TÜV Rheinland Immissionsschutz
und Energiesysteme GmbH

TÜV Rheinland Group

DETERMINATION REPORT

ARA CARBON FINANCE GMBH

DETERMINATION OF THE
METHANE RECOVERY PROJECT
PRAKTIJKCENTRUM STERKSEL
STERKSEL, NORTH BRABANT

THE NETHERLANDS

REPORT NO. VER 200612-5024
REVISION NO. 01

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DETERMINATION REPORT

Date of first issue: 2007-07-31	Project No.: 6466604	*TÜV Rheinland Group* Am Grauen Stein 51105 Köln, Germany
Verified by:	Organisational unit: TÜV Rheinland Immissionsschutz und Energiesysteme GmbH	
Client: ARA Carbon Finance GmbH	Client ref.: c/o Mr. Heidelmann	Certificate Number: VER 200612-5024

Executive Summary:

TÜV Rheinland has carried out the determination of the "Methane Recovery Project Sterksel" – a planned project for the generation of voluntary emission reductions (VER) in Sterksel, North Brabant, The Netherlands - on the basis of the UNFCCC criteria for JI projects according to Article 6 of the Kyoto Protocol and subsequent decisions of the Joint Implementation Supervisory Committee with regard to JI modalities and procedures and the application of approved methodologies. Even the project activity investigated being currently treated as a VER-project, approved CDM baseline methodologies as well as the *Tool for the demonstration and assessment of additionality* of the UNFCCC were applied in order to allow a conversion into an JI project at a later stage. The determination report and the determination protocol are summarizing the findings of the determination.

The determination is executed in the following three phases:

1. Desk review of the project design documentation
2. Follow-up interviews with project stakeholders including an on-site assessment
3. The resolution of outstanding issues and the issuance of the final determination report and opinion

It is the verifier's opinion, that the "Methane Recovery Project Sterksel" as described in the project design documentation meets all relevant UNFCCC requirements with regard to the applied methodologies and the *Tool for the demonstration and assessment of additionality* of the UNFCCC. The consolidated baseline and monitoring methodology AMS III.D. in connection with AMS I.C. was correctly applied. The greenhouse gas reductions through the project activity were calculated in accordance with the applied methodologies to yearly 2,118 metric tons of carbon dioxide equivalents relying on both the reduction of methane emissions during storage of manure as well as the utilisation of renewable heat from the project substituting fossil sources in the baseline. The applied methodological approaches consider only greenhouse gas reduction occurring decentrally and showing no interactive effects with installations covered by the European Emissions Trading Scheme (EU-ETS). The production and utilisation from electricity produced through biomass was not considered when calculating the total emission reductions from the project activity. In accordance with the applied *Tool for the demonstration and assessment of additionality* the project could be proven as additional.

The verifier has requested prior to the issuance of a final determination report for the "Methane Recovery Project Sterksel" to resolve all corrective action and clarification requests, which are listed and further explained within the attached determination report and determination protocol. The corrective action and clarification requests of the determination report has all been resolved and are documented in the determination protocol (revision no. 01).

Report No.: VER 200612-5024	Subject Group: Environment & Energy	
Report title: "Methane Recovery Project Sterksel"		
Work carried out by: • Kurt Seidel		
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Indexing terms

Biogas and Biomass Project Activities, Climate Change, Clean Development Mechanism, Joint Implementation, Kyoto Protocol, Small Scale Project, Determination , Verified Emission Reductions

DETERMINATION REPORT

Abbreviations

Explain any abbreviations that have been used in the report here.

AF	Adjustment Factor
AM	Approved Methodology
ACM	Approved Consolidated Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CHP	Combined Heat and Power Generation
CL	Clarification Request
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EA	Economic Analysis
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
ERPA	Emission Reduction Purchase Agreement
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse Gas
GWh	Giga Watt Hours
GWP	Global Warming Potential
I	Interview
IETA	International Emissions Trading Organisation
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
JI	Joint Implementation
kW	Kilo Watt
kWh	Kilo Watt Hours
LoA	Letter of Approval
LoI	Letter of Intent
LSTHC	Local Stakeholder Consultation
MoV	Means of Verification
MW	Mega Watt
MWh	Mega Watt Hours
NGO	Non Government Organisation
NPV	Net Present Value
ODA	Official Development Assistance
OSV	On Site Visit
PDD	Project Design Document
QC	Quality Control
QA	Quality Assurance
SItC	Supplier Information to Client
t	Tonne
VER	Verified Emission Reduction
UNFCCC	United Nations Framework Convention on Climate Change

Conversion Factors and Definitions

Insert and describe any conversion factors used in the report here. In addition, define any specific terminology used in the report.

None

Table of Contents *Page*

1 INTRODUCTION

ARA Carbon Finance GmbH has contracted the verifier TÜV Rheinland to determine the "Methane Recovery Project Sterksel" (VER-project) in the Praktijkcentrum Sterksel, North Brabant, The Netherlands, following relevant JI- and CDM-guidelines. The following report and protocol are summarizing the findings of the determination of the project. The determination was performed on the basis of UNFCCC criteria for JI projects and the criteria for the consistent operation of the project activity including a correct execution of the monitoring and reporting. The determination team consists of the following personal:

Mr. Kurt Seidel, TÜV Rheinland, CDM auditor

1.1 Objective

The purpose of the determination was to assign an independent verifier, acknowledged by UNFCCC as an accredited designated operational entity (DOE) to assess the fulfilment of the criteria of the project design. In order to confirm, that the project design, as documented, is sound and reasonable and meets the mentioned criteria, TÜV Rheinland has determined the baseline of the project, the monitoring plan and other parts of the project documentation and has also undertaken further an on-site assessment in order to confirm the project's compliance with relevant UNFCCC criteria and requirements of the selected baseline and monitoring methodologies.

1.2 Scope

The determination scope is an independent and objective review of the project design document (PDD). The PDD is checked against the criteria of article 6 of the Kyoto Protocol including the appropriate approved methodologies for methane recovery, thermal energy supply from renewable energy and grid connected renewable electricity generation. The audit team has employed on the basis of the Validation and Verification Manual a risk-based assessment with focus on the identification of significant risks for a correct project implementation and the generation of the projected emission reductions. The determination is not meant to provide any consulting towards the project participants. However stated requests for clarifications and / or corrective actions may have provided input for improvement of the project design.

1.3 GHG Project Description

The project belongs to sectoral scope 1 - Energy industries (renewable - / non-renewable sources), sectoral scope 10 - Fugitive emissions from fuels (solid, oil and gas) and 13 – Waste handling. The proposed project activity is in conformance with 2 project categories – Type I.C. (Thermal energy for the user) and Type III.D. (Methane recovery in agricultural and agro industrial activities).

The project activity is not a debundled component of a larger project activity.

The project design engineering reflects good practices through the use of a biogas - CHP plant for the electricity and heat production, described in the project design documentation. This practice and technology is new and advanced in The Netherlands and in the province of North Brabant.

The common practice in The Netherlands is the open storage of manure in tanks before being used as fertiliser for farm lands. The cattle and pig manure when kept in open-top basins, tanks or lagoons open to the atmosphere will undergo anaerobic fermentation and release greenhouse gases (methane, CO2 and N2O) to the atmosphere and also produce bad smell for the neighbourhood. Nitrogen when applied to the fields in excess would contaminate the soil and the ground water.

The project activity employs state of the art technology which is above the local standard and had to be imported partly from abroad. The biogas plant will not only be fed with cattle and swine manure, it will supplemented with other biodegradable substrates and co-ferments.

The project activity is approved and implemented with conformance of the environmental legislation and requirements in The Netherlands according to the interviews with the project owner during the on-site assessment. Relevant permits could be shown for evidence.

Even the applied approved small scale methodologies request only a barrier analysis, for this project the comprehensive *Tool for the demonstration and assessment of additionality* was used in order to prove the additionality of this project activity.

The projects is expected to be in line with the host country specific requirements for JI. An endorsement or approval as JI project from the Designated Focal Point (DFP) of The Netherlands has not been applied yet.

The exact amount of emission reductions will be measured continuously ex-post after project implementation. The estimated total amount of the GHG reduction from the project is 21,178 tons of CO_{2e} during the fixed crediting period from 05/2006 until 04/2016 (2,118 tons of CO_{2e} per year on the average).

The project comprises the implementation of anaerobic digestion for the treatment of cattle and swine manure from the own farm located in the near vicinity of the project site. The objective of the project is to capture the biogas generated by the anaerobic digestion process and to utilise it for electricity generation and thermal use.

Generated electricity will be used on-site and will displace electricity imports from the Dutch grid and fossil fuels for thermal energy production, which is used within the own farm.

The project installed generation capacity will be 330 $kW_{electrical}$ and 400 $kW_{thermal}$, which is below the threshold values of 15,000 $kW_{electrical}$ respectively 45,000 $kW_{thermal}$.

The project reflects good practice for the collection of the methane contained in biogas and its utilization for generation of electricity and thermal energy. The technologies applied in the project will be partly imported partly from abroad, which means also technology and know how transfer.

A fixed crediting period of 10 years has been chosen with the starting date being 1st of May 2006.

The project spatial boundaries have been defined and are clearly described in chapter A.2, A.4 (incl. a map) and B.4. of the PDD. The project system's boundaries are limited to the geographic area of the installation including its raw material baseline sources (manure). The biogas plant of the project activity would receive the cattle and swine manure from the own farm located near to the project site. The technical description (A.4.) presented in the PDD, shows in general a complete description of the project's system.

1.4 Methodology

The determination consisted of the following three phases:

i. A desk review of the project design documentation

ii. Follow-up interviews with project stakeholders including an on-site assessment

iii. The resolution of outstanding issues and the issuance of the determination report and opinion

In order to ensure transparency, the determination protocol of the Validation and Verification Manual was applied and customized for VER projects of sectoral scope 1, 10 and 13. The protocol shows, in a transparent manner first of all the specific requirements, how to verify them, means of verification, and finally the concluding results from the determination of the identified requirements.

The determination protocol therefore has the following functions:

- It organises, details and clarifies the requirements, which the VER project is expected to meet;
- It ensures a transparent validation process where the independent entity will document how he has validated a particular requirement, and finally it shows the concluding result of the determination.

The determination protocol consists of three tables. The different columns in these tables are described in Figure 1. The completed determination protocol for the "Methane Recovery Project Sterksel" is enclosed in Appendix A to this report.

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Determination Protocol Table 1: Mandatory Requirements			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the determination report.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent determination process.*

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

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

Figure 1 Determination protocol tables

1.5 Review of Documents

The Project Design Document (PDD), Version 04 of 28th of June, 2007 submitted by ARA Carbon Finance GmbH was assessed by TÜV Rheinland. Also complimentary calculation sheets, supporting documentation were assessed. The main topics of the interviews were (1) local stakeholder consultation process, (2) permits and approvals, (3) status of project implementation and (4) status of preparation of the monitoring plan.

1.6 Follow-up Interviews for Resolution of Clarification and Corrective Action Requests

The objective of this phase of the determination is to resolve any requests for corrective actions and clarification and any other outstanding issues which needed to be clarified prior to the positive conclusion of the verifier on the project design. The initial desk-review of the project identified 02 (two) Corrective Action Requests (CARs) and 9 (nine) Requests for Clarification (CLs). The project participant's response to TÜV Rheinland's findings has addressed these issues sufficiently. The PDD was amended accordingly. Hence the CARs and CLs could be closed.

1.7 Clarification and Corrective Action Requests

To guarantee the transparency of the determination process, the concerns raised are documented as Annex A – determination report. The above Corrective Action Requests and Clarification Requests were identified and presented to the project proponent. This has finally resulted in a revision of the PDD.

2 DETERMINATION FINDINGS

The findings of the determination, related to the project design document (PDD of 28th June, 2007) are summarized in the following sections. The requirements, the means of verification and the concluding results are documented in more detail in the determination protocol in Appendix A.

The project participants of the project activity are listed under chapter A.3. The participating Party is The Netherlands as the Host Party. No other Annex I Investor Party could be identified so far.

2.1 Project Design

2.1.1 Discussion

The proposed small-scale project activity correctly applies the simplified baseline methodology for type I.C small-scale CDM project activities and also the requirements of type III.D are met for the methane recovery component, as per the guidelines in AMS III.D. The project activity substitutes the business as usual scenario of open storage of manure and use of fossil fuels for heat use.

The proposed project activity is a Combined Heat and Power Plant that will utilise biogas produced by efficiently managing and upgrading the existing manure system and drastically reducing the open storage dwell time of the manure produced. Main objective of the project activity is the technical production of biogas using pig manure that otherwise would emit uncontrolled methane emissions into the atmosphere during its storage. Another objective of the project activity is to mitigate GHG emissions by replacing fossil fuels (natural gas) in the existing stall and office building heating system. Instead of the previously used natural gas waste heat from the biogas fired CHP motor will be used for these thermal applications. Additionally, renewable energy is produced to be fed in the local power grid. The biogas plant receives cattle and pig manure from the operators own farm operations located in the near vicinity of the project site. The substrate or digestate after extracting the biogas can be used as a fertiliser due to the high ammonia content. But, after the fermentation process the ammonia is mineralized and does behave better in the soil with regards to ground water contamination and application to growing plants. Hence, the biogas installation not only reduces the GHG emissions by reducing both uncontrolled methane and laughing gas emissions and the use of fossil fuels, but also contributes to an improved ecological sustainability and increased flexibility for fertilizer application to the fields.

The applied project technology represents good practice. The owner of the combined heat and power generating facilities in Sterksel, the Praktijkcentrum Sterksel Research Centre, is supervised and assisted by the specialized technical consultants of ARA Carbon Finance GmbH.

2.1.2 Findings

None

2.2 Baseline and Additionality

2.2.1 Discussion

Conservative Baseline Approach

The approved CDM-baseline methodologies AMS-III.D. and AMS-I.C. have been adopted to the specific European circumstances of fermentation of manure with addition of co-substrates. The project involves construction and operation of an anaerobic digester for production of biogas from manure and organic bi-products.

Emission reductions are claimed only for cattle and swine manure. The biogas from other organic fractions (e.g. maize silage, solid and liquid food residues) are deducted, which is a conservative approach, developed by ARA Carbon Finance GmbH. The project does not include any fractions from municipal solid wastes, that contain fossilized and/or non-biodegradable material.

The biogas produced by the project is used for thermal applications on-site replacing fossil fuels and for production of electricity for on-site use and feed into the electricity grid replacing fossil fuel dominated electricity. Resulting emission reductions are not claimed.

Baseline for the biogas capture:

The selected baseline methodology AMS III.D. is the only approved small-scale methodology applicable for this kind of project activity.

Baseline for electricity production and heat production displaced:

The selected baseline methodology AMS I.C. is the only approved small-scale methodology applicable for this kind of project activity, component heat production through fossil fuels displaced.

The other component displacement of electricity from the electricity grid, which would be covered by AMS I.D., was not applied because of a conservative approach and in order to avoid any double counting with the NAP or any other conflicts with other legal acts in The Netherlands (such as MEP law regulating feed-in-tariffs, as well as the implementation of the EU linking directive).

The application of the chosen baseline methodology could be demonstrated in a transparent manner. The baseline scenario is the atmospheric release of methane to the atmosphere (AMS-III.D.) respectively the displacement of fossil fuels by renewable biomass (AMS-

I.C.). The project activity consists of the collection of manure in order to produce as final products heat by a CHP plant as well as electricity. Biogas is generated by technical fermentation of manure as an intermediary product to be fed into the CHP engines.

The baseline scenario is supported by available data.

Additionality

Additionality to be determined is a compulsory criteria for a VER project. Therefore additionality assessments by an independent third party like a DOE are requested. Though not required for small scale CDM methodologies, the project activity has been evaluated entirely according to the Tool for the demonstration and assessment of additionality of the UNFCCC:

Step 0: It was proven, that emission reduction credits where considered during the design stage, to overcome investment barriers, the technological barrier and the barrier due to common practice.

Step 1a: Beside of the proposed CDM project activity, two alternatives have been identified. The identified alternative scenarios to proposed project activity are in line with the current legal and regulatory requirements include:

- BAU: Release of methane from manure to the atmosphere
- Other renewable energy projects (i.e. wind, solar) at the same location
- Project activity not implementing the generation of emission credits

The only plausible alternative scenario remains the business as usual scenario, which is treated in the further elaboration as the baseline scenario.

Step1b: As there is no legislation in North Brabant and The Netherlands to utilize biogas from cattle and swine manure management, the above alternatives are in compliance with the applicable legal and regulatory requirements.

Therefore the business as usual scenario (BAU) has been selected as the baseline scenario. This can be further justified through the next steps:

Step 2: **Investment Analysis**

The purpose of investment analysis is to determine whether the proposed project activity is economically or financially less attractive than other alternatives without the revenue from the sale of certified emission reductions (CERs).

To conduct the investment analysis, the following sub-steps were used:

Sub-step 2a. Determine appropriate analysis method

The *Tools for the Demonstration and Assessment of Additionality of the UNFCCC (Version 02)* recommends three analysis methods, including simple cost analysis (Option I), investment comparison analysis (Option II) and benchmark analysis (Option III).

The proposed project generates electricity revenue in addition to VER revenues. Therefore the simple cost analysis (Option I) is not applicable. And the investment comparison analysis (Option II) is only applicable to projects whose alternatives are similar investment projects. The alternative baseline scenario of the proposed project is the release of methane

of methane to the atmosphere.

Therefore the proposed project will use benchmark analysis method.

Sub-step 2b. Apply benchmark Analysis (Option III)

With reference to quoted sources from neighboring Germany (Uwe Boehmer-Beuth, M.M. Warburg & CO; Schroeder & Co.) was the RRR (required rate on return) in Germany in 2002 / 2003 between 8 and 13 % respectively more than 10.29 – 10.90 %.

Sub-step 2c. Calculation and comparison of financial indicators

Parameters needed for calculation of key financial indicators like Internal rate of Return (IRR) are e.g.:

- Investment costs
- Operating and maintenance costs
- Revenues (VERs and electricity)

In accordance with benchmark analysis (Option III), if the total investment IRR of the proposed project is not substantially higher than the benchmark, the proposed project is considered to be financially unattractive.

The analysis indicates that without the sales of CERs, the NPV is negative and the return on equity RRR is only 3.8 %, much lower than the benchmark. It is obvious that the "Methan Recovery Project Sterksel" faces financial barriers.

Another lead indicator for the high financial risk of investing in biogas installations in The Netherlands is the fact that the Dutch banks approached for financing of the projects did not grant a project financing. The bank loans for the plants have been given to the project company but requesting direct guarantees of the biogas plant project company shareholder. So the owner of the biogas plant are liable for the complete loan with its own lands and property as the banks do not trust the biogas plant installation to be sufficient security for their loan.

The second alternative "Other renewable energy projects (i.e. wind, solar) at the same location" is not a baseline scenario.

Step 3. Barrier analysis

Besides of the above mentioned financial barrier the following barriers exist:

Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;

Up to date there are only a handful of biogas power plants in operation in The Netherlands. Although in neighbouring Germany a high number of biogas power plants are installed and in operation, due to the economic unattractiveness nearly no biogas market exists in The Netherlands so far.

Core technology, turnkey capability and O&M support are not available in The Netherlands, but have to be imported e.g. from Germany. The results are not only higher prices but also higher operational risks and performance uncertainties.

Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;

The treatment of manure is not compulsory in The Netherlands. The baseline system of manure storage in open lagoons and the subsequent disposal on fields is state of the art. No political initiatives are known to make a less emitting technology mandatory in the future or mandate the utilization of biogas from manure management.

Conclusions:

It was comprehensively and successfully demonstrated that the project is additional to the business as usual scenario (BAU). This means that the project would not have been realized without the carbon finance provided (= additionality).

The starting date is defined in the PDD on May 1st, 2006. The operational lifetime is about 20 years. The ex-post emission reductions will be verified annually beginning in 2007, based on the available data of energy sources, energy outputs and raw materials.

The underlying factors for the financial project calculation and the realism of the forecasted emission reductions from manure/organic fractions have been checked. The calculations show an unfavourable financial performance of the project activity.

The project thus faces an investment barrier. A technological barrier and barrier due to common practice also exists as the project is one of the first of its kind in North Brabant and is often visited by other farmers as a demonstration project.

In summary, it is TÜV Rheinland's opinion that the project would not have been implemented in the absence of the possibility to get VER funding and is considered as additional.

2.2.2 Findings

None

2.3 Monitoring Plan

2.3.1 Discussion

The project applies the approved simplified monitoring methodologies AMS-III.D titled "Methane recovery in agricultural and agro industrial activities" and AMS-I.C titled "Thermal energy for the user". The monitoring parameters proposed in the PDD are fully consistent with both methodologies.

The authority for project management is sufficiently described in section D.4. and D.5 of the PDD.

The responsibilities for collection of project related data, entering data into spreadsheets, making periodical reports, archive data and reports and calibration / maintenance of monitoring equipment have been allocated.

The methodology provides the basis for the monitoring of emission reductions generated from cogeneration projects that displace grid electricity and also displace fossil fuel for use in industrial process heat boilers. The monitoring methodology is based on the direct measurement of thermal and electrical energy generated by the project and the direct measurement of biomass respectively biogas used by the cogeneration system.

The operator Praktijkcentrum Sterksel Research Centre is responsible for the operation and maintenance of the co-generation plant. The responsibilities and authorities for operation and maintenance as well as calibration activities will be part of their quality management system. The daily recording will be carried out by the operator. Procedures for daily recording are deemed sufficient for this type of project.

The selected monitoring methodology is in line with Type AMS-I.C and AMS-III.D for small-scale CDM project activities. The monitoring plan makes provision for monitoring of the thermal energy supplied and the electricity drawn from the Dutch grid and the emergency generator diesel set until the energy plant is fully implemented and whenever the plant stops for maintenance. Procedures for monitoring and recording of data are in place. However, the operator Praktijkcentrum Sterksel Research Centre supervised and supported in this regard by ARA Carbon Finance GmbH still needs to ensure that procedures for maintenance and back-up of data are developed and implemented.

It was confirmed during site interviews that a standardized monitoring and reporting procedure to cover project activity addressing parameters critical to a future verification of VERs generated, is still in progress. Procedures for monitoring and recording of data are in place.

It has also been confirmed during site visit that all data will be kept until 2 years after the end of the crediting period.

According to the project design emissions caused by emergency operations are not expected to occur for a long term.

2.3.2 Findings

None.

2.4 Calculation of GHG Emissions

2.4.1 Discussion

The IPPC Guidelines (see references) and the above mentioned approved baseline methodologies are used to determine estimated methane emissions from manure management. The methane generation estimate applied for the ex-ante estimation of emission reductions was determined using reasonable assumptions. The actual amount of methane being generated and utilized will be measured ex-post.

The emission reductions for displacing fossil fuels by supply of heat energy for utilization at the user (thermal energy) will be directly measured by a heat heat-meter according to the monitoring plan and calculated ex-post according to the applied approved methodology.

The project's electricity generation will be metered. In addition, the electricity consumption of the project equipment will be measured and subtracted from electricity generation and only the net electricity are used to calculate CO_2 emissions from displacing grid electricity, though not claimed for credits in order to avoid double counting effects.

TÜV Rheinland is of the opinion that the selected approach is sound and reasonable for the purpose, that according to the revised baseline and monitoring methodology the project emissions have to be monitored and to be deducted from the emission reductions.

2.4.2 Findings

None.

2.5 Environmental Impacts

2.5.1 Discussion

The project activity is not expected to cause any significant environmental impacts. The implementation of the biogas gas project has lot of positive effects like reduction of greenhouse gas emissions from manure and additional reduction of odour. Moreover the project will have positive impacts on the sustainable development in the region throughout additional employment and creation of added value. The Sterksel project has been formally and finally approved by the responsible regional authorities of the Netherlands in accordance to the Dutch building law "Wet op de Ruimtelijke Ordening". This act provides the set of rules which regulates the impact assessment of plants or projects on the environment. The approval covers the installation and operation of the biogas power plant including all components such as storage, feeders, fermenters, CHP modules, etc.

2.5.2 Findings

None.

2.6 Comments by Local Stakeholders

2.6.1 Discussion

The Dutch "Wet milieubeheer" environmental law and also the building law "Wet op de Ruimtelijke Ordening" implies public involvement during the authorisation process of the project. This is including the submission and public display of certain project application documents (such as plans, drawings, studies). Public stakeholders have the right to comment on the project and apply for rejection. The public had been informed by the responsible permitting authority about the final decision and the content/reasoning of this decision. Additionally to these legal aspects, the regional press reported about the project well before and during its start.

No negative comments were reported, which led to the endorsement of the project. The project activity demands transfer of knowledge and technology especially concerning design, dimensioning, implementation, operation and maintenance of the plant including training by skilled personal all needed to introduce the advanced technology.

2.6.2 Findings

None

2.7 Comments by Parties, Stakeholders and NGOs

No global stakeholder process was undertaken, because voluntary emission reduction projects do not require a publication like CDM- or JI-projects.

3 DETERMINATION OPINION

TÜV Rheinland has carried out the determination of the planned GHG Mitigation Project "Methane Recovery Project Sterksel" in Sterksel, North Brabant in the Netherlands on the basis of the UNFCCC criteria for JI projects according to Article 6 of the Kyoto Protocol and subsequent decisions of the Joint Implementation Supervisory Committee with regard to JI modalities and procedures and the application of approved methodologies. Even the project activity investigated being currently treated as a voluntary carbon offset project (VER-project), approved CDM baseline methodologies as well as the "Tool for the demonstration and assessment of additionality" of the UNFCCC were applied in order to allow a conversion into an JI project at a later stage.

The project participant of the project activity, is the Praktijkcentrum Sterksel Research Centre. The participating Party is The Netherlands as the Host Party. No other Annex I Investor Party could be identified so far. The host Party The Netherlands meets the requirements to participate in the JI. Letter of Approvals, including authorization of the project participants, by the Designated Focal Point (DFP) of The Netherlands and the Annex I Investor Party have not been obtained yet.

The review of the project design documentation and the subsequent follow-up interviews have provided the verifier with sufficient evidence to determine the fulfilment of stated criteria. Having an installed capacity of less than 15 MW electrical and less than 45 MW thermal and having emission reduction of less than 60 000 tonnes CO_2 equivalents per year, the project is eligible as type I and type III small-scale JI project activity, respectively.

By treating cattle and pig manure in an anaerobic digester, by capturing generated methane and by utilising it to generate renewable energy, which will displace fossil fuel based thermal and electrical energy, the project results in reductions of CH4 and CO2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change.

It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

In summary, it is the verifier's opinion that the project, as described in the project design document and other subsequent documents, meets all relevant UNFCCC requirements for the JI, is eligible as category I.C. and III.D small-scale JI project activity. Hence, the verifier TÜV Rheinland recommends the GHG Mitigation Project "Methane Recovery Project Sterksel" as a VER project activity, which fulfils the above mentioned prerequisites.

The determination is based on the information given in the Project Design Document (PDD), Monitoring Plan and Letters of Response detailed in this report and the attached protocol.

4 REFERENCES

Category 1 Documents:

Documents provided by the Client that relate directly to the GHG components of the project

1 Project Design Document (PDD)
2 Annexes to the Project Design Document
3 Press News
4 Construction and Operation Permit
5 Letters of Response

Category 2 Documents:

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

List	Book Title
1	International Emission Trading Association (IETA): VVM – Validation and Verification Manual
2	Approved Baseline Methodology AMS-III.D and AMS-I.C respectively AMS-I.D.
3	Approved Monitoring Methodology AMS-III.D and AMS-I.C respectively AMS-I.D.
4	2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual, Chapter 2 “Energy”, Chapter 4”Agriculture”
5	IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, Chapter 2 “Energy”, Chapter 4”Agriculture”
6	„Handreichung Biogasgewinnung und – nutzung“, Fachagentur Nachwachsende Rohstoffe e.V. (FNR), 2004

Persons interviewed:

List persons interviewed during the validation, or persons contributed with other information that are not included in the documents listed above.

1 Mr. Norbert Heidelmann, project manager, ARA Carbon Finance GmbH

2 Mr. John Horrevots, Praktijkcentrum Sterksel Research Centre

3 Mr. Rüdiger Wolf, Sustainable Heat & Power Europe GmbH