refilling of the digester was in progress. The normal operation of digester 1 is expected from March. The cleaning of digester 2 is planned after the restart and normal operation of digester 1.



### 3.4. Completeness of Monitoring

Data for the calculation of the emission reduction is collected in accordance with the Monitoring Plan /2/, /3/.

The fermentation and electricity production process is monitored and controlled by a computer system. The data used for the calculation of the emission reduction are collected by the computer system continuously.

The volume and the methane content of the biogas produced are measured continuously by relevant gas flow-meter and gas analyser. Biogas flow is corrected to 22 degrees Celsius, 982 hPa (source: Höntzsch VA40 1603 E flow sensor: range  $-20 \pm 100$  degrees Celsius) and result is recorded in % of volume as all parameters in excel sheet for calculation.

The amount of the electricity produced by the gas engines is measured by an electricity meter.

The mass of the digested substrate – when spreaded on the fields – is carried by trucks and is measured on bridge scales (as differential measurement).

The amount of the fermented liquid substrate is measured on bridge scale (differential measurement) and it is sampled over head every 3 months and nitrogen content is determined in accredited laboratory

### 3.5. Accuracy of Emission Reduction Calculations

The project generates carbon dioxide emission reduction originating from

- Avoiding methane emission from the natural decomposition of the organic waste
- Substituting fossil fuels for electricity and heat generation
- Decreasing the consumption of artificial fertilizers using the fermented substrate



- However the project proposed heating from biogas plant for using in laundry in the PDD /1/, this process is not implemented in the reviewed period and thus there are no emission reductions for this part in the Monitoring report /7/.

The Project Design Document /1/ contains a method for the estimation of the methane generation. The base of this estimation is the livestock numbers, the specific emission factors, the daily volatile solids excreted, the methane producing capacities and the methane conversion factors by climate considering the species. The uncertainty of this method is not known, for this reason the approved CDM method, AMS-III.D Version 13 *Methane recovery in agricultural and agro industrial activities* was considered /9/. This methodology was not mentioned in PDD but the Track 1 Authority in Hungary preferred methodologies based on estimated factors (manure/methane conversions etc.) and thus this methodology was applied 11/.

The methane generated from the decomposition of the organic waste is measured exactly by gas flow meter and gas-photometer. In consequence that the full fermentation can not be guaranteed, after the fermentation process in digesters the formation of 2% of the total biogas generation potential is realistic. In order to calculate these emissions conservatively, the emissions are calculated with 3%, the calculated emission reduction is decreased with this as determined in PDD /1/ and the Baseline Study /4/.

The emission reduction from combustion of the methane content of the biogas in gas engines and production electricity is calculated by product of the purchased electricity with the specific emission factor. For the estimation of this factor the forecasts of International Energy Agency (IEA) was used.

The emission factors used for calculation are resourced from PDD /1/. However, the Hungarian Ministry of Environment and Water published valid grid emission factor for 2007/2008. But the Ministry as the Track 1 Authority agreed that the published factors is to be used by new JI projects only and has allowed the application of PDD factors for JI projects already determined /14/.

In relation of the substitution of the chemical fertilizers by digested substrates the Project Design Document /1/ uses as baseline the consumption of 2001-2003. For estimation of the



avoided emissions from the production of chemical fertilizers the factual amount of the digested substrate is compared with the up to dated consumptions in the period 2005-2007. The nitrogen content of the digested substrate is determined by accredited laboratory, for the chemical fertilizers this parameter is given in the specifications of the products. Comparing the total nitrogen content of the digested substrate took off to the fields and the consumption and the content of artificial fertilizers can be calculated the reduction of the chemical fertilizers by types. The emission reduction is calculated by summarising the product of the amount with the emission factor.

### **3.6. Quality of Evidence to Determine Emission Reductions**

The input data necessary for the calculations of emission reduction are reviewed and approved by the management. The data collecting process and the operation of the biogas plant is inspected yearly. The correctness of the data flow and data in the Monitoring report /7/ was confirmed on site by DNV on base of comparison of operational data with information stored in the Monitoring report /7/.

### **3.7. Management System and Quality Assurance**

Pálhalmi Agrospeciál Ltd operates certified quality management system meeting with the requirements of ISO 9001 : 2000. (No of the Certificate: 22786 issued by NQA, valid until 20 October 2010.)

The documents of the installation and the operation of the biogas plant including the description of the facility, emergency and maintaining plans, the handling instructions of equipment, evaluation of the damaging factors were available during the initial verification. The volume of this documentation is very large. To improve the use of the documents the set of the technological and relevant work instructions is recommended considering each defined jobs. (FAR2)



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**VERIFICATION REPORT**

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An internal inspection is planned with yearly frequency for the auditing of the whole operation of the Biogas Project. The topics of the audit are defined; the performance of the first inspection was planned for the end of the year, but was not executed. The operation of the biogas plant was included into the internal audits. The integration of the biogas plant operation into the quality management system is recommended. (planning of the self inspections, execution of the corrective actions, handling of documents) (FAR 3)

The operation of the Pálhalma Biogas Project and the achieved emission reduction is followed by the management.



#### 4. VERIFICATION STATEMENT

Det Norske Veritas Certification AS (DNV) has performed a verification of the emission reductions reported for the Pálhalma Biogas Project in Hungary for the period 1 October 2008 to 31 December 2008.

Pálhalmai Agrospecial Ltd is responsible for the collection of data in accordance with the validated monitoring plan and the reporting of GHG emissions reductions from the project.

It is DNV's responsibility to express an independent verification statement on the reported GHG emission reductions from the project and the compliance with the monitoring plan.

DNV conducted the verification on the basis of the Monitoring Plan /2/ /3/, the PDD of the project /1/ and the Monitoring Report for 2008 /7/. The verification included i) checking whether the provisions of the monitoring plan in the PDD were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV's verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In DNV's opinion, the GHG emissions reduction for the project as reported in the Monitoring Report for 2008 are fairly stated.

The GHG emission reductions were correctly calculated on the basis of the validated Monitoring Plan /2/ and /3/ and formulae given in the Project Design Document /1/.

Det Norske Veritas Certification AS is able to verify that the emission reductions from the Pálhalma Biogas Project in Hungary for the period 1 October 2008 to 31 December 2008 amount to **3 931** tonnes of CO<sub>2</sub> equivalent.

DNV does not assume any responsibility towards the issuance and utilization of the emission reductions hereby verified and certified. The verification of reported emission reductions is based on the information made available to DNV and the engagement conditions detailed in this report. DNV cannot be held liable by any party for decisions made or not made based on this report.



## 5. REFERENCES

### Category 1 Documents:

- /1/ Pálhamai Agrospeciál Kft: Project Design Document Pálhalma Biogas Project, Version from 30 June 2004
- /2/ Monitoring Plan Draft June 2004
- /3/ Monitoring Plan Version 2.0 issued 15 October 2008
- /4/ Baseline Study Draft June 2004
- /5/ TÜV SÜD Industrie Service : Determination Report No: 487255 issued on 13 August 2004
- /6/ Initial and First Periodic Verification Report No. 2009-9164 – issued by DNV
- /7/ Excel spreadsheets as Monitoring report :  
Agrospec\_biogaz\_Monitoring\_TENY\_v2\_2007\_DNV;  
Agrospec\_biogaz\_Monitoring\_TENY\_v2\_2008\_egesz\_eves\_DNV;  
Agrospec\_biogaz\_Monitoring\_TENY\_v2\_2008\_egesz\_eves\_DNV\_english;  
Agrospec\_biogaz\_Monitoring\_TENY\_v2\_2008\_I-IXho\_DNV

### Category 2 Documents:

- /8/ Clean Development Mechanism: Validation and Verification Manual, EB 44 report, annex 3 [http://cdm.unfccc.int/EB/044/eb44\\_repan03.pdf](http://cdm.unfccc.int/EB/044/eb44_repan03.pdf) (previous version: Internal Emission Trading Association/World Bank's Prototype Carbon Fund: Validation and Verification Manual)
- /9/ Methane recovery in agricultural and agro industries activities - AMS-IIID Version 13 Sectoral Scope 15,EB 33 issued by CDM Executive Board
- /10/ ISO 14064-3:2006 and ISO 14065:2007.
- /11/ 323/2007 (XII.11.) Gov. Decree on the implementation of Act LX of 2007 on the implementation framework on the UN Framework Convention on Climate Change and the Kyoto Protocol
- /12/ 1/2009 (II.10.) KvVM Decree about the rules of the verification process (+ professional and personal criteria of the verifiers of JI projects in Hungary)
- /13/ Calibration plan 2009 2009.01.05.
- /14/ E-mail from Ministry of Environment and Water with confirmation to use emission factors stated in PDD dated 29 June 2009

### Persons interviewed:

- /15/ Mr Tamás Kovács managing director
- /16/ Mr János Gecse plant manager
- /17/ Ms Boglárka Áldott shift leader
- /18/ Mr Kálmán Dénes representative of the Hese Gmbh, operation consultant
- /19/ Mr József Czeilinger repairer
- /20/ Mr György Bernáth repairer

**APPENDIX A**

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**PERIODIC VERIFICATION CHECKLIST**

### Table 1: Data Management System/Controls

The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table. A score is assigned as follows:

- Full - all best-practice expectations are implemented.
- Partial - a proportion of the best practice expectations is implemented
- Limited - this should be given if little or none of the system component is in place.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i> )
<b>A. Defined organisational structure, responsibilities and competencies</b>		
<b>A.1. Position and roles</b>	F	The responsibilities in relation of the project's operation and monitoring are clearly defined in the Monitoring Plan. The activities performed are in compliance with these requirements.
<b>A.2. Responsibilities</b>	F	See above, A.1.
<b>A.3. Competencies needed</b>	P	The basic education of the relevant operating staff meets with the necessary competencies.  The necessary training was performed both in relation of the operation of the biogas plant and the monitoring activities.  In consequence of the change in the staff the necessary trainings of the new employee should be planned (FAR4).

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i> )
<b>B. Conformance with monitoring plan</b>		
<b>B.1. Reporting procedures</b>	F	<p>The Monitoring Plan was up to dated (the valid version was 2.0 during the site visit) and so it is in accordance with the project operation.</p> <p>The heat produced by the gas engines at the moment is not used in laundry as was predicted in the Project Design Document. (It is consumed for the heating of technological steps for example for sterilization of the kitchen residues, there are plans to use it for heating of pigsties to substitute the fossil fuels there) For this reason this source of the emission reduction is neglected.</p>
<b>B.2. Necessary Changes</b>	F	See above, B.1.
<b>C. Application of GHG determination methods</b>		
<b>C.1. Methods used</b>	F	<p>There is no change in the calculation method of the emission reduction. The project generates carbon dioxide emission reduction originating from</p> <ul style="list-style-type: none"> <li>• Avoiding methane emission from the natural decomposition of the organic waste</li> <li>• Substituting fossil fuels for electricity and heat generation</li> <li>• Decreasing the consumption of artificial fertilizers using the fermented substrate</li> </ul> <p>The Project Design Document /1/ contains a method for the estimation of the methane generation. The base of this</p>

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i> )
		<p>estimation is the livestock numbers, the specific emission factors, the daily volatile solids excreted, the methane producing capacities and the methane conversion factors by climate considering the species. The uncertainty of this method is not known, for this reason the approved CDM method, AMS-III.D Version 13, Sectoral Scope:15, EB 33 was considered. How was described in this report in chapter 3.5.</p> <p>The methane generated from the decomposition of the organic waste is measured exactly by gas flow meter and gas-photometer. In consequence that the full fermentation can not be guaranteed. In order to calculate these emissions conservatively, the emissions are calculated with 3%, the calculated emission reduction is decreased with this.</p> <p>The emission reduction from combustion of the methane content of the biogas in gas engines and production electricity is calculated by product of the purchased electricity with the specific emission factor. For the estimation of this factor the forecasts of International Energy Agency (IEA) was used. How was mentioned in this report, the emissions factors stated in PDD /1/ are accepted by Ministry of Environment and Water /13/</p>
<b>C.2. Method used cont.</b>	F	<p>In relation of the substitution of the chemical fertilizers by digested substrates the Project Design Document uses as baseline the consumption of 2001-2003. For estimation of the</p>

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i> )
		<p>avoided emissions from the production of chemical fertilizers</p> <p>the factual amount of the digested substrate is compared with the up to dated consumptions in the period 2005-2007. The nitrogen content of the digested substrate is determined by accredited laboratory, for the chemical fertilizers this parameter is given in the specifications of the products.</p> <p>Comparing the total nitrogen content of the digested substrate took off to the fields and the consumption and the content of artificial fertilizers can be calculated the reduction of the chemical fertilizers by types. The emission reduction is estimated by summarising the product of the amount with the emission factor.</p>
<b>C.3. Information/process flow</b>	F	<p>The raw data needed for the calculation of the emission reduction are given in the Monitoring Plan.</p> <p>The fermentation and electricity production process is monitored and controlled by a computer system. The data used for the calculation are collected by the computer system</p>

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i> )
		continuously. The emission reduction is calculated in Excel spreadsheets.
<b>C.4. Data transfer</b>	F	The transfer of the basic data from the computer system into the Excel spreadsheets was checked during the site visit and was found correct.
<b><i>D. Identification and maintenance of key process parameters</i></b>		
<b>D.1. Identification of key parameters</b>	F	<p>The fermentation and electricity production process is monitored and controlled by a computer system. (the automatically measure parameters: substrate volume in digester, temperature, pH, pressure and the content and volume of the biogas)</p> <p>The measuring equipment for the content of the biogas is a Fresenius gas-photometer, for the volume is a gas flow meter. The data used for the calculation are collected by the computer system continuously.</p> <p>The produced electricity is measured a suitable meter.</p> <p>The amount of the digested substrate used as fertilizer is measured before the delivery on the base of its mass.</p>
<b>D.2. Calibration/maintenance</b>	P	<p>The calibration records of the measuring equipment were shown.</p> <p>Gas-photometer 1 (3170420005, 2007.04.20., TÜV, DIN EN 61557)</p> <p>Gas-photometer 2 ( 3180710015, 2008.07.10., TÜV, DIN EN</p>

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i> )
		<p>61557 )</p> <p>Electricity meter (ZMD410CT4424081810 Prod.nr.:93756283 - V-121 verification mark)</p> <p>Balance (Metrisoft MS-01/MTT/TEN/MTEN - TH-8301/8/2004)</p> <p>The calibration record of the gas flow meter is available. ( Flogiston Ipari Gázmérő Hitelesítő Laboratórium Kft. – approved by MKEH – number of the record 08112706, dated on 27 November 2008)</p> <p>The calibration plan was prepared.</p>
<b>E. GHG Calculations</b>		
<b>E.1. Use of estimates and default data</b>	F	<p>The mixed grid emission factors were determined on the base of the electricity sector forecast (electricity demand, efficiency and distribution of the fossil fuelled power plants, IPCC carbon factors)</p> <p>Emissions from fertilizer production are calculated by using a model established by Hydro Agri Europe ( Energy Consumption and Greenhouse Gas Emissions in Fertilizer Production – G. Kongshaugm 1998)</p> <p>These data were validated during the determination of the project.</p>
<b>E.2. Guidance on checks and reviews</b>	L	<p>An internal inspection is planned with yearly frequency for the auditing of the whole operation of the Biogas Project. The topics of the audit are defined. The first internal inspection was planned at the end of this year; only the internal audit</p>

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i> )
		was executed. (FAR6)
<b>E.3. Internal verification</b>	L	<p>Pálhalma Agrospeciál Ltd operates certified quality management system meeting with the requirements of ISO 9001 : 2000. (No of the certificate: 22786 issued by NQA, valid until 20 October 2010.)</p> <p>The integration of the biogas plant operation into the quality management system is recommended. (planning of the self inspections, execution of the corrective actions, handling of documents) (FAR3)</p>
<b>E.4. Internal validation</b>	P	The yearly monitoring report is prepared on the decision of the managing director by the appointed person.
<b>E.5. Data protection measures</b>	P	The main data of the operation of the biogas plant including the key parameters for calculation of the emission reduction is printed out every day by the computer system.

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