VERIFICATION REPORT

PÁLHALMA BIOGAS PROJECT IN HUNGARY

Verification Period:

1 July 2007 - 30 September 2008

REPORT NO. 2009-9164

REVISION NO. 03

DET NORSKE VERITAS

VERIFICATION REPORT

Date of first issue: 2009-07-03	Project No.: PRJC-97597-2008-CCS-HUN
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 the verification of the emission reductions reported for the Pálhalma Biogas Projectin in Hungary for the period 1 July 2007 – 30 September 2008. This report summarises the findings of this verification.

The verification was carried out in accordance with the Validation and Verification Manual (VVM) /7/ and National Guidelines and Procedures /10/ by reviewing by the project's Baseline Study /4/, Monitoring Plan /2/, /3/ and the project Determination Report /5/. During the verification the project site was visited. On-site inspections and interviews with the staff of the biogas plant were carried out during the visit.

It is DNV's opinion that the project is implemented, with exception of heat supply for the laundry, the monitoring system is in place and fully functional and the project generates verifiable emission reduction. The GHG emission reductions reported for the project in the Excel spreadsheets submitted to DNV are fairly stated.

Det Norske Veritas Certification AS was able to verify that the emission reductions from Pálhalma Biogas Project amount to 4 382 t CO_2e from 1 July 2007 until 31 December 2007 and 19 574 t CO_2e in 2008 from 1 January 2008 until 30 September 2008, and hence 23 956 t CO_2e for whole period from 1 July 2007 to 30 September 2008.

Report No.: 2009-9164	Subject Group: Environment
Report title: Pálhalma Biogas Project in Hungary	
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Date of this revision: 2009-07-03	Rev. No.: 03	Number of pages: 21

Indexing terms

Key words Climate Change Kyoto Protocol Validation Clean Development	Service Area Verification Market Sector Process Industry

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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_4	Methane
CO_2	Carbon dioxide
CO_{2e}	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
MVP	Monitoring and Verification Plan
N_2O	Nitrous oxide
PDD	Project Design Document
PP	Project Participant
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 by the Pálhalma Biogas Project in Hungary for the period 1 July 2007 – 30 September 2008. This report summarises 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.

1.1 Objective

The objective of the verification of the Pálhalma Biogas Project was to verify that the project is in compliance with the the National Guidelines /10/, the project and the monitoring system was implemented in accordance with the Project Design Documents (PDD) /1/ and that is fully functional.

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

- The monitoring and reporting systems are in place and fully functional to ensure the data for determination of the emission reduction reached by the project
- the data collected for period 1 July 2007 – 30 September 2008, the first period of the project performance is correct
- The monitoring report /6/ content provided from Pálhalmai Agrospeciál Ltd. is in accordance with the monitoring practice and plan

1.2 Scope

The verification has addressed the following aspects:

- Review the compliance of the Project Design Documents /1/ with the National Guidelines /10/
- Follow up the observations from the Determination Report /5/ for the project issued by TÜV Süd Industrie Service
- Project implementation and status
- Implementation and operation of the monitoring plan /2/, /3/
- Internal data resources
- External data resources
- Environmental and social indicators
- Management and operational system
- Assessment of the emission reduction produced by the project

The verification shall ensure that reported emission reductions are complete and accurate.

The verification was carried out in accordance with Validation and Verification Manual /7/, the National Guidelines /10/ and ISO 14064-3:2006 and ISO 14065:2007 /9/, employed a risk-based approach, focusing on the identification of significant reporting risks and verifying the mitigation measures for these

Since the baseline and the calculation methods determining CO_2 and CH_4 emission reductions had already been validated by an independent entity, TÜV Süd Industrie Service /5/, and were accepted by both the Sponsor and Host Country, DNV did not assess the baseline determination and the approach for determining CO_2 and CH_4 emission reductions.

Since the determination of the project, the project participants identified an approved CDM methodology for monitoring and used it for calculation of emission reductions in the updated monitoring plan (2008) /2/, /3/ for increasing of the certainty for the actual measured data. Thus AMS-III.D Version 13, *Methane recovery in agricultural and agro industrial activities* /8/ is used for determination of the methane emission avoided by the operation of the biogas plant. This methodology was not mentioned in PDD /1/ but the Track 1 Authority in Hungary prefers methodologies based on estimated factors (manure/methane conversions etc.) and thus this methodology was applied. This approach was realized in several cases in track 1 projects in Hungary.

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
UNFCCC registration No:	HU1000010
Project Entity:	Mr Tamás Kovács managing director, Pálhalmai Agrospeciál Ltd.
Location of the project activity:	Pálhalma, Hungary

The project is registered as a Joint Implementation project, track 1, between the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management and Pálhalmai Agrospeciál Ltd. and includes the installation of a biogas plant.

The sphere of activity of Pálhalmai Agrospeciál Ltd is the follows:

- Animal husbandry
  - pig husbandries are situated in Újgalambos and Bernátkút - the majority of the pigs are kept in Újgalambos (breeding and fattening) and in Bernátkút which are pig fattening farms
  - cattle husbandries are located in Hangos and Parrag – in Parrag cattle are fattened, in Hangos diary cattle are kept
- Crop production

- the produced crops are used by about 30% in the husbandry for feeding of the animals on the farms,
- the 70 % of the produced crops (sunflowers and maize) are sold to local partners

- Other industrial activities
  - laundry
  - radiator production, steel construction and manufacturing

The project activity comprises the installation of a biogas plant at Pálhalmai Agrospecial Ltd.

The biogas plant generates electricity and heat from animal and plant wastes. Electricity is directly fed into the public Hungarian electricity grid. Heat is used as an energy source, for heating the technological blocks of the biogas plant.

The biogas plant and its storage solve the manure management problem of Pálhalmai Agrospeciál Ltd.

The feedstocks (agricultural wastes: pig and cattle manure, kitchen wastes, slaughterhouse wastes, wastewater from pig husbandries, main silage, remains from sunflower oil production) 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 are generated. The electricity is fed into the public Hungarian electricity grid and Biogas heat is used for heating of the sterilisation container of kitchen wastes. In spite of the Project Design Document /1/ the produced heat has not been used in the laundry, there are plans to use it for heating of the near pigsties substituting the natural gas used.

Biogas flow is corrected to 22 degrees Celsius, 982 hPa (source: Höntzsch VA40 1603 E flow sensor: 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 the PDD /1/.

The digested substrates are stored in sealed storages. The liquid effluent of the biogas plant contains nutrients in a high quality state. Pálhalmai 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 reduction has assessed all factors and 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.

These include:

i) requirements the Hungarian Focal Point in compliance with the Track 1 procedure /10/

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.

Verification team

				Type of involvement					
Role/Qualification	***Last Name***	***First Name***	***Country***	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	Máté	Magdolna	Hungary	✓	✓	✓			
Technical reviewers	Ramachandran	Ramesh	India					✓	

Duration of verification

Preparations: 2008-10-10

On-site verification: 2008-10-20 - 2008-10-21

Reporting and QA: 2008-10-23, 2008-11-14, 2009-05-05 to 2009-07-03

2.1 Review of Documentation

The key documents of the emission reduction project, the Project Design Document /1/, the Monitoring Plan /2/, /3/ and the Determination Report /5/ were reviewed. During the site visit the operation of the monitoring activities were reviewed and compared with the requirements of the Monitoring Plan /2/ and /3. The Monitoring Report for 2007-2008 /6/ presented by the Pálhalmai Agrospeciál Ltd. was reviewed.

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.

2.2 Site Visits

On 20-21 October 2008 a 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 on-site inspections also included a review of the work instructions for different monitoring and reporting tasks, performance records, observation of collection of measurements and checking of calibration of measuring equipment.

A special focus was given during the site visit on the proper implementation of the project as described by the Project Design Document /1/ and readiness of the system to deliver verifiable emission reduction.

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

- Installation and operation of the biogas plant
- Data collection for the calculation of the emission reduction achieved by the project
- Installation and operation of the monitoring system
- Control of the operation
- Allocation of the responsibilities
- Training and awareness of the responsible staff
- Environmental impacts of the project
- Calculation of the emission reduction (formulas, data sources)
- The annual monitoring report

2.3 Assessment

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 and local stakeholders, 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 are 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

3.1 Remaining issues, CARs, FARs from previous validation

The determination of the project carried out by TÜV Süd Industrie Service identified three Corrective Action Requests and two Clarification Requests. Responses to belonging issues were accepted by TÜV Süd Industrie Service.

3.2 CARs, CLs or FARs from this verification

This section summarises the findings from the verification of the emission reductions reported for the project for the period 1 July 2007 to 30 September 2008. The findings of the verification are documented in more detail in the verification checklist given in Appendix B.

N° of CAR, CL or FAR	Description of the findings	Conclusion
CAR1	The calibration records of the gas flow meter has not been available	The calibration of the gas flow meter was ordered. (76-24/9-90/2008, 25.11.2008.) The calibration was executed by relevant calibration entity (Flogiston Ipari Gázmérő Hitelesítő Laboratórium Kft. – approved by MKEH – number of the record 08112706, dated on 27 November 2008 /21/) .Previous calibration was performed as part of installation procedures on 11 May 2007 by Hese Biogas /21/ The CAR is closed
FAR1	As a work instruction the set of the calibration plans but for the measuring equipment is preferable considering the recommendations of the equipment's producers. To improve the use of the documents the set of the technological and relevant work instructions is recommended considering each defined jobs.	*This FAR will be checked during the subsequent verification.*
FAR2	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. The clarification of documented procedures	*This FAR will be checked during the subsequent verification.*

	for data handling and archiving is required too	

3.3 Project Implementation

The main parts of the biogas plant

- two feedstock batchers for the acceptance of solid manure, they are dimensioned to store feedstock for 2 days, the feedstock is cut with a milling machine and fed into the primary digestors after dilution by worm type feeders, the storage facility is ventilated, the air is treated by biofilter
- mixing pits are installed for the liquid feedstocks
- container for the sterilisation of the kitchen wastes on 70°C during 1 hour – it is heated by the heat of the gas engines, the other animal wastes used are treated by the supplier
- two complete mixed primary digesters, with paddle agitators – the digesters are operated mesophilic at a temperature 38°C, insulated to reduce heat demand, the heat of CHP is used for the heating, the retention time in the primary digesters is about 23 – 28 days
- two complete mixed secondary digesters ensuring the full fermentation of the substrate, also operates at a temperature 38°C, the retention time is about 23 – 28 days.
- gasholders are installed above the secondary digesters, at full load the gas engines are operating approximately 4 hours.
- two gas engines (Type: Deutz) combust the biogas producing electricity and heat – before combustion the biogas is biologically desulfurised, in case of a breakdown of the engines the biogas is combusted in an emergency flare to avoid the methane emission
- covered digested manure storages with leakage detection system and suitable capacity, according to Hungarian regulation the liquid substrate must be used after at least 120 days

The project, pointing the installation of a biogas plant to generate electricity and heat, was implemented. 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 the calculation of the emission reduction achieved by the project, there is no emission reduction from the natural gas substitution.

3.3.1 Discussion

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

The implementation was followed up by the site visit.

3.3.2 Findings

No remarks, only was confirmed that no implemented heat production by the gas engines is not used in the laundry thus the emission reduction from this process are not calculated.

3.3.3 Conclusion

The emission reduction achieved by the project is calculated by neglecting the natural gas substitution.

3.4 Internal data

The Monitoring Plan /2/, /3/ issued in 2004 uses estimation for determination of the methane producing from the manure. The bases of this estimation are 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 fertilizer mix has been updated with the help of the professionals of Pálhalmai Agrospeciál Ltd. A fertilizer mix applicable for the activities of 2007/2008 was used. These products were tested within the range and that adequate matching for them was found. The fertilizing department of Pálhalmai Agrospeciál Ltd has an extensive knowledge of the different fertilizer types, therefore emission factors could be selected by the nitrogen content of the different fertilizer types (many products are basically the same as at the time of the PDD completion, they have just been rebranded – some types was simply left out to stay on the conservative bases).

In spite of this estimation in compliance with the updated Monitoring Plan (2008) /2/, /3/ the actual measured data are used for determination of the methane emission avoided by the operation of the biogas plant as is in accordance with the AMS-III.D Version 13 /8/. 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.

The emission factors used for calculation are resourced from PDD /1/ however the Hungarian Ministry of Environment and Water published valid grid mix emission factor for 2007/2008. However, the Ministry as the Track 1 Authority agreed that the published factors are to be used for new JI projects only and has allowed the application of PDD factors for JI projects already determined /20/.

During the on-site inspection it was verified that this procedure is followed by the relevant staff.

The whole 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 and recorded daily too in printed form. The method of archiving is not absolutely clear., but the raw data for the calculation are available in printed form.

The volume and the methane content of the biogas produced are measured continuously by relevant gas flow-meter and gas analyser. The amount of the electricity produced by the gas engines is measured by an electricity meter.

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.

The calibration record of this gas photometer, electricity meter and bridge scales was issued by an accredited body and is attached to the document system, the calibration records of the gas flow meter has not been available.

3.4.1 Discussion

The data collection and archiving process is in compliance with the requirements of the Monitoring Plan /2/, /3/ but the procedure for archiving should be better clarified.

3.4.2 Findings

The calibration record of gas flow meter has not been available (CAR1)

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 should be done clear. (FAR2)

3.4.3 Conclusion

Calibrations were performed as part of installation procedures on 11 May 2007 by Hese Biogas /21/ and on 25 November 2008 by Flogiston Ipari Gázmérő Hitelesítő Laboratórium Kft. /21/. The CAR1 is closed.

The clarification of documented procedures for data handling and archiving is required (FAR2).

3.5 External data

External data to be monitored for the method used of the calculation of the emission reduction are not necessary. All constant factors as grid emission factor, nitrogen constant and emission factor of the several types of fertilizers are referred in the Project Design Document /1/, Monitoring Plan /2/, /3/ or the Hungarian Ministry of Environment and Water /20/.

3.5.1 Discussion

External data used for the calculation of the emission reduction are referred in the Project Design Document /1/ or from official source.

3.5.2 Findings

No remarks.

3.5.3 Conclusion

The sources of the used factors are listed in the Project Design Document /1/ or are issued from the Hungarian Ministry of Environment and Water /20/, thus continuous monitoring of external data is not necessary.

3.6 Environmental and Social Indicators

The implementation of the project – in accordance with the expectation – improves the environmental aspects for the project neighbourhoods.

The project activity has significant effect on the ground and surface water, air and waste.

In consequence of use of digested substrates of biogas plant as fertilizers the consumption of the artificial fertilizers, chemicals, insecticides are reduced, thus, the ground water will not be contaminated with chemical substances. Furthermore nitrogen of the biogas fertilizer is better infiltrated by crops compared to nitrogen content of the non-digested or chemical fertilizers. The origin of nitrates is reduced.

Burning biogas in a biogas engine is naturally linked with emission like noise, carbon monoxide (CO), nitrogen oxides (NO_x) and non-methane hydrocarbons.

Compared to the baseline scenario the agricultural wastes are fermented under controlled conditions. Thus, the manure is digested and more or less odourless. Because of the huge amount of manure and the fact that manure is used for fertilizing most of the fields, the odourless manure of the biogas plant represents significant positive effect on nearby habitants.

The biogas plant has valid environmental operation permission issued by the local environmental authority (90329/31/2005, valid until 31 December of 2011) /11/. The necessary permission for the transport of the biomass also was available (16.1/02243/2008 issued on 10 April of 2008) /12/.

The permission for using the fermented liquid substrate as fertilizer was available during the site visit, its validity is 31 May of 2013 /13/.

The point sources of the gas engines were reported for the environmental authority, the operation permission was issued (6649/2008 issued on 16 April of 2008) /14/. The emission of carbon monoxide, nitrogen-oxides and non-methane hydrocarbons will be measured in compliance with the national regulations. The first yearly report will be prepared and sent to the environmental authority until 31 March of 2009.

The operation of the biogas engines produces used oil as hazardous waste, which is disposed according to the national regulations. The first report required by local legislation also will be prepared next year.

The report about the measuring results of the monitoring wells around the fermented liquid substrate storage should be sent to the local environmental authority next year.

The project operation created new jobs, the number of the operating staff is 13 persons. From this 7 are the employees of Pálhalmai Agrospeciál Ltd., and the further 6 persons are prisoners.

3.6.1 Discussion

The project has positive impacts on the nature solving the manure management problems of the Pálhalma Agrospecial Ltd. Digesting the manure the contamination of the ground water is avoided. The project uses several organic wastes as raw materials. The digested substrate is used as fertilizer substituting the artificial ones also eliminating the potential ground water contamination. The methane emission from the natural decomposition of the manure is decreased. The methane produced during the fermentation process is utilised for energy production.

3.6.2 Findings

No findings were found.

3.6.3 Conclusion

The necessary permissions /11/ - /15/ (listed under the References and mentioned in chapter 3.5) for the operation of the project were available during the site visit. The positive environmental impacts of the project and the compliance with the relevant requirements may be verified on the base of the first reports for the authority.

3.7 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.

During the trial operation run in July and August 2007 flaring of the methane was not recorded (operation hours of flare), however the flaring started automatically, when biogas is generated. This was reason for methane avoidance was only taken for ER for this period.

The volume and the methane content of the biogas produced are measured continuously by relevant gas flow-meter and gas analyser. The relevant calibration protocol misses out, see CAR 1 in the chapter 3.4.2 or table in chapter 3.2). 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.

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

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.

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

3.8 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

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 approved CDM methodology AMS-III.D Version 13, *Methane recovery in agricultural and agro industrial activities*, was considered for verification as it is considered to improve the accurateness of the verification compared to the method used during determination to estimate emission reductions. The reasons are explained in detail in chapter 3.4. DNV consider that the chosen approach for verification is acceptable

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 (see Baseline study /4/). In order to calculate these emissions conservatively, the emissions are calculated with 3%, and the calculated emission reduction is reduced with this, how it is staded in PDD /1/ and Baseline study /4/.

The emission reduction from combustion of the methane content of the biogas in gas engines and electricity production 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.

In relation to 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 taken off to the fields and the consumption and the content of artificial fertilizers can be calculated by the reduction of the chemical fertilizers by types. The emission reduction is estimated by summarising the product of the amount with the emission factor.

3.9 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 /6/ was confirmed on site by DNV on base of comparison of operational data with information stared in the Monitoring report /6/.

3.10 Management System and Quality Assurance

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 is planned for the end of the year.

Pálhalmai Agrospeciál Ltd has certified quality management system implemented in accordance with the requirements of ISO 9001:2000. (No of the certificate: 22786 issued by NQA, valid until 20 October 2010 /19/).

The operation of the project and the achieved emission reduction is followed by the management. The Progress Reports in compliance with the ERPA requirements are prepared quarterly.

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 is planned for the end of the year.

The responsibilities in relation of the operation and performance of the Monitoring Plan /2/, /3/ were appointed.

The installation and the operation documents of the biogas plant includes the description of the facility, emergency and maintaining plans, equipment handling instructions, 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. (FAR1)

The members of the operating staff were in Germany (October of 2006) to study a biogas plant during the operation. There was a continuous training by the constructor of the project from 2007 for the staff discussing the different technological processes in details. On the base of the contract with constructor its representative helps the operation of the biogas plant one year. Relevant personnel were trained and instructed how to handle the data collection and processing and those people are aware of the Monitoring Plan /2/, /3/, accordingly.

3.10.1 Discussion

The operation and related monitoring activities are in place.

3.10.2 Findings

The set of the technological instruction(s) and working instruction(s) is recommended to ensure the use of the relevant controlling documents for the operators regarding to large extent of the relevant technological documentation of individual components. (FAR1)

3.10.3 Conclusion

The operation of the project and the production of the emission reduction is reviewed by the management. The operation of the biogas plant is a part of the quality management system based on ISO 9001:2000.

The relevant staffs of the biogas plant were trained on the operation of the plant and on the Monitoring Plan /2/, /3/.

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 July 2007 to 30 September 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/ and /3/, the PDD of the project /1/ and the Monitoring Report for the period 1 July 2007 to 30 September 2008 /6/. The verification included i) checking whether the provisions of the monitoring 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 /6/ for period 1 July 2007 to 30 September 2008 are fairly stated.

Det Norske Veritas Certification AS is able to verify that the emission reductions from the Pálhalma Biogas Project in Hungary for the period 1 July 2007 to 30 September 2008 amount to **23 956** tonnes of CO_2 equivalent (**4 382** t CO_2e from 1 July 2007 to 31 December 2007, **19 574** t CO_2e from 1 January until 30 September of 2008).

DNV does not assume any responsibility towards the issuance and utilization of the emission reductions hereby verified. 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 Draft 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/ 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:

/7/ Internal Emission Trading Association / World Bank's Prototype Carbon Found: Validation and Verification Manual)

/8/ Methane recovery in agricultural and agro industries activities - AMS-IIID Version 13 Sectoral Scope 15,EB 33 issued by CDM Executive Board

/9/ ISO 14064-3:2006 and ISO 14065:2007.

/10/ National Guidelines and Procedures – 323/2007 (XII.11.) Government Decree on implementation of Act LX of 2007 of the implementation framework of the UN Framework Convention and Climate Change and the Kyoto Protocol

/11/ 90329/31/2005 Environmental permission for operation (issued by local environmental authority)

/12/ 16.1/02243/2008 Transport permission for the transport of biomass (issued by local authority)

/13/ 16.2/30456/7/2008 Permission for use of digested substrat as fertilizer (issued by local authority)

/14/ 6649/2008 Operation permission of point sources of biogas plant (issued by local environmental authority)

/15/ 293/2008 Site permission (issued by local government)

/16/ 3170420005 and 3180710015 calibration records of gas photometers (issued by TÜV)

/17/ TH-8301/8/2004 Conformity declaration for the bridge balance issued by accredited body

/18/ Data sheet about the electricity meter owned by E-ON, V-121 verification mark

/19/ ISO Certificate (No: 22786 issued by NQA)

/20/ E-mail from Ministry of Environment and Water with confirmation to use emission factors stated in PDD dated 29 June 2009

/21/ The calibration records of the gas flow meter – No. 76-24/9-90/2008 from 25.11.2008 by Flogiston Ipari Gázmérő Hitelesítő Laboratórium Kft. – approved by MKEH –

number of the record 08112706, dated on 27 November 2008 and previous calibration record (it was performed as part of installation procedures) dated on 11 May 2007 by Hese Biogas

Persons interviewed:

/22/ Mr Tamás Kovács managing director

/23/ Mr János Gecse plant manager

/24/ Ms Boglárka Áldott shift leader

/25/ Mrs Zsuzsanna Bogáti plant protection leader at Pálhalma Agrospeciál Ltd

/26/ Mr Tibor Erdős plant protection manager at Pálhalma Agrospeciál Ltd

/27/ Mrs Mária Zsömbör Steier environmental specialist at Pálhalma Agrospeciál Ltd

APPENDIX A

INITIAL VERIFICATION CHECKLIST

This document contains a generic Initial Verification Checklist for CDM and JI projects, which must be seen in conjunction with the Validation and Verification Guidelines and the Initial Verification Report Template.

This initial verification checklist serves the following purposes:

- It organises, details and clarifies the requirements a CDM/JI project is expected to meet straight before starting its operation; and
- It ensures a transparent initial verification process by inducing the verifier to document how a particular requirement has been verified and which conclusions have been reached

Initial Verification Checklist

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
A. Opening Session			
A.1. Introduction to audits			
A.2. Clarification of access to data archives, records, plans, drawings etc.	I	The total project documentation and the raw data of the calculation were available on site.	OK
A.3. Contractors for equipment and installation works	I	HESE GmbH was contracted for the planning, construction of the biogas plant and for the installation of the equipment.	OK
A.4. Actual status of installation works .	/11/ /12/ /13/ /14/ /15/	The construction works of the biogas plant were finished in July of 2007, beginning date of the official operation is 19 August of 2007	OK
B. Open issues indicated in validation report			
B.1. Missing steps to final approval	/5/.	The determination of the project was carried out by TÜV SÜD Industrie	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		Service. /5/ The Corrective Action Requests documented are the follows: CAR1: The approach for estimating the type of industrial fertilizer to be replaced by the extended amount of biologically based fertilizer (digester substrate) is based on the assumption that costs are the main driver for the decision which fertilizer is bought. During the on-site audits it has been recognized that such decision is much more based on other factors (meteorological situation, type of crops, applicability of wet or dry fertilizers. It is required to provide a more realistic approach to estimate the type of the replaced fertilizers. CAR2: Concerning the emission factors of volatile solids from pigs and litter the upper value of the indicated range of emission factors given by the referred literature has been used. This is inconsistent with regard to the required conservativeness. CAR3: The figure for "VS" used for non diary cattle is not identical with one indicated in the referred literature. It is one used for buffaloes, whereas for non diary cattle there is a value of 2,65 kg/h/d. The Clarification Requests documented are the follows: CR1: It is envisaged that the project has to be approved by both countries (Austria and Hungary) at the end of the validation process. This has been confirmed by the Hungarian National Focal Point. A written letter of approval was not available at the time of the determination. CR2: National guidelines and procedures are currently available for the Austrian tender but not for JI project in Hungary. It has been indicated that this will be published soon.	

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		Validator declared, that all responses given to the indicated CARs were resolving the belonging issues, the project fulfilled the prescribed requirements completely.	
C. Implementation of the project			
C.1. Physical components	/1/	The main facilities of the biogas plant: • two feedstock batchers for the acceptance of solid manure (300 m^3 and 400 m^3 volume) • mixing pits for the liquid feedstocks with volume 484 m^3 and 314 m^3 • container for the sterilisation of kitchen wastes • two complete mixed primary digesters, with 3500 m^3 each and with paddle agitators • two complete mixed secondary digesters with volume 1718 m^3 • gasholders (680 m^3) connected directly to the secondary digesters • two gas engines (Type: Deutz) with the capacity 0,7 MW and 1 MW • 3 covered digested manure storages with leakage detection system (with volume 12000 m^3)	OK
C.2. Project boundaries	/1/	All significant anthropogenic GHG emission sources has been included in the project boundary: • conventional manure management system	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		• chemical fertilizer production • Hungarian grid power plants • biogas plant	
C.3. Monitoring and metering systems	/1/ /3/ /16/ /17/ /21/	The relevant internal data for the calculation of the emission reduction: • Quantity of produced biogas • Methane content of produced biogas • Electric power production of gas engines • Take off from storage of digested substrate The used measuring equipment: • Gas flow meter • Gas-photometers (Fresenius airFOX gas-photometer GPM for monitoring of the content of carbon-dioxide, oxygen, methane and hydrogen sulfide in biogas) • Electricity meter (ZMD410CT4424081810 Prod.nr.:93756283) • Balance for measuring of the digested substrate (Metrisoft MS-01/MTT/TEN/MTEN) The monitoring equipment are calibrated by accredited bodies. • Gas-analyzator 1 (3170420005, 2007.04.20., TÜV, DIN EN 61557) • Gas-photometer 2 (3180710015, 2008.07.10., TÜV, DIN EN 61557)	CAR1 OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		• Electricity meter (V-121 verification mark) • Bridge scale (TH-8301/8/2004) **The calibration records of gas flow meter has not been available (CAR1)**. The CAR is closed after providing of the calibration records as evidence /21/	
C.4. Data uncertainty	/1/ /8/	The PDD uses estimation for determination of the methane producing from the manure The bases of this estimation are 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. In spite of this estimation the actual measured data are used for determination of the methane emission avoided by the operation of the biogas plant.(AMS-III.D Version 13, Sectoral Scope:15, EB 33 Methane recovery in agricultural and agro industrial activities) The measurements are carried out by calibrated measuring equipment. The produced electricity is measured by calibrated measuring equipment. The nitrogen content of the digested substrate is also measured by accredited laboratory.	
C.5. Calibration and quality assurance	I	The measuring equipment was calibrated during the installation of the biogas plant. **The calibration record of measuring equipment has not been available. See under C.3 (CAR1).** **As a work instruction the set of the calibration plan for the measuring equipment is preferable considering the**	CAR 1, FAR 1

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		recommendations of the equipment's producers. (FAR 1).	
C.6. Data acquisition and data processing systems .	I	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 should be done clear. (FAR2)**	FAR2
C.7. Reporting procedures	/3/	The data for the calculation of the emission reduction achieved by the operation of the biogas plant are collected and the plant manager is responsible for the performance of the reporting process.	OK
C.8. Documented instructions	I	The documents of the installation of the biogas plant including the description of the facilities, emergency and maintaining plans, the handling instructions of equipment, evaluation of the damaging factors are available at the bureau of the biogas plant. This documentation is available for the responsible staff. **To improve the use of the documents the set of the technological and relevant work instructions is recommended considering each defined jobs. (FAR1)**	FAR 1
C.9. Qualification and training .	I	The qualification of the staff responsible for the operation of the biogas plant and the data collection for calculation of the emission reduction is ensured. There was a continuous training by Hege Biogas GmbH, the constructor of the project from 2007 for the staff discussing the different technological processes in details. On the base of the contract with constructor its representative helps the operation of the biogas plant one year. The Monitoring Plan, the requirements in relation of the data collection,	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		processing was trained for the responsible employees	
C.10. Responsibilities	/3/	The responsibilities for the data collection are documented in the Monitoring Plan. The plant manager is responsible for the process, the shift leaders perform the data collection in relation of the plant operation and head of the crop production department follows the take off the digested substrates.	OK
D. Internal Data			
D.1. Type and sources of internal data	/3/	The basic data for calculation of the emission reduction are collected by the responsible staff of the biogas plant and the employee of Pálhalmai Agrospecial Ltd. The operation of the biogas plant is monitored by computer system, the data collection in relation of the methane and electricity production is continuous direct measurements. The take off of the digested substrate is periodic, the used amount is measured before delivery.	OK
D.2. Data collection	/3/	The data are processed in the relevant Excel tables given in the Monitoring Plan.	OK
D.3. Quality assurance	I	The quality management system of the Pálhalmai Agrospecial Ltd is certified by accredited body and the operation of the biogas plant belongs to the scope of this. (No of the certificate: 22786 issued by NQA, valid until 20 October 2010). A further 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 is planned for the end of the year.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
E. External Data			
E.1. Type and sources of external data	/1/ PDD D.3. 7.	External data for the calculation of the emission reduction produced by the project are: • mixed grid emission factors for Hungary (0,7987 t CO_2 / MWh for 2007 and 0,7812 t CO_2/MWh for 2008) – given in the PDD • emission factors for the chemicals fertilizers production depending on the nitrogen content of the product Nitrosol 1,82 t CO_2 / t N-34 1,82 t CO_2 / t Karbamide 0,61 t CO_2 / t Fertisol 0,34 t CO_2 / t Pétisó 2,28 t CO_2 / t MAP 0,31 t CO_2 / t K-60 0,34 t CO_2 / t – given in the PDD 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) 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)	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
F. Environmental and Social Indicators			
F.1. Implementation of measures	/11/ /14/ /12/	The environmental permission issued by the local environmental authority controls the necessary monitoring activities. (90329/31/2005, valid until 31 December of 2011).(10) Operation permission of point sources of the biogas engines (6649/2008 issued on 16 April of 2008) (11) Permission for the transporting vehicles (16.1/02243/2008 issued on 10 April of 2008) (13)	
F.2. Monitoring equipment	/11/	The efficiency of the bio-filter, the concentration of the Hydrogen Sulfide is monitored continuously by gas photometer. The equipment is calibrated. The emissions of the two point sources will be reported to the local environmental authority and measured by accredited laboratory. The samples from the monitoring wells around the digested substrate storage will be measured by accredited laboratory.	
F.3. Quality assurance procedures		In compliance with the national legislation the data should be measured by accredited laboratories. The data are handled under the quality management system of the company.	
G. Management and Operational System		.	
G.1. Documentation	I	The documents of the installation of the biogas plant including the	FAR 1

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		description of the facilities, emergency and maintaining plans, the handling instructions of equipment, evaluation of the damaging factors are available at the bureau of the biogas plant. This documentation is available for the responsible staff. To improve the use of the documents the set of the technological and relevant work instructions in the frames of the quality management system (Certificate Nr: 22786) (18) is recommended considering each defined jobs. (FAR1)	
G.2. Qualification and training	I	The qualification of the staff responsible for the operation of the biogas plant and the data collection for calculation of the emission reduction is ensured. There was a continuous training by the constructor of the project from 2007 for the staff discussing the different technological processes in details. On the base of the contract with constructor its representative helps the operation of the biogas plant one year. The Monitoring Plan, the requirements in relation of the data collection, processing was trained for the responsible employees	OK
G.3. Allocation of responsibilities	/3/	The responsibilities for the data collection are documented in the Monitoring Plan	
G.4. Data archiving	I	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 should be done clear. (CL 1)**	CL 1
G.5. Monitoring report	/3/	The monthly emission reduction calculation is prepared by filling the Excel data tables. The responsibility for the data collection and the system operation is defined in the Monitoring Plan.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		The yearly emission reduction calculation summarises the monthly datasheets. The yearly monitoring report is prepared on the decision of the managing director by the appointed person.	
G.6. Internal audits and management review	/3/ /19/	Pálhalmai Agrospeciál Ltd has certified quality management system implemented in accordance with the requirements of ISO 9001:2000. (No of the certificate: 22786 issued by NQA, valid until 20 October 2010). The operation of the Biogas Project and the achieved emission reduction is followed by the management. The Progress Reports in compliance with the ERPA requirements are prepared quarterly. 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.	OK

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APPENDIX B

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 *Forward Action Requests*)
A. Defined organisational structure, responsibilities and competencies		
A.1. Position and roles	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. The management of the firm reviews and evaluates the performance.
A.2. Responsibilities	F	See above, A.1.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
A.3. ***Competencies needed***	F	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. The staff has awareness on the GHG emission reduction.
B. Conformance with monitoring plan		
B.1. Reporting procedures	F	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. 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.
B.2. Necessary Changes	F	See above, B.1.
C. Application of GHG determination methods		
C.1. Methods used	F	The project generates carbon dioxide emission reduction originating from • Avoiding methane emission from the natural decomposition of the organic waste

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
		• Substituting fossil fuels for electricity and heat generation • Decreasing the consumption of artificial fertilizers using the fermented substrate The Project Design Document 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, Sectoral Scope:15, EB 33 was considered. 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. 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.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
C.2. Method used cont.	F	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 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 estimated by summarising the product of the amount with the emission factor.
C.3. Information/process flow	F	The basic data needed for the calculation of the emission reduction are given in the Monitoring Plan. 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 continuously. The emission reduction is calculated in Excel spreadsheets.
C.4. Data transfer .	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.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
D. Identification and maintenance of key process parameters		
D.1. Identification of key parameters	F	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) 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. The produced electricity is measured a suitable meter. The amount of the digested substrate used as fertilizer is measured before the delivery on the base of its volume.
D.2. Calibration/maintenance	P	The calibration records of the measuring equipment were shown. Gas-photometer 1 (3170420005, 2007.04.20., TÜV, DIN EN 61557) Gas-photometer 2 (3180710015, 2008.07.10., TÜV, DIN EN 61557) Electricity meter (ZMD410CT4424081810 Prod.nr.:93756283 - V-121 verification mark) Balance (Metrisoft MS-01/MTT/TEN/MTEN - TH-8301/8/2004) The calibration record of the gas flow meter has not been available. See Initial Verification Report findings and Checklist (CAR1). The device will be sent for calibration to accredited laboratory. The calibration plan is recommended to ensure the validity

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
		of the calibrated status. See Initial Verification Report findings (CAR1)
E. GHG Calculations		
E.1. Use of estimates and default data .	F	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). The emission factors used for calculation are resourced from PDD however the Hungarian Ministry of Environment and Water published valid gridmix emission factor for 2007/2008. But the Ministry agree as the Track 1 Authority that the published factors to be used with new JI projects only and has allowed the application of PDD factors for JI projects already determined /20/. 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) These data were validated during the determination of the project.
E.2. Guidance on checks and reviews	F	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 is planned at the end of this year.
E.3. Internal verification	F	Pálhalma Agrospeciál Ltd operates certified quality management system meeting with the requirements of ISO 9001 : 2000. (No of the certificate: 22786 issued by NQA,

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
		valid until 20 October 2010.)
E.4. Internal validation	F	The yearly monitoring report is prepared on the decision of the managing director by the appointed person. The prepared report will be approved by the managing director of Pálhalmai Agrospeciál Ltd.
E.5. Data protection measures	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. The data saving should be done clear. See Initial Verification Report

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