GOLD STANDARD VERIFICATION REPORT

- 2ND PERIODIC –

M/S SOCIAL EDUCATION AND DEVELOPMENT SOCIETY (SEDS)

SOCIAL EDUCATION AND DEVELOPMENT SOCIETY (SEDS) BIOGAS CDM PROJECT FOR THE RURAL POOR

GOLD STANDARD REF. NO.: GS - 849

Monitoring Period: 2013-01-01 to 2014-04-30
(incl. both days)

Report No: 8000445320 - 14/083

Date: 2015-07-06

TÜV NORD CERT GmbH
JI/CDM Certification Program
Langemarckstraße, 20
45141 Essen, Germany
Phone: +49-201-825-3329
Fax: +49-201-825-2139
www.tuev-nord.de
www.global-warming.de

Verification Report:	***Report No.***	***Rev. No.***	***Date of 1st issue:***		***Date of this rev.***
	8000445320 - 14/083	1	2015-05-19		2015-07-06
Project:	***Title:***		***UNFCCC No & Registration Date***	***Gold Standard No:***	***Gold Standard-registration.:***
	Social Education and Development Society (SEDS) Biogas CDM project for the rural poor		3541 2010-09-09	GS 849	15-02-2012
			GS Verification No.:		
			2nd periodic verification		
	Project Scale:				
	☐ *Large Scale* ☒ *Small Scale*				
Project Participant(s):	***Client:***				
	M/s Social Education and Development Society (SEDS)				
	Non Annex 1 country:		***Annex 1 country:***		
	India		Germany		
	PP from non Annex 1 country:		***PP from Annex 1 country:***		
	M/s Social Education and Development Society (SEDS)		Evangelisches Werk für Diakonie und Entwicklung e.V.		
Applied methodology/ies:	***Title:***		***No.:***		***Scope(s) / TA(s)***
	Switch from Non-Renewable Biomass for Thermal Applications by the User		AMS-I.E ver. 1		I /1.2
Monitoring period and monitoring report	***Monitoring period (MP):***			***Monitoring Report:***	
	From:	***To:***	***No. of days:***	***Draft version:***	***Final version:***
	2013-01-01	2014-04-30	***485***	2014-05-17	2015-03-03
Verification team / Technical Review and Final Approval:	***Verification Team:***			***Technical review:***	***Final approval:***
	G Ezhilarasu TL/TE Indrapal Parmar	Pankaj Patel TM TM		Christina Stöhr (OR) Stefan Winter	Stefan Winter
Key dates of verification:	***Publication of MR :***	***DVerR issued:***	***On-site (from):***		***On-site (to):***
	2014-07-01	2014-12-08	2014-10-31		2014-11-01
Summary of Verification opinion	M/s Social Education and Development Society (SEDS) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 2nd periodic verification of the project: "Social Education and Development Society (SEDS) Biogas CDM project for the rural poor", with regard to the relevant requirements for Gold Standard project activities. 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 CDM 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 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, 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 listed below (verified amount).				

Emission reductions: [t CO_{2e}]	***Total verified amount***	***As per draft MR:***	***As per GS PDD:***	
	9,932	9,932	21,611 /a	
		ER achieved up to 2012-12-31	***ER achieved from 2013-01-01***	
		0	9,932	
Document information:	*Filename:*			*No. of pages:*
	FVeR SEDS II MP Final GS_TR Reply.docx			68

Abbreviations:

SEDS	**Social Education and development Society**
CA	**Corrective Action / Clarification Action**
CAR	**Corrective Action Request**
CBO	**Community Based organisation**
CDM	**Clean Development Mechanism**
CER	**Certified Emission Reduction**
CL	**Clarification Request**
CO_2	**Carbon dioxide**
CO_{2eq}	**Carbon dioxide equivalent**
DVerR	**Draft Verification Report**
ER	**Emission Reduction**
FAR	**Forward Action Request**
GHG	**Greenhouse gas(es)**
MP	**Monitoring Plan**
MR	**Monitoring Report**
PA	**Project Activity**
PDD	**Project Design Document**
PP	**Project Participant**
QA/QC	**Quality Assurance / Quality Control**
UNFCCC	**United Nations Framework Convention on Climate Change**
GS	**Gold Standard**
TN CERT	**TÜV NORD Certification GmbH**
GST	**Gold Standard Toolkit (GSv2.2)**
GSP	**Gold Standard Passport**
VT	**Verification Team**
VVS	**Validation and Verification Standard**
XLS	**Emission Reduction Calculation Spread Sheet**

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1. INTRODUCTION

M/s Social Education and Development Society (SEDS) has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 2nd periodic Gold Standard (GS) verification of the project

"Social Education and Development Society (SEDS) Biogas CDM project for the rural poor*"*

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 was verified in detailed manner applying the set of requirements, audit practices and principles as required under the Validation and Verification Standard /VVS/ of the UNFCCC and additional Gold Standard requirements/GS/.

This report summarizes the findings and conclusions of this 2nd periodic verification of the above mentioned Gold Standard registered 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. 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,
- 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/, Sustainable Development Indicators Report/SDI/, the monitoring report /MR/, emission reduction calculation spread sheet /XLS/, 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 GSPDD /PDD/,
- Approved CDM Methodology.
- Gold Standard Version 2.2/GS/
- Gold Standard Passport/GSP/.

2. GHG PROJECT DESCRIPTION

2.1. Technical Project Description

The project activity involves the installation of 5,000 biogas digesters of 2 m^3 capacity each, in the 5 Mandals of Roddam, Somandepalli, Penukonda, Chilamathur and Gorantla in Anantapur district, state of Andhra Pradesh, India.

The biogas digester equipment consists of a digester of 2 m^3 capacity with a fixed, non-movable gas space. Gas is produced through anaerobic digestion of cow dung and other organic wastes which is stored in the upper part of the digester before being piped to the biogas stove in the kitchen. The gas pressure displaces the digested slurry into the compensating tank, which then can be used as manure. The technology used in the project activity is indigenously available in India and is based on the Deenbandhu digester model approved by the Ministry of Non- Conventional Energy Sources (MNES).

The key parameters of the project are given in Table 2-1:

Table 2-1: Technical data of the project activity

Parameter	Unit	Value
Volume of the biogas digester	m^3	2
No of biogas digester		5,000
Model		Fixed dome, Deenbandhu

2.2. Project Location

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

Table 2-2: Project Location

No.	Project Location
Host Country	India
Region:	Andhra Pradesh
Project location address:	Roddam, Somandepalle, Penukonda, Chilamatturu and Gorantla Mandals in Anantapur District
Latitude: Penukonda	14° 05' 00" North,
Longitude: Penukonda	77° 35' 00" East
Latitude: Roddam	14° 06' 00" North,
Longitude: Roddam	77° 26' 00" East
Latitude: Somandepalle	14° 00' 44" North
Longitude: Somandepalle	77° 36' 30" East

No.	Project Location
Latitude: Gorantla	13° 59' 21" North
Longitude: Gorantla	77° 46' 13" East
Latitude: Chilamatturu	13° 34' 25" North
Longitude: Chilamatturu	80° 00' 12" East

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

#	Item	Time	Status
1	1st Monitoring period	2011-01-01 to 2012-12-31	Issued
2	2nd Monitoring period	2013-01-01 to 2014-04-30	Issuance Requested

An overview of all Post Registration Changes is given in the following table.

Table 2-4: Overview Post Registration Changes (PRC)

#	Applicable as of	MP	Type of PRC [1)]	Description	Status[2)] / Date
1	NA		TDfrMP		NA
2	NA		TDfMM		NA
3	NA		CrPDD		NA
4	NA		PCfrMP		NA
5	NA		PCfMM		NA
6	2013-07-11	1st	CoPD	The changes occurred during the course of implementation of the project, which started in December 2010.The villages now considered (250 villages) are more than that identified initially and the households were also different from that initially surveyed	Approved on 2013-07-11[1]

1) TDfrMP : Temporary deviation from registered monitoring plan
TDfMM : Temporary deviation from the monitoring methodology
CrPDD : Corrections to the registered PDD
PCfrMP : Permanent changes from registered Monitoring Plan
PCfMM : Permanent changes from Monitoring Methodology
CoPD : Changes to the project design of a registered project activity

2) Approval (by EB) or Acceptance (by DOE)

[1] http://cdm.unfccc.int/Projects/DB/RWTUV1269520327.35/view

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
- Upload of 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 2 additional team members, 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.	G Ezhilarasu	TUV India Private Limited	TL/TE	SA	☒	1.2	☒	☒	☒
☒ Mr. ☐ Ms.	Pankaj Patel	TUV India Private Limited	TM[A)]	LA	☒		☒	☒	☐
☒ Mr. ☐ Ms.	Indrapal Parmar	TUV India Private Limited	TM[A)]	LA	☒	1.2	☒	☒	☐
☐ Mr. ☒ Ms.	Stöhr, Christina	TN Cert	OR[B)]	LA	☒		☐	☐	-
☒ Mr. ☐ Ms.	Stefan Winter	TN CERT GmbH	TR/ FA[B)]	SA	☒	1.2	☒	☐	-

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

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) As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, …)

5) In case of verification projects

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

B) No team member

All team members 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. Technical experts contributed to the assessment of special aspects of the project activity, e.g. technical or host country aspects.

Statements of competence for the above mentioned team members are enclosed in annex 3 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 occurance.	*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 last revision of the PDD, additional Annexes and further attached documents including the monitoring plan/PDD/,
- the last revision of the GS validation report/VAL/,
- documentation of previous verifications/VER/

- the monitoring report including the claimed emission reductions for the project/MR/, and Sustainability Development Indicators report/SDI/
- the emission reduction calculation spreadsheet/XLS/.

Other supporting documents, such as publicly available information on the Gold Standard Website and 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 monitoring data were checked completely.
- An assessment of the implementation and operation of the registered project activity as per the registered PDD or any approved revised PDD;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.
- Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD;
- A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD and the selected methodology and corresponding tool(s), where applicable;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

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 M/s Social Education and Development Society (SEDS) and Fair Climate Network (project consultant) including the operational staff of the plant 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. Projects & Operations Personnel 2. Consultant	- General aspects of the project - Technical equipment and operation - Changes since validation / previous verification - Monitoring and measurement procedures - Remaining issues from validation/ 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 - GHG emission reduction calculation - Procedural aspects of the verification - Maintenance - Environmental aspects - Gold Standard Requirements - GS monitoring parameters
3. Stakeholders	- Air quality - Water quality and quantity - Soil condiiton (aplication of spent slurry, usage of chemical fertilizers, sludge treatment) - Quantity of employement - Saving time in fuel wood collections, cooking time savings, Annual money savings - Technical problems with bioga stove, use of kerosene and fuel wood if any, - Continuous Supply of biogas - Trainings related to local VRV personnel, their frequency of visits - Fuel uasge and firewood procurement methods with non users - Number of cattle heads

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

Non-conformities 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 GS 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 project documents will be submitted 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[/XLS/], GSPDD[/PDD/], the GS 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	2	0
B – Implementation of project activity	0	1	0
C – Description of monitoring system	0	0	0
D – Data and parameters	0	1	0
E - Calculation of Emission Reductions	0	0	0
F - Sustainable Indicator	0	0	0
SUM	**0**	**4**	**0**

The following tables include all raised CARs, CLs and FARs and the assessments of the same by the verification team. For an in depth evaluation of all verification items it should be referred to the verification protocols (see Annex).

Finding	**A1**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	In section A.3 of the MR, the project proponent name is not identical with name in the project page of UNFCCC website. Kindly Clarify.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details. In case the MR is changed as part of the CA, the PP is requested*	The project proponent is Social Education and Development Society (SEDS) as mentioned in the PDD and the Host Country Approval. As mentioned in the UNFCCC website, M/s Social Education and Development Society (SEDS) is the project proponent mentioned in the revised Monitoring report.		

Finding	**A1**		
to indicate the revised sections as well as the new version No.	☒ Changes in MR	Section(s):A.3	New version No.:2
	☐ Changes in XLS	Worksheet(s):	New version No.:
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The project proponent name given in all sections of the monitoring report is in line with the project page of UNFCCC website, Hence CL A1 is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	**A2**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	1. The MR template used is not the latest one available in the UNFCCC website, Kindly clarify 2. The estimated emission reductions presented in the first page of the MR is not consistent with the other sections and Emission reduction sheets , Please clarify		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details. In case the MR is changed as part of the CA, the PP is requested to indicate the revised sections as well as the new version No.*	1. The monitoring report has been revised using the latest MR template Version 4. 2. The estimated emission reductions presented in the first page of the MR is made consistent with the other sections and Emission reduction sheets in the revised MR.		
	☒ Changes in MR	Section(s):	New version No.:2
	☐ Changes in XLS	Worksheet(s):	New version No.:
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	1. The Latest available form CDM-MR-FORM Version 4 available in the UNFCCC website is used hence accepted. 2. The ER figures given in all the sections are made consistent i.e., the estimated emission reductions and the Ex-ante estimated in the PDD are corrected in the first page. Hence accepted CL A2 is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	**B1**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	In section B.1 of the MR is not as per the filling guidelines and not in line with the information provided in Excel sheets for the implementation schedule.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details. In case the MR is changed as part of the CA, the PP is requested to indicate the revised sections as well as the new version No.*	The section B.1 of Monitoring Report has been revised to include the information provided in excel sheets for the implementation schedule. The section has been modified to include the implementation status for the monitoring period, the breakdown details.		
	☒ Changes in MR	Section(s):B.1	New version No.:2
	☐ Changes in XLS	Worksheet(s):	New version No.:
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The section B.1 of the revised MR includes the implementation status of the project till the end of the monitoring period as well as the proposed implementation schedule along with the break down details. This is in line with the filling guidelines given in the CDM MR FORM for section B.1. Hence accepted and CL B1 is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic 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)*	In the MR section D.1, the list of ex-ante parameters fixed during validation mentioned is not in line with the registered PDD, Please clarify.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details. In case the MR is changed as part of the CA, the PP is requested to indicate the revised sections as well as the new version No.*	In the revised MR, section D.1 has been updated as per the registered PDD.		
	☒ Changes in MR	Section(s):D.1	New version No.:2
	☐ Changes in XLS	Worksheet(s):	New version No.:
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The parameter rating of the biogas is included in the revised MR and all the parameters now mentioned in the revised MR are in line with the registered PDD. Hence CL D1 is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic 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 CLs 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	India	M/s Social Education and Development Society (SEDS)
Annex 1	Germany	Evangelisches Werk für Diakonie und Entwicklung e.V.

5.2. Implementation of the project

During the GS verification a site visit was carried out. 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 recording procedure, the project has been implemented and operated as described in the registered GS PDD/PDD/ and GS Passport/GPP/.

The project activity involves the installation and operation of 5 000 digesters in phases, at individual households and use of biogas produced in biogas stoves for cooking purpose and heating of hot water, replacing the commonly used inefficient wood fired mud stoves technology, thus avoiding the use of non-renewable biomass like the fuel wood from forests and the use of kerosene in the baseline scenario. In accordance with the chosen methodology, AMS-I.E. version 01 in the absence of the project activity, the baseline scenario would be the use of fossil fuels (kerosene) for meeting similar thermal energy needs.

As for this monitoring period only 3,014 digesters of 2 m^3 capacity have been installed. This is as per the database and as verified from the invoice for the supplies made as well as from the end user agreements (between SEDS and End users). These 3,014 biogas units have been considered in the calculation of emission reductions during this monitoring period. Also for the new digester installed during this monitoring period the emission reduction is apportioned accordingly for the

number of days they were in operation (from the date of installation to the last day of the monitoring period).

Also the 3,014 digester as part of the project activity were implemented in villages of 5 mandals of Anantapur district. The first biogas unit was commissioned and started use on 4 March 2011.

5.3. Project history

During the validation the validating DOE has not raised any issues that could not be closed or resolved during the validation stage. For this purpose no FARs is raised. No such issues were identified for this project. This was confirmed from table 4-1 of the validation report/VAL/

During the on-site visit and the desk review process, the audit team reviewed different information from the operational system of the project, logbooks, surveys reports, communications and other internal reports and records in order to identify changes or incidents during the operation of the project.

No events or situations occurred in the monitoring period that impacted the applicability of the methodology and monitoring plan.

Furthermore in the first periodic verification also no issues were raised by the verifying DOE as referred from the verification report.

5.4. Post registration changes

There was a change in the implementation area. Based on the survey in 2008 121 villages in 5 mandals of Anantapur district were identified for the proposed installations. During the course of implementation, after the registration of the project, due to various factors the PP could not implement the 5,000 biogas digesters in the identified 121 villages and hence decided to implement the same in 250 villages within the 5 mandals of the District. The executive board of the UNFCCC already approved this proposed change on 2013-07-11[2]

5.5. Compliance with the GS monitoring plan

The monitoring system and all applied procedures are completely in compliance to the registered GS carbon and sustainability monitoring plan. Regarding the compliance with the monitoring plan, the verification team reviewed if:

- The monitoring of reductions in GHG emissions resulting from the proposed CDM Project activity were implemented in accordance with the monitoring plan contained in the registered PDD.
- The monitoring plan and the applied methodologies had been properly implemented and followed by the project participants.

[2] http://cdm.unfccc.int/Projects/DB/RWTUV1269520327.35/view

- All parameters stated in the monitoring plan, the applied methodologies and relevant CDM EB decisions had been sufficiently monitored and updated.
- The responsibilities and authorities for monitoring and reporting were in accordance with the responsibilities and authorities stated in the monitoring plan.

The monitoring system and all applied procedures are in compliance with the monitoring plan contained in the registered PDD, and the applied methodology AMS-I.E. ver.01, based on the information included in the final monitoring report.

Thus, it is concluded by verification team that the monitoring plan as stipulated in section B.7.2 of the registered PDD, and is observed to be followed in the project and the description of the monitoring system provided under section C of the Carbon Monitoring Report/MR/ is verified during onsite observation, verification of plant records/REC/, and interview with the involved personnel in operation and maintenance of the biogas digesters are found to be appropriate by verification team.

5.6. Compliance with the sustainability monitoring plan

The SD indicators as per the validated monitoring plan/GPP/ are monitored and reported appropriately and cross-verified by means of desk review of supporting documents, interviews with the PP, and with the involved personnel in operation and maintenance of the biogas digesters. The monitoring system and all applied procedures are in compliance to the registered monitoring plan and the Gold Standard conservativeness principle.

5.7. Compliance with the monitoring methodology

The monitoring system is in compliance with the applied monitoring methodology AMS-I.E. ver.01 i.e. “Switch from Non-Renewable Biomass for thermal applications by the user”).

The verification team reviewed whether the registered monitoring plan was in accordance with the applied methodology and if any other monitoring aspect of the project activity that is not specified in the methodology was identified.

- The verification team confirmed that the monitoring plan of the validated CDM Project acitivity is in accordance with the applied approved methodology AMS-I.E. ver.01 (“Switch from Non-Renewable Biomass for thermal applications by the user”) based on the following reasons:
- During the desk review monitoring parameters included in the applied methodology were compared with the ones included in the monitoring plan of the registered PDD and they were found consistent.

- During this verification process no need was identified for revision of the monitoring plan.
- No other relevant aspects for monitoring not included in the methodology were identified.
- No deviations from the monitoring methodology were identified during the verification process.

Thus, it is concluded by verification team that the monitoring report and emissions reduction calculations are in line with the requirements of the validated monitoring plan as well as with the applied methodology. Thus, the reporting procedures correctly reflect the requirements of the monitoring plan

5.8. Monitoring parameters

During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the PDD) 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.

The following data and parameters fixed ex ante were checked by the verification team to be in line with registered PDD used for ER calculations (CER calculation sheets are also checked)

(1) Net calorific value of the non-renewable biomass that is substituted;

$NCV_{biomass}$ = 0.015 TJ/t

(2) Emission factor for the projected fossil fuel consumption in the baseline; **$EF_{projected\_fossil\ fuel}$** = 71.5 tCO_2 / TJ for kerosene

(3) Fraction of biomass used in the absence of the project activity in year y that can be established as non renewable biomass using nationally approved methods; **$f_{NRB,y}$ = 90%**

(4) The rating of the biogas digesters 1.78 kW/digester.

(5) Quantity of woody biomass that is substituted or displaced in tonnes per year and appliance;

By = 3.37/tonnes/family/year.

The Ex-post monitoring parameter required to be monitored are

(1) biogas units constructed which are 3,014 based on the data base and supply invoices.

(2) Number of biogas plants operating which are 3,014 based on maintenance records which are monitored

(3) Confirmation that non-renewable biomass of By has been substituted. – as per the sample survey.

(4) Non-usage of biogas plants – total 1,45,252 days as per the maintenance records.

(5) Diversion of non-renewable biomass saved under the project activity by non-project households - no leakage observed as per the sample surveys.

The Verification team checked the data base (invoice records), maintenance records as well as the survey records to confirm that the values of the monitored parameters are correct and therefore the emission reduction calculation is also correct.

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.

5.9. Monitoring report

A draft monitoring report was submitted to the verification team by the project participants. The team has made this report publicly available prior to the start of the verification activities. No comments were received.

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 in accordance with the registered PDD and other relevant requirements.

5.10. Sampling

5.10.1. Implementation of the sampling plan

The sampling was required to determine the following monitored parameters.

(i) Confirmation that non-renewable biomass of B_y has been substituted.
(ii) Diversion of non-renewable biomass saved under the project activity by non-project households.

The PP took the target population as 3,014 to confirm that non-renewable biomass of B_y has been substituted. The sample size estimated through stratified sampling survey to obtain 90/10 confidence/precision levels with 80% response rate is 72 households. However the PP took 106 samples hence the sample size taken is adequate as the PP used the formula as per EB 67 annex 6. As per the survey records it can be confirmed that the extent of replacement of non-renewable fuelwood is complete.

Secondly the PP used the Bill Godden equation[3] for the sample size estimation to determine the diversion of non-renewable biomass saved under the project activity by non-project households as the target population is infinite (> 50,000) and considering 90/10 confidence/precision levels the estimated sample size is 68. However the PP took the 167 samples for the same.

The sample estimated (for both the cases) are apportioned accordingly to the number of biogas digesters implemented in each mandal and accordingly the villages and households are selected.
The analysis of the sample survey indicates that the leakage is zero for this project. However the PP considered 5% leakage for the project as per the latest version 5 of the applied methodology.

The above determined parameter is not directly concerned with the estimation of the baseline emissions and is required for the leakage emissions only. Since PP considered 5% leakage which is conservative, VT comes to the decision that the sampling plan is correct and appropriately applied for this monitoring period.

5.10.2. Sampling approaches during verification

For the calculation of Baseline emissions all parameters are monitored by PP. But for the estimation of the parameters for leakage in the above section the PP used Sample survey.

VT verified the installations and non - operational days of all the 3,014 digesters from the data base and other records provided by PP. However, for the physical location of the digesters, the VT combined the samples of the PP for leakage estimation to arrive at the number of digesters to be visited, by considering the travelling requirements. Accordingly the VT decided to verify 20% of the samples taken by PP and visited 20 sampled households from 106 samples and furthermore 10 non sample households. Also VT interviewed 15 households from both the sampled villages and non - sampled villages.

The VT prepared a questionnaire for the same and recorded observed details and cross checked for correctness for all those households visited with the data information provided in the data base as well as in the survey records andfound correct.

Thus the sample size taken by VT is 20 out of 106. Thus around 20% of the PP samples are covered which deemed adequate. Also the non- sampled households are also visited to ensure the usage of non- renewable biomass.

[3] http://williamgodden.com

5.11. ER Calculation

During the verification no mistakes in the ER calculation were identified after thoroughly checking the ER calculations prepared by the PP. Thus it is confirmed that the ER calculation is overall correct.

The formulae and factors used in the calculations of removals are in accordance to the applied methodology AMS-I.E version 1[/METH/]. All aspects related to the GHG reductions have been addressed and calculations are presented in a transparent manner and in line with the applied methodology, tools and the revised approved PDD[/PDD/].

All assumptions, default values etc., are in accordance with AMS-I.E version 1 and have been appropriately applied. The sources of project specific original data were cross–checked and found to be correct based on the evidence provided by the PP. The same is listed in table 7-1 of this report.

The following formula is used to calculate the Emission reductions:

$$ERy = B_y * f_{NRB,y} * NCV_{Biomass} * EF_{projected\_fossilfuel}$$

Where:

ERy	=	*Emission reductions during the year y*
By	=	*Quantity of biomass that is substituted or displaced in* t/family/yr
$f_{NRB,y}$	=	*Fraction of biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods*
$NCV_{Biomass}$	=	*Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/t)*
$EF_{projected\_fossilfuel}$	=	*Emission factor for the projected fossil fuel consumption in the baseline.*

For B_y PP considered non-operational days and accordingly calculated B_y = 10,832 t.

$$ER_y = 10{,}832 \text{ t} * 90\% * 0.015 \text{ TJ/t} * 71.5 \text{ tCO}_2\text{e/TJ}$$

$$= 10{,}455 \text{ tCO}_2\text{e}$$

There are no project emissions in the project activity, so $PE_y = 0$.

As per the survey methods the following parameters are estimated as zero.

(i) Confirmation that non-renewable biomass of B_y has been substituted.

(ii) Diversion of non-renewable biomass saved under the project activity by non-project households

However PP considered 5% leakage as per the latest version 5 of the methodology to account for leakage.

LE_y = 5% * 10,455 tCO_2e = 523 tCO_2e.

Therefore

ER_y = BE_y - PE_y - LE_y
= 10,455 tCO_2e – 0 – 523 tCO_2e
= 9,932 tCO_2e.

Thus total emission reductions achieved during this monitoring period is **9,932** tCO_2e.

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 CDM 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.

SEDS is responsible for the operation and maintenance of the project and data collection. SEDS has sufficiently established management procedures and has implemented them effectively to ensure that the process is consistent and the same has been verified to be in place by VT during on site audit. The procedure for data collection methods and storage is evidenced during the onsite visits on interviewing the responsible persons for the same. The training records indicate that proper training was given to the field level persons.

The procedures cover management responsibilities, data monitoring procedures, training procedures, management reviews and corrective actions in case of any deviations. VT confirms from the discussions that were held during the site visit that the responsibilities and authorities in the management and operational system for monitoring and reporting are in accordance with the responsibilities and authorities as detailed in the PDD and complies with the monitoring plan as per the PDD.

5.13. Monitoring of Sustainable Development Indicators

The Sustainable development parameters are monitored as indiated in the below table.

Indicator	Parameter	Value	Verification Opinion
Air quality	Reduction in 1. Indoor Smoke 2. Suspended Air particles in air	100% 100%	The survey results (conducted by the PP) indicate that due the implementation of the project activity the indoor smoke and suspended air particles are completely eliminated in the installed households due to the complete combustion of biogas. During the on-site visit the VT randomly selected some of the households (both

Indicator	Parameter	Value	Verification Opinion
			surveyed and non-surveyed) and enquired about the air quality and concluded that the project completely reduced the smoke and suspended air particles after the implementation of the biogas plant when compared with traditional cooking. The sampling plan for the indicator is annual by recording the experience.
Other pollutants	Total Bacterial Count (X 10^7 CFU/g)	Dung – 3.65 Slurry- 0.95 Reduction - 75%	Accredited Lab test was conducted once in two years and the same is checked to ascertain the same. Thus it is confirmed that the project reduces the organic pathogens in the project area.
Quality of employment	Training given to staff to develop skills	170 in total	The implementation of the project has given employment to masons and VLV (Village level Volunteer) to effective monitoring and maintenance. The trainings records are checked and interviews with the masons and VLV confirmed that the project improved the quality of employment. Also the wage records of those persons were checked to confirm the same.
	Direct employment increase in other activities	One labour replacement	Before the start of the project the women folk and/children in the project households are entrusted with the job collecting fuel wood. Due the project it completely eradicated the time spent on fuel wood collection and women are able to go for other agricultural activities and thus in turn their employment has increased.
	Other activities	Dairy related	During the onsite visit the interview one of the milk procurement society it was confirmed that the milk procurement has increased in the project area (increase in cattle heads as well as high yielding cattle). Thus the project improves the employment generation.
Livelihood of the poor	Decrease in cooking hour and fuel wood	5.30 hours to 1.45 hours	The survey conducted indicates that there is a daily reduction in cooking time of about 3.45 hours at an average. This

Indicator	Parameter	Value	Verification Opinion
	collection.	Fuel wood collection eradicated	is relives the women of the household from drudgery work. During the on-site visit all those women folks interviewed happily indicated the same. Also the project completely eradicated the fuel wood collection time. Thus the project improves the livelihood of the poor.
Access to affordable and clean energy services	Click of Knob	-	The composition of biogas is methane and carbon dioxide. The operation of the stoves itself similar to the LPG stoves, click of the knob they start the cooking. During site visit the beneficiaries indicated that during rainy reason it is difficult for them to litter the fire woods. Thus due to this project they are having good access to the clean energy.
Human and institutional capacity	Children going to school in time	86% - said Yes	Due to the less time in cooking and no time spent on colleting fire woods, the children of the beneficiary households are able to attend the school in time.
	Attending unexpected guests	39% - Said Yes	During the onsite visit interview the women folks are happy to prepare Tea/ coffee at short notice. Also some women folk indicated that they cook variety of item and able to attend the unexpected guests properly. Thus the project improves the human and institutional capacity of the people.
Quantitative employment and income generation	Dairy Income	INR 560/month	As indicated under quality of employment, the average income due to dairy activities has increased by INR 560/month.
	Painting Walls	INR 400/year	The wall painting is not required to be done as the black smoke is completely eradicated.
Balance of payments and	Funding	INR 70 Million	The project brought INR 70 Million as forward funding through sale of CERS. Thus due to this project the investment is

Indicator	Parameter	Value	Verification Opinion
investment			made.
Technology Transfer and Technological Self-Reliance	Other NGOs – replicating	WORD, BEST, SACRED and CROSS	The other NGOs has started replicating the project. The evidences like training workshops conducted and visit photographs are checked to conclude the same.

5.14. Actual emission reductions during the first commitment period and the period from 1 January 2013 onwards

The MR includes actual ER values achieved up to 31 December 2012 and actual values achieved from 1 January 2013 onwards as follows:

Table 5-2: Emission reductions before and after the end of 2012

	until 2012-12-31 [1)]	from 2013-01-01 [1)]	Sum
Emission reductions [tCO_{2e}]	NA	9,932	9,932

[1)] Both days included

In the emission reduction calculation excel file (CER calculation sheets) the vintage wise emission reduction are given for the monitoring period and as follows

	01-01-2013 to 31-12-2013 [1)]	01-01-2014 to 30-04-2014[1)]	Sum
Emission reductions [tCO_{2e}]	7,503	2,429	9,932

[1)] Both days included

5.15. 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.

The calculated value was found to be proportionally lower than the ex-post determined value due to the lesser number of installations than the anticipated one, thus no further justification was required.

5.16. 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 installations of the plant 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 not compliant with the GS requirements or any other scheme the monitoring is referring to.

5.17. Hints for next periodic Verification

No FARs was raised during the course of this (second) verification.

6. VERIFICATION AND CERTIFICATION STATEMENT

M/s Social Education and Development Society (SEDS) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 2nd periodic verification of the project: "Social Education and Development Society (SEDS) Biogas CDM project for the rural poor", with regard to the relevant requirements for GS project activities. The project reduces GHG emissions due to implementation of the biogas digesters to replace non-renewable biomass for thermal energy requirements. This verification covers the period from 2013-01-01 to 2014-04-30(including both days).
In the course of the verification 0 Corrective Action Requests (CAR) and 4 Clarification Requests (CL) were raised and successfully closed. Furthermore 0 FARs are raised to improve the monitoring system in the future. The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the registered GS PDD, the validation report, emission reduction calculation spreadsheet 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 CDM methodology, i.e., AMS-I.E ver. 1
- 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 2nd periodic verification, 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: **9,932** t CO_{2e}

Coimbatore , 2015-07-06

G Ezhilarasu.

TÜV NORD JI/CDM Certification Program
Verification Team Leader

Essen, 2015-07-06

Winter Stefan

TÜV NORD JI/CDM Certification Program
Final Approval

7. REFERENCES

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

Reference	Document
/MR/	Carbon Monitoring report for the titled project activity dated 17/05/2014 Version 1 for the mentioned monitoring period - dated 12/12/2014 Version 2 for the mentioned monitoring period - dated 03/03/2015 Version 3 for the mentioned monitoring period
/XLS/	Emission reduction calculation spreadsheet corresponding to the monitoring report Emission reduction calculation spreadsheet with vintage wise calculation corresponding the SDI report
/REC/	Monitoring solution database at SEDS head office in Ananthpur for installed biogas units monitoring details Biogas CDM project-Break down log book for monitoring of biogas units maintained by village level volunteers for details of individual biogas units regarding break down, operational and non operational hours Database at SEDS head office in Ananthpur maintaining information on the construction, operation & breakdown /repairs of biogas digesters
/PO/	End user agreements between SEDS and biogas unit users Store register maintained which has details of biogas stove issued by CREST Purchase order and specification for biogas stoves issued by SEDS
/TRG/	Training records for stove repair and maintenance to field level workers conducted at Village level.
/SDI/	Sustainability development Indicators report dated 16 May 2014, version 1 Sustainability development Indicators report dated 30 June 2015, version 2
/SUR/	Survey records of studying diversion of non-renewable biomass saved under the project activity; Survey records of survey of the usage of non-renewable biomass and kerosene usage

Table 7-2: Background investigation and assessment documents

Reference	Document
/meth/	AMS-I.E ver. 1, "Switch from Non-Renewable Biomass for Thermal Applications by the User"
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/GSPDD/	Project Design Document for CDM project: "Social Education and Development Society (SEDS) Biogas CDM project for the rural poor" version 6, dated 2010-03-18
/GSP/	Approved GS passport for the project: "Social Education and Development Society (SEDS) Biogas CDM project for the rural poor" version 5, dated 2012-02-17
/IPCC/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)
/MRT/	Monitoring Report Form (CDM-MR-FORM), Version 4.0
/PDD/	Project Design Document for CDM project: "Social Education and Development Society (SEDS) Biogas CDM project for the rural poor" version 8, dated 2013-03-26
/PS/	CDM Project Standard (Version 7.0)
/VAL/	Validation Report for CDM project "Social Education and Development Society (SEDS) Biogas CDM project for the rural poor" version 0, dated 2010-03-22
/VER/	Documents of previous verifications (GS carbon Monitoring report, GS sustainability Monitoring report, sustainability verification report, ER calculation sheet)
/VVS/	CDM Validation and Verification Standard (Version 07.0)

Table 7-3: Websites used

Reference	Link	Organisation
/dna/	http://cdmindia.in/	DNA of India
/unfccc/	http://cdm.unfccc.int	UNFCCC
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/gs/	http://www.goldstandard.org/	Gold standard

Table 7-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☐ Mr. ☒ Ms	Manil Jayasena. J	SEDS/ CEO
/IM01/	V	☒ Mr. ☐ Ms.	Rohith Joshua	SEDS / Staff Advisor
/IM01/	V	☒ Mr. ☐ Ms.	G Kasi Viswantha Rao	SEDS/ System Admin (Data Base)
/IM01/	V	☐ Mr. ☒ Ms.	P Nagamani	SEDS/ Co-ordinator
/IM01/	V	☒ Mr. ☐ Ms.	Filip Tetaert	SEDS/ Facilitotor
/IM02/	V	☐ Mr. ☒ Ms.	Sudha Padmanabha	FCN/ Senior CDM Specialist
/IM02/	V	☒ Mr. ☐ Ms.	Chethan T R	FCN/ CDM Facilitator
/IM02/	V	☒ Mr. ☐ Ms.	Nayan Madappa	FCN/ Project Manager

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

ANNEX

A1: Verification Protocol

A2: Calibration dates and validity of installed monitoring equipment

A3: 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	• 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 • Inappropriate QA/QC	• 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	organized • Training • Internal audit procedures • Internal check of QA/QC measures of involved Third Parties	measures of Third Parties	• Application of CDM management system procedures • Check of trainings • Check of responsibilities • Check of QA/QC documentation / evidence 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 • Usage of standard software solutions	• 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*)
	(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 evidence 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 the carbon monitoring report and sustainability monitoring report 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 equipments ☒ Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods etc ☒ Total emission reductions achieved in this monitoring period	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/ /IM/	The verification team has checked the carbon monitoring report and sustainability monitoring report 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	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		☒ Physical / Geographical location		
A.3. Parties and Project Participants *Check if the MR includes the following:* - *All PPs as displayed on the UNFCCC website* - *A correctly filled table as per the MR template*	/MR/ /unfccc/	The verification team has checked the MR as well as the UNFCCC website and confirms that: ☐ all PPs as displayed on the project related UNFCCC website are correctly listed ☒ the table as per the template MR has been correctly filled In this context the following findings have been identified: CL A1 is raised.	~~CL A1~~	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* - *Relevant EB decisions, if applicable*	/MR/ /PDD/ /unfccc/	The verification team has checked the carbon monitoring report and sustainability monitoring report and confirms by means of comparison with the information given in the PDD and displayed on the UNFCCC website that the information provided is complete and correct with regards to the following: ☒ Number, title and version of the applicable CDM Methodology ☒ Name and version of applicable CDM methodological tools ☒ Relevant EB decisions	OK	OK
A.5. Crediting period of project activity *Check if the MR correctly includes the following:* - *Start date of the crediting period. In this context*	*/MR/* */unfccc/*	*The verification team ha*s checked the carbon monitoring report and sustainability monitoring report and confirms by means of comparison with the information displayed on the UNFCCC website that the information provided is complete and 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.**
please check, if applicable, whether post registration changes to the start date have been accepted by the EB. - *Length and type of the crediting period*		with regards to the following: ☒ Start date of the crediting period. ☒ Type and length of the crediting period		
B. Implementation of project activity				
B.1. Description of implemented 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* - *Diagrams (where appropriate)*	/MR/ /PDD/ /PS/ /IM/	The verification team has checked the carbon monitoring report and sustainability monitoring report and confirms by means of comparison with the information given in the PDD, 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 project standard ☒ an appropriate description of the installed technology(ies), technical process and equipment incl.diagrams, where applicable, has been included	OK	OK
B.1.1. Initial project implementation ***(VVS; §§ 260 a, 261)*** *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.*	/IM01/ /PDD/	*Description:* The description of the implementation schedule is not in line the data base *Verifier´s action:* PDD MR and ER sheets are checked *Conclusion:* CL B1 is raised.	~~CL B1~~	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 the project is still in compliance with the applicability conditions of the methodology. *Also, discuss – if applicable – the necessity of PRC notifications / approvals.*				
B.1.2. Technical equipment changes ***(VVS; §§ 260 a, 261)*** *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.* *In case of post registration changes pl. refer to chapter B.2.*	/IM01/ /PDD/ /DB/ /REC/	*Description:* Specifications of key equipment i.e. biogas plants were evidenced during the verification site visit. Key equipment at site were found to be consistent with the registered PDD, MR and calculation spreadsheet. *Verifier´s action:* Interview with plant users were conducted and plant maintenance records (Data base in soft copies and hard copies) was checked. *Conclusion:* As evident from site visit observations, interviews and document check that no technical equipment related to project operation is changed	OK	OK
B.1.3. Operation of the project activity ***(VVS; §§ 260 a, 261)*** *Check if relevant operation modes of the project activity have been exchanged or modified during the monitoring period.*	/IM01/ /PDD/	*Description:* By means of interviews with the biogas plant users, SEDS, FCN and site personnel, site visit observations and review of SEDS database it was evidenced, that no relevant operation modes were exchanged or modified within the monitoring period as there were no change reflected in Biogas user manual and SEDS database in current MP.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
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.* *In case of post registration changes pl. refer to chapter B.2.*		*Verifier´s action:* The SEDS database operating software original was checked and has been verified randomly during the site visits and compared with observations during the on field enquiry.. *Conclusion:* No relevant operation modes the bio gas digesters have been exchanged or modified during the monitoring period.		
B.1.4. Incidents ***(VVS; §§ 260 a, 261)*** *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.*	/IM01/	*Description:* No abnormal incident /deviant operation mode found as evident during the monitoring period. Out of ~30 households interviewed, all users reported that plants were working. Most of the households interviewed were of the view that gas production in normal throughout the year. Verification team understands that this is attributable to the constant microbial degradation rates during whole year due to the sub-tropical climatic conditions and hence is reflection of the normal biochemical activities. *Verifier´s action:* Interview with plant users were conducted and plant maintenance records was checked. *Conclusion:* No abnormal incident /deviant operation mode found evident.	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	/IM01/ /MNRE/	*Description:* As per the onsite interviews with the representatives of the project participants and verification of various documents, verification team found that the various aspects of project activity w.r.t. the biogas is line with regulatory requirements. Moreover the national/sectoral regulations were	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
changed. Assess, in case of changes, whether consequences for the PA with regard to relevant CDM requirements have been accounted for. In case of changes data sources shall be referenced.		verified from Ministry of New and Renewable Energy. There were no changes in the regulation which can affect the emission reduction of the project activity. Therefore the verification team confirms that the change in legislation has no impact on the project activity *Verifier´s action:* MNRE regulations are publically available documents. *Conclusion:* No relevant legislation with effect on the project activity 's in the host country has been changed.		
B.1.6. Open issues from validation ***(VVS; § 248)*** *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
B.1.7. Open issues from previous verification ***(VVS; §§ 248, 319 h)*** *Check in case of further periodic verifications whether there are any open issues indicated in previous verification reports (FAR) and take into consideration the guidance as specified in VVS.*	/VER/	☒ 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:	OK	OK
B.2. Post registration changes				

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
B.2.1. Are post registration changes applicable to the proposed project activity?	/PRC/ /PDD/	☐ No, by means of site visit, document check and interview it could be verified that the project is implemented and operated in line with the registered PDD and the applied methodology. (Please proceed with section C) ☒ Yes, post registration changes have been identified and are assessed in detail in the subsequent steps. (Please proceed with B.2.2.)	OK	OK
B.2.2. Temporary deviations from the registered monitoring plan or applied methodology (TDfrMP; TDfMM) ***(VVS §§ 286 - 291)*** *Indicate whether any temporary deviations have been applied during this monitoring period.* *In cases where approval has been sought from the EB please provide reference.* *If applied, provide a description of the deviation(s).* *This should include the reasons for the deviation(s), how it deviates from the monitoring plan and/or applied methodology(ies), the duration for which the deviation(s) is(are) applicable and justification on the conservativeness of the approach. Indicate if the deviation will lead to a reduction in the accuracy and if so, which conservative assumptions and discount factors have been applied.* *For deviation(s) that require prior approval by the*	/PS/ /unfccc/	☒ No TDfrMP or TDfMM.have been submitted to the UNFCCC prior to the current monitoring period ☐ The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC 1 Title Status ☐ under approval; ☐ approved Appr.date Ref. No. 2 Title Status ☐ under approval; ☐ approved Appr.date Ref.No. ☒ During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Board, include the date of approval and reference number.		☐ plan is in accordance with the approved methodology applied by the PA ☐ An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply. 1 Issue: 2 Issue: ☐ The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied: 1 Issue: 2 Issue:		
B.2.3. Corrections ***(VVS; §§ 292 - 294)*** *Indicate whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report.* *In cases where the correction(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD.* *Please check and report that the corrected information is an accurate reflection of the actual*	/MR/ /PDD/ /PRC/	☒ During the verification of the current MP no need for corrections has been identified. ☐ The following corrections have been applied: 1 Issue: 2 Issue:	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.				
B.2.4. Permanent changes from the registered monitoring plan or applied methodology (PCfrMP; PCfMM) ***(VVS; §§ 295 - 303)*** *Indicate whether any permanent changes from the registered monitoring plan or applied methodologies have been approved during this monitoring period or submitted with this monitoring report.* *In cases where the change(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD.*	/MR/ /PDD/	☒ No PCfrMP or PCfMM.have been submitted to the UNFCCC prior to the current monitoring period ☐ The following PCfrMP or PCfMM have been approved or are under approval by the UNFCCC 1 Title: ; Status: ☐ under approval; ☐ approved; Appr.date: ; Ref. No.: ; 2 Title: ; Status: ☐ under approval; ☐ approved; Appr.date: ; Ref.No.: ☒ During the verification of the current MP no need for a PCfrMP or PCfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA ☐ An approval of the following PCfrMP or PCfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		☐ 1 Issue: 2 Issue: ☐ The following PCfrMP or PCfMM for which appendix 1 of the PS is applicable have been applied: 1 Issue: 2 Issue:		
B.2.5. Changes to the project design of the registered project activity (CoPD) ***(VVS; §§ 304 - 317)*** *Indicate whether any changes to the project design of the project activity have been approved during this monitoring period or submitted with this monitoring report.* *In cases where the change(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD.*	/PDD /MR/ /PRC/	☐ No CoPD has been submitted to the UNFCCC prior to the current monitoring period ☒ The following CoPD has been approved or are under approval by the UNFCCC 1 Title: The changes occurred during the course of implementation of the project, which was started in December 2010.The villages now considered (250 villages) are more than that identified initially and the households were also different from that initially surveyed Status: ☐ under approval; ☒ approved Appr.date: 2013-07-11 Ref. No.: PRC-3541-001	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		☐ 2 Title: ; Status: ☐ under approval; ☐ approved; Appr.date: ; Ref.No.: ☒ During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA ☐ An approval of the following CoPD.is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply. 1 Issue: 2 Issue: ☐ The following CoPD for which appendix 1 of the PS is applicable have been applied: 1 Issue: 2 Issue:		
C. Description of monitoring system				
C.1. Monitoring Plan – PDD Compliance ***(VVS, §§ 268-271)*** *Check if the monitoring plan is in accordance with the validated monitoring plan and the GS monitoring*	/MR/ /PDD/	By means of comparison of the MR with the registered PDD (or any revisions thereof) the verification team has checked whether the MP is in compliance with the registered PDD. The outcome is as follows:	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
matrix. *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*		☒ The MP is in line with the validated monitoring plan and the GS monitoring matrix.		
C.2. Monitoring Plan – Meth Compliance ***(VVS, §§ 264-267)*** *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.*	/MR/ /PDD/ /Meth/	By means of comparison of the MR with the applied CDM 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 approved methodology applied by the CDM project (last registered/approved version of the PDD)	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
C.3. Management System ***(VVS, § 252 (a) (iii))*** *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 CDM 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.*	/IM01/ PDD /MR /TR/	*Description:* The section C of the MR is described as per the approved monitoring plan given in the registered PDD. *Verifier´s action:* During the site visit the data capture and backup storage using Tristle software developed for the data management for this project have been checked. The organisational flow chart and data flow from the end user to the data base and its management system are found to be in line with the registered monitoring plan. The training records and audit team records are checked for the consistency. Also all the field observations during the visit to households are checked for the correctness in the data base for example, slurry too thin, knob repair, gas pipe cut etc., were are all captured in the data. *Conclusion:* Thus, it is concluded by verification team that the GHG Monitoring and evaluation system in place leading to accurate calculation of the emission reductions for the current monitoring period.	OK	OK
C.4. Metering diagram ***(PS §242)*** *Check first if the MR includes a metering diagram*	/PS/ /PDD/ /MR	*Description:* The MR does not include a metering diagram. The biogas utilization system does not require any metering equipment. Hence this checklist section is not applicable. This reflects the actual situation and is in line with the registered PDD	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
showing all relevant monitoring points. *Check further if this diagram reflects the actual situation and is in line with the registered PDD and with the requirements of the applied methodology.*		and with the requirements of the applied methodology. *Verifier´s action:* Desk review of registered PDD and webhosted MR *Conclusion: N/A*		
C.5. Roles and Responsibilities ***(PS §242)*** *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.* *Identify, if relevant personnel w.r.t. monitoring has been exchanged?* *If so, have appropriate training measures been carried out.* *In case of changes, assure that the implemented monitoring procedures have not been affected.*	/PS/ /PDD /MR/	*Description:* The section C of the MR gives the information flow for the data capture to storage and roles and responsibilities of the personal involved are clearly given. *Verifier´s action:* The MR and registered PDD are checked. *Conclusion:* Thus it is concluded that the roles and responsibilities are clearly the data flow is easily identified and in line with the registered monitoring plan.	OK	OK
C.6. Emergency procedures for the monitoring system ***(PS §242)*** *Check, as appropriate, whether relevant emergency procedures for the monitoring system have been included in the MR and assess whether these*	/PS/ /MR/ /PDD/	*Description:* As an emergency procedures the data is backed up within 2-3 days for this project activity and stored in the server as well as in the external device *Verifier´s action:* By means of desk study of registered PDD & MR. *Conclusion:* The non-usage is monitored there is no emergency	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
procedures have been implemented, when required		procedure for the monitoring other than the data back		
C.7. Data archive and data protection ***(PS §56 b)*** 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.	/PDD/ /MR /IM01/	*Description:* All the monitoring parameters are archived electronically and or in paper according to registered monitoring plan as verified during site visit. Appropriate measures are in place in order to avoid unintended or intended manipulation of the measured data. The archiving computer is password protected. Authority of login in the database is restricted with authorized personnel only. Moreover regular check-up procedure is there to check the file server in SEDS. *Verifier´s action:* This is confirmed through interview of SEDS personnel and physical verification archiving system. *Conclusion:* The archiving system is in place in accordance to the registered PDD, and adequate measures are taken in order to avoid any kind of manipulation of data or information.	OK	OK
D. Data and parameters				
D.1. Data and Parameters fixed ex ante				
a) Compliance with registered PDD ***(VVS § 246 (d))*** *Check whether the value applied is in compliance with the registered PDD.*	***/MR/*** ***/PDD/*** ***/XLS/***	*Description:* The *ex-ante* fixed parameters are NCV of biomass (NCV $_{biomass}$ biomass substituted By, Fraction of Non-Renewable Biomass $f_{NRB,y}$, Emission factor for kerosene, $EF_{projected\_fossilfuel}$ Values mentioned in the webhosted MR as fixed *ex ante* are correct and in consistence with the registered PDD *Verifier´s action:* By means of the registered PDD, webhosted MR and submitted CER calculation sheet..	~~CL 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: Thus, it is concluded by verification team that the ex-ante fixed parameter values applied are in compliance with the registered PDD. However CL D1 is raised.		
b) Compliance with the applied methodology ***(Attachment; D1)*** *Check whether the value applied is in compliance with the applied methodology or any other tool.*	**/PDD/** **/MR/** **/XLS/** **/meth/**	*Description:* All the values mentioned in the webhosted MR as fixed *ex ante* are correct and in consistence with the applied methodology and the sources mentioned thereof. *Verifier´s action:* The applied methodology AMS-I.E "Switch from Non-Renewable Biomass for thermal applications by the user", webhosted MR and submitted CER calculation sheets are checked along with the registered PDD. *Conclusion:* No change has been found in the ex-ante values from the applied methodology.	OK	OK
D.2. Data and Parameters monitored				
a) Measurement / Determination method ***(VVS, §§ 268, 271)*** *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination*	/IM01/ /PDD/ /meth/	*Description:* The following parameters are monitored as per the registered PDD. I. Biogas Units Constructed II. Number of biogas plants operating III. Non-usage of biogas units IV. By – Confirmation that non-renewable biomass has been substituted	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
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 of the PDD and the applied methodology.*		V. Diversion of non-renewable biomass saved under the project activity by non-project households *Verifier´s action:* The PDD,MR and methodologies applied are checked *Conclusion:* The parameters determined monitored are in line with the applied methodology.		
b) Accuracy and QA/QC Procedure ***(VVS, §§ 272-278)*** *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 in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*	/MR /PDD	*Description:* Not applicable as no calibration equipment is used *Verifier´s action:* *Conclusion:*	N/A	NA
c) Correctness ***(VVS, §§ 268, 271)***	/MR/ /PDD/	☒ Correct ☐ Not correct (initial assessment) *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.**
Determine whether the value given in the 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.*	/REC/ /XLS/	The parameters which are required for the purpose of emission reduction sheets are monitored. The values taken are taken from the data base. *Verifier´s action:* MR, PDD and data base is checked along with the ER calculation sheets. *Conclusion:* Thus it is concluded that the value taken for monitoring parameters are correct and conservative and in line with the registered PDD		
***D.3.* Parameters monitored for Sustainability**				
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. .*	/GSP/ /SDI/	Description: The following parameters are monitored. 1. Air quality 2. Other pollutants 3. Quality of employment 4. Livelihood of the poor 5. Access to affordable and clean energy services 6. Human and institutional capacity 7. Quantitative employment and income generation 8. Balance of payments and investment 9. Technology Transfer and Technological Self-Reliance. Verifier´s action: The GSP and SDI are checked along with the survey results along with the data base.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		Conclusion: Thus all the parameters are monitored in accordance to the GSP and toolkit.		
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.*	/GSP/ /SDI/	☒ Correct ☐ Not correct (initial assessment) Description: The values are determined according to the GS Passport Verifier´s action: The survey results are checked and randomly seleted households are interviewed to confirm the same during the onsite visits. Also the data base is checked. Conclusion: The value applied are correct and in accordance to the GSP and toolkit requirements. Scoring: It is appropriate as per the GSP	OK	OK
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*	***/REC/*** ***/PDD*** ***/MR/***	☐ No sampling approach has been used by the PP to determine the monitored parameters **OR**. ☒ A sampling approach has been taken for the following monitored parameter:	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
described the implemented sampling plan including *a) Description of the implemented sampling design* *b) Collected data* *c) Analysis of collected data* *d) Demonstration on whether the required confidence/precision has been met.*		***Parameter:*** ***I. By – Confirmation that non-renewable biomass has been substituted*** ***II. Diversion of non-renewable biomass saved under the project activity by non-project households*** *Description:* The Parameters used for emission reduction calculations are monitored. However for the above mentioned parameters the PP used the sample survey to determine the same as per the registered PDD. *Verifier´s action:* The section D.3 of the MR gives a clear description of the sampling plan conducted for this monitoring,, the data collection procedures, analysis and information about the achieved precision level. *Conclusion:* Sampling survey is in compliance with EB69 of Annex 5.		
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.*		☐ No sampling approach has been used by the VT to verify the monitored parameters **OR**. ☒ A sampling approach has been applied by the VT for the following monitored parameter: ***Parameter:*** ***I. Biogas Units Constructed***	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		II. Number of biogas plants operating ***III. Non-usage of biogas units*** ***IV. By – Confirmation that non-renewable biomass has been substituted*** ***VI. Diversion of non-renewable biomass saved under the project activity by non-project households*** *Description:* The verification team in order to verify the above parameters used the following approach. The PP followed the sampling as per the proportionate approach for all the five mandals for sampling. The VT followed the same approach and handpicked the mandals with maximum installations and within those 3 mandals handpicked the villages with maximum installations (decreasing order) from the PP samples and randomly selected the sampled households in those villages. Also some of the non-sampled households are visited. Also some of the households in non-sampled villages are also visited. Thus VT visited around 30 households (with biogas units) and 15 non- bio gas households during the site visit The information gathered during the visits was checked for correctness for all those households visited with the data information provided in the data base and found correct. *Conclusion:* Thus the sample size taken by VT is 20 sampled sizes out of the		

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		106 PPs sample, thus around 20% of the PP samples are covered which deemed adequate.		
E. Calculation of Emission reductions				
E.1. Traceability ***(VVS, §§ 247, 249)*** *Assess if the calculation is fully traceable. In case of complex calculations an Excel calculation spread-sheet shall be used. All applied formulae must be visible.*	/XLS/ /meth/ /PDD/	*Description:* An excel calculation spreadsheet was used. All applied formulae are visible. *Verifier´s action:* The provided excel sheet has been thoroughly assessed by the VT *Conclusion;* The calculation is in line with the registered PDD and the applied methodology	OK	OK
E.2. Parameter consistency ***(VVS, § 249)*** *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.*	/XLS/ /MR/	Description: All the data are correctly presented in MR as well as in excel sheet. Moreover consistent designations for parameters are mentioned in PDD and excel sheet. Verifier´s action: The MR has been crosschecked with the provided excel sheet and PDD Conclusion: All the parameters are consistent between MR and excel sheet of emission reduction calculation sheet.	OK	OK
E.3. Correctness of calculation ***(VVS, §§ 279-280)*** *Check if the applied formulae and methods for calculating baseline emissions, project emissions and*	/XLS/ /MR/ /PDD/	*Description:* The formulae used for the calculation of the ER as per the registered PDD and applied methodology.	OK	OK

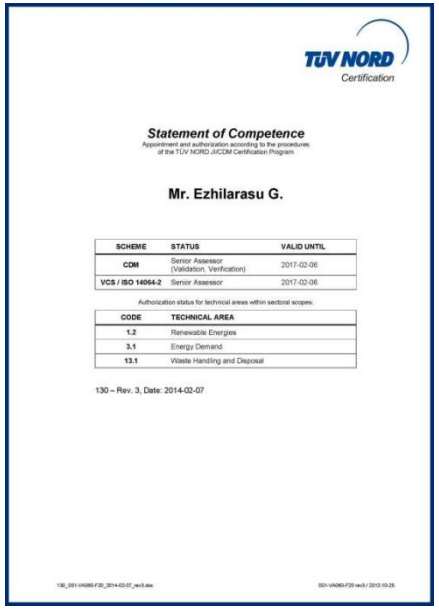
Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
leakage are in accordance with the monitoring plan and / or the approved methodology. *Assess whether the provided calculations are 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.*		*Verifier´s action:* The PDD and methodology is checked with ER sheets and MR. *Conclusion:* Thus it is concluded that the calculations complies with the requirements of the monitoring plan		
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/ /XLS/	☒ The MR includes in section E.4 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 table in E.4 needs to be revised.	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.* *Check further whether in case of an increase an appropriate explanation is included in the MR.*	/XLS/ /MR/ /PDD/	*Description:* The comparison of the actual emission reductions with the emission reductions mentioned in the registered PDD has been mentioned in the section E.5 of the webhosted MR and the justifiable reason is mentioned for the lowering of the ER values in section E.6. *Verifier´s action:* Desk review of registered PDD,and webhosted MR.	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 in case of a significant increase whether this is due to technical or organisational changes within or outside the control of the PP and – if this is case – whether the PRC have been considered appropriately.		*Conclusion:* The reason mentioned for the decrease of the ER values is found justifiable and accepted by verification team.		
E.6. ER during the 1st commitment period and the period from 1 January 2013 onwards *Check if the MR includes in chapter E.7 a breakdown of the actual ER into* *a) ER up to 2012-12-31 and* *b) ER from 2013-01-01 onwards* *The ERs for each period should be determined as per the actual generation. In cases where this is not possible or a cap has been applied a proportional (time related) approach should be chosen.*		☒ The MR in section E.7 includes a summary table of the ER breakdown *a) ER up to 2012-12-31 and* *b) ER from 2013-01-01 onwards* ☒ The breakdown of the ERs during the first commitment period and from 2013-01-01 onwards is as follows: ☐ The ER have completely been generated during the first commitment period ☒ The ERs have completely been generated from 2013-01-01 onwards, ☐ The ERs have partly been generated during the first commitment period and partly from 2013-01-01 onwards. ☒ The breakdown of the ERs is correct, considering the applicable guidance.	OK	OK

ANNEX 2: CALIBRATION DATES AND VALIDITY OF INSTALLED MONITORING EQUIPMENT

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
Not applicable as no monitoring equipment is used								☐ No ☐ Yes	From: To:

ANNEX 3: 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. Ezhilarasu G.

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2017-02-06
VCS / ISO 14064-2	Senior Assessor	2017-02-06

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies
3.1	Energy Demand
13.1	Waste Handling and Disposal

130 – Rev. 3, Date: 2014-02-07

TÜV NORD Certification

Statement of Competence

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

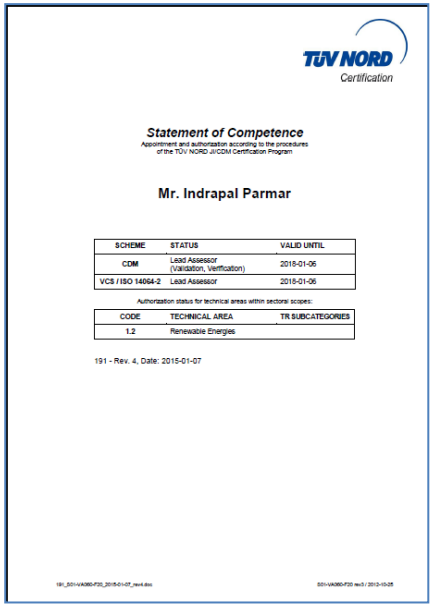
Mr. Pankaj Patel

SCHEME	STATUS	VALID UNTIL
CDM (Validation,Verification)	Lead Assessor	2016-06-21
VCS	Lead Assessor	2016-06-21

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
2.2	Heat Distribution	
3.1	Energy Demand	

31 - Rev.1 Date: 2014-01-09



TÜV NORD Certification

Statement of Competence

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

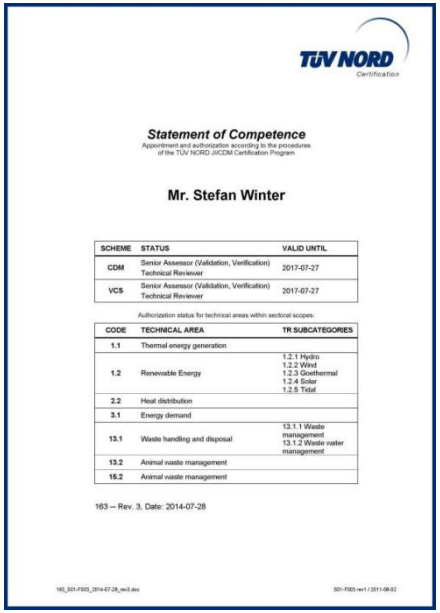
Mr. Indrapal Parmar

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2018-01-06
VCS / ISO 14064-2	Lead Assessor	2018-01-06

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.2	Renewable Energies	

191 - Rev. 4, Date: 2015-01-07



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	2017-07-27
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2017-07-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.1	Thermal energy generation	
1.2	Renewable Energy	1.2.1 Hydro 1.2.2 Wind 1.2.3 Geothermal 1.2.4 Solar 1.2.5 Tidal
2.2	Heat distribution	
3.1	Energy demand	
13.1	Waste handling and disposal	13.1.1 Waste management 13.1.2 Waste water management
13.2	Animal waste management	
15.2	Animal waste management	

163 – Rev. 3, Date: 2014-07-28