GOLD STANDARD VERIFICATION REPORT

– 3RD PERIODIC –

BIOGAS PROGRAM FOR ANIMAL HUSBANDRY SECTOR OF VIETNAM

GOLD STANDARD REF. NO.: GS1083

Monitoring Period: 01/07/2013 to 31/12/2014
(incl. both days)

Report No: MY-PVerGS 17/10 <17/132>

Date: 15/03/2018

TÜV NORD CERT GmbH
JI/CDM Certification Program
Langemarckstraße, 20
45141 Essen, Germany
Phone: +49-201-825-3335
Fax: +49-201-825-2139
www.tuev-nord.de
www.global-warming.de

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Project:	***Title:***		***GS No***	***Registration date:***	***Gold Standard No.:***
	Biogas Program for Animal Husbandry Sector of Vietnam		1083	2012-06-28	GS1083
				Verification No.:	
				3rd Periodic verification	
Project Participant(s):	***Non Annex 1 country:***			***Annex 1 country:***	
	Vietnam			N/A	
	PP from non- Annex 1 country:			***PP from Annex 1 country:***	
	Biogas Program for the Animal Husbandry Sector of Vietnam SNV Vietnam			N/A	
Applied methodology/ies:	***Title:***			***No.:***	***Scope(s) / TA(s)***
	Technologies and practices to displace decentralized thermal energy consumption, version 1.0			Ver. 1.0	1.1 / 3. / 13.1
Monitoring period and monitoring report	***Monitoring period (MP):***			***Monitoring Report:***	
	From:	***To:***	***No. of days:***	***Draft version:***	***Final version:***
	01/07/2013	31/12/2014	549	01/06/2017 v 1.0	30/11/2017
Verification team / Technical Review and Final Approval:	***Verification Team:***			***Technical review:***	***Final approval:***
	Cheong, Chun Yuen Pham, Van Trung – TM (Robert)) – TL/TE			Lubanga, David Winter, Stefan	Winter, Rainer
Key dates of verification:	***Publication of the work plan:***			***On-site (from):***	***On-site (to):***
	18/09/2017			03/10/2017	06/10/2017
Summary of Verification opinion	Nexus Carbon for Development Ltd has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 3rd periodic verification of the project: "Biogas Program for Animal Husbandry Sector of Vietnam", with regard to the relevant Gold Standard requirements. As a result of this verification, the verifier confirms that: ☒ all operations of the project are implemented and installed as planned and described in the validated project design document and Gold Standard additional Annexes to the project design document, ☒ the monitoring plan is in accordance with the applied approved GS methodology, ☒ the monitoring plan as set out in the validated project design document and the validated additional Annexes has been followed, ☒ the project contributes to sustainability development ☒ the monitoring system is in place and functional. The project has generated GHG emission reductions, and ☒ the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:				
Emission reductions: [t CO_{2e}]	***Verified amount***				***As per PDD:***
	1,072,197				589,125/a
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Abbreviations:

BCC	**Biodigester Construction Companies**
CA	**Corrective Action / Clarification Action**
CAR	**Corrective Action Request**
CDM	**Clean Development Mechanism**
CER	**Certified Emission Reduction**
CL	**Clarification Request**
CO_2	**Carbon dioxide**
CO_2eq	**Carbon dioxide equivalent**
CP	**Crediting Period**
ER	**Emission Reduction**
ERC	**Emission Reduction Calculation Spread Sheet**
FAR	**Forward Action Request**
GHG	**Greenhouse gas(es)**
GS	**Gold Standard**
GSP	**Gold Standard Passport**
GST	**Gold Standard Toolkit 2.1**
MP	**Monitoring Plan**
MR	**Monitoring Report**
NBP	**National Biodigester Programme**
PA	**Project Activity**
PBPO	**Provincial Biodigester Programme Officer**
PDD	**Project Design Document**
PP	**Project Participant**
QA/QC	**Quality Assurance / Quality Control**
UNFCCC	**United Nations Framework Convention on Climate Change**
VVS	**Validation and Verification Standard**

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1. INTRODUCTION

Nexus Carbon for Development Ltd has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 3rd periodic Gold Standard (GS) verification of CP I for the project

"Biogas Program for Animal Husbandry Sector of Vietnam"

with regard to the relevant requirements for Gold Standard project activities. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered Gold Standard project.

GHG data as well as sustainability aspects for the monitoring period were verified in detailed manner applying the set of requirements, audit practices and principles as required under the Gold Standard requirements /GS/ and additional Validation and Verification Standard /VVS/ of the UNFCCC.

This report summarizes the findings and conclusions of this 3rd periodic verification for CP I of the above mentioned registered Gold Standard project activity.

1.1. Objective

The objective of the verification is the review and ex-post determination by an independent entity of the GHG emission reductions and the contribution to sustainable development. It includes the verification of the:

- implementation and operation of the project activity as given in the PDD and GS Passport,
- compliance of the actual monitoring system and procedures with the provisions of the monitoring plan as a part of registered PDD, the GS monitoring matrix and the applied approved monitoring methodology,
- data given in the monitoring report by checking the monitoring records, the emissions reduction calculation and supporting evidence,
- accuracy of the monitoring equipment,
- quality of evidence,
- significance of reporting risks and risks of material misstatements.

1.2. Scope

The verification of this registered project is based on the validated project design document /PDD/, the validated Gold Standard Passport /GSP/, the carbon monitoring and sustainability monitoring report /MR/, the registered GS validation report /VAL/, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The verification is carried out on the basis of the following requirements, applicable for this project activity:

- Article 12 of the Kyoto Protocol /KP/,
- guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 3/CMP.1 /MA/, and subsequent decisions made by the Executive Board and COP/MOP,
- other relevant rules, including the host country legislation,
- CDM Validation and Verification Standard /VVS/,
- monitoring plan as given in the registered PDD /PDD/,
- Approved GS methodology. /GSM/
- Gold Standard Version 2.1/GS/
- Gold Standard Passport/GSP/.

2. GHG PROJECT DESCRIPTION

2.1. Technical Project Description

The project activity installs biodigesters at household level to treat animal manure to generate biogas replacing conventional fuel namely firewood, charcoal, coal, LPG, kerosene and agricultural residues for cooking. The digestate (bio-slurry) from the biodigester is further exploited for use as soil conditioners to replace chemical fertilizers for crops.

The biodigesters under the program consists of two designs KT1 and KT2 which were first developed by the Institute of Energy and further streamlined with the standard issued by the Ministry of Agriculture and Rural Development, which is the sectoral standard 10TCN 497:2005 - Part 6. Both designs have dome capacity range from 4 – 50 m^3. /T1/

Animal manure and / or human waste is fed into the biodigester and anaerobically degraded by microbes to produce biogas. The biogas is captured in an integrated gasholder and stored for household thermal energy services, mainly for cooking.

A typical system comprises of a hemispherical fixed dome type biodigester with two chambers, one for generation of the biogas and one for removal of the bio-slurry, a biogas stove and the necessary piping. Toilet connection to the biodigester is optional (recommended by the programme).

The slurry effluent from the biodigester will be utilized as organic fertilizer / soil conditioner.

The technology of the project activity will reduce GHG emissions with (1) avoidance of methane emissions from the animal waste; (2) displacement of non-sustainable energy sources such as firewood, charcoal, coal, LPG, kerosene, and agricultural residues, etc., used for cooking; and (3) displacement of chemical fertilizers with the bio-slurry from the biodigesters.

Typical key parameters of the biodigesters are given in Table 2-1:

Table 2-1: Typical Technical data of the biodigesters

Dung requirement for some typical biodigester units:								
Plant size (m^3)	5.3	7.9	10.5	13.2	15.9	21.2	26.5	31.8
Dung requirement (kg/day)	50	75	100	125	150	200	250	300

2.2. Project Location

The details of the project location are given in Table 2-2:

Table 2-2: Project Location

Description	Project Location
Host Country	Vietnam

Region:	55 provinces as of 2014-12-31 for this monitoring period III of crediting period I

Latitude/longitude of program provinces:

#	Province	Latitude (xx° xx' xx" N)	Longitude (xx° xx' xx" E)
Temperate zone			
1	Bắc Giang	21^0 16' 23"	106^0 11' 40"
2	Bắc Ninh	21^0 11'9"	106^0 04' 34"
3	Cao Bằng	22 ^{o} 42'0"	106 ^{o} 15'0"
4	Đắc Lắc	20^0 02' 12"	105^o 34' 54"
5	Đăk Nông	11 ^{o}59'50"	107 ^{o}40'0"
6	Điện Biên	21^{o}22'59"	103^{o}1'0"
7	Gia Lai	13^{o}58'59"	108^{o}0'0"
8	Hà Giang	22^{o}49'59"	104^{o}58'59"
9	Hà Nam	19^{o}19'0"	105^{o}47'59"
10	Hà Nội	21^{o}1'59"	105^{o}50'59"
11	Hà Tây	20^{o}50'0"	105^{o}40'0"
12	Hà Tĩnh	18^{o}19'59"	105^{o}54'0"
13	Hải Dương	20^{o}55'59"	106^{o}19'0"
14	Hải Phòng	20^{o}51'21"	106^{o}40'55"
15	Hoà Bình	20^{o}48'47"	105^{o}20'17"
16	Hưng Yên	20^{o}38'59"	106^{o}4'0"
17	Lâm Đồng	11^{o}55'59"	108^{o}25'0"
18	Lạng Sơn	21^{o}49'59"	106^{o}43'59"
19	Lào Cai	22^{o}28'59"	103^{o}57'0"
20	Nam Định	20^{o}25'0"	106^{o}10'0"
21	Nghệ An	18^{o}40'0"	105^{o}40'0"
22	Ninh Bình	20^{o}15'14"	105^{o}58'29"
23	Phú Thọ	21^{o}20'0"	105^{o}10'0"
24	Quảng Ninh	21^{o}14'00"	107^{o}20'05"
25	Quảng Trị	16^{o}45'0"	107^{o}12'0"
26	Sơn La	21^{o}19'0"	103^{o}54'0"
27	Thái Bình	20^{o}27'0"	106^{o}19'59"
28	Thái Nguyên	21^{o}35'34"	105^{o}50'39"
29	Thanh Hoá	19^{o}48'0"	105^{o}46'0"
30	Thừa Thiên Huế	16^{o}28'0"	107^{o}35'59"
31	Tuyên Quang	21^{o}49'23"	105^{o}13'5"
32	Vĩnh Phúc	21^{o}17'59"	105^{o}36'00"
33	Yên Bái	21^{o}42'0"	104^{o}52'0"
Warm zone			
1	An Giang	10^{o}30'0"	105^{o}13'0"
2	Bà Rịa-Vũng Tàu	10^{o}30'0"	107^{o}13'0"
3	Bạc Liêu	9^{o}17'38"	105^{o}43'40"
4	Bến Tre	10^{o}13'59"	106^{o}22'59"
5	Bình Định	14^{o}7'59"	108^{o}46'59"
6	Bình Phước	11^{o}45'33"	106^{o}51'5"
7	Cần Thơ	10^{o}1'59"	105^{o}46'59"
8	Đồng Nai	11^{o}6'0"	107^{o}20'59"
9	Đồng Tháp	10^{o}40'05"	105^{o}42'05"
10	Hậu Giang	9°47'0"	105°28'0"

	11	Khánh Hòa	10°40'59"	105°10'0"
	12	Kiên Giang	10°16'59"	104°39'0"
	13	Long An	10°24'0"	106°19'59"
	14	Phú Yên	13°07'0"	109°48'0"
	15	Quảng Bình	17°28'9"	106°35'59"
	16	Quảng Nam	15°53'8"	108°15'24"
	17	Quảng Ngãi	15°7'0"	108°47'59"
	18	Sóc Trăng	9°36'11"	105°58'48"
	19	Tây Ninh	11°18'0"	106°5'59"
	20	Tiền Giang	10°22'0"	106°40'0"
	21	Trà Vinh	9°56'4"	106°20'43"
	22	Vĩnh Long	10°15'0"	105°58'0"

2.3. Project Verification History

Essential events since the registration of the project are presented in the following Table 2-3.

Table 2-3: Status of previous Monitoring Periods

#	Monitoring Period	Monitoring Dates	Status
1	MP I (CPI)	2010-06-28 to 2011-12-31	Issued
2	MP II (CPI)	2012-01-01 to 2013-06-30	Issued
3	MP III (CPI)	2013-07-01 to 2014-12-31	Issuance Request

3. METHODOLOGY AND VERIFICATION SEQUENCE

3.1. Verification Steps

The verification consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the monitoring report / work plan
- A desk review of the Monitoring Report/MR/ submitted by the client and additional supporting documents with the use of customised verification protocol /CPM/ according to the Validation and Verification Standard /VVS/ and additional Gold Standard requirements,
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting,
- Resolution of corrective actions (if any),
- Final verification reporting,
- Technical review,
- Final approval of the verification.

3.2. Contract review

To assure that

- the project falls within the scopes for which accreditation is held,
- the necessary competences to carry out the verification can be provided,
- Impartiality issues are clear and in line with the CDM and GS accreditation requirements

a contract review was carried out before the contract was signed.

3.3. Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a verification team, consisting of one team leader and one additional team member, was appointed.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the Table 3-1 below.

Table 3-1: Involved Personnel

	Name	Company	Function [1]	Qualification Status [2]	Scheme competence [3]	Technical competence [4]	Verification competence [5]	Host country Competence	On-site visit
☒ Mr. ☐ Ms.	Cheong, Chun Yuen (Robert)	TUV NORD Malaysia	TL	SA	☒	1.2, 13.1	☒	☒	☒
☒ Mr. ☐ Ms.	Pham, Van Trung	TUV NORD Malaysia	TM[A]	LA	☒	1.2	☒	☒	☒
☒ Mr. ☐ Ms.	Lubanga, David	TUV NORD Cert GmbH	OR	LA	☒	1.2	☒	☐	-
☒ Mr. ☐ Ms.	Winter, Stefan	TUV NORD Cert GmbH	TR[B]	SA	☒	1.2 13.1	☒	☐	-
☒ Mr. ☐ Ms.	Winter, Rainer	TUV NORD Cert GmbH	FA[B]	SA	☒	1.2	☒	☐	-

1) TL: Team Leader; TM: Team Member[A], TR: Technical review[B]; OT: Observer-Team[B], OR: Observer-TR[B]; FA: Final approval[B]

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member: OT, TR, OR, FA

2) GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

3) GHG auditor status (at least Assessor)

4) Technical Area / TR Subcategory as per S01-VA000-F02 or S01-VA070-F01 (such as 1.1, 1.2, …)

5) In case of verification projects

The team member contributed to the review of documents, the assessment of the project activity and to the preparation of this report under the leadership of the team leader.

Statements of competence for the above mentioned team member are enclosed in annex 2 of this report.

3.4. Verification Planning

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Risk analysis and detailed audit testing planning

For the identification of potential reporting risks and the necessary detailed audit testing procedures for residual risk areas table A-1 is used. The structure and content of this table is given in Table 3-2 below.

Table 3-2: Table A-1; Identification of verification risk areas

Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing				
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)**
The following potential risks were identified and divided and structured according to the possible areas of occurrence.	*The potential risks of raw data generation have been identified in the course of the monitoring system implementation.* *The following measures were taken in order to minimize the corresponding risks.* *The following measures are implemented:*	*Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and have to be addressed in the course of every verification.*	*The additional verification testing performed is described. Testing may include:* - *Sample cross checking of manual transfers of data* - *Recalculation* - *Spreadsheet 'walk throughs' to check links and equations* - *Inspection of calibration and maintenance records for key equipment* - *Check sampling analysis results* *Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.*	*Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.*

The completed table A-1 is enclosed in Annex 1 (table A-1) to this report.

Project specific periodic verification checklist

In order to ensure transparency and consideration of all relevant assessment criteria, a project specific GS verification protocol has been developed. The protocol shows, in a transparent manner, criteria and requirements, means and results of the verification. The verification protocol serves the following purposes:

- It organises, details and clarifies the requirements a GS project is expected to meet for verification
- It ensures a transparent verification process where the verifying DOE documents how a particular requirement has been proved and the result of the verification.

The basic structure of this project specific verification protocol for the periodic verification is described in Table 3-3.

Table 3-3: Table A-2; Structure of the project specific periodic verification checklist

Table A-2: Periodic verification checklist				
Checklist Item	***Reference***	***Verification Team Comments***	***Draft Conclusion***	***Final Conclusion***
The checklist items in Table A-2 are linked to the various require-ments the monitoring of the project should meet. The checklist is organised in various sections as per the requirements of the topic and the individual project activity. It further includes guidance for the verification team.	*Gives reference to the information source on which the assessment is based on.*	*The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the verification team and how the assessment was carried out. The reporting requirements of the VVS shall be covered in this section.*	*Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CL or FAR (see below) is raised. The assessment refers to the draft verifi-cation stage.*	*In case of a corrective action or a clarification the final assessment at the final verification stage is given.*

The GS periodic verification checklist (verification protocol) is the backbone of the complete verification starting from the desk review until final assessment. Detailed assessments and findings are discussed within this checklist and not necessarily repeated in the main text of this report.

The completed verification protocol is enclosed in Annex 1 (table A-2) to this report.

3.5. Desk review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- the registered version of the PDD, additional Annexes and further attached documents, including the monitoring plan /PDD/,
- the registered GS validation report /VAL/,
- the Monitoring/Usage Survey and Report/SDB2//SDB2//SDB1//SDB1/SDB3/
- the last revision of the carbon and sustainability monitoring report/MR/, including the claimed emission reductions for the project
- documentation of previous verifications/VER/
- the emission reduction calculation spreadsheet/ERC/.
- GS Passport /GSP/

Other supporting documents, such as publicly available information on the Gold standard website, on the UNFCCC website and background information were also reviewed.

3.6. On-site assessment

As most essential part of the verification exercise it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with

the applicable criteria. Furthermore, the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. Changes to the key sustainable development indicators and the achievement and implementation of mitigation / compensation measures are other integral parts of the on-site assessment. The main tasks covered during the site visit include, but are not limited to:

- The on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- The duly calibration of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data and monitoring/usage survey data were checked.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.
- Possibility of leakage was also checked.

Before and during the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

Representatives of the Biogas Project Management Unit (PMU), SNV Vietnam and Nexus Project Consultant including the operational staff of the project were interviewed. The main topics of the interviews are summarised in Table 3-4.

Table 3-4: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Project Participant & Operations Personnel: Biogas Project Management Unit (PMU) SNV Vietnam 2. Consultant Nexus Carbon 3. District / Provincial Masons / Technicians /	• General aspects of the project • Technical equipment and operation • Changes since validation / previous verification • Monitoring and measurement equipment • Remaining issues from previous verification • Calibration procedures • Quality management system • Involved personnel and responsibilities • Training and practice of the operational personnel • Implementation of the monitoring plan • Monitoring data management • Data uncertainty and residual risks

Interviewed Persons / Entities	Interview topics
Provincial Biogas Program Department	• GHG emission reduction calculation • Procedural aspects of the verification • Maintenance • Environmental aspects • Gold Standard Requirements • GS monitoring parameters

The list of interviewees is included in chapter 7.4.

3.7. Draft verification reporting

On the basis of the desk review, the on-site visit, follow-up interviews and further background investigation the verification protocol is completed. This protocol together with a general project and procedural description of the verification and a detailed list of the verification findings form the draft verification report. This report is sent to the client for resolution of raised CARs, CLs and FARs.

3.8. Resolution of CARs, CLs and FARs

Nonconformities raised during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CARs) are issued, if:

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

The verification team uses the term Clarification Request (CL), which is be issued if:

- information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Forward Action Requests (FAR) indicate essential risks for further periodic verifications. Forward Action Requests are issued, if:

- the monitoring and reporting require attention and / or adjustment for the next verification period.

For a detailed list of all CARs, CLs and FARs raised in the course of the verification pl. refer to chapter 4.

3.9. Final reporting

Upon successful closure of all raised CARs and CLs the final verification report including a positive verification opinion can be issued. In case not all essential issues could finally be resolved, a final report including a negative verification opinion is issued.

The final report summarizes the final assessments w.r.t. all applicable criteria.

3.10. Technical review

Before submission of the final verification report a technical review of the whole verification procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

3.11. Final approval

After successful technical review an overall (esp. procedural) assessment of the complete verification will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the verification team will submit the verification report including the verification opinion to the client via e-mail and to Gold Standard via the GS registry.

4. VERIFICATION FINDINGS

In the following paragraphs the findings from the desk review of the monitoring report/MR/, the calculation spreadsheet/ER/, PDD/PDD1//PDD/, the Validation Report/VAL/ and other supporting documents, as well as from the on-site assessment and the interviews are summarised.

The summary of CAR, CL and FAR issued are shown in Table 4-1:

Table 4-1: Summary of CAR, CL and FAR

Verification topic	No. of CAR	No. of CL	No. of FAR
A – Description of project activity	0	0	0
B – Implementation of project activity	1	2	0
C – Description of Monitoring System	2	0	0
D – Carbon Data and Parameters	6	2	0
E - Calculation of Emission Reductions	4	1	0
F – Sustainability Monitoring Parameters	0	0	0
SUM	**13**	**5**	**0**

The findings of the verification process are summarized in the tables below.

Finding	**B1**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section B.1, the average size of the biogas plant stated was 11.35m^3 whilst in page 46 it states 11.43m^3 and 11.26m^3.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	There were typo mistakes in average sizes in page 46 of the MR version 1.0. The PP confirms that section B.1 of the MR indicated the average size of all installed biogas plants, which is 11.35 m^3 (average of 121,783 units built between 01/01/2007 and 31/12/2014). Please refer to the calculation in the project database (cell O1, tab "All Provinces", CMS and KPT_sampling HHs_MP3_20150714.xlsx). The correct value for average size of digesters according to the surveyed households' responses is 11.07 m^3. Please refer to the table 3-21, BUS report, page 34 of the report (or page 35 of the PDF file). The information and sources in the updated MR, section D.3.5, page 52 (page 55 track change version) have been corrected and updated accordingly, including the typo mistake for average sizes (11.43m^3 and 11.26m$^{3)}$.		

Finding	B1
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 1.0, Section B.1: The average size of the biogas plant stated was 11.35m^3 based on the average of 121,783 units built between 01/01/2007 and 31/12/2014 and cross-checked with cell O1, tab "All Provinces", CMS and KPT_sampling HHs_MP3_20150714.xlsx for correctness. The reported average sizes in page 46 is incorrect. The correct average size of digester based on the survey BUS report, page 34 of the report (or page 35 of the PDF file), table 3-21 stated 11.07m^3. The revised MR page 52, section D.3.5 is updated and corrected for the average size of the digester based the survey is 11.07m^3 whilst the average size of all installed digester is 11.35 m3 (average of 121,783 units built between 01/01/2007 and 31/12/2014).
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Finding	B2		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section B.3: Clarification requested in respond to FAR 2 as regards to "What are the 3 baseline scenarios"?		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The PP's responses in Section B.3. for FAR2 has been updated with a footnote explaining more detail about 3 baseline scenarios.		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section B.3: The 3 baseline scenarios have been updated in footnote 18 of revised MR that reflects the actual situation of the project.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	B3		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section B.3: The PP is requested to clarify foot note 18 for the average weight of a sow and fattening pigs are 158 kg and 44 kg, respectively being obtained.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The average weight of animal was based on the previous survey result (MP2). Please find the result in cell DE477 for average weight of sow and cell EL477 for average weight of fattening pig, tab Data, MP2 field survey result "MP2_CMS and KPT_Field survey results.xlsx"		

Finding	B3
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section B.3: The submitted survey results was verified for the average weight of a sow and fattening pigs are 158 kg and 44 kg which now as footnote 21.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Finding	C1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section C.1, Quality Control Monitoring: The PP has proposed a change for the quality control monitoring in revised PDD version 4.0. However, the changes were not reflected in the MR.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The description on QC system deviation has been updated in Section C.1. of the MR.		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section C.1, Quality Control Monitoring: The proposed change for the quality control monitoring in revised PDD version 4.0 is updated in the revised MR.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	C2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, MPIII database US Sampling HH spreadsheet: The data in RN Gens tab are keyed-in and not linked the data source.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The sources for random number generations were added to the cells B38:I38, tab RN_Gens, MPIII database US Sampling HH spreadsheet. The screenshots are also submitted herewith: • RN generation screenshot_Age group 01.pdf • RN generation screenshot_Age group 12.pdf • RN generation screenshot_Age group 23.pdf • RN generation screenshot_Age group 34.pdf • RN generation screenshot_Age group 45.pdf • RN generation screenshot_Age group 56.pdf • RN generation screenshot_Age group 67.pdf • RN generation screenshot_Age group 78.pdf		

Finding	C2
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, MPIII database US Sampling HH spreadsheet: The referred source of the data in the RN Gens tab were cross-checked with the submitted screenshot documents RE generation for correctness of the are keyed-in data.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Finding	D1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section D.2: The reference source for the following parameters are not traceable to which tab and cells of the MPIII Monitoring database: $P_{bs1,y}$, $P_{bs2,y}$,, $P_{bs3,y}$, $P_{h,y}$,, $MS_{(P,S,k)}$, $N_{(T)}$,		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Reference sources for the following parameters: $P_{bs1,y}$, $P_{bs2,y}$,, $P_{bs3,y}$, $P_{h,y}$,, $MS_{(P,S,k)}$, $N_{(T)}$, have been updated in the MR, section D.2.		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 1.0, Section D.2: The updated reference source for the below parameters were cross-checked with the stated tab and cells of the MPIII Monitoring database spreadsheet for correctness. $P_{bs1,y}$, $P_{bs2,y}$,, $P_{bs3,y}$, $P_{h,y}$,, $MS_{(P,S,k)}$, $N_{(T)}$,		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	D2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section D.2, Parameter $MS_{(T,S,k)}$. Please provide the source for the data and calculation.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Source for data and calculation for parameter $MS_{(T,S,k)}$ has been updated in the MR.		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section D.2, Parameter $MS_{(T,S,k)}$.The updated referred data source was cross-checked for correctness.		

Finding	D2
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Finding	D3		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section D.2, Parameter $EF_{awms,T}$: The PP is requested to provide the table of the referred document for the default factor applied in the calculation.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The table numbers of default factors from IPCC report have been updated in the MR for Parameter $EF_{awms,T}$		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 1.0, Section D.2, Parameter $EF_{awms,T}$: The reference for the table of the default factor applied in the calculation is updated and cross reference to tables 10A-4, 10A-5, 10A-6, 10A-7, chapter 10, volume 4 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, chapter 10 and reviewed for correctness.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	D4		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section D.3.2. Table 13. The reference for this table is footnote 29 does not reflect to row 133 of tab "Input" of the "MPIII_Monitoring database" spreadsheet.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The reference for table 13 in Section D.3.2. has been updated in the updated MR.		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section D.3.2. Table 13. The reference for this table footnote is change 47 with the referred data is linked to row from B130:E136 of tab "Inputs" of the "MPIII_Monitoring database" ER spreadsheet. The reference has been cross-checked for correctness.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	D5		
Classification	☐ CAR	☒ CL	☐ FAR

Finding	D5
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section D.3.2, Table 14: Sampled steps for warm zone: How is the data in the table is calculated.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The reference to the excel calculation for table 14 has been added into the updated MR.
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section D.3.3, Table 14: Sampled steps for warm zone: The data in the table reference is from column E of tab "Warm" of the "CMS and KPT_sampling HHs_MP3" spreadsheet and cross-checked for correctness.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Finding	D6		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section D.3.2: The table for temperate zone is not included.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The table for temperate zone has been added into section D.3.2. of the updated MR.		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section D.3.2: The table for temperate zone is added in revised MR. The data is reference to column E of tab "Temperate" of the "CMS and KPT_sampling HHs_MP3" spreadsheet.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	D7		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section D.3.3, KPT survey design: 1. It is unclear the degree mention for temperate zone is Celsius or Fahrenheit. 2. For the warm zone the number 27 is not indicated the degree representation.		

Finding	D7
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Section D.3.3 of the MR has been updated: 1. The unit of temperature is Celsius degree (°C) 2. The unit for average temperate of warm zone has been added.
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 1.0, Section D.3.3, KPT survey design: 1. The unit of temperature is defined as Celsius degree (°C). 2. The unit for temperature for the warm zone is added °C
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Finding	D8		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section D.3.4, Table 21: The footnote reference is not traceable to MPIII_Monitoring database" spreadsheet		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The footnote for table 21 (which was changed to table 22 in the updated MR) "Weighted average uptime" has been updated and linked to the correct source.		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 1.0, Section D.3.4, Table 22 (previously 21): The footnote reference is corrected and traceable to ER usage rate of "Usage survey results spreadsheet"		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	E1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section E.1.2, Tables 24, 25 and 26: The source of data is not traceable.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The reference sources of the above tables in Section E.1.2 has been updated.		

Finding	E1
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section E.1.2, Tables 25, 26 and 27 (previously 24, 25 & 26): The source of data is updated and traceable to the respective source stated.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Finding	E2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section E.3.1, Tables 28 & 29: The headings in the table "MCF factor by system from IPCC guidelines Volume 4, chapter 10 at 23 degrees" is incorrect.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The headings of above tables in section E.3.1. have been corrected.		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section E.3.1, Tables 29 & 30 (previously 28 & 29): The headings in the table is corrected and consistent with the table in the ER AWMS tab of the MPIII_Monitoring database" spreadsheet.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	E3		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section E.4, tables 44 & 45: The footnote reference for the ER tab is not traceable of the "MPIII_Monitoring database" spreadsheet.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The footnote for reference sources have corrected in the section E.4.		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section E.4, tables 45 & 46 (previously 44 & 45): The footnote for the reference is corrected and traceable to the correct tabs of the "MPIII_Monitoring database" spreadsheet.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	**E4**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section E.4: The data in table 46 are not traceable to the ER All tab of MPIII Monitoring Database Spreadsheet.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The links for number of digesters in ER summary table in the ER spreadsheet were fixed. The reference sources for tables in Section E.4 have also been updated.		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section E.4: The reference for the data in table 47 & 48 (previously 46 & 47) is updated and traceable to the ER temperate and ER warm tabs of MPIII Monitoring Database Spreadsheet.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	**E5**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	MR version 1.0, Section E.5: The PP is requested to clarify how the ex-ante 917,301 tCO_2e is derived.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The ex-ante ER of 917,301 is calculated from the registered ER spreadsheet "25 Sep 2012 ER worksheet BP VGS v3.1.xlsx". Please refer to the cell P131, tab "ER database" of the attached ER spreadsheet "25 Sep 2012 ER worksheet BP VGS v3.1.xlsx".		
Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.*	MR version 2.0, Section E.5: The ex-ante ER refers to cell P131 of "25 Sep 2012 ER worksheet BP VGS v3.1.xlsx was reviewed and could confirmed it is correct.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

5. SUMMARY OF VERIFICATION ASSESSMENTS

The following paragraphs include the summary of the final verification assessments after all CARs and CRs are closed out. For details of the assessments pl. refer to the discussion of the verification findings in chapter 4 and the verification protocol (Annex 1).

5.1. Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity.

Table 5-1: Project Parties and project participants

Characteristic	Party	Project Participant
Non-Annex 1	Vietnam	Biogas Program for the Animal Husbandry Sector of Vietnam SNV Vietnam
Annex 1	N/A	N/A

5.2. Implementation of the project

During the verification, an onsite inspection was carried out from 2017-10-03 to 2017-10-06. On the basis of this site visit and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipment, as well as the monitoring and metering equipment, the project has been implemented and operated as described in the GS registered and revised PDDs and the GS Passport. /PDD/GSP/

This is the 3rd monitoring period under the first renewable crediting period of the biogas programme.

During this monitoring period, the biogas programme has built up and commissioned 15,612 biogas units from 2013-07-01 to 2014-12-31. The accumulated number of biogas units commissioned as at 2014-12-31 was 121,783 units. /ER/

The number of units in operation for this monitoring period is107,949 is derived from the user survey report. /S2/BUS1/

Refer findings CL B1 and CL B3 raised and successfully closed out.

5.3. Project history

During the registration and 1st verification for MPI, the validating / verifying DOE might have raised issues that could not be closed or resolved during the validation / previous verification stage. For this purpose FARs might have been raised.

In the 1st monitoring period, there are 5 FARs raised. FAR01, FAR03, FAR04, and FAR05 have been closed out by the verifying DOE during the final issuance review by GS secretariat. The PP has included the responses in Section B.3 of MR.

The verification team has reviewed the responses and could confirm they have been addressed appropriately.

The verification team has reviewed GS final issuance review report and could confirm that one FAR was raised that needed to be addressed in MPII. The FAR raised is same as FAR02 raised by the verifying DOE for MPI. /GSR/

The PP has responded appropriately in Section B.3 of MR. The verification team has reviewed the response by the PP and could confirm appropriate measures have been taken to meet the target for Quality of Employment, for SD4 that “At least 2 district biogas technicians and 2 biogas masons per district provided with training”.

During the issuance of MPII, GS has raised the following FARs.

FAR1: The PP shall update the emission reduction estimated approach for future issuances to account the month wise installation of units in both temperature zone

PP Respond: The emission reduction calculation for MPIII for each zone has been separated and based on the month wise installation of units in each zone.

The verification team has reviewed the ER spreadsheet “ER_temperate” and “ER_warm” tabs that indicate the account of the installed units on a month wise .

FAR2: The parameter % population/Row16/ER Fuel is derived from baseline KPT sample group, which has been distributed among three baseline scenarios. Now that the ER assessment approach has changed, the % population distribution estimation approach is not representative anymore. The PP shall collect this information regarding the baseline scenarios through project / monitoring surveys prior to next issuance. The PP may discuss the survey questions separately.

Due to redistribution of baseline KPT sample group for each baseline scenario, the sample size for each baseline scenario is less than the minimum sample size requirement for this issuance. Therefore, the PP must carry out the additional baseline KPTs prior to next issuance.

Accordingly, emission reduction in MP1 and MP2 must adjust if there is a decrease in emission reduction at the time of next issuance

PP Respond: The PP has emailed GS for clarification on 20/07/2015 and GS has agreed on the approach proposed by the PP in an email response on 21/07/2015.

Section B.3 of MR, the PP has provided the approach and breakdown into 3 baseline scenarios.

The verification team has reviewed the approaches and the survey taken and could confirmed in compliance to the suggested approach agreed by GS.

Refer CL B2 raised and successfully closed out.

5.4. Compliance with the monitoring plan

The PP has updated the monitoring system with improvement through modernising process moving towards paperless archivng ysytem.

Section B..2 of the revised PDD version 4.0 dated 11/09/2017 was reviewed and cross-cheked on the system to confirm the implementation of the revised monitoring system

as described in the updated PDD. Evidences were available to the verification team to check the compliance of the revised monitoring system

There were changes to the reporting requirements of the monitoring plan for the carbon monitoring and updated based on FAR raised by GS during issuance of MPII. The revised PDD version 4.0 is updated to include the addition parameters for monitoring of the 3 baseline scenarios. It could be concluded the added parameters are in-line with GS FAR raised during MPII issuance review.

All relevant data is stored for the whole monitoring period, including MPI and traceable to the computer server located at the PP office.

Refer CL C1 and CAR C2 raised and successfully closed out.

5.5. Compliance with the sustainability monitoring plan:

The SD indicators as per the GS matrix are monitored and reported appropriately and cross-verified by means of desk review of supporting documents, interviews with the PP and selected householders. The monitoring system and all applied procedures are in compliance to the sustainability monitoring plan in the GS registered / revised PDDs and the Gold Standard principles. During the site visit, the verification team has randomly selected 234 households to conduct interviews by means of personal visits and telephone calls in several provinces of Vietnam (178 households were interviewed via telephone calls and 56 households were visited). The questions asked, where applicable, were basically based on requirements of the Annex I, Rules and Toolkit to the Gold Standard version 2.1. The main topics included, but not limited to the followings:

- Air quality
- Water quality and quantity
- Soil condition
- Biodiversity
- Quality of employment
- Livelihood of the poor
- Access to affordable and clean energy services
- Human and institutional capacity
- Quantitative employment and income generation
- Access to investment
- Technology transfer and technological self-reliance

A summary of interviewed questions and feedback received as presented in the below table:

SD indicator	Questions for households/masons/technicians during site interviews	Summary of feedback
Air quality (questions for households)	1. Do you have sufficient biogas from the biodigester for your daily cooking now? Do you need to use any other fuel now?	Households have sufficient biogas and sometimes redundant and do not need to use any other fuel except in festive season or family gathering. The use of firewood or LPG mainly for small businesses or for cooking additional food during festive seasons or family gatherings. Biogas is now the main source of cooking fuel.
	2. Has there been a problem with the outdoor / indoor air quality in your house in the past? Do you think that the project help for cleaner air?	Before installing the biogas system, firewood and rice straw were used to cook food and sometime pigs feed which caused the ash scattered in the kitchen. With sufficient biogas, there is no need to use firewood any more. LPG is use to cook more food during festive seasons. This does not affect the air quality in the house in general and particularly in the kitchen. There is no ash now with the biogas system (almost zero) due to a significant reduction in use of firewood or other agricultural wastes.
	3. Have there been bad odour problems in the past? Do you think this project help or worsen this problem?	The households visited mainly raise pigs (some have cows) and the pigs dung is smelly without proper treatment. With the biogas unit, the pig dung is fed into unit which is covered-up, thus reduced the smell significantly.
Soil condition (questions for households)	1. Have you ever removed the bio-slurry from the biodigester so far? If yes, what have you done with it?	Most of the interviewed households said that they have not removed the bio-slurry so far and the biodigesters are still in good operation condition. Only a small percentage of households have apply the bio-slurry to fertilize their rice field and vegetable garden crops. In case, it is necessary to remove the bio-slurry, the households expressed that they would use for their rice field and crops in order to save money from buying chemical fertilizer.
	2. How is the water and soil quality after the installation and operation of the biodigesters?	Before the biogas unit is built the animal waste was either dumped into surrounding water bodies or into drainage system in the villages. Now with the biogas units, animal waste is treated in the system. The water and soil quality has been improved.
	3. What is the main crops / farming activities taking place in your household?	Most of households have paddy rice fields and short term crops mainly vegetables and fruits. Some of the households visited have small trading businesses or workshops or sundry shops or small catering businesses.
Biodiversity (questions for households)	1. How biogas from biodigester has helped you in savings money from buying fuel?	The biogas is sufficient and sometime it is redundant. There is no need to buy firewood or any other fuel type now. Households have saving on the fuel costs.

SD indicator	Questions for households/masons/technicians during site interviews	Summary of feedback
Quality of employment (questions for masons and technicians)	1. Did you participate in the training to be the program mason/technician? What are the criteria for selection of candidate mason / technician?	All masons and technicians participated in trainings provided by the program management have received certificates and codes after successful completion of training. Masons or technicians were trained based on the program rules and procedures.
	2. Do you think that this project could provide more permanent jobs?	The masons interviewed by the verification team during the onsite inspection could confirm they are local natives from the commune or village. Therefore, the program has created employment directly for the local residents to be masons and technicians.
	3. What suggestions would you give that may help the quality of employment in your community?	The interviewed masons are satisfied with their job as the biodigester builders. Both the masons and provincial technicians are very proud of having such a job in providing a cleaner environment to the villages.
Livelihood of the poor (questions for households)	1. How many persons are there in your household?	On average, a household consists of from 2-5 persons. In some households, children have grown up and gone to work or study away from their families.
	2. Have this program helps poor people?	Households expressed that the biodigester program is a very good and assist to improve the lifestyle reduce expenses on buying firewood or LPG or charcoal for cooking. Some household wish to be built addition biodigester as their animals population is increasing and have more waste to be treated.
	3. Have the program lead to better local sanitation or health?	Households responded that their premises and even the village roads have become much cleaner than before. Animal waste are now much better managed and treated in the biodigester.
Access to affordable and clean energy services (questions for households)	1. How are the biogas stoves in comparison with using kerosene, LPG and firewood / charcoal before?	Most of the households used double stoves with some have one double and one single stove. The biogas stoves are much cleaner than the normal firewood or kerosene stoves. As compared with cooking fuels, the biogas is free and therefore the households have savings. Most of the interviewed households do not using firewood, kerosene or charcoal for their daily cooking anymore. Firewood are used where they need to cook more food during festive seasons. LPG is a standby gas in case additional cooking required. In general, biogas has replaced the traditional cooking fuel.
	2. Do you have electricity access before and now?	All the visited households have accessed to the local power grid for lightings. Households do not need biogas for lighting.

SD indicator	Questions for households/masons/technicians during site interviews	Summary of feedback
	3. How much on average do you have to pay for fuel in the past? How is it compared with the biogas as a source of fuel?	Households are not able to give a specific amount but they expressed that they can save some amount of money from buying LPG, firewood or charcoal.
	4. Are you satisfied with your biogas fuel for cooking?	The biogas fuel is a free fuel, clean and can cook food very fast as compared to using charcoal or firewood or agriculture waste..
	5. Do you think the project will contribute to a long lasting solution for your fuel needs?	As long as households are still raising animals they are happy with the biodigesters and biogas supply. Hence, biogas will be their free and clean source of fuel for daily use.
Technology transfer and technological self-reliance (questions for masons)	1. Have you been trained to become the program mason? Do you receive sufficient training to operate the biodigesters properly and safely?	The masons attend training organized by the program. They are provided with theoretical knowledge and then practical training by building one biodigester unit under supervision. When the skills are fulfilled a certificate will be issued with a mason code.
	2. Do you think that the biodigesters introduced is appropriate and will be help the community?	The biodigesters have helped villagers to have free of cost biogas as the main cooking fuel. The villages have become cleaner with the better management of animal waste.
	3. Do you think that biodigesters are important to the development of your community?	Biodigesters have significantly improved villagers' economic and environmental values.

Below are detailed data and assessments for each sustainable development indicator.

Sustainable Development Indicators

Indicator	Parameter	Value	Verification Opinion
SD1: Air Quality	Reduction in fuel (wood, agricultural residues, kerosene, charcoal and coal) consumption (kg of fuel reduced / year)	Firewood: 2,950.6kg Agriculture residue: 941.2kg	The value was derived from the Kitchen Performance Test (KPT) conducted on May to June 2016. /SD1/S1/BUS1/ Based on the KPT results, it was reported 2,950.6kg of firewood and 941.2kg of agricultural residues consumed as compared with the baseline situation of 0kg firewood and 0kg agricultural residues respectively. /SD1/S1/BUS1/ During the onsite interview and inspection for this monitoring period, 234 randomly selected households/LHH/ it was observed that the households do not use firewood for their daily cooking anymore. Firewood is used when required to cook lots of food during festive seasons and for small businesses. In general, the interviewed households have sufficient biogas for their daily cooking. Some has redundant and pipe to the neighbour.

<table>
<tr><th>Indicator</th><th>Parameter</th><th>Value</th><th>Verification Opinion</th></tr>
<tr><td></td><td></td><td></td><td>As compared with the baseline scenario, the amount of fuel consumed has reduced significantly thus improved air quality. Therefore, the score for this SD indicator is positive.</td></tr>
<tr><td>SD2:
Soil condition</td><td>Usage of bio-slurry (%)</td><td>Temperate zone: 42.17%
Warm zone: 36.51%</td><td>The data was derived from the Carbon Monitoring Survey (CMS). /SD1/BUS1/S1/ The results for the current monitoring period is as follows:
<table>
<tr><th>Zone</th><th>Fertilizer</th><th>Don't use</th><th>Fish feed</th><th>Other</th></tr>
<tr><td>Temperate</td><td>14.11%</td><td>47.40%</td><td>2.82%</td><td>35.67%</td></tr>
<tr><td>Warm</td><td>2.55%</td><td>56.25%</td><td>1.02%</td><td>40.18%</td></tr>
</table>
The survey results were checked during the onsite interview of the randomly selected households that they used bio-slurry as fertilizers for their rice field and vegetable or garden crops whenever they empty the biodigesters. Those households who used the bio-slurry as an alternative fertiliser reported a savings from buying chemical fertilizers. Besides the bio-slurry has helped to improve the yield.

It is noted that during the onsite inspection, the number of households found using bio-slurry for their rice field and crops is low.

In the baseline scenario, no bio-slurry used as fertilisers. Therefore, the score for this SD indicator is positive.</td></tr>
<tr><td>SD3:
Biodiversity</td><td>Cumulative savings of wood (tons/year)</td><td>294,170</td><td>The value was calculated from the difference between the baseline and project fuel usage, multiplied by the number of biodigesters installed and usage rate during the monitoring period.

The baseline and project fuel usage were based on the Carbon Monitoring Survey conducted on May to June 2016. /SD1/S1/BUS1/

As at 31/12/2014 for this monitoring period, a total savings of 294,170 tons of wood savings was achieved.

The accumulative savings of firewood was cross-checked with interview results during the onsite inspection that all households have sufficient biogas for their daily cooking and do not need to use firewood.

In the baseline scenario, firewood is commonly used for daily cooking. Therefore, the score for this SD indicator is positive.</td></tr>
<tr><td>SD4:
Quality of Employment</td><td>Number of masons and technicians</td><td>Masons: 1156
Technicians: 790</td><td>The value was based on the records of trained masons and technicians in the project database. /ER/</td></tr>
</table>

Indicator	Parameter	Value	Verification Opinion
	participating in the trainings		During this monitoring period there is an increase for masons from 1,038 to 1,156 and technicians from 707 to 790. During the onsite inspections, the training records in the database for the number of masons and technicians trained for this monitoring period and the total numbers since the start of the program was verified. There is an increased of trained masons and technicians, therefore, the score for this SD indicator is positive.
SD5: Livelihood of the poor	Number of people having access to an improved waste management system	482,279	The value was derived from the Carbon Monitoring Survey (CMS). /SD1/S1/BUS1/ In this monitoring period, 482,279 people have access to an improved waste management system. The number of people is calculated based on the number of households having biodigesters in operation. From the onsite inspection, it could be observed that the average size of households is 2-5 persons. This is as assessed as the actual situations in rural villages in Vietnam since grown-up children normally migrate to cities for work or study and stay away from their parents. Therefore, the average size of household is small. In the baseline scenario, there is no accessed to an improved waste management system. Therefore, the score for this SD indicator is positive.
SD6: Access to affordable and clean energy services	Total amount of energy replaced by biogas (MJ/hh/year)	46,954	The data is derived from the Carbon Monitoring Survey. /SD1/BUS1/S1/ For the current monitoring period, the total amount of energy displaced by biogas was reported at 46,954 MJ/hh/year. From the onsite inspections and interviews, it could be observed the households have a better living condition in terms of access to low-cost and clean energy (biogas) for their daily cooking. Most of the interviewed household expressed they have sufficient and abundent amount of biogas for daily cooking and do not have to purchase LPG, firewood, charcoal or other type of fuel anymore. Some households share the biogas with their neighbours who do not have a biodigester installed. In the baseline situation, there is no biogas to displace the amount of energy. Therefore, the score for this SD indicator is positive.

Indicator	Parameter	Value	Verification Opinion
SD7: Technology transfer and technological self-reliance	Number of masons trained in the construction of KT1 or KT2 bio-digesters	1,156	The data is based on the records of masons trained for the program. /ER/ As at 31/12/2014 for this monitoring period, a total number of 1,156 masons have been trained. The training records in the program database were verified and could be confirmed as correct. In the baseline scenario, there were no trainings provided. Therefore, the score for this SD indicator is positive.

For further details concerning the sustainability indicators please refer to Annex 2.

5.6. Compliance with the monitoring methodology:

The monitoring system is in compliance with the applied monitoring methodology "Technologies and practices to displace decentralized thermal energy consumption", version 1.0.

5.7. Carbon data and parameters:

During the verification all relevant monitoring parameters as listed in the GS revised and registered PDDs have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist.

In this monitoring period, 3 addition parameters were added to address FAR raised by GS during issuance review for the different baseline scenarios. The GS PDD is revised and updated the 3 addition parameters to be monitored. /PDD1/

In addition, several ex-ante parameters were revised to update the GWP for methane and N_2O emission factor in accordance to 2nd commitment period.

After appropriate corrections were carried out by the project participant it can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.

Data and parameters monitored:

Parameter	Value	Verification opinion
$f_{NRB,y}$: Fraction of non-renewability	67%	The data is a fixed value from the baseline study for each crediting period. For this crediting period the fraction for non-renewability for woody biomass is 67%.

Parameter	Value	Verification opinion
		The data was from the baseline study for each crediting period and fixed for the first crediting period as reported in the GS registered PDD annex 3.
$P_{bs1,y}$: Quantity of fuel that is consumed in the baseline scenario 1 in year y	Fuel *i* / Value (kg/hh/day) LPG: 0.15 Firewood: 0 Agriculture residues: 0	The data was based on the CMS / KPT results conducted on May to June 2016 and applied for this monitoring period./SD1/S1/BUS1/ According to the registered PDD, the data will be updated every 2 years or more frequent after 1st verification.
$P_{bs2,y}$: Quantity of fuel that is consumed in the baseline scenario 2 in year y	Fuel *i* / Value (kg/hh/day) LPG: 0 Firewood: 10.04 Agriculture residues: 3.81	The data was based on the CMS / KPT results conducted on May to June 2016 and applied for this monitoring period./SD1/S1/BUS1/ According to the registered PDD, the data will be updated every 2 years or more frequent after 1st verification.
$P_{bs3,y}$: Quantity of fuel that is consumed in the baseline scenario 3 in year y	Fuel *i* / Value (kg/hh/day) LPG: 0.15 Firewood: 9.13 Agriculture residues: 2.28	The data was based on the CMS / KPT results conducted on May to June 2016 and applied for this monitoring period./SD1S1/BUS1// According to the registered PDD, the data will be updated every 2 years or more frequent after 1st verification.
$P_{h,y}$: Quantity of fuel that is consumed in the project scenario in year y	Fuel *i* / Value kg/hh/day LPG: 0.04 Firewood: 0.54 Agriculture residues: 0.19	The data was based on the CMS / KPT results conducted on May to June 2016 and applied for this monitoring period. /SD1/S1/BUS1/ According to the applied GS methodology, the data will be updated every 2 years or more frequent. /GSM/ During the onsite inspection of the 234 randomly selected households, no charcoal or LPG being used for daily cooking although some households may use firewood or agriculture residues when they need to cook a lot of food during festive seasons and for small businesses. /LHH/
$U_{p,y}$: Percentage of bio-digesters in use in monitoring period y	81.87%	The data is calculated using data from the usage survey conducted on April to November 2015 /S2/BUS1/

<table>
<tr><th>Parameter</th><th>Value</th><th>Verification opinion</th></tr>
<tr><td>$N_{p,y}$: Number of biogas plants commissioned</td><td>121,783</td><td>The data was the accumulated number of biodigesters constructed since the start of the program recorded in the project database. /ER/</td></tr>
<tr><td>$MS_{(T,s,k)}$: Fraction of livestock category T's manure fed into the bio-digester S, in climate zone k</td><td><table><tr><th>Animal</th><th>Temperate zone</th><th>Warm zone</th></tr><tr><td>Pig</td><td>94.26</td><td>90.91</td></tr><tr><td>Buffalo</td><td>55.56</td><td>0</td></tr><tr><td>Dairy cow</td><td>N/A</td><td>N/A</td></tr><tr><td>Cattle</td><td>47.52</td><td>25.86</td></tr></table></td><td>The data was based on the carbon monitoring survey (CMS) conducted on May to June 2016. /SD1/S1/BUS1

Tab Data of the survey worksheet was reviewed on the data, calculation and could be confirmed as correctly applied in the ER worksheet, tab ER_AWMS.</td></tr>
<tr><td>$MS_{(P,s,k)}$: Fraction of livestock category T's manure not fed into the bio-digester S, in climate zone k</td><td><table><tr><th>Animal</th><th>Temperate zone</th><th>Warm zone</th></tr><tr><td>Pig</td><td>5.74</td><td>9.09</td></tr><tr><td>Buffalo</td><td>44.44</td><td>100</td></tr><tr><td>Dairy cow</td><td>N/A</td><td>N/A</td></tr><tr><td>Cattle</td><td>52.48</td><td>74.14</td></tr></table></td><td>The data was based on the carbon monitoring survey (CMS) conducted on May to June 2016 /SD1/S1/BUS1/.

The fraction of livestock category T's manure not fed into the bio-digester S, in climate zone k is calculated as the difference between the total amount of VS excreted and total VS entering biodigesters.

The data from the survey results was reviewed. The calculation for the fraction of livestock category T's manure fed into the bio-digester S, in temperate and warm zones. /SD1/S1/BUS1/</td></tr>
<tr><td>N(T): Number of animals of livestock category T</td><td><table><tr><th>Animal</th><th>Temperate zone</th><th>Warm zone</th></tr><tr><td>Pig</td><td>24.52</td><td>30.52</td></tr><tr><td>Buffalo</td><td>0.09</td><td>0.01</td></tr><tr><td>Dairy cow</td><td>0</td><td>0</td></tr><tr><td>Cattle</td><td>0.23</td><td>0.70</td></tr></table></td><td>The data was based on the carbon monitoring survey (CMS) conducted on May to June 2016. /SD1/S1/BUS1/

Tab ER_AWMS of the ER worksheet was reviewed for the calculation of these values for both temperate and warm zones. /ER,/SD1/S1/</td></tr>
<tr><td>PL: Physical leakage of the biodigester</td><td>10%</td><td>The data is a default value derived from the applied GS methodology. /GSM/</td></tr>
<tr><td>$EF_{awms,T}$: Animal waste methane emission factor by average temperatures</td><td><table><tr><th>Animal</th><th>Temperate zone</th><th>Warm zone</th></tr><tr><td>Pig</td><td>2.058</td><td>1.962</td></tr><tr><td>Buffalo</td><td>5.458</td><td>0.954</td></tr><tr><td>Dairy cow</td><td>0.000</td><td>0.000</td></tr><tr><td>Cattle</td><td>2.947</td><td>1.760</td></tr></table></td><td>The data is calculated using 2006 IPCC default value and local annual average temperature for each province in the respective zone. /IPCC/ER/</td></tr>
<tr><td>$PE_{bio-slurry}$: Emissions from anaerobic disposal of bio-slurry</td><td><table><tr><th></th><th>Units</th><th>CO_2e/ unit</th><th>CO_2e</th></tr><tr><td>Temperate</td><td>93,236</td><td>0.131</td><td>12,256</td></tr><tr><td>Warm</td><td>28,547</td><td>0.150</td><td>4,281</td></tr><tr><td>Total</td><td>121,783</td><td></td><td>16,537</td></tr></table></td><td>The data is calculated using the CMS survey multiplied with the number of installed biodigester. /ER/SD1/S1/BUS1/</td></tr>
</table>

Parameter	Value	Verification opinion
	Ave. emissions: 0.136 $tCO_2e/yr/hh$	

Data and parameters not monitored:

Parameter	Value	Verification opinion / Data source
$EF_{b,CO2}$ - CO2 emission factor arising from use of fuels in the baseline scenario	**Fuel *b*** / **EF_{CO2}, (kg/TJ)**: LPG 63100; Charcoal 112000; Coal 94 600; Firewood 112000; Agriculture residues 100000; Kerosene 71900; Charcoal production 1285 gCO_2 /kg charcoal[1]	The data was taken from the 2006 IPCC Guidelines defaults, see chapter 2 Stationary Combustion: http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html
$EF_{i,CH4}$ - CH_4 emission factor arising from use of fuels in the baseline scenario	**Fuel *i*** / **EF_{CH4}, (kg/TJ)**: LPG 11.95; Charcoal 330.5; Coal 1458.5; Firewood 1224; Agriculture residues 2210; Kerosene 12.6; Charcoal production 1000	The data was taken from the 2006 IPCC Guidelines defaults see chapter 2 Stationary Combustion: http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html, table 2.9. For Charcoal production Good Practice Guidance and Uncertainty Management in National GHG inventories: http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_2_Non-CO2_Stationary_Combustion.pdf table 1
$EF_{i,N2O}$ - N_2O emission factor arising from use of fuels in the baseline scenario	**Fuel *i*** / **EF_{N20}, (kg/TJ)**: LPG 2.1; Charcoal 5.45; Coal NA; Firewood 11.25; Agriculture residues 9.7; Kerosene 1.55; Charcoal production NA	The data was taken from the 2006 IPCC Guidelines defaults, see chapter 2 Stationary Combustion, table 2.9 http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html.
NCV_i - Net calorific value of the fuel i used in the baseline	Fuel *i* / **NCV_i (TJ/Gg)**: LPG 47.3; Charcoal 29.5	The data was taken from the 2006 IPCC Guidelines defaults, see chapter 1 Energy table

[1] Averaged CO_2 emissions from Kirk R. Smith, David M. Pennise (1999) Charcoal-Making Kilns in Thailand. Smith et al reported the CO2 emission as being between 970-1600 gCO_2/kg charcoal produced, 1285 is the average of that figure. Charcoal kilns are assumed to be similar or better in Thailand compared to Vietnam.

<table>
<tr><th>Parameter</th><th>Value</th><th>Verification opinion / Data source</th></tr>
<tr><td></td><td><table><tr><td>Coal</td><td>25.8</td></tr><tr><td>Firewood</td><td>15.6</td></tr><tr><td>Agriculture residues</td><td>11.6</td></tr><tr><td>Kerosene</td><td>43.8</td></tr></table></td><td>1.2 http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html.</td></tr>
<tr><td>GWP_{CH4} - Global Warming Potential (GWP) of methane</td><td>25 as from 01/01/2013</td><td>For the second commitment as from 2013-01-01, the GWP value of 25 is applied which is in accordance to EB69 report annex 3 and GS guidance on the application of GWP for Gold Standard project activities.
Therefore, the PP has applied the GWP value correctly.</td></tr>
<tr><td>GWP_{N2O} - Global Warming Potential (GWP) of nitrous oxide</td><td>298 as from 01/01/2013</td><td>For the second commitment as from 2013-01-01, the GWP value of 298 is applied which is in accordance to EB69 report annex 3 and GS guidance on the application of GWP for Gold Standard project activities.
Therefore, the PP has applied the GWP value correctly.</td></tr>
<tr><td>$VS_{(T)}$ - Daily volatile solid excreted for livestock category T</td><td><table><tr><td>Animal T</td><td>VS (T) kg/day</td></tr><tr><td>Pig</td><td>0.3</td></tr><tr><td>Buffalo</td><td>3.9</td></tr><tr><td>Dairy Cow</td><td>2.8</td></tr><tr><td>Cattle</td><td>2.3</td></tr></table></td><td>The default value applied was based on 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10. /IPCC/
http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html)</td></tr>
<tr><td>$Bo_{(T)}$ - Maximum methane production capacity for manure produced by livestock category T</td><td><table><tr><td>Animal T</td><td>VS (T) kg/day</td><td>Bo(T) m3CH4/ kgVS</td></tr><tr><td>Pig</td><td>0.3</td><td>0.29</td></tr><tr><td>Buffalo</td><td>3.9</td><td>0.1</td></tr><tr><td>Dairy Cow</td><td>2.8</td><td>0.13</td></tr><tr><td>Cattle</td><td>2.3</td><td>0.1</td></tr></table></td><td>The default value applied was based on 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10. /IPCC/
http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html)</td></tr>
<tr><td>$MCF_{(k)}$ - Methane conversion factor for each manure management system by climate region k</td><td>10% for bio-digester systems</td><td>The default value applied was based on 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10. /IPCC/
http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html)</td></tr>
</table>

Parameter	Value	Verification opinion / Data source
$EF_{awms,T,}$ - Animal waste methane emission factor by average temperatures	Animal T / EF ($kgCH_4$/head/yr): Temperate zone / Warm zone Pig: 5.00 / 7.00 Buffalo: 2.00 / 2.00 Dairy cow: 23.00 / 31.00 Cattle: 1.00 / 1.00	The default value applied was based on 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10. /IPCC/ http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html)
$\eta_{biogasstove:}$ Combustion efficiency of the biogas stove	98%	The value of 98% is the default value derived from the applied GS methodology: Indicative Programme, baseline, and monitoring methodology for Small Scale Bio-digester /GSM/

Refer findings CAR D1, CAR D2 and CL D3 raised and successfully closed out.

5.8. Contribution to sustainable development:

During the verification, the SD indicators were verified with regards to the appropriateness that will contribute to sustainable development.

It was evidenced that the project mainly contributes to sustainable development in under-developed and remote villages in Vietnam.

For details assessment of SD indicators, refer to section 5.5 above.

5.9. Monitoring report:

A Gold Standard Monitoring Report along with relevant supporting documents was submitted to the verification team by the project participants. These documents form the basis for the verification opinion of TÜV NORD.

During the verification, mistakes and needs for clarification were identified. The PP has carried out the requested corrections so that it can be confirmed that the Monitoring report is complete and transparent and accordance with the registered and revised PDDs, GS Passport and relevant GS requirements.

Refer CL C1 raised and closed out successfully.

5.10. Sampling:

5.10.1. Implementation of the sampling plan:

The PP has taken the approach for the sampling plan by adopting EB69 Annex 5 and EB69 Annex 4.

The CMS/KPT and usage survey sampling plan was designed with a confidence interval of at least 90/30 according to GS recommendation to ensure the households interviewed are representative.

The sample size for the CMS is 17 households (include a 10% oversampling) from 20 clusters (10 clusters from each temperate and warm zone). The purpose of the 10% oversampling is to support any of the main selected households are not available during the survey. The total households for CMS survey are 340.

For PFT survey 3 household per district, 20 clusters, 60 households and KPT survey 3 households per district for each baseline scenario per districts (total 9 households per district), 20 clusters, 180 households were selected.

For usage survey a sample size of 35 households (with oversampling of 5 households) from 8 aged group making a total of 280 households. /S2/ The purpose of the 5 households oversampling is to support any of the main selected households are not available during the survey.

The verification team has checked the sampling plan and considered appropriate since the number of households for each type of survey is representative. /S1/S2/BUS1/SD1/

5.10.2. Sampling approaches during verification:

The verification team has applied the sampling plan based on 90/30 confidence level according to GS recommendation to ensure the number households interviewed are representative.

The sample size of 234 households is selected from the clusters in the same village in different districts & provinces located in both temperate and warm zones. /LHH/ The selected households in the temperate zone provinces are Bac Ninh, Thai Binh, Bac Giang, Dac Lac, Gia Lai, Ha Nam, Ha Tinh, Hai Duong, Hoa Binh, Hung Yen, Ninh Binh, Quang Ninh, Thanh Hoa, Yen Bai, Ha Noi, Lao Cai, Nghe An, Nam Dinh, Tuyen Quang, Vinh Phuc.

The selected households in the warm zone provinces are Quang Nam, Binh Dinh, Can Tho, Khanh Hoa, Dong Nai, Long An, Tra Vinh and Quang Ngai. Therefore, the sampled households selected by the verification team are from both the two climatic zones to ensure the results are representative.

Furthermore, the verification team has cross checked with the below link to ensure the sample size of 234 is sufficient. With the number of households, the sample size for 95% CI with margin of error of 10% is 96. Therefore, the 234 sample of households is sufficient and meets the GS sampling requirements of 100. http://www.raosoft.com/samplesize.html /sz/

For details of the sampled households in the respective provinces, please refer to the list of sample households table 7-4 below of this report.

5.11. ER Calculation:

During the verification mistakes in the ER calculation were identified. Corresponding CARs were raised. A revised ER calculation was prepared by the PP and presented to the verification team. All raised issues were addressed appropriately so that all corresponding CARs and CLs could be closed out.

Baseline emission from thermal energy demand:

The baseline emissions are derived from the KPT results using the below equation.

$BE_{th,h} = \sum_i (f_{NRB,y} F_{i,bl,h} \times NCV_i \times EF_{CO2,i} + F_{i,bl,h} \times NCV_i \times EF_{nonCO2,i})$

Where:

BE_{thh}	Total baseline emissions from the thermal energy demand of one household (tCO_{2e}/hh/y)
$f_{NRB,y}$	Fraction of biomass used during year y that is non-renewable (100% for fossil fuel)
$F_{i,bl,h}$	Quantity of fuel i consumed in the baseline during year y (kg/household/year)
	Total amount of fuel type i in the baseline scenario (kg/year) of one household
NCV_i	Net calorific value of the fuel type i (TJ/ton of fuel)
$EF_{CO2,i}$	CO_2 emissions factor per unit of energy of fuel (tCO_{2e}/TJ)
$EF_{nonCO2,i}$	Non-CO_2 emissions factor per unit of energy of fuel (tCO_{2e}/TJ)

Emission for Baseline Scenario 1: Usage of fossil fuel, LPG

Therefore, $BE_{th,h,LPG}$ = 0.17 tCO_2e/hh/y

Emission for Baseline Scenario 2: Usage of firewood and agriculture residue.

Therefore, $BE_{th,h,,Biomass}$ = 5.71 tCO_2e/hh/y

Emission for Baseline Scenario 3: Usage of mixed fuel, fossil fule, firewood and agriculture residue.

Therefore, $BE_{th,h,\ Mix}$ = 5.13 tCO_2e/hh/y

Baseline Emission for fuel:

According to the TPDDTEC methodology, the 90/30 rule check are applied to all 3 scenarios. For the emission reduction with baseline scenarios 2 and 3 were met (see cell D13 and E13, tab "ER_fuel", ER spreadsheet) so the mean ER value was used. However, for the baseline scenario 1, the 90/30 rule was not met. Therefore, the 90% confidence rule (Lower bound of the one-sided 90% confidence interval) option was applied as specified on page 14 of the methodology:

"b. 90% confidence rule. When the sample sizes are such that the "90/30 rule" is not complied with, the emission or fuel saving result is not the mean (or average) test result, but a lower value, i.e. the LOWER BOUND of the one-sided 90% confidence interval"

The applied emission reductions for fuel is 4.45 tCO_{2e}/hh/y, therefore the baseline emission is the result of the project emission plus the calculated emission reductions. The weighted average emission reduction for fuel is therefore:

$BE_{th,h,}$ = 4.87 tCO_2e/hh/y

The detail calculation presented in the ER spreadsheet was verified as appropriate and correct.

Baseline emission from AWMS:

The baseline emissions from animal waste management systems is calculated as follows:

$$BE_{awms,h} = GWP_{CH4} * \sum_{T} \left(EF_{awms(T)} * N_{(T),h} \right)$$

Where:

$BE_{awms,h}$	Baseline emissions from handling of animal waste in premise h (tCO_{2e}/hh/y)
GWP_{CH4}	Global warming potential of methane (tCO_{2e}/tCH_4).
	The GWP applied for the second commitment period, 25 for CH_4 and 298 for N_20
$N_{(T),h}$	The number of animals of livestock species per category T
$EF_{awms(T)}$	Emission factor for the defined livestock population category T, (tCH_4/head/y). The relevant Default methane emission factor for livestock for default animal waste methane emission factors by temperature and region can be found in tables 10.14, 10.15 & 10.16 in Chapter 10: Emissions from Livestock and Manure Management, Volume 4 - Agriculture, Forestry and Other Land Use, 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

The baseline emissions from AWMS for this monitoring period as follows:

$BE_{AWMS, temperate}$ = 3.07 tCO_{2e}/hh/y

$BE_{AWMS, warm}$ = 5.36 tCO_{2e}/hh/y

For details calculations presented in the ER spreadsheet were verified and considered as correct.

Project Emissions:

The project emissions are from thermal energy demand derived from KPT test results

$PE_{th,h} = \sum_i (f_{NRB,y} F_{i,bl,h} \times NCV_i \times EF_{CO2,i} + F_{i,bl,h} \times NCV_i \times EF_{nonCO2,i})$

Where:

PE_{thh}	Total project emissions from the thermal energy demand of one household (tCO_{2e}/hh/y)
$f_{NRB,y}$	Fraction of biomass used during year y that is non-renewable (100% for fossil fuel)
$F_{i,bl,h}$	Quantity of fuel i consumed in the baseline during year y (kg/household/year)
	Total amount of fuel type i in the baseline scenario (kg/year) of one household

NCV_i Net calorific value of the fuel type i (TJ/ton of fuel)

$EF_{CO2,i}$ CO_2 emissions factor per unit of energy of fuel (tCO_{2e}/TJ)

$EF_{nonCO2,i}$ Non-CO_2 emissions factor per unit of energy of fuel (tCO_{2e}/TJ)

Therefore, project emissions for this monitoring period as follows:

$PE_{th,h,}$ = 0.42 tCO_{2e}/hh/y

The detail calculation presented in the ER spreadsheet was verified as appropriate and correct.

Leakage:

The leakage enmissions are from physical leakage and incomplete combustion of biogas, as well as emissions from the animal waste not treated in the bio-digester and emissions from bio-slurry storage.

The physical leakage from bio-digester per household is:

$PE_{awms,h,y}$ = 0.16 tCO_{2e}/hh/y (weighted average for temparate and warm zones)

Leakage emissions from digestate (bio-slurry) per household is:

$LE_{Bio\text{-}slurry}$ = 0.136 tCO_{2e}/hh/y (average for temparate and warm zones.

Emissions Reductions:

From the above calculations,

The cumulative emissions reductions for temperate zone is calculated as follows:

$$\boldsymbol{ER_{y,h} = U_{y,h} \times (BE_{y,h-}PE_{y,h}) ER_{y,h} = U_{y,h} \times (BE_{y,h-}PE_{y,h})\ x\ N_{p,y}}$$

= 7.24 tCO_{2e}/hh/y

= 763,413 tCO_2e

The cumulative emissions reductions for warm zone is calculated as follows:

$$\boldsymbol{ER_{y,h} = U_{y,h} \times (BE_{y,h-}PE_{y,h}) ER_{y,h} = U_{y,h} \times (BE_{y,h-}PE_{y,h})\ x\ N_{p,y}}$$

= 9.48 tCO_{2e}/hh/y

= 308,784 tCO_2e

Therefore, the emission reductions achieved for this monitoring period are **1,072,197 tCO_2e**.

The ER spreadsheet was reviewed and could confirmed is overall correct.

Refer finding CAR E1, CAR E2, CAR E3 and CAR E4 raised and successfully closed out.

5.12. Quality Management:

Quality Management procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel in the framework of this GS project activity have been defined. The procedures defined

can be assessed as appropriate for the purpose. No significant deviations thereof have been observed during the verification.

5.13. Comparison with ex-ante estimated emission reductions:

The MR includes a comparison of the calculated actual emission reductions with the ex-ante calculated values in the registered PDD.

Average Ex-Ante ERs per year: 589,125 tCO_2e

Ex-Ante ERs for this monitoring period (549 days): 917,301 tCO_2e

Ex-Post ERs for this monitoring period (549 days): 1,072,197 tCO_2e

Difference: 154,896 tCO_2e

The ex-post value is found to be 16.9% higher than the ex-ante determined value. The increase in ex-post ERs are due to:

1. Change of GWP for CH_4 from 21 to 25 as from 01/01/2013
2. the number of pigs per household for temperate zone is 24.52 pigs/HH and warm zone is 30.52 pigs/HH which is higher than in the registered PDD an average of 18.73 pigs/HH. Thus, increases the BE for AWMS.

Refer CL E5 raised and closed out successfully.

5.14. Overall Aspects of the Verification:

All necessary and requested documentation was provided by the project participants so that a complete verification of all relevant issues could be carried out.

Access was granted to all installed households which are relevant for the project performance and the monitoring activities.

No issues have been identified indicating that the implementation of the project activity and the steps to claim emission reductions are compliant with the GS requirements or any other scheme the monitoring is referring to.

5.15. Hints for next periodic Verification:

No FAR has been raised for consideration during the next monitoring period.

6. VERIFICATION AND CERTIFICATION STATEMENT

Nexus Carbon for Development Ltd has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 3rd periodic verification of CPI for the project: "*Biogas Program for Animal Husbandry Sector of Vietnam*", with regard to the relevant requirements for GS project activities. The project reduces GHG emissions due to displacement of non-renewable cooking fuel by biogas, avoidance of methane emission from animal and human waste by capturing and destroying methane for thermal energy use and displacement of chemical fertilizers by bio-slurry. This verification covers the period from 01/07/2013 to 31/12/2014 (including both days).

In the course of the verification, 13 Corrective Action Requests (CAR) and 5 Clarification Requests (CL) were raised and successfully closed. No Forward Action Request (FAR) was raised and needs to be checked in the next verification. The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the registered PDD, the validation report, emission reduction calculation worksheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document.
- the monitoring plan is in accordance with the applied approved GS methodology, i.e., Technologies and practices to displace decentralized thermal energy consumption, version 1.0.
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 3rd periodic verification of first renewable crediting period, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. The emission reductions are calculated in compliance with the monitoring plan and Gold Standard conservativeness principle. Furthermore, all parameters listed in the Sustainability monitoring plan are duly monitored and verified. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **1,072,197 tCO_2e**

Subang Jaya, 15/03/2018	Essen, 15/03/2018
Cheong, Chun Yuen (Robert)	Winter, Rainer
TÜV NORD JI/CDM Certification Program	TÜV NORD JI/CDM Certification Program
Verification Team Leader	Final Approval

7. REFERENCES

Table 7-1: Documents provided by the project participant(s)

Reference	Document
Monitoring Report	
/MR/	Monitoring report version 1.0 dated 2016-06-21 Monitoring report version 2.0 dated 2017-10-12 Monitoring report version 2.1 dated 2017-11-19 Monitoring report version 3.0 dated 2018-01-30
ER spreadsheet	
/ER/	MPIII Monitoring Database spreadsheet version 1.0 dated 2016-06-04 MPIII Monitoring Database spreadsheet version 2.0 dated 2017-10-12 MPIII Monitoring Database spreadsheet version 2.1 dated 2017-11-19 MPIII Monitoring Database spreadsheet version 2.3 dated 2018-03-05
Biogas Usage Survey	
BUS1	BUS 201 and Carbon Monitoring Survey report by EPRO Consulting JSC dated August 2016
Calibration	
/C1/	Calibration for weighing scales for KPT conducted by Quality Assurance and Testing Centre 1 issued on 12/04/2016
Survey database	
SD1	Survey Database dated 2016-06-06
Sampling	
/S1/	CMS & KPT survey sampling households version 1.0 dated 2015-07-14
/S2/	Usage survey sampling households version 1.0 dated 2015-12-10
Sustainable Indicator	
/SI1/	Air Quality – reduction in usage of fuel , ER spreadsheet SD sheet
SI2/	Soil condition – usage of bio-slurry ER spreadsheet SD sheet
/SI3/	Biodiversity – Savings in wood ER spreadsheet SD sheet
/SI4/	Quality employment ER spreadsheet SD sheet List of trained masons per district List of trained technicians per district

Reference	Document
/SI5/	Livelihood of the poor ER spreadsheet SD sheet
/SI6/	Access to affordable and clean energy services ER spreadsheet SD sheet
/SI7/	Technology transfer and technological self-reliance ER spreadsheet SD sheet
Forms	
/F1/	Biodigester unit form records: 1. Form 03 – Application for subsidy for building biodigester unit 2. Form 04 – Contract on technical and financial support for household building biodigester unit 3. Form 07 – Minute of final acceptance for constructed biodigester unit 4. Form 09 – Minute of inspection and evaluation of completed biodigester unit
Technology	
/T1/	Bio-digester KT1 and KT2 design parameters
Others	
/O1/	HHs agreement about VER transferring temperate and warm zones Agreement about VER transferring template translation
/O2/	Declaration No RECS Issued dated 2017-10-11
/O3/	Weight Calibration Report dated 2016-04-12
/O4/	Emission Reductions Acquistion Agreement dated 2015-30-12
/O5/	Development of Biomass Fuel Chain in Vietnam year 2012

Table 7-2: Background investigation and assessment documents

Reference	Document
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/EB69/	CDM EB 69 Report Annex 3: Standard for application of the global warming potentials to clean development mechanism project activities and programmes of activities for the second commitment period of the Kyoto Protocol
/EB77/	CDM EB 77 Meeting Report version 01.0
/GS/	Gold Standard version 2.1
/GSM/	Technologies and practices to displace decentralized thermal energy consumption, version 1.0 (TPDDTEC)

Reference	Document
/GSP/	Gold Standard Passport Version 3.1 dated 2012-09-25
/GSR/	GS MPII Issuance Review dated 2015-04-29
/GSS/	Guidelines for Sampling and Surveys for CDM Project Activities and Programme Of Activities, EB 69, Annex 5
/GST/	Gold Standard Toolkit version 2.1
/IPCC/	Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories: 1. Non-CO_2 Stationery Combustion 2. Emissions from Livestock and Manure Management (Chapter 10) 3. IPCC Second Assessment Report – Climate Change 1995: A Report of the Intergovernmental Panel on Climate Change
/PDD/	GS Registered Project Design Document Version 3.1 dated 2012-09-24
/PDD1/	GS Revised Project Design Document Version 4.0 dated 2017-09-11
/PLEAD/	Tool “Project and leakage emissions from anaerobic digesters” version 01.0.0 EB 66 Annex 32
/PS/	Project Standard Version 01
/SSS/	Standard for Sampling and Surveys for CDM Project Activities and Programme Of Activities, EB 69, Annex 4
/VAL/	Sustainability Validation Report, by TUV Rheinland, Version 02.2 dated 2012-10-25 (Report No. 01 997 9105066812-GS)
/VER/	Verification Report, Moniroting Report and ER spreadsheets for MPI and MPII
/VVS/	CDM Validation and Verification Standard (Version 01)

Table 7-3: Websites used

Reference	Link	Organisation
/dna-HP/	http://www.noccop.org.vn/	DNA of Vietnam
/dna-SP/	http://www.government.nl/ministries/ienm/organisation	DNA of Netherlands
/gs/	http://www.CDMgoldstandard.org/	CDM Gold Standard
/unfccc/	http://cdm.unfccc.int	UNFCCC

Reference	Link	Organisation
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/ss/	http://www.raosoft.com/samplesize.html	Raosoft

Table 7-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	Hoang Thanh Ha	Nexus / Technical Manager
/IM02/	V	☐ Mr. ☒ Ms	Nguyen Thi Thu Ha	SNV Vietnam / Advisor
/IM03/	V	☐ Mr. ☒ Ms	Luu Ngoc Anh	VN Biogas Programme / Coordinator
/IM04/	V	☒ Mr. ☐ Ms	Dao Ba Hoan	Quang Nam provincial BVP / Vice Director
	V	☒ Mr. ☐ Ms	Le Anh Duc	VBP / Quality Controller
	V	☒ Mr. ☐ Ms	Truong Can	Quang Nam province, Dai Loc district, Dai Chanh commune / Technician & Mason
	V	☒ Mr. ☐ Ms	Nguyen Hung	Quang Nam province, Dai Loc district, Dai Hiep commune / Mason
	V	☒ Mr. ☐ Ms	Ngo Van Thanh	Quang Nam province, Thang Binh district, Binh Chanh, Binh An commune / Mason
/IM05	V	☒ Mr. ☐ Ms	Nguyen Van Luong	VBP Bac Ninh Province, Gia Binh District / Technician
	V	☒ Mr. ☐ Ms	Huong Dinh Thuo	Bac Ninh Province, Gia Binh District, Binh Duong Commune / Mason
	V	☒ Mr. ☐ Ms	Le Cong Vu	Bac Ninh Province, Gia Binh District, Binh Duong Commune / Mason
	V	☒ Mr. ☐ Ms	Doan Cong Phuong	Bac Ninh Province, Gia Binh District, Cao Duc Commune / Mason
/IM06/	V	☒ Mr. ☐ Ms	Hoang Ngoc Tan	Thai Ninh Province, Vu Thu district, Bach Thuan commune / Mason

List of households visited: /LHH/

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
Bac Ninh province				
1	V	BNI-GB-TGB-801	Nguyễn Đức Quyền	Bac Ninh, Gia Binh, Gia Binh, Huong Vinh
2	V	BNI-GB-TGB-802	Phạm Thị Nhung	Bac Ninh, Gia Binh, Gia Binh, Dong Binh
3	V	BNI-GB-TGB-962	Hoàng Thị Hằng	Bac Ninh, Gia Binh, Gia Binh, Dong Binh
4	V	BNI-GB-TGB-1044	Trịnh Thị Nội	Bac Ninh, Gia Binh, Gia Binh, Huong Vinh
5	V	BNI-GB-TGB-1065	Hoàng Đăng Nhiêu	Bac Ninh, Gia Binh, Gia Binh, Dong Binh
6	V	BNI-GB-TGB-1064	Nguyễn Thị Hải	Bac Ninh, Gia Binh, Gia Binh, Huong Vinh
7	V	BNI-GB-TGB-1075	Nguyễn Xuân Bút	Bac Ninh, Gia Binh, Gia Binh, Huong Vinh
8	V	BNI-GB-BD-838	Nguyễn Gia Tỵ	Bac Ninh, Gia Binh, Binh Duong, Bung
9	V	BNI-GB-BD-839	Trần Như Chức	Bac Ninh, Gia Binh, Binh Duong, Bung
10	V	BNI-GB-BD-868	Phạm Văn Toàn	Bac Ninh, Gia Binh, Binh Duong, Bung
11	V	BNI-GB-BD-922	Lê Thị Hằng	Bac Ninh, Gia Binh, Binh Duong, Dia
12	V	BNI-GB-BD-993	Trần Xuân Diến	Bac Ninh, Gia Binh, Binh Duong, Bung
13	V	BNI-GB-BD-992	Nguyễn Thị Hạnh	Bac Ninh, Gia Binh, Binh Duong, Phuong Do
14	V	BNI-GB-BD-1026	Lê Công Thuyên	Bac Ninh, Gia Binh, Binh Duong, Dia
15	V	BNI-GB-BD-1029	Lê Công Chiến	Bac Ninh, Gia Binh, Binh Duong, Dia
16	V	BNI-GB-BD-1027	Phùng Văn Trọng	Bac Ninh, Gia Binh, Binh Duong, Dia
17	V	BNI-GB-CĐ-874	Nguyễn Văn Tuyến	Bac Ninh, Gia Binh, Cao Duc, Kenh Pho
18	V	BNI-GB-ĐB-472	Nguyen Xuan Trieu	Bac Ninh, Gia Binh, Cao Duc, Kenh Pho
19	V	BNI-GB-CĐ-378	Nguyen Van Huong	Bac Ninh, Gia Binh, Cao Duc, Tan Tien

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
20	V	BNI-GB-TB-225	Nguyen Duc Bay	Bac Ninh, Gia Binh, Thai Bao, Van Ty
21	V	BNI-GB-CD-862	Pham Dinh Dao	Bac Ninh, Gia Binh, Cao Duc, Tan Tien
Thai Binh province				
22	V	TBI- VT-BT-55	Nguyễn Hữu Hiệu	Thai Binh, Vu Thu, Bach Thuan, Toan Thang
23	V	TBI- VT-BT-51	Nguyễn Văn Hải	Thai Binh, Vu Thu, Bach Thuan, Lien Hong
24	V	TBI- VT-BT-46	Nguyễn Đình Quyến	Thai Binh, Vu Thu, Bach Thuan, Toan Thang
25	V	TBI- VT-BT-41	Phạm Văn Phong	Thai Binh, Vu Thu, Bach Thuan, Lien Hong
26	V	TBI- VT-BT-58	Trần Sách Trọng	Thai Binh, Vu Thu, Bach Thuan, Thuong Xuan
27	V	TBI- VT-BT-56	Đặng Thị Hải	Thai Binh, Vu Thu, Bach Thuan, Thuong Xuan
28	V	TBI- VT-BT-59	Trịnh Xuân Minh	Thai Binh, Vu Thu, Bach Thuan, Toan Thang
29	V	TBI- VT-BT-60	Nguyễn Văn Hùng	Thai Binh, Vu Thu, Bach Thuan, Tien Phong
30	V	TBI- VT-BT-61	Nguyễn Đình Dũng	Thai Binh, Vu Thu, Bach Thuan, Toan Thang
31	V	TBI- VT-BT-65	Nguyễn Văn Chiến	Thai Binh, Vu Thu, Bach Thuan, Toan Thang
32	V	TBI- VT-BT-72	Nguyễn Thị Hột	Thai Binh, Vu Thu, Bach Thuan, Toan Thang
33	V	TBI- VT-BT-67	Phạm Văn Thuân	Thai Binh, Vu Thu, Bach Thuan, Thuan Nghiep
34	V	TBI- VT-BT-68	Nguyễn Thị Phấn	Thai Binh, Vu Thu, Bach Thuan, Toan Thang
35	V	TBI- VT-BT-64	Trần Văn Thảo	Thai Binh, Vu Thu, Bach Thuan, Toan Thang

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
36	V	TBI- VT-BT-69	Nguyễn Đình Uyển	Thai Binh, Vu Thu, Bach Thuan, Toan Thang
37	V	TBI- VT-BT-167	Pham Van Truong	Thai Binh, Vu Thu, Bach Thuan, Bach Tinh
38	V	TBI- VT-BT-96	Trinh Van Chiem	Thai Binh, Vu Thu, Bach Thuan, Lien Hong
39	V	TBI- VT-BT-167	Nguyen Van Truong	Thai Binh, Vu Thu, Bach Thuan, Toan Thang
40	V	TBI- VT-BT-86	Pham Van Tu	Thai Binh, Vu Thu, Bach Thuan, Lien Hong
41	V	TBI- VT-BT-210	Pham Ba Thanh	Thai Binh, Vu Thu, Bach Thuan, Toan Thang
Quang Nam province				
42	V	QNA-ĐL-ĐC-53	Đoàn Văn Hùng	Quang Nam, Dai Loc, Dai Chanh, Tap Phuoc
43	V	QNA-ĐL-ĐC-71	Võ Văn Phương	Quang Nam, Dai Loc, Dai Chanh, Thanh Trung
44	V	QNA-ĐL-ĐC-79	Võ Ngọc Dinh	Quang Nam, Dai Loc, Dai Chanh, Thanh Trung
45	V	QNA-ĐL-ĐC-101	Đỗ Thế Tam	Quang Nam, Dai Loc, Dai Chanh, Thanh Trung
46	V	QNA-ĐL-ĐC-105	Nguyễn Văn Trung	Quang Nam, Dai Loc, Dai Chanh, Thanh Trung
47	V	QNA-ĐL-ĐCh-05	Trương Sáu	Quang Nam, Dai Loc, Dai Chanh, Thanh Trung
48	V	QNA-ĐL-ĐCh-168	Lưu Văn Mến	Quang Nam, Dai Loc, Dai Chanh, Dai Khuong
49	V	QNA-ĐL-ĐH-92	Nguyễn Hữu Trung	Quang Nam, Dai Loc, Dai Hiep, Dong Phu
50	V	QNA-ĐL-ĐH-106	Nguyễn Thêm	Quang Nam, Dai Loc, Dai Hiep, Tich Phu
51	V	QNA-ĐL-ĐH-107	Nguyễn Như Thành	Quang Nam, Dai Loc, Dai Hiep, Dong Phu

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
52	V	QNA-ĐL-ĐH-109	Chế Văn Hội	Quang Nam, Dai Loc, Dai Hiep, Dong Phu
53	V	QNA-ĐL-ĐH-120	Phan Văn Ánh	Quang Nam, Dai Loc, Dai Hiep, Tich Phu
54	V	QNA-ĐL-ĐH-119	Nguyễn Như Tuấn	Quang Nam, Dai Loc, Dai Hiep, Dong Phu
55	V	QNA-ĐL-ĐH-133	Nguyễn Ngọc Vinh	Quang Nam, Dai Loc, Dai Hiep, Dong Phu
56	V	QNA-ĐL-ĐH-110	Nguyễn Như Long	Quang Nam, Dai Loc, Dai Hiep, Dong Phu

List of households interviewed by telephone calls:/LHH/

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
1	T	AGI-CM-HA-52	Trần Văn Sáu	An Giang, Huyện Chợ Mới, xã Hội An, Ấp An Khương,
2	T	VTA-CD-CB-804	Nguyễn Khánh	Bà Rịa-Vũng Tàu, Huyện Châu Đức, Xã Cù Bị, Thôn Hiệp Cường
3	T	VTA-CD-SN- 404	Trần Thị Tâm	Bà Rịa-Vũng Tàu, Huyện Châu Đức, Xã Suối nghệ, Ấp Trung Sơn
4	T	VTA-XM-PT-439	Nguyễn Văn Bình	Bà Rịa-Vũng Tàu, Huyện Xuyên Mộc, Xã Phước Tân, Ấp Thạnh Sơn 2B
5	T	BGI-UN-MA-155	Vũ Văn Phú	Bắc Giang, Lục Ngạn, Xã Mỹ An, Thôn An Phú
6	T	BGI-TP-TP-082	Nguyễn Thị Thuận	Bắc Giang, Thành phố Bắc Giang, phường Trần Phú, Số Nhà 93 Đường Á Lữ
7	T	BGI-VY-QM-542	Trần Văn Biển	Bắc Giang, Việt Yên, xã Quang Châu, Thôn Đông Tiến
8	T	BLI-HB-VB-02	Liêu Thị Thê	Bạc Liêu, Hòa Bình, Xã Vĩnh Bình, Ấp Thạnh Hưng II
9	T	BNI-GB-ĐL-1054	Nguyễn Sĩ Nhu	Bắc Ninh, Gia Bình, Xã Đại Lai, Thôn Trung Thành ,
10	T	BNI-QV-PL-1190	Nguyễn Văn Sơn	Bắc Ninh, Quế Võ, Xã Phù Lãng, Thôn Phấn Trung

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
11	T	BNI-TT-ĐT-1618	Nguyễn Thị Thoả	Bắc Ninh, Thuận Thành, Xã Đình Tổ,Thôn Đại Trạch
12	T	BDI-AN-NK-871	Nguyễn Thành Mẫn	Bình Định, An Nhơn, Xã Nhơn Khánh,Thôn Khánh Hòa
13	T	BDI-PC-CT-265	Lê Hồng Sơn	Bình Định, Phù Cát, Xã Cát Thắng,Thôn Phú Giáo
14	T	CTH-OM-CVL-012	Trần Quốc Khành	Cần Thơ, Ô Môn, Phường Châu Văn Liêm,Khu Vực 14
15	T	DLA-EK-CH-536	Nguyễn Thị Thủy	Đắc Lắc, Ea Kar, Xã Cư Huê,Thôn Tứ Xuân
16	T	DNA-CM-SN-180	Lưu Thanh Tú	Đồng Nai, Cẩm Mỹ, Xã Sông Nhạn, Ấp 2
17	T	DNA-DQ-SN-069	Vũ Xuân Bân	Đồng Nai, Định Quán, Xã Suối Nho, Tổ 11,ấp 4
18	T	GLA-PT-CN-151	Đỗ Thị Lựu	Gia Lai, Phú Thiện, Xã Chưrô PơNan, Làng Bôn Sơ Ama Biơng
19	T	HTA-TT-DD-035	Trần Thị Hồng Cẩm	Gia Lai, Phú Thiện, Xã IaKe, Thôn Glung A
20	T	HNA-BL-HC-860	Trần Thị Dung	Hà Nam, Bình Lục, Xã Hưng Công, Thôn Hàn Mạc
21	T	HNA-KB-DH-056	Chu Văn Khải	Hà Nam, Kim Bảng, Xã Đồng Hoá, Thôn Yên Lạc
22	T	HNA-KB-VX-818	Nguyễn Thị Phượng	Hà Nam, Kim Bảng, Xã Văn Xá, Xóm 4
23	T	HNA-LN-HL-981	Lã Văn Thập	Hà Nam, Lý Nhân, Xã Hợp Lý, Xóm 7
24	T	HTI_CX_CN_662	Nguyễn Thị Ngôn	Hà Tĩnh, Cẩm Xuyên, Cẩm Nam, Thôn Hà Bắc
25	T	HDU-CL-CT-47	Trần Văn Hoan	Hải Dương, Chí Linh, Xã Cổ Thành, Thôn Lý Dương
26	T	HDU-KM-HS-03	Nguyễn Văn Khoả	Hải Dương, Kinh Môn, Xã Hoành Sơn, Thôn 2
27	T	HBI-LS-XH-089	Quách Thị Tỷ	Hoà Bình, Lạc Sơn, Xã Xuất Hoá, Xóm Vỏ
28	T	HYE-TPHY-TN-450	Vũ Viết Long	Hưng Yên, Thành phố Hưng Yên, Xã Trung Nghĩa, Thôn Đào Đặng

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
29	T	HYE-THY-TN-286	Trần Đăng Thuận	Hưng Yên, Thành phố Hưng Yên, Xã Trung Nghĩa, Thôn Đào Đặng
30	T	KHO-CL-CHN-068	Nguyễn Hữu Tình	Khánh Hòa, CAM LÂM, Xã Cam Hiệp Nam, Thôn Vĩnh Thái
31	T	KHO-CL-CT-329	Đinh Văn Báu	Khánh Hòa, CAM LÂM, Xã Cam Tân, Thôn Xuân Lập
32	T	KHO-CR-CN-103	Dương Văn Vinh	Khánh Hòa, CAM RANH, Phường Cam Nghĩa, Thôn Nghĩa Phú
33	T	KHO-NT-VN-067	Nguyễn Bùi Văn	Khánh Hòa, NHA TRANG, Xã Vĩnh Ngọc, Thôn Hòn Nghê I
34	T	NH-NĐ-015	Lê Văn Muốn	Khánh Hòa, NINH HOÀ, Xã Ninh Đông, Thôn Văn Định
35	T	LAN-CĐ-LK-16	Phạm Văn Hậu	Long An, Cần Đước, xã Long Khê, Ấp 4
36	T	LAN-TT-TH-11	Nguyễn Thị Giữ	Long An, Tân Thạnh, Xã Tân Hòa, Ấp Tây Bắc
37	T	NBI-GV-GP-513	Vũ Thị Niên	Ninh Bình, Huyện Gia Viễn, xã Gia Phú, Thôn Đồi
38	T	NBI-GV-GP-501	Hà Văn Giang	Ninh Bình, Huyện Gia Viễ, xã Gia Phú, Thôn Kính Chúc
39	T	NBI-GV-GX-368	Vũ Văn Tiến	Ninh Bình, Huyện Gia Viễn, xã Gia Xuân, Thôn Mưỡu Giáp
40	T	NBI-GV-GX-378	Phạm Công Quang	Ninh Bình, Huyện Gia Viễn, xã Gia Xuân, Thôn Mưỡu Giáp
41	T	NBI-KS-ĐH-575	Bùi Thị Thắm	Ninh Bình, Huyện Kim Sơn, xã Định Hoá, Xóm 7
42	T	NBI-YM-KT-1164	Nguyễn Thị Lư	Ninh Bình, Huyện Yên Mô, Xã Khánh Thượng, Xóm 3 Đồng Phú
43	T	QNA-ĐL-ĐQ-62	Nguyễn Chưởng	Quảng Nam, Huyện Đại Lộc, Xã Đại Quang, Thôn Hoà Thạch
44	T	QNA-DX-DP-41	Trương Thị Loan	Quảng Nam, Huyện Duy Xuyên, Xã Duy Phước, Thôn Mỹ Phước
45	T	QNA-TPTK-TX--3	Đinh Văn Cẩm	Quảng Nam, Thành phố Tam Kỳ, Phường Trường Xuân, Khối Phố 1

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
46	T	QNG-ST-TG-000460	Lê Văn Mến	Quảng Ngãi, Sơn Tịnh, Xã Tịnh Giang, Thôn Đông Hòa
47	T	QNG-ST-TM-000436	Nguyễn Chức	Quảng Ngãi, Sơn Tịnh, Xã Tịnh Minh, Thôn Minh Khánh
48	T	QNG-TN-NM-000596	Nguyễn Được	Quảng Ngãi, Tư Nghĩa, Xã Nghĩa Mỹ, Thôn Phú Mỹ
49	T	QNI-ĐT-TMK-1175	Lê Xuân Bẩy	Quảng Ninh, Đông Triều, Thị Trấn Mạo Khê, Khu Vĩnh Sinh, Tổ 10
50	T	QNI-CP-CH-07	La Văn Thành	Quảng Ninh, Thành Phố Cẩm Phả, Xã Cộng Hòa, Thôn Lạch Cát
51	T	QNI-QY-HH-788	Đinh Thị Thê	Quảng Ninh, TX.QUẢNG YÊN, Xã Hiệp Hòa, Thôn 8
52	T	QNI-QY-HH-798	Vũ Văn Tư	Quảng Ninh, TX.QUẢNG YÊN, Xã Hiệp Hòa, Thôn 16
53	T	QNI-QY-HH-700	Đinh Thị Thơ	Quảng Ninh, TX.QUẢNG YÊN, Xã Hiệp Hòa, Thôn 7
54	T	QNI-Qy-SK-720	Lê Bá Tuyển	Quảng Ninh, TX.QUẢNG YÊN, Xã Sông Khoai, Thôn 8
55	T	QNI-QY-SK-462	Đinh Văn Thành	Quảng Ninh, TX.QUẢNG YÊN, Xã Sông Khoai, Thôn 4
56	T	TBI- ĐH- HT - 404	Nguyễn Văn Tín	Thái Bình, Đông Hưng, Xã Hợp Tiến, Thôn Tân Bình
57	T	TBI- VT-BT-369	Phạm Thị Thuý	Thái Bình, Vũ Thư, Xã Bách Thuận, Thôn Bình Minh
58	T	TBI- VT-BT-305	Phạm Văn Lập	Thái Bình, Vũ Thư, Xã Bách Thuận, Thôn Bách Tính
59	T	THO-HT-HV-747	Nguyễn Văn Tâm	Thanh Hoá, Hà Trung, xã Hà Vân, Thôn 1
60	T	THO-HH-HĐ-445	Trần Xuân Tư	Thanh Hoá, Hoằng Hoá, xã Hoằng Đạt, Thôn Trù Ninh
61	T	THO-TH-TĐ-392	Lê Thiêm Ba	Thanh Hoá, Thiệu Hoá, xã Thiệu Đô, Thôn 10
62	T	THO-TH-TL-1043	Trương Thị Hòe	Thanh Hoá, Thiệu Hoá, xã Thiệu Long, Thôn Phú Lai

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
63	T	THO-TH-TT-439	Nguyễn Thị Phường	Thanh Hoá, Thiệu Hoá, xã Thiệu Thành, Thôn Thành Bảo
64	T	THO-TX-TTX-1527	Nguyễn Hồng Tuấn	Thanh Hoá, Thọ Xuân, Thị Trấn Thọ Xuân, Khu 2
65	T	THO-TG-HA-430	Nguyễn Trọng Thanh	Thanh Hoá, Tĩnh Gia, Xã Hải An, Thôn 5
66	T	THO-TS-MC-1093	Hà Xuân Hải	Thanh Hoá, Triệu Sơn, xã Minh Châu, Thôn 1
67	T	TVI-CL-ĐM-025	Nguyễn Văn Tỷ	Trà Vinh, Càng Long, Xã Đức Mỹ, Ấp Đức Mỹ
68	T	TVI-RC-TS-0222	Huỳnh Hữu Tài	Trà Vinh, Trà Cú, Xã Tân Sơn, Ấp Bến Thế
69	T	YBA-YB-BH-306	Hoàng Thị Mai Hiên	Yên Bái, Yên Bình, Xã Bạch Hà, Thôn 3 Phai Thao
70	T	HNO-SS-20-54	Lê Văn Kiểm	Hà Nội, Sóc Sơn, Xã Phù Linh, Thôn Cộng Hòa
71	T	HYE-TX-TN-008	Phạm Xuân Tặng	Hưng Yên, Ayun Pa, Xã Trung Nghĩa, Thôn Tính Linh
72	T	LCA -BY-VY-005	Nguyễn Tiến Sy	Lào Cai, Bảo Yên, Vĩnh Yên, Thôn Khuổi Vèng
73	T	NAN-DC-DH-1698	Tăng Đình Long	Nghệ An, Diễn Châu, Xã Diễn Hạnh, Thôn 1
74	T	NBI-YK-KH-347	Vũ Thị Ngoan	Ninh Bình, Huyện Yên Khánh, xã Khánh Hải, Xóm Thượng - Đông Mai
75	T	TBI- VT- HP-284	Nguyễn Xuân Du	Thái Bình, Vũ Thư, Xã Hồng Phong, Thôn Nghĩa Tường
76	T	THO-TX-TX-1373	Nguyễn Văn Tạo	Thanh Hoá, Thọ Xuân, Xã Thọ Xương, Thôn Mục Ngoại
77	T	THO-NT-CK-196	Lê Văn Hoa	Thanh Hoá, Như Thanh, Xã Cán Khê, Thôn 5
78	T	BGI-LN-ĐP-921	Đào Thị Huân	Bắc Giang, Lục Nam, Xã Đông Phú, Thôn Tân Tiến
79	T	BNI-TT-ĐT-1767	Nguyễn Văn Hoa	Bắc Ninh, Thuận Thành, Xã Đình Tổ, Thôn Đại Trạch

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
80	T	DLA-EK-XP-451	Lý Văn Thành	Đắc Lắc, Ea Kar, Xã Xuân Phú, Thôn Cao Sơn
81	T	GLA-AK-TA-96	Đặng Văn Hải	Gia Lai, An Khê, Xã Tú An, Thôn Cửu Đạo 2
82	T	HNA-LN-NC-1033	Trần Thị Liễu	Hà Nam, Lý Nhân, Xã Nhân Chính, Xóm 13
83	T	THI-CX-CTA-200	Phan Thị Hà	Hà Tĩnh, Cẩm Xuyên, xã Cẩm Thành, Thôn Đông Mỹ
84	T	HDU-NG-VP-91	Phạm Phú Biền	Hải Dương, Ninh Giang, Xã Vạn Phúc, Thôn 2
85	T	HYE-KC-TC-447	Lê Văn Bằng	Hưng Yên, Khoái Châu, xã Tân Châu, Thôn Mãn Hòa
86	T	NDI-HH-HS-319	Phạm Thị Liễu	Nam Định, Hải Hậu, Xã Hải Sơn, Xóm 9
87	T	NBI-KS-KM-426	Trần Văn Bản	Ninh Bình, Huyện Kim Sơn, xã Kim Mỹ, Thôn Tân Khẩn
88	T	QNI-QY-HH-939	Vũ Mạnh Cương	Quảng Ninh, Tx.Quang Yen , Xã Hiệp Hòa, Thôn 1
90	T	TBI-ĐH-ĐH-151	Lê Văn Lương	Thái Bình, Đông Hưng, Xã Đông Hoàng, Thôn Thái Hoà 1
91	T	TNG-TN-07-18	Dương Văn Khải	Thái Nguyên, Thành phố Thái Nguyên, Xã Phúc Trìu, Xóm Soi Mít
92	T	THO-TG-TD-356	Lê Thị Lan	Thanh Hoá, Tĩnh Gia, xã Triêu Dương, Thôn Thanh Cao
93	T	THO-TX-TTX-2372	Đặng Văn Dũng	Thanh Hoá, Thọ Xuân, Thị Trấn Thọ Xuân, Khu 2
94	T	TQU-SD-MT-008	Nguyễn Văn Thuật	Tuyên Quang, Sơn Dương, Xã Minh Thanh, Thôn Niếng
95	T	VPH-SL-QY-9	Nguyễn Thị Thư	Vĩnh Phúc, Sông Lô, Xã Quang Yên, Thôn Đá Đen
96	T	HNO-SS-20-169	Nguyễn Văn Hậu	Hà Nội, Soc Son, Xã Mỹ Hưng, Thôn Yên Tàng
97	T	HNO-SS-09-197	Nguyễn Xuân Bất	Hà Nội, Chuong My, Bac Phu, Thôn Bắc Vạng

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
98	T	HNO-SS-20-68	Lê Văn Tiến	Hà Nội, Me Linh, Tran Phu, Thôn Xuân Đồng
99	T	HNO-ML-15-86	Phùng Đình Thú	Hà Nội, Me Linh, Thach Da, Thôn 4, Đội 19
100	T	HNO-ML-15-30	Lưu Văn Hà	Hà Nội, Me Linh, Hoang Kim, Thôn Hoàng Xá
101	T	HNO-ML-15-103	Bùi Văn Thỏa	Hà Nội, Quang Xuong, Tam Dong, Thôn Cư An
102	T	THO-QX-QL-364	Lê Huy Thành	Thanh Hoa, Yen Dinh, Quang Long, Thôn Lộc Xá
103	T	THO-YĐ-TQL-239	Lê Thế Đào	Thanh Hoa, Tho Xuan, Quan Lao, Tiểu Khu 2
104	T	THO-TX-XP-1578	Lê Văn Thành	Thanh Hoa, Yen Dinh, Xuan Phong, Thôn 9
105	T	THO-YĐ-YP-229	Thiều Quang Thông	Thanh Hoa, Nong Cong, Yen Phu, Thôn 3
106	T	THO-NC-TL-211	Lê Văn Đảm	Thanh Hoa, Tho Xuan, Thang Long, Thôn Thập Lý
107	T	THO-TX-TX-2339	Nguyễn Văn Thêm	Thanh Hoa, Tho Xuan, Tho Xuong, Thôn Luận Văn 1
108	T	THO-TX-BL-2467	Nguyễn Hữu Hiệp	Thanh Hoa, Yen Dinh, Bac Luong, Thôn Nhuế Thôn 3
109	T	THO-YĐ-YP-683	Nguyễn Thị Huệ	Thanh Hoa, Ha Trung, Yen Phu, Thôn 1
110	T	THO-HT-HL-733	Nguyễn Thị Hải Yến	Thanh Hoa, Thach Thanh, Ha Linh, Thôn 2
111	T	THO-TT-TT-852	Bùi Thị Hồng	Thanh Hoa, Hoang Hoa, Thanh Tho, Thôn Phú Cốc
112	T	THO-HH-HP-492	Nguyễn Thị Hoài	Thanh Hoa, Thuong Xuan, Hoang Phuc, Thôn Thọ Văn
113	T	THO-TXU-XD-162	Phạm Thị Uyên	Thanh Hoa, Bim Son, Xuan Duong, Thôn Xuân Thịnh
114	T	THO-BS-BĐ-123	Đặng Thị Phương	Thanh Hoa, Yen Dinh, Ba Dinh, Khu 7
115	T	THO-YĐ-YP-630	Bùi Thị Trang	Thanh Hoa, quang Xuong, Yen Phong, Thôn 8

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
116	T	THO-QX-QH-368	Trần Thị Hà	Thanh Hoa, Ha Trung, Quang Hoa, Thôn 07
117	T	THO-HT-HL-740	Lê Thị Thịnh	Thanh Hoa, My Hao, Ha Linh, Thôn 10
118	T	HYE-MH-NH-93	Phạm Quốc Huấn	Hưng Yên|, My Hao, My Duc, Thôn Dương Hòa
119	T	HYE-MH- NH-094	Hoàng Văn Bẩy	Hưng Yên|, Khoai Chau, Nhan Hoa, Thôn Lỗ Xá
120	T	HYE-KC-AV-041	Hoàng Văn Công	Hưng Yên|, Khoai Chau, An Vi, Thôn Lỗ Xá
121	T	HYE-KC-DN-042	Đàm Trọng Vân	Hưng Yên|, Tan tru, Dong Ninh, Thôn Trung
122	T	LAN-TTR-NN-002	Mai Bá Đền	Long An, Tan Tru, Nhut Ninh, Ấp Nhựt Hòa
123	T	LAN-TR-NN-001	Nguyễn Hồng Đô	Long An, Can Duoc, Nhat Ninh, Ấp Bình Thạnh
124	T	LAN-CĐ-TL-10	Nguyễn Văn Vũ	Long An, Can Duoc, Tan Lan, Ấp Bình Hòa
125	T	LAN-CĐ-TL-12	Trần Thị Ba	Long An, Tan An, Tan Lan, Ấp Bình Hòa
126	T	LAN-TA-P4-001	Trương Thị Nhiều	Long An, Duc Hoa, Phuong 4, Số 10/11, Võ Văn Môn
127	T	LAN-ĐHO-ĐLT-02	Lê Minh Huy	Long An, Dong Hung, Duc Lap Thuong, Ấp Đức Ngãi 2
128	T	LAN-ĐHU-MTĐ-06	Trần Văn Làm	Long An, Tan Thanh, My Thanh, Ấp 3
129	T	LAN-TT-TN-25	Nguyễn Văn Điền	Long An, Tan Thanh, Tan Ninh, Ấp Năm Ngàn
130	T	LAN-TT-BH-11	Dương Thị Hoàng Yến	Long An, Tan Than,h Bac Hoa, Ấp Nhơn Hòa
131	T	LAN-TA-NTT-04	Nguyễn Văn Muôn	Long An, Tan An,Nhon Thach, Ấp Bình Trung 2
132	T	LAN-TA-NTT-07	Nguyễn Thành Lý	Long An, Tan An,Nhon Thạnh, Ấp Nhơn Thuận
133	T	LAN-THO-TB-01	Phan Văn Hiền	Long An, Thanh Hoa, Thuan Binh, Ấp T3

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
134	T	LAN-TT-NN-015	Trần Văn Màng	Long An, Tan Thanh, Nhin Ninh, Ấp Trại Lòn Bắc
135	T	VPH-LT-VQ-205	Nguyễn Thị Thanh Huyền	Vinh Phuc, Lap Thach, Van Quan, Thôn Xuân Quang
136	T	VPH-PY-TC-52	Nguyễn Văn Minh	Vinh Phuc, Phuc Yen, Tien Chau, Thôn Đại Lợi
137	T	VPH-SL-ĐB-42	Lê Cao Quỳnh	Vinh Phuc, Song Lo, Duc Bac, Thôn Giáp Trung
138	T	VPH-TD-AH-114	Nguyễn Văn Quân	Vinh Phuc, Tam Duong, An Hoa, Thôn Đô Lương
139	T	VPH-TD-HH-115	Nguyễn Văn Thọ	Vinh Phuc, Tam Duong, Hoang Ha, Thôn 6
140	T	VPH-TD-AH-122	Lê Đức Dưỡng	Vinh Phuc, Tam Duong, An Hoa, Thôn Nội Điện
141	T	VPH-TD-TV-84	Nguyễn Công Khai	Vinh Phuc, Tam Duong, Thanh Van, Thôn Phú Ninh
142	T	VPH-TD-TV-085	Nguyễn Thị Miền	Vinh Phuc, Tam Duong, Thanh Van, Thôn Phú Ninh
143	T	VPH-TD-ĐT-241	Nguyễn Văn Sửu	Vinh Phuc, Tam Duon,g Dao Tu, Cẩm Trạch
144	T	VPH-TD-HĐ-233	Phùng Văn Nông	Vinh Phuc, Tam Duong, Huong Dao, Thôn 5
145	T	VPH-TD-HĐ-228	Nguyễn Thị Mít	Vinh Phuc, Tam Duong, Huong Dao, Phú Cường
146	T	VPH-TD-HH-278	Nguyễn Thị Duyên	Vinh Phuc, Tam Duong, Huong Hoa, Khu 6
147	T	TVI-CK-HT-0219	Nguyễn Văn Giãng	Trà Vinh, Cau Ke, Hoa Tan, Ấp Hội An
148	T	TVI-CK-PP-0228	Thạch Thị Sươne	Trà Vinh, Cau Ke, Phong Phu, Ấp Kinh Xáng
149	T	TVI-CL-ĐM-0276	Trần Thanh Sơn	Trà Vinh, Cang Long, Duc My, Ấp Đại Đức

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
150	T	TVI-DH-LT-010	Lê Văn Sàng	Trà Vinh, Duyen Hai, Long Toan, Ấp Long Thạnh
151	T	TVI-DH-LK-011	Kim Sương	Trà Vinh, Duyen Ha,i Long Khanh, Ấp Đình Cũ
152	T	TVI-TC-T-0310	Nguyễn Tuyết Lâm	Trà Vinh, Tieu Cau, Long Tho,i Ấp Định Phú B
153	T	TVI-CK-PT-0260	Bùi Thị Đầm	Trà Vinh, Cau Ke, Phong Thanh, Ấp Xóm Giữa
154	T	TVI-CK-APT-0161	Nguyễn Văn Vinh	Trà Vinh, Cau Ke, Phu Tan, Âp An Trại
155	T	TQU-HY-TH-038	Đinh Văn Lợi	Tuyen Quang, Ham Yen, Thai Hoa, Thôn Khánh An
156	T	TQU-NH-SP-001	Hà Văn Tuyển	Tuyen Quang, Na Hang, Son Phu, Thôn Bản Lằn
157	T	TQU-SD-TY-001	Phạm Thế Thế	Tuyen Quang, Son Duong, Trung Yen, Thôn Trung Long
158	T	TQU-SD-MT-25	NGUYỄN VĂN TIẾN	Tuyen Quang, Son Duong, Minh Thanh, Thôn Cả
159	T	TQU-SD-HL-014	Dương Văn Minh	Tuyen Quang, Son Duong, Hong Lac, Thôn Cây Châm
160	T	TQU-YS-MB-052	Phạm Văn Tĩnh	Tuyen Quang, Yen Son, My Bang, Thôn Cây Quân
161	T	TQU-YS-NH-023	Lê Văn Tuyên	Tuyen Quang, Yen Son, Nhu Han, Thôn Liên Minh 2
162	T	TQU-YS-PN-038	Tô Văn Bình	Tuyen Quang, Yen Son, Phuc Ninh, Thôn Thái Ninh
163	T	TQU-YS-NH-052	Nguyễn Hữu Thành	Tuyen Quang, Yen Son, Nhu Han, Đội 11
164	T	TQU-YS-MB-031	Nguyễn Thu Hương	Tuyen Quang, Yen Son, My Bang, Thôn 13
165	T	HTI-CX-CM-264	Trần Như Hà	Ha Tinh, Cam Xuyen, Cam My, Thôn 12

No.	MoI[1]	Plant Code	Household Name	Location (Province, District, Commune, Village)
166	T	HTI-CX-CTHI-12	Hà Văn Vang	Ha Tinh, Cam Xuyen, Cam Thinh, Thôn 2
167	T	HTI-HS-ST-48	Phan Thanh Hải	Ha Tinh, Huong Son, Son Tien, Xóm 9
168	T	HTI-HS-STI-53	Phan Đình	Ha Tinh, Huong Son, Son Tien, Xóm 13
169	T	HTI-HS-STI-51	Phan Văn Phúc	Ha Tinh, Huong Son, Son Tien, Xóm 15
170	T	HTI-TH-TTA-56	Nguyễn Văn Báu	Ha Tinh, Tan Hong, Thach Tan, Xóm 17
171	T	HTI_TH_NH_127	Lê Hữu Khánh	Ha Tinh, Tan Hong Nam, Huong Thôn, Việt Yên
172	T	HTI_CX_CD_895	Võ Tá Phương	Ha Tinh, Cam Xuyen, Cam Due, Thôn 11
173	T	HNA-BL-BC-682	Lê Công Định	Ha Nam, Binh Luc, Boi Cau, Thôn Viễn Lai
174	T	HNA-BL-NL-717	Đào Thị Liệu	Ha Nam, Binh Luc, Ngoc Lu, Đội 1
175	T	HNA-DT-TN-707	Đặng Văn Sanh	Ha Nam, Duy Tien, Tien Ngoai, Thôn Thượng
176	T	HNA-LN-HL-755	Nguyễn Văn Hưng	Ha Nam, Ly Nhan, Hop Ly, Xóm 2
177	T	HNA-DT-MB-635	Nguyễn Văn Thành	Ha Nam, Duy Tien, Moc Bac, Thôn Dỹ Phố - Xóm 6
178	T	HNA-LN-HL-834	Nguyễn Văn Khiết	Ha Nam, Ly Nhan, Hop Ly, Thôn Phúc Thuỷ - Xóm 6

[1)] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

ANNEX

A1: Verification Protocol

A2: Statements of Competence of involved Personnel

ANNEX 1: VERIFICATION PROTOCOL

Table A-1: GHG calculation procedures and management control testing / detailed audit testing of residual risk areas and random testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
Raw data generation				
• Installation of measuring equipment • Dysfunction of installed equipment • Maloperation by operational personnel • Downtimes of equipment • Exchange of equipment • Change of measurement equipment characteristic • Insufficient accuracy • Change of technology	• Installation of modern and state of the art equipment • Process control automation • Internal data review • Regular visual inspect-ions of installed equip-ment • Only skilled and trained personnel operates the relevant equipment • Daily raw data checks • Immediate exchange of dysfunctional equipment • Stand-by duty is organized	• Inadequate installation / operation of the monitoring equipment • Inadequate exchange of equipment • Change of personnel • Undetected measurement errors • Inappropriateness of Management system procedures w.r.t. monitoring plan requirements (e.g. substitute value strategies) • Non-application of management system procedures • Insufficient accuracy	• Site – visit • Check of equipment • Check of technical data sheets • Check of suppliers information / guarantees • Check of calibration records, if applicable • Check of maintenance records • Counter-check of raw data and commercial data • Check of CDM management system • Check of CDM related procedures	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
• Accuracy of values supplied by Third Parties	• Training • Internal audit procedures • Internal check of QA/QC measures of involved Third Parties	• Inappropriate QA/QC measures of Third Parties	• Application of CDM management system procedures • Check of trainings • Check of responsibilities • Check of QA/QC documentation / evidences of involved Third Parties	
Raw data collection and data aggregation				
• Wrong data transfer from raw data to daily and monthly aggregated reporting forms • IT Systems • Spread sheet programming • Manual data transmission • Data protection • Responsibilities	• Cross-check of data • Plausibility checks of various parameters. • Appropriate archiving system • Clear allocation of responsibilities • Application of CDM Management system procedures	• Unintended usage of old data that has been revised • Incomplete documentation • Ex-post corrections of records • Ambiguous sources of information • Non-application of management system procedures • Manual data transfer mistakes	• Check of data aggregation steps • Counter-calculation • Data integrity checks by means of graphical data analysis and calculation of specific performance figures • Check of management system certification • Check of data archiving system	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
	• Usage of standard software solutions (Spreadsheets) • Limited access to IT systems • Data protection procedures	• Unintended change of spread sheet programming or data base entries • Problems caused by updating/upgrading or change of applied software	• Check of application of Management system procedures	
Other calculation parameters				
• Emission factors, oxidation factors, coefficients	• The values and data sources applied are defined in the PDD and monitoring plan	• Unintended or intended Modification of calculation parameters • Wrong application of values • Misinterpretations of the applied methodology and/ or the PDD • Missing update of applicable regulatory framework (e.g. IPCC values)	• Update-check of regulatory framework • Countercheck of the applied MP in the MR against the methodology and the PDD	• **See Table A-2**
Calculation Methods				

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
• Applied formulae • Miscalculation • Mistakes in spread-sheet calculation	• Advanced calculation and reporting tools • A CDM coordinator is in charge of the CDM related calculations • Usage of tested / counterchecked Excel spreadsheets • Involvement of external consultants	• The danger of miscal-culation can only be minimized.	• Countercheck on the basis of own calculation. • Spread sheet walk-trough. • Plausibility checks • Check of plots	• **See Table A-2**
Monitoring reporting				
• Data transfer to the author of the monitoring report • Data transfer to the monitoring report • Unintended use of outdated versions	• An experienced CDM consultant is responsible for monitoring reporting. • CDM QMS procedures are defined	• The danger of data transfer mistakes can only be minimized • Inappropriate application of QMS procedures	• Counter check with evidences provided. • Audit of procedure application	• **See Table A-2**

Table A-2: (Project specific) Periodic Verification Checklist

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
A. Description of the project activity				
***A.1.* Purpose and general description of the project activity** *Check if the MR includes the following:* - *Purpose of the PA and the measures taken to reduce GHG emissions* - *Brief description of the installed technology and equipment* - *Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods etc.)* - *Total emission reductions achieved in this monitoring period*	/MR/	The verification team has checked section the MR and confirms that the information provided is complete and correct with regards to the following: ☒ Purpose of the PA and the measures taken to reduce GHG emissions ☒ Brief description of the installed technology and equipment ☒ Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods etc ☒ Total emission reductions achieved in this monitoring period In this context no findings have been identified:	OK	OK
***A.2.* Location of project activity** *Check if the MR reflects correctly the following:* - *Host Party(ies)* - *Region / State / Province etc.* - *City / Town / Community etc.* - *Physical / geographical location (e.g. Latitude and Longitude)*	/MR/ /PDD/ /IM01/	The verification team has checked the MR and confirms by means of comparison with the information given in the PDD and information gathered during the site visit that the information provided is complete and correct with regards to the following: ☒ Host Party(ies) ☒ Region / State / Province ☒ City / Town / Community ☒ Physical / Geographical location In this context no findings have been identified:	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
A.3. **Parties and Project Participants** *Check if the MR includes all PPs:* - *All PPs as displayed on the GS website*	/MR/ /gs/	The verification team has checked the MR as well as the GS website and confirms that: ☒ all PPs as displayed on the project related GS website are correctly listed In this context no findings have been identified:	OK	OK
A.4. **Reference of applied methodology** *Check if the MR correctly describes / includes the following:* - *Reference to the applicable version of the methodology* - *Reference to the applicable version(s) of relevant methodological tools*	/MR/ /PDD/ /gs/	The verification team has checked the MR and confirms by means of comparison with the information given in the PDD and displayed on the UNFCCC/ GS website that the information provided is complete and correct with regards to the following: ☒ Number, title and version of the applicable GSF Methodology ☒ Name and version of applicable GSF methodological tools In this context no findings have been identified:	OK	OK
A.5. **Crediting period of project activity** *Check if the MR correctly includes the following:* - *Start date of the crediting period.* - *Length and type of the crediting period*	/MR/ /gs/	The verification team has checked the MR and confirms by means of comparison with the information displayed on the GS website that the information provided is complete and correct with regards to the following: ☒ Start date of the crediting period. ☒ Type and length of the crediting period In this context no findings have been identified:	OK	OK
A.6. **Publication of the Verification Work Plan and monitoring report**	/gs/	The verification work plan has been uploaded to the GS Registry on 19/09/2017.	OK	OK
B. Implementation of project activity				

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
B.1. **Description of implemented registered project activity** *Check if the MR correctly describes / includes the following:* - *Implementation status of the PA* - *Detailed description of installed technology(ies) / technical processes and equipment applied*	/MR/ /PDD/ /GSP/ /IM01/	The verification team has checked the MR and confirms by means of comparison with the information given in the PDD and the GS Passport/GSP/, the project standard and information gathered during the site visit that: ☒ the description of the implementation status of the PA is in line with the applicable provisions of the Gold Standard Requirements and Toolkit ☐ an appropriate description of the installed technology(ies), technical process and equipment has been included In this context following finding has been identified: Refer CAR.B1 raised.	~~CAR.B1~~	OK
B.1.1. Initial project implementation *Assess whether the project has been implemented and operated as per the registered PDD and are all physical features of the project in place?* *Further focus on the potential phase wise implementation and check the reporting on the corresponding status and starting dates accordingly.* *Check if the project is still in compliance with the applicability conditions of the methodology.*	/MR/ /PDD1/ /IM01/	The verification team has checked the implemented project activity and the MR and confirms by means of comparison with the information given in the PDD, the applicable Gold Standard Requirements and Toolkit and information gathered during the site visit that: ☒ the project has been implemented and operated as per the registered PDD and the GS Passport and all physical features of the project are in place ☒ the project has been implemented phase wise and corresponding evidence has been provided ☒ the project is still in compliance with the applied methodology In this context no findings have been identified:	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
B.1.2. Technical equipment changes *Check if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period. Further ensure that consistent notations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied.* *Consider e.g. interviews with operational personnel, QMS records, maintenance records, instrument specifications.* *In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.*	/MR/ /PDD1/ /GSP/ /GST/ /IM01/	The verification team has checked the implemented project activity and the MR and confirms by means of comparison with the information given in the PDD, the applicable Gold Standard Requirements and Toolkit and information gathered during the site visit and interviews that: ☒ no technical equipment has been exchanged or modified during the monitoring period ☒ the notations of key equipment are consistently applied in the project documentation In this context no findings have been identified:	OK	OK
B.1.3. Operation of the project activity *Check if relevant operation modes of the project activity have been exchanged or modified during the monitoring period.* *Consider e.g. interviews with operational personnel, operation log sheets, data management system records.* *In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.*	/MR/ /GSP/ /GST/ /PDD1/	The verification team has checked the implemented project activity and the MR and confirms by means of comparison with the information given in the PDD, the applicable Gold Standard Requirements and Toolkit and information gathered during the site visit and interviews that: ☒ no relevant operation modes of the project activity have been exchanged or modified during the monitoring period ☐ the following changes have been adopted during the monitoring period, however the project is still in line with the registered PDD: Refer CL B3 raised	~~CL B3~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
B.1.4. Incidents *Identify if there have been any significant incidents, deviant operation modes and / or downtimes of the equipment?* *Consider e.g. interviews with operational personnel, operational log sheets, analysis of performance data.*	/MR/ /onsite/	The verification team has checked the implemented project activity and the MR and confirms by means of comparison with the information given in the PDD, the applicable Gold Standard Requirements and Toolkit and information gathered during the site visit and interviews that: ☒ no significant incidents, deviant operation modes and / or downtimes of the equipment happened during the monitoring period ☐ the following incidents, deviant operation modes and / or downtimes of the equipment happened during the monitoring period:	OK	OK
B.1.5. Legislation Find out – esp. in the context of methodological requirements - whether relevant legislation with effect on the project activity in the host country has been changed. Assess, in case of changes, whether consequences for the PA with regard to relevant GS requirements have been accounted for. In case of changes data sources shall be referenced.	/MR/ /IM01/	The verification team has checked the host country legislation and confirms by means of comparison with the implemented project that: ☒ no relevant legislation with effect on the project activity in the host country has been changed In this context no findings have been identified.	OK	OK
B.1.6. Open issues from GS validation *Check (esp. in case of 1st periodic verification) whether there are any open issues indicated in the validation report (e.g. FAR)?*	/VAL/	☐ There were no open issues addressed in the validation report ☒ All open issues from the validation have been appropriately addressed. ☐ The following issues related to the validation have not yet been appropriately addressed:	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
B.1.7. Open issues from previous verification *Check in case of further periodic verifications whether there are any open issues indicated in previous verification reports (FAR).*	/VER/ /GSR/	☐ There were no open issues addressed in the previous verification report ☐ All open issues from the previous verification have been appropriately addressed. ☒ The following issues related to the previous verification have not yet been appropriately addressed: Refer CL B2 raised.	~~CL B2~~	OK
C. Description of monitoring system				
C.1. **Monitoring Plan – PDD and GS Passport Compliance** *Check if the monitoring plan is in accordance with the monitoring plan contained in the registered GS PDD (or any accepted revised MP).* *Please check esp. if* - *all parameters stated in the MP of the registered PDD have been monitored and updated as applicable* - *the monitoring equipment has been controlled and calibrated as per the MP* - *the monitoring results are consistently recorded as per the approved frequency* - *QA/QC procedures have been applied in accordance with the MP*	/MR/ /PDD/ /PDD1/ /GSP/	By means of comparison of the MR with the registered / revised GS PDD (or any revisions thereof) the verification team has checked whether the MP is in compliance with the registered GS PDD and GS Passport. The outcome is as follows: ☐ The MP is completely in accordance with the last registered / revised version of the PDD / MP / GS Passport. In this context the below finding has been identified: Refer CAR C1 and CAR C2 raised	~~CAR C1~~ ~~CAR C2~~	OK OK

<table>
<tr><th>Checklist Item
(incl. guidance for the verification team)</th><th>Refe-rence</th><th>Verification Team Comments
(Means and results of assessment)</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr>
<td>C.2. Monitoring Plan – Meth Compliance
Check if the monitoring plan is in accordance with the applied methodology.
In case the methodology references applicable tools it has to be ensured that the MP is also compliant with those tools.
Also please specify if monitoring aspects have been identified that are not specified in the methodology but may enhance the level of accuracy and completeness of the monitoring plan – this esp. applies for SSC PAs.</td>
<td>/MR/
/PDD/
/PDD1/
/GST/
/AT/
/PLEAD/</td>
<td>By means of comparison of the MR with the applied Gold Standard methodology and related tools the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology. The outcome is as follows:
☒ The MP is completely in accordance with the applied methodology by the GS project (last registered / revised version of the GS PDD)
☒ The MP is completely in accordance with the applied tools which the methodology references. A breakdown of the referenced tools is as follows:
<table>
<tr><td>1</td><td>Title (of the tool)</td><td>Gold Standard Toolkit</td></tr>
<tr><td></td><td>Version</td><td>2.1</td></tr>
<tr><td></td><td>MP compliance</td><td>☒ full compliance
☐ findings have been raised
☐ N/A (for MP)</td></tr>
<tr><td>2</td><td>Title (of the tool)</td><td>Tool for the demonstration and assessment of additionality</td></tr>
<tr><td></td><td>Version</td><td>6.1</td></tr>
<tr><td></td><td>MP compliance</td><td>☐ full compliance
☐ findings have been raised
☒ N/A (for MP)</td></tr>
</table>
</td>
<td>OK</td>
<td>OK</td>
</tr>
</table>

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		3 | Title (of the tool) | Tool Project and leakage emissions from anaerobic digesters Version | 01.0.0 MP compliance | ☒ full compliance ☐ findings have been raised ☐ N/A (for MP) In this context no findings have been identified:		
C.3. **Management System** *Check if the GHG data monitoring system can be assessed as appropriate.* *In case reference is made to a (certified) company quality management system, check if all GHG related monitoring procedures have been fully integrated in the project participant's quality management system.* *In case of a stand-alone system, check how the GHG management system has been implemented and effectiveness is ensured.*	/MR/ /GSP/ /PDD1/	*Description:* The monitoring system is described in Section C of the MR including monitoring and survey methods applied. 1. Quality control measures 2. Carbon monitoring survey 3. Usage survey A project database which is established and managed by the project management unit office in Hanoi. *Verifier´s action:* The project database, survey procedures and forms have been reviewed by the verification team. The verification team as interviewed relevant district and provincial technicians to confirm the quality control and monitoring procedures are implemented appropriately. *Conclusion:*	~~CAR C1~~ ~~CAR C2~~ ~~CAR B3~~	OK OK OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		The management system was set up as a stand-alone system to monitor the biogas program. Refer CAR C1, CAR C2 and CAR B3 raised		
C.4. **Roles and Responsibilities** *Check if all roles and positions of each person in the GHG data management process are clearly defined and implemented as stated in the monitoring plan. Please consider the complete data trail from raw data generation to submission of the final data.* *In case of changes, assure that the implemented monitoring procedures have not been affected.*	/MR/ /PDD1/	*Description:* Section C described the monitoring system which includes monitoring methods applied for: 1. Quality control measures 2. Carbon monitoring survey 3. Usage survey *Verifier´s action:* Section C of MR was reviewed and the roles and responsibilities are not defined. *Conclusion:* No inconsistencies found.	OK	OK
C.5. **Emergency procedures for the monitoring system** *Check, as appropriate, whether relevant emergency procedures for the monitoring system have been included in the MR and assess whether these procedures have been implemented, when required*	/MR/ /PDD1/ /IM01/ /IM02/ /IM03/	*Description:* Emergency procedures are included in the MR. *Verifier´s action:* The verification team has interviewed the representatives of Nexu-Carbon for Development, SNV Vietnam and Biogas Project Management Unit in visited provinces on how the emergency procedures are implemented for the program. Emergency procedures are implemented. *Conclusion:*	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		No inconsistencies found		
C.6. **Data archive and data protection** *Check whether all records of monitoring parameters are archived according to the monitoring plan.* *Assess further whether appropriate measures have been taken in order to avoid unintended or intended manipulation or loss of the measured data.*	/MR/ /PDD1/ /IM01/	*Description:* Data archiving and data protection included in the MR. *Verifier´s action:* Review of MR and cross-checked in server for data archiving and data protection. *Conclusion:* No inconsistences found.	OK	OK
D. Data and parameters				
D.1. **Data and Parameters fixed ex ante and ex post**				
D.1.1. Compliance with registered PDD and the applied methodology (ex-ante) *Check whether the value applied is in compliance with the registered PDD and the applied methodology or any other tool.*	/MR/ /PDD1/	By means of comparison of the MR with the registered PDD (or any revisions thereof) the verification team confirms that: ☒ all ex ante data and parameters are in compliance with the registered PDD and the applied methodology or any other tool. In this context no findings have been identified:	OK	OK OK
D.1.2. Compliance with registered PDD and the applied methodology (ex post) *Check whether the value applied is in compliance with the registered PDD and the applied methodology or any other tool.*	/MR/ /PDD1/	By means of comparison of the MR with the registered PDD (and the revision) the verification team confirms that: ☒ all ex post and parameters are in compliance with the registered PDD and the applied methodology or any other tool.	~~OK~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		In this context no findings have been identified:		
D.2. **Data and Parameters monitored for ER**				
D.2.1. $f_{NRB,y}$		**Fraction of non-renewability**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*	/MR/ /PDD1/ /ER/	*Description:* The data is a fixed value from the baseline study for each crediting period. For this crediting period the fraction for non-renewability for woody biomass is 67%. The data is applied to calculate the portion of project CO_2 emission from the biomass fuel consumption in the baseline scenario. *Verifier´s action:* The data was from the baseline study for each crediting period and fixed for the first crediting period as reported in the GS revised PDD annex 3 was reviewed. The data in the ER spreadsheet was verified. *Conclusion:* The parameter is monitored in accordance to the GS revised PDD.	OK	OK
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance*	/MR/ /PDD1/ /ER/	*Description:* The fraction applied is derived from the baseline study. No instruments used to measure the data	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/IM01/ /IM03/	*Verifier´s action:* The value applied is cross-checked with GS registered PDD and is correctly applied in ER calculation. QA/QC procedure is implemented. Project personnel and consultants were interviewed. *Conclusion:* The data applied is consistent with the baseline study data.		
c) Correctness *Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /ER/ /PDD1/	☒ Correct ☐ Not correct (initial assessment) *Description:* The value applied is taken from the baseline study data reported in Annex 3 of GS revised PDD. *Verifier´s action:* The data applied in ER calculations is cross-checked with GS revised PDD for correctness. *Conclusion:* The value applied is applied correctly in the ER calculations..	OK	OK
D.2.2. P_{bs1y}		**Quantity of fuel that is consumed in the baseline scenario 1 in year y**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard*	/MR/ /ER/ /PDD1/ /GSM/	Description: The data applied for this monitoring period is based on the KPT monitoring survey conducted on May to June 2016 for the quantity of fuel consumed by the households in the monitoring period.	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*	/SD1/ /SI/ /BUS1/	According to the applied methodology, a survey for this parameter data will be conducted at least once every 2 years or more frequently. The data is applied to determine project emission for fuel use in the project scenario. Verifier´s action: The KPT survey results are verified. The data in the ER spreadsheet was checked and applied correctly for PE calculations. Conclusion: The parameter is monitored in accordance to the GS registered PDD. Refer CAR D1 raised		
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/MR/ /ER/ /SD1/ /S1/ /BUS1/ /C1/ /IM01/ /IM03/	Description: The data applied was based on the KPT survey results conducted on May to Junel 2016. The usage of LPG is measured by a calibrated weighing scale. Verifier´s action: The data applied in the ER calculation was cross-checked with survey results conducted and found to be consistent. QA/QC procedure is implemented. Project personnel and consultants were interviewed. Calibration report for the weighing scale is verified and valid for the monitoring period.	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		Conclusion: The data applied is not traceable. Refer CAR D1 raised		
c) Correctness *Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /PDD1/ /ER/ /SD1/ /S1/ /BUS1/	☐ Correct ☒ Not correct (initial assessment) Description: The data applied as based on the KPT survey conducted on May to June 2016. Verifier´s action: The data applied in the ER calculation was cross-checked against the survey results. Conclusion: The data applied is not traceable. Refer CAR D1 raised.	OK	OK
D.2.3. P_{bs2y}		**Quantity of fuel that is consumed in the baseline scenario 2 in year y**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.*	/MR/ /ER/ /PDD1/ /GSM/ /SD1/ /S1/ /BUS1/	Description: The data applied for this monitoring period is based on the KPT monitoring survey conducted on May to June 2016 for the quantity of fuel consumed by the households in the monitoring period. According to the applied methodology, a survey for this parameter data will be conducted at least once every 2 years or more frequently. The data is applied to determine project emission for fuel use in the project scenario.	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.		Verifier´s action: The KPT survey results are verified. The data in the ER spreadsheet was checked and applied correctly for PE calculations. Conclusion: The parameter is monitored in accordance to the GS revised PDD. Refer CAR D1 raised		
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/MR/ /ER/ /SD1/ /C1/ /S1/ /BUS1/ /IM01/ /IM03/	Description: The data applied was based on the KPT survey results conducted on May to June 2016. The usage of firewood and agriculture residues are measured by a calibrated weighing scale. Verifier´s action: The data applied in the ER calculation was cross-checked with survey results conducted and found to be consistent. QA/QC procedure is implemented. Project personnel and consultants were interviewed. Calibration report for the weighing scale is verified and valid for the monitoring period. Conclusion: The data applied is not raceable. Refer CAR D1 raised	~~CAR D1~~	OK
c) Correctness	/MR/ /PDD1/	☐ Correct ☒ Not correct (initial assessment) Description:	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner. *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/ER/ /SD1/ /S1/ /BUS1/	The data applied as based on the KPT survey conducted on May to June 2016. Verifier´s action: The data applied in the ER calculation was cross-checked against the survey results. Conclusion: The data applied is not traceable. Refer CAR D1 raised.		
D.2.4. P_{bs3y}		**Quantity of fuel that is consumed in the baseline scenario 3 in year y**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*	/MR/ /ER/ /PDD1/ /SD1/ /S1/ /BUS1/	Description: The data applied for this monitoring period is based on the KPT monitoring survey conducted on May to June 2016 for the quantity of fuel consumed by the households in the monitoring period. According to the applied methodology, a survey for this parameter data will be conducted at least once every 2 years or more frequently. The data is applied to determine project emission for fuel use in the project scenario. Verifier´s action: The KPT survey results are verified. The data in the ER spreadsheet was checked and applied correctly for PE calculations.	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		Conclusion: The parameter is monitored in accordance to the GS revised PDD. Refer CAR D1 raised		
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/MR/ /ER/ /SD1/ /S1/ /BUS1/ /IM01/ /IM03/	Description: The data applied was based on the KPT survey results conducted on May to June 2016. The usage of mixed fuel of firewood, LPG and agriculture residues are measured by a calibrated weighing scale. Verifier´s action: The data applied in the ER calculation was cross-checked with survey results conducted. QA/QC procedure is implemented. Project personnel and consultants were interviewed. Calibration report for the weighing scale is verified and valid for the monitoring period. Conclusion: The data applied is not traceable. Refer CAR D1 raised	~~CAR D1~~	OK
c) Correctness *Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of*	/MR/ /PDD1/ /ER/ /SD1/ /BUS1/	☐ Correct ☒ Not correct (initial assessment) Description: The data applied as based on the KPT survey conducted on May to June 2016. Verifier´s action:	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
the conservativeness of the approach used should be given. *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/S1/	The data applied in the ER calculation was cross-checked against the survey results. Conclusion: The data applied is not traceable. Refer CAR D1 raised.		
D.2.5. $P_{h,y}$		**Quantity of fuel that is consumed in the project scenario in year y**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*	/MR/ /ER/ /PDD1/ /GSM/ /SD1/ /S1/ /BUS1/	*Description:* The data applied for this monitoring period is based on the KPT monitoring survey conducted on May to June 2016 for the quantity of fuel consumed by the households in the monitoring period. According to the applied methodology, a survey for this parameter data will be conducted at least once every 2 years or more frequently. The data is applied to determine project emission for fuel use in the project scenario. *Verifier´s action:* The KPT survey results are verified. The data in the ER spreadsheet was corss-checked with data applied for PE calculations. *Conclusion:* The parameter is monitored in accordance to the GS revised PDD. Refer CAR D1 raised	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/MR/ /ER/ /SD1/ /C1/ /IM01/ /IM03/	*Description:* The data applied was based on the KPT survey results conducted on May to June 2016. The usage of fuel is measured by a calibrated weighing scale. *Verifier´s action:* The data applied in the ER calculation was cross-checked with survey results conducted. QA/QC procedure is implemented. Project personnel and consultants were interviewed. Calibration report for the weighing scale is verified and valid for the monitoring period. *Conclusion:* The data applied is not traceable. Refer CAR D1 raised	~~CAR D1~~	OK
c) Correctness *Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /PDD1/ /BUS1/ /ER/ /SD1/	☐ Correct ☒ Not correct (initial assessment) *Description:* The data applied as based on the KPT survey conducted on May to June 2016. *Verifier´s action:* The data applied in the ER calculation was cross-checked against the survey results. *Conclusion:* The data applied is not traceable. Refer CAR D1 raised.	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
D.2.6. $U_{p,y}$		**Percentage of bio-digesters in use in monitoring period y**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*	/MR/ /PDD1/ /ER/ /SD1/ /S2/ /BUS1/	*Description:* The data is is calculated using the usage survey results conducted from Aprilto November 2015. The cumulative total number of bio-digesters installed as at 31/12/2014 for this current monitoring period is 121,782 units. The number of bio-digesters in operation for this monitoring period is 101,798 units with a usage rate of 88.60%. The cumulative usage rate for this monitoring period is determine 81.87% due to the dropped off. Therefore, the effective usage rate applied in the ER calculations is 81.87% and the number of units are 99,700. *Verifier´s action:* The data was cross-checked with the usage survey results to confirm that the data applied to calculate the usage rate in operation. The data applied in ER calculation is cross-checked to verify the results of the number of units in operation. *Conclusion:* The parameter is monitored in accordance to the GS revised PDD.	OK	OK
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for*	/MR/ /PDD1/	*Description:* The data applied is calculated using the usage survey results conducted from April to November 2015.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/ER/ /S2/ /IM01/ /IM03/	No instrument is used to measure this data. *Verifier´s action:* The data applied in the ER calculation was cross-checked with survey results conducted for consistency. QA/QC procedure is implemented. Project personnel and consultants were interviewed. *Conclusion:* The data applied is correct.		
c) Correctness *Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /S2/ /ER/	☒ Correct ☐ Not correct (initial assessment) *Description:* The data is calculated using the usage survey results conducted from April to November 2015. *Verifier´s action:* The data applied in the ER calculation was cross-checked against the survey results for correctness. *Conclusion:* The data applied is considered as correct.	OK	OK
D.2.7. $N_{p,y}$		**Number of biogas plants commissioned**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.*	/MR/ /PDD1/ /ER/	*Description:* The total accumulative number of biogas plants commissioned until the end of this monitoring period as at 31/12/2014 was 121,783 units based on the project program database.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*		The newly commissioned units for this monitoring period from 01/07/2013 to 31/12/2014 were 15,612 units. *Verifier´s action:* The data was cross-checked with the database for the number of units commissioned as at 31/12/2014 and number of newly units commissioned during this MP. The ER spreadsheet was checked to verify the number of units stated is according to the database. *Conclusion:* The parameter is monitored in accordance to the GS revised PDD.		
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/MR/ /PDD/ /ER/ /IM01/ /IM03/	*Description:* The data was based on the number of units commissioned as at 31/12/2014 No instrument is used to measure the data. *Verifier´s action:* The data applied in the ER spreadsheet was cross-checked with the database. QA/QC procedure is implemented. Project personnel and consultants were interviewed. *Conclusion:* The data applied is correct.	OK	OK
c) Correctness	/MR/	☒ Correct ☐ Not correct (initial assessment)	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner. *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/ER/	*Description:* The data is based on the total number of units commissioned as at 31/12/2014 *Verifier´s action:* The data in the ER spreadsheet was verified with the database for correctness. *Conclusion:* The data applied is correct.		
D.2.8. $MS_{(T,S,k)}$		**Fraction of livestock category T's manure fed into the bio-digester S, in climate zone k**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*	/MR/ /PDD1/ /ER/ /SD1/ /S1/ /BUS1/	*Description:* The fraction of manure fed in the biodigesters for the respective animal category is based on the CMS survey results conducted on May to June 2016. *Verifier´s action:* The CMS survey results were verified. The data applied in the ER spreadsheet was cross-checked with the CMS survey results for the temperate and warm zones. *Conclusion:* The parameter is monitored in accordance to the GS revised PDD. However, refer CAR D2 raised.	~~CAR D2~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/MR/ /ER/ /SD1/ /S1/ /IM01/ /IM03/	*Description:* The data applied is based on the CMS survey results conducted on May to June 2016 No instrument is used to measure the data. *Verifier´s action:* The data applied in the ER calculation was cross-checked with survey results conducted and found to be consistent. QA/QC procedure is implemented. Project personnel and consultants were interviewed. *Conclusion:* The data applied is not traceable. Refer CAR D2 raised	~~CAR D2~~	OK
c) Correctness *Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /PDD1/ /ER/ /SD1/ /S1/ /BUS1/	☐ Correct ☒ Not correct (initial assessment) *Description:* The data is based the CMS survey results. *Verifier´s action:* The data applied in the ER calculation was cross-checked against the survey results for correctness. *Conclusion:* The data applied is not traceable. Refer CAR D2 raised	~~CAR D2~~	OK
D.2.9. $MS_{(P,S,k)}$		**Fraction of livestock category *T*'s manure not fed into the bio-digester *S*, in climate zone *k***		

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*	/MR/ /PDD/ /ER/ /SD1/ /BUS1/ /S1/	*Description:* The fraction of manure not fed in the biodigesters is based on the CMS survey results conducted on May to June 2016: *Verifier´s action:* The CMS survey results are verified. The data applied in the ER spreadsheet was cross-checked with the CMS survey results for the temperate and warm zones. *Conclusion:* The parameter is monitored in accordance to the GS revised PDD. However refer to CAR D1 raised	~~CAR D1~~	OK
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/MR/ /PDD1/ /ER/ /SD1/ /IM01/ /IM03/	*Description:* The data applied was based on the CMS survey results conducted on May to June 2016. No instrument is used to measure the data. *Verifier´s action:* The data applied in the ER calculation was cross-checked with survey results conducted and found to be consistent. QA/QC procedure is implemented. Project personnel and consultants were interviewed. *Conclusion:* The data applied is not traceable.	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		Refer CAR D1 raised		
c) Correctness *Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /PDD1/ /ER/ /SD1/ /S1/ /BUS1/	☐ Correct ☒ Not correct (initial assessment) *Description:* The data is derived from the CMS survey results. *Verifier´s action:* The data applied in the ER calculation was cross-checked against the survey results for correctness. *Conclusion:* The data applied is not traceable. Refer CAR D1 raised.	~~CAR D1~~	OK
D.2.10. $N_{(T)}$		**Number of animals of livestock category T**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*	/MR/ /PDD1/ /ER/ /SD1/ /S1/ /BUS1/	*Description:* The data is derived from the CMS survey results conducted on May to June 2016. *Verifier´s action:* The CMS survey results are verified. The data applied in the ER spreadsheet was cross-checked with the CMS survey results for the temperate and warm zones *Conclusion:* The parameter is monitored in accordance to the GS revised PDD.	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		However refer CAR D1 raised		
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/MR/ /PDD1/ /ER/ /SD1/ /IM01/ /IM03/	*Description:* The data applied is based on the CMS survey results conducted on May to June 2016. No instrument is used to measure the data. *Verifier´s action:* The data applied in the ER calculation was cross-checked with survey results conducted for consistency. QA/QC procedure is implemented. Project personnel and consultants were interviewed. *Conclusion:* The data applied is not traceable Refer CAR D1 raised	~~CAR D1~~	OK
c) Correctness *Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /PDD1/ /ER/ /SD1/ /S1/ /BUS1/	☐ Correct ☒ Not correct (initial assessment) *Description:* The data has been calculated from the CMS survey results. *Verifier´s action:* The data applied in the ER calculation was cross-checked against the survey results for correctness. *Conclusion:* The data applied is not traceable. Refer CAR D1 raised.	~~CAR D1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
D.2.11. PL		**Physical leakage of the bio-digester**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*	/MR/ /PDD1/ /ER/ /GSM	*Description:* The value applied is a default value from the applied methodology. *Verifier´s action:* The methodology is reviewed to cross-check on the default value. The data applied in the ER spreadsheet is verified as correct. *Conclusion:* The parameter is monitored in accordance to the GS revised PDD.	OK	OK
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/MR/ /ER/ /GSM /IM01/ /IM03/	*Description:* The value applied is a default from the applied methodology. No instrument is used to measure the data *Verifier´s action:* The data in the ER spreadsheet was verified for consistency. QA/QC procedure is implemented. Project personnel and consultants were interviewed. *Conclusion:* The data applied is correct.	OK	OK
c) Correctness	/MR/	☒ Correct ☐ Not correct (initial assessment)	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner. *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/ER/ /GSM	*Description:* The value applied is a default from the applied methodology. *Verifier´s action:* The data applied in the ER calculation was cross-checked for correctness. *Conclusion:* The value applied is considered correct.		
D.2.12. $EF_{awms,T,}$		**Animal waste methane emission factor by average temperatures**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*	/MR/ /PDD1/ /ER/ /ipcc/	*Description:* The data applied is calculated using default data derived from 2006 IPCC volume 4 Guidelines for National Greenhouse Gas Inventories, chapter 10, tables 10A-4 to 10A-7 for Asia region and average annual temperature of the temperate and warm zones of the provinces. *Verifier´s action:* 2006 IPCC volume 4 Guidelines for National Greenhouse Gas Inventories, chapter 10, tables 10A-4 to 10A-7 were reviewed for the default data applied in the calculation. The annual average temperature of the provinces for both temperate and warm zones was cross-checked. http://www.vietnamtourism.com/e_pages/country/overview.asp	~~CL D3~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		The data applied in the ER spreadsheet was verified for both temperate and warm zones. *Conclusion:* The parameter is monitored in accordance to the GS revised PDD. However refer to CL D3 raised		
b) Accuracy and QA/QC Procedure *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/MR/ /PDD1/ /ER/ /ipcc/ /IM01/ /IM03/	*Description:* The data is calculated using 2006 IPCC default and local average temperature data No instrument is used to measure the data. No instrument is used. *Verifier´s action:* The data in the ER spreadsheet was verified and cross checked with 2006 IPCC default and local data applied in the calculation. QA/QC procedure is implemented. Project personnel and consultants were interviewed. *Conclusion:* The data is calculated correctly. However, refer CL D3 raised	~~CL D3~~	OK
c) Correctness	/MR/ /PDD1/ /ER/	☒ Correct ☐ Not correct (initial assessment) *Description:* The data is calculated using 2006 IPCC default and local data.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner. *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/ipcc/	*Verifier´s action:* The data applied in the ER calculation was cross-checked for correctness. *Conclusion:* The data callculated is considered correct.		
D.2.13. $PE_{bio-slurry}$		**Emissions from anaerobic disposal of bio-slurry**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan and the applied methodology.*	/MR/ /PDD1/ /ER/ /SD1/ /S1/ /BUS1/ /IM01/ /IM02/ /LHH/	*Description:* The data is calculated using the CMS survey multiplied with the number of installed bio-digester for both temperature and warm zones. The data was derived from the CMS survey results conducted on May to June 2016. *Verifier´s action:* The CMS survey data was verified. The data applied in the ER spreadsheet was cross-checked with the CMS survey results for the temperate and warm zones *Conclusion:* The parameter is monitored in accordance to the GS revised PDD.	~~CAR D3~~	OK
b) Accuracy and QA/QC Procedure	/MR/	*Description:*		OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out by competent personnel.*	/ER/ /SD1/ /S1/ /BUS1/ /IM01/ /IM03/	The data is calculated used data from CMS survey results conducted on May to June 2016. No instrument is used to measure the data. *Verifier´s action:* The data applied in the ER calculation was cross-checked with survey results conducted and found to be consistent. QA/QC procedure is implemented. Project personnel and consultants were interviewed *Conclusion:* The data applied is correct		
c) Correctness *Determine whether the value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /PDD/1 /ER/ /SD1/ /BUS1/ /S1/	☒ Correct ☐ Not correct (initial assessment) *Description:* The data has been calculated using data from the CMS survey results. *Verifier´s action:* The data applied in the ER calculation was cross-checked against the survey results for correctness. *Conclusion:* The data applied is considered correct..		OK
***D.3.* Parameters monitored for Sustainability Development**				

<table>
<tr><th>Checklist Item
(incl. guidance for the verification team)</th><th>Refe-rence</th><th>Verification Team Comments
(Means and results of assessment)</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr><td>D.3.1. No. 1 - Air quality</td><td></td><td>Reduction in fuel (wood, agricultural residues, kerosene and coal) consumption (kg of fuel reduced/year)</td><td></td><td></td></tr>
<tr><td>a) Measurement / Determination method
Describe how the monitoring parameter was measured / determined.
Assess whether the measurement / determination method is in line with the registered passport, applied toolkit and PDD.</td><td>/MR/
/ER/
/GSP/
/GST/
/onsite/
/S1/
/SI1/
/LHH/</td><td>Description:
The chosen parameter for this indicator is the reduction of fuel consumption using firewood and agricultural residues.
During this monitoring period, the reductions achieved as follows:
<table>
<tr><td>Fuel</td><td>Baseline</td><td>MPIII</td><td>Reduction</td></tr>
<tr><td>Firewood</td><td>3,145.9kg/y</td><td>195.3kg/y</td><td>2,950.6kg/y</td></tr>
<tr><td>Agriculture residues</td><td>1,012.2kg/y</td><td>71.0kg/y</td><td>941.2kg/y</td></tr>
<tr><td>LPG</td><td>48.9kg/y</td><td>14.8kg/y</td><td>34.15kg/y</td></tr>
</table>
The data was based on the KPT survey results conducted.
Verifier´s action:
The verification team has checked the KPT survey data and cross-checked with data applied in ER spreadsheet
During the onsite interviews of the 234 randomly selected households, the responses indicate biogas is the main fuel for cooking with less usage of firewood, charcoal and LPG.
All respondents said that they only used firewood and LPG during special events where they needed to cook more food and those have small businesses.
Conclusion:</td><td>OK</td><td>OK</td></tr>
</table>

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		The monitoring of this SD indicator is in accordance with the GS Passport.		
b) Correctness and Scoring *Determine whether the monitoring method/value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /ER//S1/ /BUS1/ /SD1/ /PDD1/ /GST/ /SI1/ /LHH/	☒ Correct ☐ Not correct (initial assessment) *Description:* The data is derived from the Kitchen Performance Test (KPT) survey conducted fon May to June 2016. *Verifier´s action:* The KPT survey results were reviewed and cross checked with the onsite interview for 234 randomly selected households. *Conclusion:* The data of the survey is considered correct. *Score:* The verification team concluded on a score of positive impact (+) as per the Toolkit Annex I.	OK	OK
D.3.2. No. 2 - Soil condition		**Usage of bio-slurry**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Assess whether the measurement / determination method is in line with the registered passport, applied toolkit and PDD. .*	/MR/ /ER/ /GST/ /GSP/ /SD1/ /S1/ /SI2/	*Description:* The indicator measured the percentage of households using bio-slurry as fertilizers. The data was derived from the Carbon Monitoring Survey (CMS). *Verifier´s action:* The CMS survey data was reviewed and cross-checked with the data applied in the ER spreadsheet.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
	/BUS1/ /LHH/	A cross-check was conducted with the interview results for the 234 randomly selected households on the usage of bio-slurry by a few households for their rice fields and vegetables garden. *Conclusion:* The monitoring of this SD indicator is in accordance with the GS Passport.		
b) Correctness and Scoring *Determine whether the monitoring method/value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /ER/ /S1/ /SD1/ /BUS1/ /GSP/ /GST/ /SI2/	☒ Correct ☐ Not correct (initial assessment) *Description:* The data was derived from the CMS data survey. *Verifier´s action:* The CMS survey data was reviewed and cross-checked with the applied in the ER spreadsheet for correctness. *Conclusion:* The data from the survey is determined correctly. *Score:* The percentage of households using bio slurry as fertilizers for this monitoring period has decreased when compared with the MPII. However, when compared with the baseline situation, there is usage of bio-slurry by the households for this monitoring period. Therefore, the score for this SD parameter is positive (+).	OK	OK
D.3.3. No. 3 - Biodiversity		**Cumulative savings of wood (ton/year)**		
a) Measurement / Determination method	/MR/	*Description:*	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Describe how the monitoring parameter was measured / determined. *Assess whether the measurement / determination method is in line with the registered passport, applied toolkit and PDD. .*	/GSP/ /ER//S1/ /BUS1/ /SD1/ /SI3/	The cumulative savings of wood as at 31/12/2014 for this monitoring period is 294,170 tons. The cumulative savings of firewood was calculated based on the KPT data survey from PFT results. The reduction in the usage of savings from firewood for 1 year multiplied with the number of biodigesters installed up to 31/12/2014 for the current monitoring period. *Verifier´s action:* The data applied in the ER spreadsheet was cross-checked with the CMS surveyed data. *Conclusion:* The monitoring of this SD indicator is in accordance with the GS Passport.		
b) Correctness and Scoring *Determine whether the monitoring method/value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /ER/ /GSP/ /SD1/ /S1/ /BUS1/ /SI3/	☒ Correct ☐ Not correct (initial assessment) *Description:* The data is calculated using the CMS surveyed data. *Verifier´s action:* The data applied in the ER spreadsheet is cross-checked with surveyed data results for correctness. *Conclusion:* The data of the survey is considered as correct. *Score:*	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		The savings of firewood has increased to 294,170 ton as at 31/12/2014 from 148,859 ton as at 30/06/2013 and from zero in the baseline situation. Therefore, the score for this SD parameter is positive (+).		
D.3.4. No. 4 - Quality of Employment		**Number of masons and technicians participating in the trainings**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Assess whether the measurement / determination method is in line with the registered passport, applied toolkit and PDD. .*	/MR/ /GSP/ /ER/ /SI4/	*Description:* The number of masons and technicians participating in trainings for this monitoring period was 118 and 83 respectively for this monitoring period as at 31/12/2014. *Verifier´s action:* The project database for the trained masons and technicians were reviewed. *Conclusion:* The monitoring of this SD indicator is in accordance to the GS Passport.	OK	OK
b) Correctness and Scoring *Determine whether the monitoring method/value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.*	/MR/ /ER/ /SI4/ /GSP/	☒ Correct ☐ Not correct (initial assessment) *Description:* The data is the number of masons and technicians trained during the monitoring period. *Verifier´s action:* The project database and certificates were checked for correctness and applied correctly in the ER spreadsheet..	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Score in accordance to Toolkit Annex I *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*		*Conclusion:* The data can be confirmed for correctness. *Score:* As compared with situation at 30/06/2013, the number of trained masons and technicians for the current monitoring period has increased from the first monitoring period from 1,038 to 1,156 for masons and 707 to 790 for technicians. The score for this parameter for the current monitoring period is positive (+).		
D.3.5. No. 5 - Livelihood of the poor		**Number of people having access to an improved waste management system**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Assess whether the measurement / determination method is in line with the registered passport, applied toolkit and PDD. .*	/MR/ /GSP/ /BUS1/ /S1/ /SD1/ /S2/ /ER/	*Description:* The number of people having access to an improved waste management system as at 31/12/2014 was 482,279. The data was derived from the usage survey conducted on June to Nov 2015 for the number of digester in operation by aged group and data from the CMS survey conducted on May to June 2016. In the CMS survey, a total of 349 households with 1,578 people for both zones was surveyed to obtain the average number of people per household was 4.5 The total number of digester commissioned as at 31/12/2014 multiplied by the percentage in used based on the usage survey to obtain the number of units in operation for the monitoring period was 101,798.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		The number of units in operation multiplied with the average number of people per household is the total number of people has access to improved waste management system. *Verifier´s action:* The usage and CMS survey results were reviewed. The data applied in the ER spreadsheet to determine the number of people benefitted the improved waste management system was cross-checked with the usage and CMS survey data results. *Conclusion:* The monitoring of this SD indicator is in accordance with the GS Passport.		
b) Correctness and Scoring *Determine whether the monitoring method/value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /GSP/ /GST/ /ER/ /S1/ /S2/ /BUS1/	☒ Correct ☐ Not correct (initial assessment) *Description:* The data was derived from the usage survey conducted from June to Nov 2015 for the number of digester in operation by aged group and data from the CMS survey conducted from May to June 2016. *Verifier´s action:* The usage and CMS survey results were reviewed. The data applied in the ER spreadsheet to determine the number of people benefitted the improved waste management system was cross-checked with the usage and CMS survey data results for correctness. *Conclusion:*	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		The number of people have access is determined correctly. *Score:* As compared with the situation as at 30/06/2013, the number of people having access to an improved waste management system has increased from 427,539 to 482,279 as at 31/12/2014. In the baseline scenario, there is no similar waste management system built, hence the score for this current monitoring period is positive (+).		
D.3.6. No. 6 - Access to affordable and clean energy services		**Total amount of energy replaced by biogas (MJ/hh/year)**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Assess whether the measurement / determination method is in line with the registered passport, applied toolkit and PDD. .*	/MR/ /ER/ /GSP/ /SD1/ /SI6/ /LHH/	*Description:* The data was based on the KPT survey conducted for PFT in measuring the amount of fuels displaced by biogas by the householders under the programme data *Verifier´s action:* The KPT survey database was checked and reviewed during the onsite visit. During the onsite interviews with 234 randomly selected households, all the households use biogas as the main fuel for their daily cooking. Thus displaced the usage of firewood, agriculture residues and LPG. The data in the ER spreadsheet was cross-checked with the survey data. *Conclusion:*	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		The monitoring of this SD indicator is in accordance with the GS Passport.		
b) Correctness and Scoring *Determine whether the monitoring method value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /GSP/ /ER/ /SD1/ /S1 /LHH/	☒ Correct ☐ Not correct (initial assessment) *Description:* The data was based on the KPT survey conducted for PFT in measuring the amount of fuels displaced by biogas by the householders under the programme data *Verifier´s action:* The data applied in the ER spreadsheet was cross-checked with the survey data for correctness. *Conclusion:* The amount of energy displaced by the biogas has been correctly determined. *Score:* The total amount of energy displaced by biogas for this monitoring period as at 31/12/2014 was **46,954 MJ/hh/y** as compared with baseline situation was zero. Hence the score for this parameter is positive (+)	OK	OK
D.3.7. No. 7 - Technology transfer and technological self-reliance		**Number of masons trained in the construction of KT1 or KT2 bio-digesters**		
a) Measurement / Determination method *Describe how the monitoring parameter was measured / determined.*	/MR/ /ER/ /GSP/	*Description:* A total number of 1,156 masons were trained in the construction of KT1 or KT2 biodigesters as at 31/12/2014.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Assess whether the measurement / determination method is in line with the registered passport, applied toolkit and PDD. .	/SI7/ /SI4/	The number of masons trained during this monitoring period is 118. The data was derived from the project database. The number of trained masons was kept track and monitored by the provincial program management unit and the central program office located in Hanoi. *Verifier´s action:* The project database was reviewed and verified during the onsite visit to cross-checked on the data reported and applied correctly in the ER spreadsheet. *Conclusion:* The monitoring of this SD indicator is in accordance with the GS Passport.		
b) Correctness and Scoring *Determine whether the monitoring method value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /GSP/ /ER/ /T1/ /F1/	☒ Correct ☐ Not correct (initial assessment) *Description:* The data was derived from the records database for the number of masons trained in the construction of KT1 and KT2 biodigesters. *Verifier´s action:* The project database was reviewed and verified during the onsite visit for correctness. *Conclusion:* The data could be confirmed as correct.	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		Score: The number masons trained has increased from 1,308 as at 30/06/2013 to 1,156 as at 31/12/2014 with an increase of 118 for this monitoring period. In the baseline scenario, there was no trained masons, therefore, the score for this SD indicator is positive (+).		
D.4. **Sampling**				
a) Implementation of sampling plan *Check whether the PP has applied a sampling approach to determine the monitored values (as per section D.2 above).* *If this is the case, please provide an assessment whether the PPs have correctly and sufficiently described the implemented sampling plan including* - *Description of the implemented sampling design* - *Collected data* - *Analysis of collected data* - *Demonstration on whether the required confidence/precision has been met.*	/MR/ /GSP/ /PDD1/ /BUS1/ /SSS/ /GSS/ /O5/ /S1/ /S2/	☒ A sampling approach has been taken by the PP due to large number of implemented biodigesters. *Description:* The PP has conducted CMS / KPT and Usage survey using a sampling approach is accordance to GS and UNFCCC guidelines *Verifier´s action:* The CMS and KPT surveys were conducted from May to June 2016 which includes Baseline Fuel Test and Performance Field Test (PFT) and the survey results were applied to the current monitoring period. The verification team has checked on the sampling plan for US is 280 households and CMS / KPT is 349 households with an addition of 10% been included to ensure the level of assurance and the number of households is representative. Thus, considered appropriate.	~~CAR D4~~ ~~CL D5~~ ~~CAR D6~~ ~~CAR D7~~ ~~CAR D8~~	OK OK Ok OK OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		The data collected were reviewed and cross checked during the onsite field inspection on the selected households to confirm the correctness. *Conclusion:* The number of households in the sample plan is assessed as representative and in accordance to GS requirements. However, refer CAR D4, CL D5, CAR D6, CAR D7 and CAR D8 raised		
b) Sampling during verification *In case the VT has applied a sampling approach in the course of the verification the approach shall be described for each parameter.*	/MR/ /GSP/ /PDD1/	☒ A sampling approach has been applied by the VT for selected the household for the field inspection and interview. *Description:* According to GS recommendation, the sampling plan of 90/30 a sample size of 100 households will be sufficient to ensure the number of households interviewed is representative. The verification team has selected a sample size of 234 households in different villages, districts & provinces in Vietnam. *Conclusion:* The verification team has cross checked with the below link to ensure the sample size of 234 households is sufficient. http://www.raosoft.com/samplesize.html The statistical tool is applied accepted widely and also for GS751 MPII verification. Therefore, the reliability of this statistical tool could be confirmed.	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		With the number of households, the sample size for 95% with CI of 10%, 96 households will be sufficient. Therefore, the sample size of 234 randomly selected households by the VT is sufficient to meet GS sampling requirements.		
E. Calculation of Emission reductions				
***E.1.* Traceability** *Assess if the calculation is fully traceable. In case of complex calculations an Excel calculation spreadsheet shall be used. All applied formulae must be visible.*	/MR/ /ER/	The verification team has checked the emission reduction calculation and confirms that: ☐ the calculation is fully traceable ☒ all applied formulae are visible In this context the following finding has been identified: Refer CAR E1, CAR E2, CAR E3 and CAR E4 raised	~~CAR E1~~ ~~CAR E2~~ ~~CAR E3~~ ~~CAR E4~~	OK OK OK OK
***E.2.* Parameter consistency** *Assess whether all internal and external parameters and data used for calculation are applied consistently in the monitoring report and the calculation spreadsheet?* *Consider only the correct data exchange between the monitoring report and the calculation spreadsheet (if any). Further ensure the consistency of notations for all parameters in the PDD, MR and calculation spreadsheet.*	/MR/ /ER/	The verification team has checked the emission reduction calculation and the MR and confirms that: ☒ all parameter notations are consistent in the project documentation ☒ all internal and external parameters and data used for calculation are consistently applied In this context no findings have been identified:	OK	OK
***E.3.* Correctness of calculation** *Check if the applied formulae and methods for calculating baseline emissions, project emissions and*	/MR/ /PDD1/ /ER/	The verification team has checked the emission reduction calculation and the MR and confirms that:	~~CAR E1~~ ~~CAR E2~~ ~~CAR E3~~	OK OK OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
leakage are in accordance with the monitoring plan and / or the approved methodology. *Assess whether the provided calculations are complete and reflect all requirements of the monitoring plan.* *Check especially that no standard or old values have been used for calculation where calculations based on up-to-date data is required.*		☒ all applied formulae for calculating baseline emissions, project emissions and leakage are in accordance with the monitoring plan ☐ the provided calculations are complete In this context the following findings have been identified: Refer CAR E1, CAR E2, CAR E3 and CAR E4 raised.	~~CAR E4~~	OK
E.4. **Emission reductions table** *Check if the MR includes a summary table of the emission reductions calculation specifiying separately* - *Total baseline emissions* - *Total project emissions:* - *Total leakage* - *Total emission reductions.* *Assess whether the values are correct or need to be revised as a consequence of issues identified above.*	/MR/ /ER/	☒ The MR includes a summary table of the emission reductions calculation. ☒ The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately. ☒ The values as specified in the ER summary table are correct; no issues have been identified during the verification which require changes in the ER calculation. ☒ During the verification issues with impact on the ER calculation have been identified. Thus subject to the closure of above listed findings the summary needs to be revised. In this context no additional findings have been identified:	OK	OK
E.5. **Comparison with ex-ante determined emission reductions** *Check if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD.*	/MR/ /ER/ /PDD1/	The verification team has checked the MR and confirms that: ☒ the MR includes a comparison of actual emission reductions with the estimations of the registered PDD ☒ the increase has been appropriately explained	~~CL E5~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Check further whether in case of an increase an appropriate explanation is included in the MR. *Assess in case of a significant increase whether this is due to technical or organisational changes within or outside the control of the PP which might require a notification / approval of changes.*		In this context the following additional findings have been identified: Refer CL E5 raised.		

ANNEX 2: STATEMENTS OF COMPETENCE OF INVOLVED PERSONNEL

TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

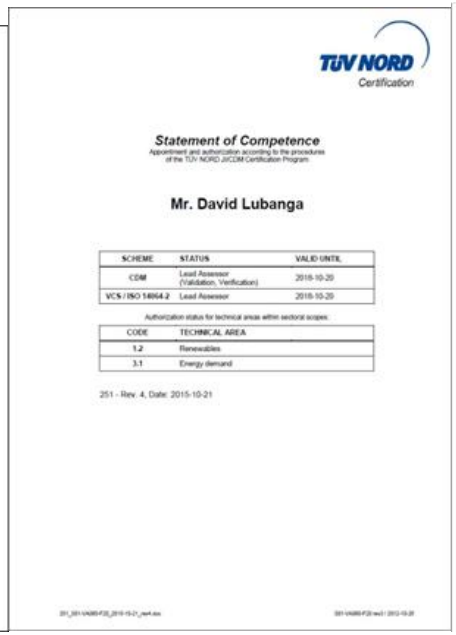
Mr. Robert Cheong

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2018-04-01
VCS	Senior Assessor	2018-04-01

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand
13.1	Solid waste and wastewater
13.2	Manure

129 - Rev. 8, Date: 2016-01-26



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

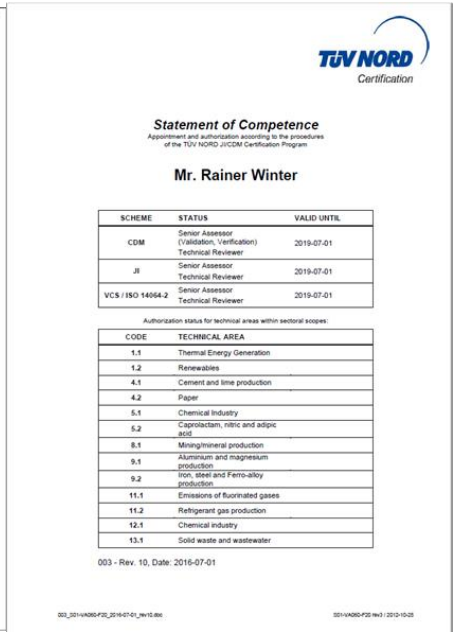
Mr. David Lubanga

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2018-10-20
VCS / ISO 14064-2	Lead Assessor	2018-10-20

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand

251 - Rev. 4, Date: 2015-10-21



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

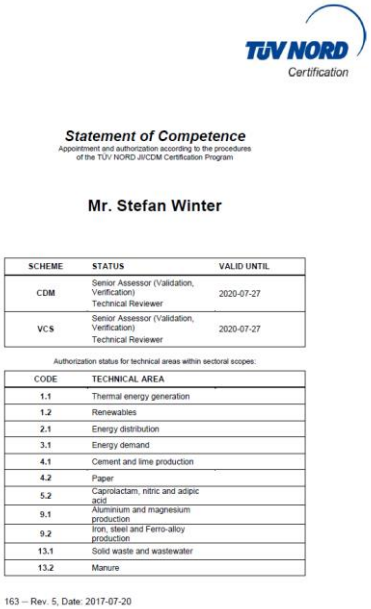
Mr. Rainer Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-07-01
JI	Senior Assessor Technical Reviewer	2019-07-01
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2019-07-01

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation
1.2	Renewables
4.1	Cement and lime production
4.2	Paper
5.1	Chemical Industry
5.2	Caprolactam, nitric and adipic acid
8.1	Mining/mineral production
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
11.1	Emissions of fluorinated gases
11.2	Refrigerant gas production
12.1	Chemical industry
13.1	Solid waste and wastewater

003 - Rev. 10, Date: 2016-07-01



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2020-07-27
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2020-07-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
4.1	Cement and lime production
4.2	Paper
5.2	Caprolactam, nitric and adipic acid
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
13.1	Solid waste and wastewater
13.2	Manure

163 – Rev. 5, Date: 2017-07-20