




**Verification and certification report form for  
CDM programme of activities  
(version 02.0)**

*Complete this form in accordance with the instructions attached at the end of this form.*

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the programme of activities (PoA)</b>	Ethiopia – Clean Cooking Energy Program - 10268	
<b>Version number(s) of the PoA-DD(s) to which this report applies</b>	9.0	
<b>Version number of the verification and certification report</b>	3.0	
<b>Completion date of the verification and certification report</b>	16/10/2019	
<b>Monitoring period number and duration of this monitoring period</b>	MP: 1 Duration: 01/04/2016-31/03/2018 (inclusive of both days)	
<b>Number and version number of the monitoring report to which this report applies</b>	Number: 1 Version: 5.0	
<b>Coordinating/managing entity (CME)</b>	Development Bank of Ethiopia	
<b>Host Parties</b>	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Federal Democratic Republic of Ethiopia	Yes
<b>Applied methodologies and standardized baselines</b>	AMS-I.E: Switch from non-renewable biomass for thermal applications by the user, version 6  AMS-I.I Version 4 Biogas/biomass thermal applications for households/small users  AMS-II.G Version 6 Energy efficiency measures in thermal applications of non-renewable biomass  No standardized baselines are applied	
<b>Mandatory sectoral scopes linked to the applied methodologies</b>	1: Energy industries (renewable - / non-renewable sources)  3: Energy Demand	
<b>Conditional sectoral scopes linked to the applied methodologies, if applicable</b>	-	
<b>Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report</b>	43,915 tCO <sub>2</sub> e	

<b>Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report</b>	34,480 tCO <sub>2</sub> e
<b>Name and UNFCCC reference number of the DOE</b>	TÜV NORD CERT GmbH E-0022
<b>Name, position and signature of the approver of the verification and certification report</b>	Kunal Rami  Senior Assessor

**SECTION A. Executive summary**

The International Bank for Reconstruction and Development (IBRD) as trustee of the Carbon Initiative for Development (Ci-Dev) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1st periodic verification of the programme of activities titled

**“Ethiopia – Clean Cooking Energy Program”**

with regard to the relevant requirements for CDM project activities.

The voluntary programme of activities was registered on 18/03/2016 and registration ID 10268 with a renewable crediting period. The first crediting period is from 18/03/2016 to 17/03/2023 (including both dates). The PoA duration is from 23/12/2014 to 22/12/2042 (including both days).

This 1<sup>st</sup> verification covers only CPA-10268-0001 with the monitoring period from 01/04/2016 – 31/03/2018 (including both days).

The CPA 10268-0001 was included on 18/03/2016 with the first renewable crediting period from 01/04/2016 to 31/03/2023.

The Ethiopia – Clean Cooking Energy Program (the PoA) is a nationwide program that targets poor and vulnerable households, who rely primarily on wood fuels for cooking. The purpose is to provide improved energy access to such households in order to help in reducing greenhouse gas emissions from the exploitation of non-renewable biomass resources and from fossil fuels such as kerosene. Associated benefits include reduced deforestation, improved health through sanitation and clean air, use of organic fertilizer (bio-slurry), and poverty alleviation.

Three alternative energy technologies are implemented under the PoA. Households are encouraged to adopt domestic biogas plants (DBPs) to generate renewable biogas for cooking and lighting, ethanol stoves for cooking, and improved cookstoves.

The specific component project activity is the generic CPA Type 1 *NBP Ethiopia Domestic Biogas Plants CPA 1* which includes the installation of domestic biogas plants that generate biogas for cooking and lighting, for rural households or other end-users in the Federal Democratic Republic of Ethiopia. The CPA reduces mainly CO<sub>2</sub> emissions by substituting the renewable biogas for the use of wood fuels mainly non-renewable biomass for cooking. Bio-slurry, an organic fertilizer is a by-product of anaerobic fermentation of animal and agricultural waste is of high value for agricultural production.

It also will reduce the use of fossil fuel kerosene for lighting. However, these emission reductions are not accounted for under the CPA.

During the first monitoring period, only four regions have been covered (Oromia, Tigray, SNNPR, and Amhara).

Details of the project location are given in table A-1 below:

**Table A-1:** Project Location

No.	Project Location
Host Country	Federal Democratic Republic of Ethiopia
Region:	All Regions
Project location address:	Entire host country
Latitude <sup>1</sup> :	8.00° N
Longitude:	38.00° E

<sup>1</sup> <https://www.cia.gov/library/publications/the-world-factbook/fields/2011.html>

Basic technical details of the project are summarized in table A-2.

**Table - A-2:** Technical data of the project activity

	Parameter	Unit	Value
1.	Model	-	Deenbandhu
2.	Components	-	Underground dome, domepipes, biogas stove, inlet, methane lamp, slurry outlet
2.	Useful life	years	20
3.	Size range	m <sup>3</sup>	6-8
3.	Gas production	m <sup>3</sup> /day	1-1.5
4.	Feedstock	-	Animal manure, agricultural waste

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

- the programme of activities and all included component project activities are implemented and installed as planned and described in the related validated project design document.
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., AMS-I.E: Switch from non-renewable biomass for thermal applications by the user, version 6
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of this periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **34,480 tCO<sub>2</sub>e**

**SECTION B. Verification team, technical reviewer and approver****B.1. Verification team members**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader/ Technical Expert	EI	Lubanga	David	-	x	x	x	x

**B.2. Technical reviewer and approver of the verification and certification report**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	EI	Zhao	Xuejiao (Fancy)	TN China
2.	Final Approver	IR	Winter	Stefan	TN CERT GmbH
3.	Final Approver*	IR	Rami	Kunal	TÜV NORD CERT

**SECTION C. Application of materiality in conducting the verification****C.1. Consideration of materiality in planning the verification**

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.

**Materiality Threshold**

The verification is based on the materiality threshold identified in table C-1 below:

**Table C-1:** Applied Materiality Threshold

	Threshold	Related to
<input type="checkbox"/>	0.5 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal equal to or more than 500,000 tonnes of carbon dioxide equivalent per year <sup>2</sup> ;
<input type="checkbox"/>	1 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal of between 300,000 and 500,000 tonnes of carbon dioxide equivalent per year;
<input type="checkbox"/>	2 %	Emission reductions or removals for registered large-scale CDM project activities achieving a total emission reduction or removal of 300,000 tonnes of carbon dioxide equivalent per year or less;

<sup>2</sup> A year refers to a period of 12 consecutive months.

\* Approver as of 16.10.2019

	Threshold	Related to
<input type="checkbox"/>	5 %	Emission reductions or removals for registered small-scale CDM project activities other than registered CDM project activities covered under next category below;
<input checked="" type="checkbox"/>	10 %	Emission reductions or removals for the type of registered CDM project activities referred to in decision 3/CMP.6, paragraph 38 (referred to as microscale project activities).

### Strategic Analysis

At the beginning of the verification the verification team leader has assessed the nature, scale and complexity of the verification tasks by carrying out a strategic analysis of all activities relevant to the project activity. The team leader has collected and reviewed the information relevant to assess that the designated verification team is sufficiently competent to carry out the verification and to ensure that it is able to conduct the necessary risk analysis.

### Risk analysis and detailed audit testing planning

For the identification and assessment of potential reporting risks and to determine the necessary detailed audit testing procedures for residual risk areas the following table is used.

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Transfer of data by RBPCU staff from user agreements or payment forms to the database at the RBPCU Offices	Medium	Human error during transfer of data into the regional users' database	1. 90 hard copy documents filed in the office were picked randomly and checked. Interviewed the office staff including unit managers on the complete process of data reporting, data handling, aggregation, and dissemination to the CME through the MoWIE. 2. Validation of the BUS report using acceptance sampling. Visiting and interviewing studied users 3. Check for any duplicate entries 4. Eliminating data that has no unique identification (SN or GPS coordinates) from consideration for ERs

On the basis of the risk analysis the verification has been planned. A detailed audit / verification plan has been prepared and submitted to the project participant(s) in due time before the site visit.

### **C.2. Consideration of materiality in conducting the verification**

Based on the verification planning the verification has been carried out. The concept of materiality has been considered. A breakdown of the chosen approaches is included in the following table.

Parameter	Approach <sup>+</sup>	Errors* detected	Findings reference	Corrected	Remaining verification risk
N <sub>y</sub>	ASP	<input checked="" type="checkbox"/>	CL 01	<input checked="" type="checkbox"/>	Not material

			CL 02		
UF <sub>d</sub>	ASP	<input checked="" type="checkbox"/>	CAR 05 FAR 01	<input checked="" type="checkbox"/>	Not material
Aggregate					Materiality threshold not exceeded

*\*) incl. omissions and misstatements*

*\*) Verification Approaches:*

*CDC: Complete data check of data including all data aggregation steps*

*NDC: Non-complete data check – omissions not material*

*SPL: Sampling approach (all data available)*

*ASP: Acceptance Sampling*

*COM: Data check at higher data aggregation levels and sampling at original data levels*

The verification was basically carried out as per the verification plan. However, based on the actual situation on-site and the errors, omissions and misstatements identified during the verification minor deviations from the original plan occurred.

For above mentioned risk mentioned in the table under section C.1, verification team has conducted a thorough cross check and verification as follows:

**Analysis of transfer of user documents from Masons/BCEs to the respective Woreda Energy Offices onwards to the RBPCUs where data from the region is consolidated and sent to the NBPCU at the MoWIE, and then from MoWIE to the DBE (CME) for application in ER calculations:**

The total sales records at the DBE (CME) are a product of a process starting from biodigester installers (masons/BCEs), through respective Woreda Energy offices. The installation data from all the Woredas are then sent to the RBPCUs where they are consolidated before being sent to MoWIE for further cross-check with the hard copy records and final transmission to the CME. At the NBPE offices within the ministry the data is consolidated into a national database. This data is then sent to the CME.

Total installation records presented in ER calculation spreadsheet were assessed and verified at respective RBPCUs in the four regions visited.

CME has provided satisfactory responses in the findings raised and accordingly MR and ER sheet were revised. For more detail please refer to section E.2.2, and Appendix-4 of this report.

## SECTION D. Means of verification

### D.1. Desk/document 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 PoA-DD including the monitoring plan<sup>/PoA-DD/</sup>,
- the last revisions of the CPA-DD<sup>/CPA-DD/</sup>
- the last revision of the CPA validation report<sup>/VAL/</sup>,
- the monitoring report, including the claimed emission reductions for the PoA<sup>/MR/</sup>,
- the emission reduction calculation spreadsheet<sup>/ER/</sup>.

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

**D.2. On-site inspection\***

<b>Duration of on-site inspection: 22/10/2018 to 25/10/2018, 27/10/2018, 29/10/2018 to 02/11/2018</b>				
<b>No.</b>	<b>Activity performed on-site</b>	<b>Site location</b>	<b>Date</b>	<b>Team member</b>
1.	<ul style="list-style-type: none"> <li>• Introductions</li> <li>• Audit planning</li> <li>• Check of records</li> <li>• Checking the CME organization structure and carrying out interviews with staff</li> </ul>	CME Offices (DBE)	22/10/2018	David Lubanga
2.	Visiting of the Oromia Regional Biogas Coordination Unit <ul style="list-style-type: none"> <li>- Carry out interviews</li> <li>- Check user sample agreements</li> <li>- Select sample households for inspections and interviews</li> </ul>	Oromia RBPCU Office	23/10/2018	
	Drive to SNNPR <ul style="list-style-type: none"> <li>- Carry out interviews</li> <li>- Check user sample agreements</li> <li>- Select sample households for inspections and interviews</li> </ul>	SNNPR RBPCU Office	24/10/2018	
3.	Visiting of the SNNPR Region <ul style="list-style-type: none"> <li>- Visit sampled users</li> </ul>	SNNPR	25/10/2018	
4.	Drive Back to Addis Ababa	-		
5.	Off	-	26/10/2018	
6.	Visiting of the Oromia Region <ul style="list-style-type: none"> <li>- Visit the Boset Woreda Energy Office</li> <li>- Carry out interviews</li> <li>- Visit sampled users</li> </ul>	Oromia Region Visit WEO Visit	27/10/2018	
7.	Visiting of the Amhara Regional Biogas Coordination Unit <ul style="list-style-type: none"> <li>- Carry out interviews</li> <li>- Check user sample agreements</li> <li>- Select sample households for inspections and interviews</li> <li>- Visit users</li> </ul>	Amhara RBPCU Office	29/10/2018	
8.	Travel back to Addis Ababa	-		
9.	Visiting of the Tigray Regional Biogas Coordination Unit <ul style="list-style-type: none"> <li>- Carry out interviews</li> <li>- Select sample households for inspections and interviews</li> <li>- Visit users</li> </ul>	Tigray RBPCU Office Tigray Region	31/10/2018	
10.	Visiting of the Tigray Regional Biogas Coordination Unit <ul style="list-style-type: none"> <li>- Check user sample agreements</li> </ul>	Tigray RBPCU Office	01/11/2018	
11.	Travel back to Addis Ababa			
12.	Discussions of onsite findings Meeting at SNV (donor) offices	SNV Offices	02/11/2018	



## Interviews

No .	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Belenky	Lucas	Consultant/Ci-Dev/ <b>IM01/</b>	22/10/2018	<ul style="list-style-type: none"><li>- ER calculations</li><li>- Monitoring methodology</li><li>- MR issues</li><li>- Organization PoA Implementation</li></ul>	David Lubanga
2.	Agoma	Eyob	Consultant/World Bank/ <b>IM01/</b>	22/10/2018	<ul style="list-style-type: none"><li>- Funding Sources</li><li>- Funding structure</li><li>- Roles and responsibilities</li><li>- CME Organization</li></ul>	
3.	Asnake	Elias	DBE/Energy Coordination Team Manager/ <b>IM01/</b>	22/10/2018	<ul style="list-style-type: none"><li>- DBE CDM organizational structure</li><li>- Partnerships</li><li>- Data Capture</li><li>- Information flow</li><li>- Financing</li><li>- QA/QC</li></ul>	
5.	Girma	Abiy	NBPCU/Chief Biogas engineer/ <b>IM02/</b>	22/10/2018 - 23/10/2018	<ul style="list-style-type: none"><li>- Biogas technology</li><li>- Maintenance</li></ul>	
6.	Teweale	Birhane	NBPCU/Biogas engineer/ <b>IM02/</b>	22/10/2018	<ul style="list-style-type: none"><li>- Technology issues</li></ul>	
7.	Teferi	Anene	DBE/Electrical Engineer/ <b>IM02/</b>	22/10/2018 - 02/11/2018	<ul style="list-style-type: none"><li>- Data management</li></ul>	
8.	Keneni	Gizaw	DBE/Senior Electrical Engineer/ <b>IM02/</b>	22/10/2018 - 02/11/2018	<ul style="list-style-type: none"><li>- Technology issues</li><li>- Data management</li></ul>	
9.	Legesse	Henok	Oromia RBPCU/Technician/Head/ <b>IM02/</b>	23/10/2018	<ul style="list-style-type: none"><li>- Quality management</li><li>- Data capture</li></ul>	
10.	Kubayo	Kassu	Oromia RBPCU/Slurry Extension Officer/ <b>IM02/</b>		<ul style="list-style-type: none"><li>- Slurry use</li><li>- Slurry benefits</li></ul>	
11.	Tarekeln	Teketel	Oromia RBPCU/Biogas Technician/ <b>IM02/</b>		<ul style="list-style-type: none"><li>- Technology issues</li><li>- Uptake</li></ul>	
12.	Birhane	Getu	Oromia WEO(Boset)/Energy Expert/ <b>IM02/</b>	26/10/2018	<ul style="list-style-type: none"><li>- Data capture and entry</li><li>- Technical issues</li></ul>	
13.	Tesema	Kebede	Oromia Region /User/ <b>IM03/</b>		<ul style="list-style-type: none"><li>- When it was constructed</li><li>- Performance levels</li><li>- Satisfaction</li></ul>	
14.	Hawas	Tenkolu				
15.	Bedada	Gutema				
16.	Ayalew	Tseganesh				
17.	Mulatu	Ineve				

18.	Begashaw	Fanos			<ul style="list-style-type: none"> <li>- Cost</li> <li>- Uses</li> <li>- Maintenance</li> <li>- BUS done?</li> <li>- When was BUS done</li> <li>- BUS process?</li> </ul>	
19.	Dantew	Getachew				
20.	Kassahun	Fentaye	SNNPR RBPCU/Coordinator/ <b>IM02/</b>	24/10/2018	<ul style="list-style-type: none"> <li>- Functions of the RBPCU</li> <li>- Organizational structure</li> <li>- Data management</li> <li>- Payment process</li> <li>- Data transmission</li> <li>- Data storage</li> <li>- Quality standards</li> <li>- Training aspects</li> </ul>	
21.	Sebsibbe	Gizachew	SNNPR WEO/Biogas expert/ <b>IM02/</b>		<ul style="list-style-type: none"> <li>- Technology issues</li> </ul>	
22.	Israel	Etenesh	SNNPR/User/ <b>IM03/</b>		<ul style="list-style-type: none"> <li>- When it was constructed</li> <li>- Performance levels</li> <li>- Satisfaction</li> <li>- Cost</li> <li>- Uses</li> <li>- Maintenance</li> <li>- BUS done?</li> <li>- When was BUS done</li> <li>- BUS process?</li> </ul>	
23.	Endla	Tafese				
24.	Gelaye	Genet				
25.	Ashomo	Zeritu				
26.	Worku	Gelaye				
27.	Toshora	Melkiays				
28.	Yosef	Desta				
29.	Wuletu	Chelachew	Amhara RBPCU/Biogas Technician/ <b>IM02/</b>	29/10/2018	<ul style="list-style-type: none"> <li>- Functions of the RBPCU</li> <li>- Organizational structure</li> <li>- Data management</li> <li>- Payment process</li> <li>- Data transmission</li> <li>- Quality standards</li> <li>- Training aspects</li> </ul>	
30.	Ademe	Zelake	Amhara RBPCU/Biogas Engineer/ <b>IM02/</b>		<ul style="list-style-type: none"> <li>- Technology issues</li> </ul>	
31.	Tesfaye	Dereje	Amhara RBPCU/Biogas Technician/ <b>IM02/</b>		<ul style="list-style-type: none"> <li>- Technology issues</li> <li>- Data management</li> <li>- Payment process</li> </ul>	
32.	Animen	Habtam	Amhara Region /User(brother of owner) <b>IM03/</b>		<ul style="list-style-type: none"> <li>- When it was</li> </ul>	

33.	Fentahun	Yayesh	Amhara Region /User(wife of owner)		constructed	
34.	Perian	Kasaye	Amhara Region /User(wife of owner) <b>/IM03/</b>		- Performance levels	
35.	Tafefe	Simegnaw	Amhara Region /User		- Satisfaction	
36.	Kebede	Minale	Amhara Region /User(wife of owner) <b>/IM03/</b>		- Cost	
					- Uses	
					- Maintenance	
					- BUS done?	
					- When was BUS done	
					- BUS process?	
37.	G/Tsadik	Tsegu	Tigray RBPCU/Program Manager <b>/IM02/</b>	31/10/2018	- Functions of the RBPCU	
					- Organization al structure	
					- Data management	
					- Payment process	
					- Data transmission	
					- Quality standards	
					- Training aspects	
					- Staff qualifications	
					- Future plans	
38.	Wolde	Yohannes	Tigray RBPCU/Biogas Technician <b>/IM02/</b>		- Technology issues	
					- Maintenance	
					- Data	
39.	Ali	Abdekadir	Tigray RBPCU/Finance and Admin <b>/IM02/</b>		- Payment system and process	
					- Funding sources	
40.	Kasse	Asefa	Tigray RBPCU/Biogas Technician <b>/IM02/</b>		- Technology issues	
					- Maintenance	
					- Data	
41.	G/Yesus	Hayalu	Tigray Region/User (Son found & and Mason) <b>/IM03/</b>		- When it was constructed	
					- Performance levels	
					- Satisfaction	
					- Cost	
					- Uses	
					- Maintenance	
					- BUS done?	
					- When was BUS done	
					- BUS process?	
42.	Tensai	Gebreselasi e	Tigray Region/User <b>/IM03/</b>		- When it was constructed	
43.	Gidey	Meharu			- Performance levels	
44.	Zeneb	Amare			- Satisfaction	
45.	Mehari	Lemelem			- Cost	
46.	G/Wolde	Kiros			- Uses	

					<ul style="list-style-type: none"> <li>- Maintenance</li> <li>- BUS done?</li> <li>- When was BUS done</li> <li>- BUS process?</li> </ul>	
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### D.3. Sampling approach

<input type="checkbox"/>	No sampling approach has been used by the VT to verify the monitored parameters				
<input checked="" type="checkbox"/>	A sampling approach has been applied by the VT for the following monitored parameter(s):				
	Parameter	Sampling approach <sup>1)</sup>	Sampling Type <sup>2)</sup>	Population	Sample Size
	$N_y$	SiRS	ASP	4,812 <sup>3</sup>	90
	$UF_d$	SiRS	ASP	200	28 <sup>4</sup>

<sup>1)</sup> Sampling Approaches:

SiRS: Simple Random Sampling  
 StRS: Stratified Random Sampling  
 SS: Systematic Sampling  
 CS: Cluster Sampling  
 MSS: Multi-stage Sampling

<sup>2)</sup> Sampling Types:

ASP: Acceptance Sampling  
 PS: Parameter Sampling  
 COM: Full data check at higher data aggregation levels and sampling at original data levels

### Verifier's Action

In conforming with §321 a) of the CDM validation and verification standard for programmes of Activities, the DOE has conducted a site visit for the verification of the CPA 10268-0001 with the following two main objectives:

1. To validate the procedures and results of the BUS study, and to confirm that users exist and were actually visited during the study. This was achieved through the application of random sampling within clusters (regions) using collated data obtained from the RBPCUs and used in the study. The sampling approach, design and procedures must comply with the requirements and provisions of the standard 'Sampling and surveys for CDM project activities and programmes of activities'.

The proportion of biogas units found to be working ( $UF_d$ ) should realistically reflect the results published in the BUS report.

2. To confirm the registered PoA management system and data processes in line with §299 & §319 of the VVS. As well as confirm the data transmitted from the 4 regional biogas programme coordination units are the same as the ones in the ministry furnished to the CME. And to identify quality control and quality assurance procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameter ( $N_d$ ). These measures would reflect on the quality and reliability of the data presented to the DOE for verification.

To achieve the second goal, we checked the data collection system, information flow. This is from expression of interest, signing of construction agreements, completion forms, data transmission from construction completion to payment and data transmission from the

<sup>3</sup> Only 4,097 units had a unique identifier and only applied in ER calculations for this MP

<sup>4</sup> Three users in Tigray region were called not visited

mason/BCE to the Woreda level and RBPCU for payments and record-keeping, and on to the NBP at the Ministry of Water, Irrigation, and Energy (MoWIE), as well as modalities for payment. Activities in the RBPCU offices involved checking and comparing details entered in hard copy records with the consolidated excel database maintained by the MoWIE and applied in the ER calculations, and interviewing all relevant parties involved for their roles and responsibilities.

The Biogas Users' Survey (BUS) scope covered four regions in the host country of users who received a unit in years 2015 and 2016. The BUS was conducted in February-March 2018<sup>5</sup>. According to the BUS report and interviews conducted, a total of 200 HHs were involved in the study, divided proportional amongst the 4 regions as follows per the table below.

In the four regions, a total of 10 Zones and 17 Woredas were covered. The sample zones, Woredas (districts) and Kebeles (towns) were determined based on two main factors.

1. Proportional to the number of biogas users. Those Woredas that had more than 10 biogas plants were selected using proportional to sample size method.
2. Within the sample Woreda, selected one rural and another urban (Kebele) to target data on rural and urban users, as the BUS study had interrogated a wide range of socio-economic and environmental factors and impacts of the NBPE as well!

Therefore, in line with the 'Guideline: 'Sampling and surveys for CDM project activities and programmes of activities', the CME has applied simple random sampling within the four clusters in determination of monitoring parameter UF<sub>d</sub> depicted in the table below

**Sampling table adopted from third Party Biogas Users' Survey (BUS) Report**

	Region	Survey Years		Total Beneficiaries	Sample per Region
		2015	2016		
1.	Oromia	364	736	1,100	45
2.	Amhara	601	723	1,324	54
3.	SNNPR	513	603	1,116	48
4.	Tigray	782	490	1,272	53
<b>Total</b>		<b>2,260</b>	<b>2,552</b>	<b>4,812</b>	<b>200</b>

With a conservative response rate of 50%, a minimum sample of 95 required to achieve the objectives of this sampling effort, the DOE<sup>6</sup> can confirm that;

1. The sampling frame is the population of biogas digester users within each region served by the program
2. The sampling approach and procedures defined in the BUS report are correct
3. The minimum sample of 200 instead of 67 biogas digesters from the sampling frame achieved and exceeded minimum sampling requirements of the CPA- monitoring plan of 95% Confidence level with 10% precision for biennial monitoring (5.69%), in line with the standard - Sampling and surveys for CDM project activities and programmes of activities, v7.0. The 200 households were distributed among the four regions based on the Proportion to Population Size (PPS) sample distribution procedure
4. The applied equation to determine sample size n is correct
5. The simple random sampling within the clusters provided unbiased and reliable results as the clusters were random and both vintages in the sample have been confirmed to be adequately covered. This was ensured by the using mobile app software called **random UX** which was easy to use by field officers.

<sup>5</sup> Political unrest particularly in Oromia and Amhara National Regional States during this time was part of noted limitations of the survey.

<sup>6</sup> <http://www.raosoft.com/samplesize.html>

## Verifiers' procedure for Simple random sampling of onsite records & Acceptance Sampling

The process involved selection of 25 random hard copy records stored at each of the four Regional Biogas Programme Coordination Unit (RBPCU) office, and comparing the same with the respective database that has been applied in ER calculations. The data was checked for completeness, consistency and correctness in line with the proposed monitoring plan.

Therefore, from all the regions, auditor randomly selected a total of 100 households from the sales database and conducted an office audit by comparing the hard copy records with details in the database. An excel randomizer was used to select the users to avoid bias and the households were then selected. The sample was checked to ensure that both vintages were represented. Details checked in the sample included names, telephone numbers, year and date of installation, serial numbers, and GPS coordinates. From this office exercise, Only SNNPR region had significant issues raised with regards to data correctness and completeness. Therefore, the verification team checked only 15 of those selected in the SNNPR region.

For determining the authenticity of the fraction of digesters found to be operational during the monitoring period ( $UF_d$ ) reported for this monitoring period in the BUS and monitoring reports, the verifier determined that acceptance sampling was the most ideal and practical approach in line with §29 e ii) of the CDM VVS. The DOE sampling frame is the 200 households visited during the BUS. Applying the excel randomizer; a sample would be drawn from the CME's own sample used in the Biogas User's Survey<sup>BUS//XLS/</sup> for each respective region. Based on the guidelines of the Standard - Sampling and surveys for CDM project activities and programmes of activities, version 7.0, an AQL of 1% and UQL of 20%, with 10% producer risk and 5% consumer risk was conservatively selected. Therefore, a sample size of 22 was arrived at, with 1 as the acceptance number. However, a sample size of 28 was selected to allow for possible attrition. The sample was also checked to ensure that both vintages were represented. 25 households were visited and three extra users in the Tigray region were contacted via telephone. 20 units out of the 28 were confirmed to be working, which represents 71.4%<sup>7</sup> biogas digesters in good working condition. The results not only confirmed that indeed the users were part of the study, but the estimated % working biogas digesters is correct considering the BUS was carried out approximately 9 months before the onsite visit.

All pictures of the units (25 biogas users) and their stoves, biogas lamps, inlets, and slurry pit were taken<sup>/PICS/</sup> by the auditor.

### Verifier's Sampling table

Region	Checked in Office	Visited	Called	Unit Working
Oromia	25	7	-	4
SNNPR	15	7	-	7
Amhara	25	5	-	3
Tigray	25	6	3	6
<b>Total</b>	<b>90</b>	<b>25</b>	<b>3</b>	<b>20</b>
				<b>71.4%</b>

From the defined processes and procedures including the sampling plan in the BUS report, the verification team has determined that the report provides sufficient information without errors or omissions and confirmations that would warrant a revision of the same. Therefore, the result confirms with a high level of confidence that the reported usage rates are credible.

### Conclusion

For the parameter determined ex-post through sampling, the Validation Team can confirm that the BUS was conducted in line with the proposed monitoring plan in the generic CPA-DD and the approved revised CPA-DD version 8.0.. The sampling efforts were undertaken in accordance with

<sup>7</sup> Three units reported in the BUS survey spread-sheet as not working were indeed still not working. One was reported as not working but was found to be working.

the “Standard: Sampling and surveys for CDM project activities and programme of activities” version 7.0.

#### D.4. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
<b>General</b>			
Compliance of the monitoring report with the monitoring report form	0	4	0
Remaining forward action requests from validation and/or previous verification	0	0	0
CPA(s) considered for verification and covered in this report	0	0	0
<b>Programme of activities</b>			
Compliance of the programme implementation with the registered PoA-DD	0	0	0
Implementation and operation of the management system	0	0	0
Post-registration changes			
<ul style="list-style-type: none"> <li>Temporary deviations from the registered monitoring plan, applied methodology or applied standardized baseline</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Corrections</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Inclusion of a monitoring plan</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Changes to the programme design or project design</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Change of coordinating/managing entity</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Changes specific to afforestation and reforestation activities</li> </ul>	0	0	0
<b>Component project activities</b>			
Compliance of the CPA implementation with the included CPA design document	0	0	0
Post-registration changes			
<ul style="list-style-type: none"> <li>Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Corrections</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Changes to the start date of the crediting period of component project activities</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Inclusion of a monitoring plan</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Changes to the programme design of project design</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Changes specific to afforestation and reforestation component project activities</li> </ul>	0	0	0
Compliance of the registered monitoring plan with the methodology including applicable tool(s) and standardized baseline	0	0	0
Compliance of monitoring activities with the registered monitoring plan			
<ul style="list-style-type: none"> <li>Data and parameters fixed ex ante or at renewal of crediting period</li> </ul>	0	0	0
<ul style="list-style-type: none"> <li>Data and parameters monitored</li> </ul>	2	1	1
<ul style="list-style-type: none"> <li>Implementation of sampling plan</li> </ul>	0	0	0

Compliance with the calibration frequency requirements for measuring instruments	0	0	0
Assessment of data and calculation of emission reductions or net removals			
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	0	0	0
• Calculation of project GHG emissions or actual net GHG removals by sinks	0	0	0
• Calculation of leakage GHG emissions	0	0	0
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	0	0	0
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	0	0	0
• Remarks on difference from estimated value in included CPA	0	0	0
Assessment of reported sustainable development co-benefits	0	0	0
Global stakeholder consultation	0	0	0
Others (Description of the PoA)	0	0	0
<b>Total</b>	<b>2</b>	<b>5</b>	<b>1</b>

## SECTION E. Verification findings

### E.1. General

#### E.1.1. Compliance of the monitoring report with the monitoring report form

<b>Means of verification</b>	<p>A draft monitoring report was submitted to the verification team by the project participants. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received.</p> <p>By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-PoA-MR-FORM has been used.</p> <p>Further it has been checked whether the latest instructions for filling out the MR template have been followed. Every section has been checked against the respective guidance.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /MRT/</li> <li>• /unfccc/</li> </ul>		
<b>Findings</b>	<input checked="" type="checkbox"/>	The latest reporting template CDM-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.	
	<input type="checkbox"/>	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.	
	<input checked="" type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: CAR 01, CAR 02, & CAR 03	
<b>Conclusion</b>	<input type="checkbox"/>	No CARs / CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.	
	<input checked="" type="checkbox"/>	The raised CARs / CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.	
		<p>The verification team has checked all sections of the MR and confirms by means of comparing the MR that has been used with the standardized MR template.</p> <p>After appropriate corrections were carried out by the project participant it can be confirmed the latest instructions for filling out the MR have been followed.</p>	



**E.1.2. Remaining forward action requests from validation and/or previous verifications**

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose, FARs might have been raised. Likewise, FARs might have been raised in the course of previous verifications.

In the course of this verification the latest version of the PoA-DD/<sup>PoA-DD/</sup> and the latest CPA-DD and their respective validation reports have been checked in order to identify any remaining forward action requests. For the current monitoring period the following applies:

(i) Open issues from validation:

<input checked="" type="checkbox"/>	There were no open issues which have been addressed in the latest version of the validation report.
<input type="checkbox"/>	All open issues from the validation have been appropriately addressed in the context of previous verifications.
<input type="checkbox"/>	All issues related to the validation have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the validation have <b>not</b> yet been appropriately addressed (for details please refer to appendix 4):
	N/A

(ii) Open issues from previous verifications:

<input checked="" type="checkbox"/>	N/A – as this is the first monitoring period for this CDM project activity.
<input type="checkbox"/>	There were no open issues which have been addressed in the previous verification report
<input type="checkbox"/>	All issues related to the previous verification have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the previous verification have <b>not</b> yet been appropriately addressed (for details please refer to appendix 4):
	N/A

**E.1.3. CPAs considered for verification and covered in this report**

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
10268-0001	Y	18/03/2016	9.0	Y
10268-0002	N	25/04/2017	6.0	N

**E.2. Programme of activities****E.2.1. Compliance of the programme implementation with the registered programme design document**

<b>Means of verification</b>	<p>By means of an in-depth review of the registered and approved revised PDDs in its latest form as downloaded from the UNFCCC project page site and the checks carried out during the on-site visit an assessment has been carried out whether the project has been implemented and operated in line with the latest approved version of the PoA-DD.</p> <p>The verification team has checked the information in the monitoring report and compared against the registered PoA-DD.</p> <p>During the onsite inspection, the verification team has checked the project location, implementation, technology applied, project equipment, and monitoring system and compared against the information in the registered PoA-DD.</p>
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	Interviews with operational personnel have been carried out as well. The following sources of information have been used in this context: <ul style="list-style-type: none"> <li>• /PoA-DD/</li> <li>• /CPA-DD/</li> <li>• /MR/</li> <li>• /IM01/</li> <li>• /IM02/</li> <li>• /unfccc/</li> </ul>	
<b>Findings</b>	<input checked="" type="checkbox"/>	The project has been implemented as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.
	<input type="checkbox"/>	The following deviations from the registered project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): N/A
	<input type="checkbox"/>	In this context the following CARs, CLs have been raised:
		<i>In case of phased implementation:</i>
	<input checked="" type="checkbox"/>	N/A
	<input type="checkbox"/>	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.
	<input type="checkbox"/>	The description in section B.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation during the site inspection.
	<input type="checkbox"/>	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs / CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs / CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		During the verification an onsite 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 procedures, the project has been implemented and operated as described in the latest PoA-DD and CPA-DD versions. Only four regions have installed biogas digesters under the program and are the subject of this first verification.

### E.2.2. Implementation and operation of the management system

<b>Means of verification</b>	<p>By means of an in-depth review of the registered and revised PoA-DD in its latest form, and the checks carried out during the on-site visit an assessment has been carried out whether the project has been implemented and operated in line with the latest approved version of the PoA-DD and whether all physical features of the project are in place.</p> <p>The verification team has checked the information in the monitoring report and compared against the registered and revised PoA-DD.</p> <p>During the onsite inspection, the verification team has checked the project location, implementation, technology applied, project equipment, monitoring system and compared against the information in the registered PoA-DD and CPA-DD.</p> <p>Interviews with relevant personnel have been carried out. Please refer to the below Assessments which are in line with the site-visit interviews and document checks, as well as publicly available information.</p> <p><b>Implementation/Management</b></p>
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The CME (DBE) is a public finance institution focused on development project funding from government, bilateral and multilateral organizations. It was founded in 1909.

The CME has formulated an implementation framework of the PoA which intends to use a mixture of federal and regional government aid, donor funds and carbon finance to significantly reduce the cost of owning a biogas unit in rural economically-challenged households. Households will then cover the cost through personal resources or a loan from an MFI.

Carbon finance is used as the vehicle to generate resources that could be used to incentivize the private sector to expand the market and increase the uptake of these technologies among households.

Private enterprises such as masons and BCEs shall play a key role in promotion, raising awareness, and construction of the recommended domestic biogas systems across the country. The Verification Team has verified the provisions "Operational and Management Structure" as stated under Section D of the MR and the design documents. The roles can be summarized as under: -

### **Financing**

The National Biogas Program of Ethiopia is financed by a mixture of donor funds, carbon finance and government aid. Donor finance is disbursed through the NBPE and is mainly to cover operational costs, while government funding covers aspects of materials. Households are expected to cover some costs of materials such as cement, gravel and bricks.

### **Woreda<sup>8</sup> Energy Offices**

- Promotion activities
- Recruit masons
- Recruits energy users oversee agreements between the energy office, private enterprises e.g masons
- Send biodigester demands to zones
- Quality control through the Woreda Energy Experts who work in clusters
- Collect the original user agreements and payment requests
- Sends the completed documents to the RBPCU (user agreements, payment requests, receipt from mason, QC/inspection forms)

### **Regional Energy Bureau**

A regional branch of MoWIE that deals with all matters water and energy<sup>9</sup>

### **Regional Biogas Programme Coordination Unit**

A semi-autonomous unit under the REB that has the following functions: -

- Promotion of biogas technology
- Train biogas technicians and masons recruited at Woreda level
- Train private sector (BCEs)
- Disseminate biogas units to rural households
- Coordinate biogas activities in Woredas and Zones
- Manage funds from donors, government. Releases funds to the respective Woreda Finance offices based on completed units and forms
- Supply material to users through Woredas
- Credit
- Institutional support
- Compile regional biogas digester data under the programme

<sup>8</sup> Woreda = District

<sup>9</sup> The government ministry (MoWIE) has energy structure at zone and Woreda levels for administrative purposes

	<ul style="list-style-type: none"> <li>- Report to the National Biogas Program Coordination Unit (at the MOWIE) through the REB.</li> </ul> <p><b>National Biogas Programme Office</b></p> <ul style="list-style-type: none"> <li>- Coordinates the national biogas programme</li> <li>- Collects all data from the regions and compiles the same in one database</li> <li>- Checks the data on a sample basis</li> <li>- Sends the data to the CME</li> <li>- NBPCU have a monitoring and evaluation system to check commissioned units randomly at site level</li> </ul> <p><b>QA/QC Procedures</b></p> <ol style="list-style-type: none"> <li>1. The provided data is cross-checked by qualified staff at the regional biogas office and entered into a database</li> <li>2. The soft copy entries are cross-checked with hard copies randomly by the RBPCU manager/head</li> <li>3. Data must be internally consistent (agreement and payment request) before the soft copy is sent to NBPCU. Some users are called at the regional and national level offices to verify and confirm their data</li> <li>4. Monitoring and evaluation team from CME makes periodic and random inspections of all regions to compare sample records as transmitted from the lowest levels</li> </ol> <p>The following sources of information have been used in this context:</p> <ol style="list-style-type: none"> <li>1. /PoA-DD/</li> <li>2. /CPA-DD/</li> <li>3. /MR/</li> <li>4. /IM01/</li> <li>5. /IM02/</li> <li>6. /unfccc/</li> </ol>																		
<b>Findings</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>The project has been implemented as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.</td></tr> <tr> <td><input type="checkbox"/></td><td>The following deviations from the registered project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): N/A</td></tr> <tr> <td><input type="checkbox"/></td><td>In this context the following CARs, CLs have been raised:</td></tr> <tr> <td></td><td></td></tr> <tr> <td colspan="2"><i>In case of phased implementation:</i></td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>N/A</td></tr> <tr> <td><input type="checkbox"/></td><td>The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.</td></tr> <tr> <td><input type="checkbox"/></td><td>The description in section B.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation during the site inspection.</td></tr> <tr> <td><input type="checkbox"/></td><td>The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A</td></tr> </table>	<input checked="" type="checkbox"/>	The project has been implemented as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.	<input type="checkbox"/>	The following deviations from the registered project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): N/A	<input type="checkbox"/>	In this context the following CARs, CLs have been raised:			<i>In case of phased implementation:</i>		<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.	<input type="checkbox"/>	The description in section B.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation during the site inspection.	<input type="checkbox"/>	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A
<input checked="" type="checkbox"/>	The project has been implemented as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.																		
<input type="checkbox"/>	The following deviations from the registered project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): N/A																		
<input type="checkbox"/>	In this context the following CARs, CLs have been raised:																		
<i>In case of phased implementation:</i>																			
<input checked="" type="checkbox"/>	N/A																		
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<input type="checkbox"/>	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A																		
<b>Conclusion</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>No CARs / CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.</td></tr> <tr> <td><input type="checkbox"/></td><td>The raised CARs / CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</td></tr> <tr> <td colspan="2">During the verification an onsite 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 procedures, the PoA has been implemented and operated as described in the latest CPA-DD version</td></tr> </table>	<input checked="" type="checkbox"/>	No CARs / CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.	<input type="checkbox"/>	The raised CARs / CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.	During the verification an onsite 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 procedures, the PoA has been implemented and operated as described in the latest CPA-DD version													
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During the verification an onsite 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 procedures, the PoA has been implemented and operated as described in the latest CPA-DD version																			

8.0 and PoA-DD, version 9.0.

The CME oversees all aspects of the PoA framework and ensures that all aspects related to successful operation of the programme meet all the requirements of CDM and the CPAs can be included, implemented, monitored and verified in order to earn carbon finance to help sustain the programme.

### E.2.3. Post-registration changes

#### E.2.3.1. Temporary deviations from the registered monitoring plan, applied methodology or applied standardized baseline

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been submitted to the UNFCCC prior to the current monitoring period.		
<input type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.: )
		Appr.date	
		Ref. No.	
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.: )
		Appr.date	
		Ref.No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	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. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		
	1	Issue:	
	2	Issue:	
<input type="checkbox"/>	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

#### E.2.3.2. Corrections

It has been checked whether any corrections to PoA information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	During the verification of the current MP no need for corrections has been identified.		
<input checked="" type="checkbox"/>	The following corrections have been applied:		
	1.	Issue:	The parameter Quantity of annual woody biomass used per household was indicated as $B_{y,household}$ in the generic CPA-DD Type 1 latest approved PoA-DD section I.6.2 & I.6.3. However, in the real case CPA-DDs it was approved as $B_{y,hh}$ . This has now been changed to $B_{y,hh}$ to be consistent. The units have also been revised from tonnes/year/household to tonnes/household/year

2.	Issue:	The parameter $N_d$ has been renamed as $N_y$ throughout the PDD. The same was indicated as $N_d$ in the latest approved PoA-DD section I.6.3, in the calculation of $B_y$ . $B_y$ is now calculated as $B_{y,hh} * N_y * LE_y$ . $N_y$ is the number of Full-time equivalent digesters in the monitoring period. This is in line with the proposed monitoring plan for the Type 1 generic CPA-DD
3.	Issue:	Measurement methods and procedures for the parameter $LE_y$ in section I.6.2 have been further elaborated for clarity, in line with §19 and §27 of the applied methodology. Furthermore, a correction in the $B_y$ equation in section I.6.3 has been changed from $L_y$ to $LE_y$ to be consistent with section I.6.2.
4.	Issue:	In the calculation of $ER_y$ in section I.6.3, the <i>Net-to-gross adjustment factor</i> and $L_y$ have been removed since the same is already accounted for as $LE_y$ in the calculation of $B_y$ .
5.	Issue:	Eligibility criterion 15 has been revised to reflect the actual distribution methods under generic CPA Type 1. Biogas units are constructed and commissioned as single units.
It is confirmed that the updated / corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.		
<input checked="" type="checkbox"/> A related post registration change has been submitted prior to the issuance request. The approval has been received on 28/08/2019 (effective date of approval 27/08/2018) via approval number PRC-10268-006. <input type="checkbox"/> A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		

**E.2.3.3. Inclusion of a monitoring plan**

<input type="checkbox"/>	N/A - as this monitoring plan was part of the registered PDD
<input type="checkbox"/>	In line with PS § 180 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 180 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
<input checked="" type="checkbox"/>	In line with § 180 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on 28/08/2019 (effective date of approval 27/08/2019) via approval number PRC-10268-006.

**E.2.3.4. Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools**

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring
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	period	
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC	
	1	Title
		Status <input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr. date
		Ref. No.
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA	
<input type="checkbox"/>	An approval of the following PCfrMP, PCfMM or PCfSB 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:
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:	
	1	Issue:
	2	Issue:

### E.2.3.5. Changes to the programme design or project design

It has been checked whether any changes to the CPA design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period	
<input checked="" type="checkbox"/>	The following CoPD have been approved or are under approval by the UNFCCC	
	1	Title
		The size limit for all CPA types under the PoA was revised to reflect Methodological Tool 19 Version 8 <i>Demonstration of additionality of microscale project activities</i> in the eligibility criteria. CPAs are therefore exempt from a debundling check through application of the micro-scale limit at the CDM Unit level.
		In compliance with §239 of PS version 1.0, the PoA and the CPAs eligibility and applicability criteria are amended as per the provisions of the updated tool.
		Status <input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved
		Appr. date 03/01/2018
		Ref. No. PRC-10268-001
	2	Title
		Status <input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr. date
		Ref. No.
<input checked="" type="checkbox"/>	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	
<input type="checkbox"/>	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:
<input type="checkbox"/>	The following CoPD for which appendix 1 of the PS is applicable have been applied:	

	1	Issue:	
	2	Issue:	

**E.2.3.6. Change of coordination/managing entity**

<input checked="" type="checkbox"/>	N/A. The programme of activities is not changing the coordination/managing entity
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**E.2.3.7. Changes specific to afforestation and reforestation activities**

<input checked="" type="checkbox"/>	N/A. The programme of activities is not an afforestation and reforestation project activities
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**E.3. Component project activities****E.3.1. Compliance of the CPA implementation with the included CPA design document**

<b>Means of verification</b>	By means of an in-depth review of the registered and revised CPA-DD in its latest form, and the checks carried out during the on-site visit an assessment has been carried out whether the project has been implemented and operated in line with the latest approved version of the CPA-DD.  The verification team has checked the information in the monitoring report and compared against the registered CPA-DD.  During the onsite inspection, the verification team has checked the project location, implementation, technology applied, monitoring system, and compared against the information in the registered CPA-DD.  Interviews with the relevant personnel have been carried out.  The following sources of information have been used in this context: <ul style="list-style-type: none"> <li>• /CPA-DD/</li> <li>• /MR/</li> <li>• /AMS/</li> <li>• /IM01/</li> <li>• /IM02/</li> <li>• /unfccc/</li> </ul>																		
<b>Findings</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>The project has been implemented as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.</td></tr> <tr> <td><input type="checkbox"/></td><td>The following deviations from the registered project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): N/A</td></tr> <tr> <td><input type="checkbox"/></td><td>In this context the following CARs, CLs have been raised:</td></tr> <tr> <td></td><td></td></tr> <tr> <td></td><td><i>In case of phased implementation:</i></td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>N/A</td></tr> <tr> <td><input type="checkbox"/></td><td>The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.</td></tr> <tr> <td><input type="checkbox"/></td><td>The description in section B.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation during the site inspection.</td></tr> <tr> <td><input type="checkbox"/></td><td>The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A</td></tr> </table>	<input checked="" type="checkbox"/>	The project has been implemented as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.	<input type="checkbox"/>	The following deviations from the registered project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): N/A	<input type="checkbox"/>	In this context the following CARs, CLs have been raised:				<i>In case of phased implementation:</i>	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.	<input type="checkbox"/>	The description in section B.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation during the site inspection.	<input type="checkbox"/>	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A
<input checked="" type="checkbox"/>	The project has been implemented as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.																		
<input type="checkbox"/>	The following deviations from the registered project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): N/A																		
<input type="checkbox"/>	In this context the following CARs, CLs have been raised:																		
	<i>In case of phased implementation:</i>																		
<input checked="" type="checkbox"/>	N/A																		
<input type="checkbox"/>	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.																		
<input type="checkbox"/>	The description in section B.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation during the site inspection.																		
<input type="checkbox"/>	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A																		
<b>Conclusion</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>No CARs / CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.</td></tr> <tr> <td><input type="checkbox"/></td><td>The raised CARs / CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</td></tr> </table>	<input checked="" type="checkbox"/>	No CARs / CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.	<input type="checkbox"/>	The raised CARs / CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.														
<input checked="" type="checkbox"/>	No CARs / CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.																		
<input type="checkbox"/>	The raised CARs / CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.																		



	During the verification an onsite 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, , the project has been implemented and operated as described in the latest CPA-DD version 8.0
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### E.3.2. Post-registration changes

#### E.3.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM).have been submitted to the UNFCCC prior to the current monitoring period.		
<input type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.: )
		Appr.date	
		Ref. No.	
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.: )
		Appr.date	
		Ref.No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	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. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		
	1	Issue:	
	2	Issue:	
<input type="checkbox"/>	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

#### E.3.2.2. Corrections

It has been checked whether any corrections to CPA information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	During the verification of the current MP no need for corrections has been identified.		
<input checked="" type="checkbox"/>	The following corrections have been applied:		
	1.	Issue:	The CPA-DD was corrected to apply the latest version of "Methodological tool: Demonstrating additionality of microscale project activities" instead of the tool for "Demonstration of Additionality of Small-Scale Project Activities, version 10.0", applied in the registered CPA-DD. The CPAs are now exempt from a debundling check through application of the microscale limit at the CDM Unit level

2.	Issue:	The time limit boundary for all CPA types was originally specified as covering technologies installed or disseminated over a two-year period.
3.	Issue:	The measures to avoid double counting were specified as the recording of GPS coordinates and serial numbers. The measures to avoid double counting have been revised to be specified for the specific CPA, with GPS coordinates and serial numbers given as an example of the measure
4.	Issue:	The eligibility criterion surrounding securing CER rights for the various CPA types has been clarified
5.	Issue:	The CPA-DD template were updated latest version 08.1 in line with §227 of the CDM project standard for programmes of Activities, version 2.0. Editorial changes and referencing have been updated accordingly.
6.	Issue:	The emission reduction calculations under Appendix 4 have been revised to remove the de-bundling calculation.
7.	Issue:	Measurement methods and procedures for the parameter $LE_y$ in section B.4.2 have been further elaborated for clarity, in line with §19 and §27 of the applied methodology. Furthermore, a correction in the $B_y$ equation in section B.4.3 has been changed from $L_y$ to $LE_y$ to be consistent with section B.4.2.
8.	Issue:	In the calculation of $ER_y$ in section B.4.3, the <i>Net-to-gross adjustment factor</i> has been removed since the same is already accounted for as $LE_y$ in the calculation of $B_y$ .
9.	Issue:	Eligibility criterion 15 has been revised to reflect the actual distribution methods under generic CPA Type 1. Biogas units are constructed and commissioned as single units.
<p>It is confirmed that the updated / corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.</p>		
<p><input checked="" type="checkbox"/> Related post registration changes have been submitted prior to the issuance request. The approval has been received via approval number PRC-10268-006</p> <p><input type="checkbox"/> A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.</p>		

### E.3.2.3. Changes to the start date of the crediting period of component project activities

<input type="checkbox"/>	N/A - as this is not the first verification within the crediting period
<input checked="" type="checkbox"/>	The PPs do not intend to change the start date of the crediting period.
<input type="checkbox"/>	As the change in the start date was below the related time period as indicated in PS § 277 and § 278 no prior approval was required but only a notification. This notification has been submitted by the PP without involvement of the DOE. The change and new start date has been checked from the related UNFCCC project webpage.
<input type="checkbox"/>	The PPs intend to change the start date of the crediting period. As the intended change in start date beyond the related time period as indicated in PS § 279 prior approval by the Board is required. For detailed assessment of the change please refer to related PRC validation report. As per assessment in this report the DOE confirms that the change to the start date of the crediting period are in line with the related requirements of the VVS and PS.
<input type="checkbox"/>	The approval to change the start date of the crediting period has been received on DD/MM/YYYY via approval number PRC-10268-00X

### E.3.2.4. Inclusion of a monitoring plan

<input type="checkbox"/>	N/A - as this monitoring plan was part of the registered PDD
<input type="checkbox"/>	In line with PS § 116 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 116 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to

	the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
<input checked="" type="checkbox"/>	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on 27/08/2019 via approval number PRC-10268-006.

### E.3.2.5. Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline, or other applied standards or tools

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period									
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC									
	1	<table border="1"> <tr> <td>Title</td> <td></td> </tr> <tr> <td>Status</td> <td><input type="checkbox"/> under approval; <input type="checkbox"/> approved</td> </tr> <tr> <td>Appr. date</td> <td></td> </tr> <tr> <td>Ref. No.</td> <td></td> </tr> </table>	Title		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved	Appr. date		Ref. No.	
Title										
Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved									
Appr. date										
Ref. No.										
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA									
<input type="checkbox"/>	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.									
	1	Issue: <table border="1"><tr><td></td></tr></table>								
	2	Issue: <table border="1"><tr><td></td></tr></table>								
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:									
	1	Issue: <table border="1"><tr><td></td></tr></table>								
	2	Issue: <table border="1"><tr><td></td></tr></table>								

### E.3.2.6. Changes to the programme design or project design

It has been checked whether any changes to the CPA design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period									
<input checked="" type="checkbox"/>	The following CoPD have been approved or are under approval by the UNFCCC									
	1	<table border="1"> <tr> <td>Title</td> <td>The size limit for all CPA types under the PoA was revised to reflect Methodological Tool 19 Version 8 <i>Demonstration of additionality of microscale project activities</i> in the eligibility criteria.  In compliance with §239 of PS version 1.0, the PoA and the CPAs eligibility and applicability criteria are amended as per the provisions of the updated tool.</td> </tr> <tr> <td>Status</td> <td><input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved</td> </tr> <tr> <td>Appr. date</td> <td>18/05/2018</td> </tr> <tr> <td>Ref. No.</td> <td>PRC-10268-003</td> </tr> </table>	Title	The size limit for all CPA types under the PoA was revised to reflect Methodological Tool 19 Version 8 <i>Demonstration of additionality of microscale project activities</i> in the eligibility criteria.  In compliance with §239 of PS version 1.0, the PoA and the CPAs eligibility and applicability criteria are amended as per the provisions of the updated tool.	Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved	Appr. date	18/05/2018	Ref. No.	PRC-10268-003
Title	The size limit for all CPA types under the PoA was revised to reflect Methodological Tool 19 Version 8 <i>Demonstration of additionality of microscale project activities</i> in the eligibility criteria.  In compliance with §239 of PS version 1.0, the PoA and the CPAs eligibility and applicability criteria are amended as per the provisions of the updated tool.									
Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved									
Appr. date	18/05/2018									
Ref. No.	PRC-10268-003									

	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr. date	
		Ref. No.	
<input checked="" type="checkbox"/>	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		
<input type="checkbox"/>	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:	
<input type="checkbox"/>	The following CoPD for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

**E.3.2.7. Changes specific to afforestation and reforestation component project activities**

<input checked="" type="checkbox"/>	N/A. The project activity is not an afforestation and reforestation project activities
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**E.3.3. Compliance of the registered monitoring plan with the methodology including applicable tool(s) and standardized baseline****E.3.4. Compliance of monitoring activities with the registered monitoring plan**

<b>Means of verification</b>	By means of comparison of the MR with (i) the applied CDM methodology (ii) all applicable CDM Meth tools and the verification team has checked whether the monitoring plan is in compliance with the monitoring requirements of the applied methodology. The following sources of information have been used in this context: <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /CPA-DD/</li> <li>• /AMS/</li> <li>• /unfccc/</li> </ul>			
<b>Findings</b>	<input checked="" type="checkbox"/>	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)		
	<input type="checkbox"/>	The breakdown of MP accordance of the referenced tools is as follows:		
		1	Title (of the tool)	
			Version	
			MP compliance	<input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
		2	Title (of the tool)	
	Version			
MP compliance	<input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A			
<input type="checkbox"/>	The breakdown of MP accordance of the applicable SB is as follows:			

		Title (of the SB)	
		Version	
		MP compliance	
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:	
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs / CLs / FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	
	<input type="checkbox"/>	The raised CARs / CLs / FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.	
	The applied methodology has been complied with in all aspects.		

#### E.3.4.1. Data and parameters fixed ex ante or at renewal of crediting period

<b>Means of verification</b>	<p>The verification team has checked the ex-ante parameters and data stated in Section E.1 of MR and compared with section B.4.2 of the registered CPA-DD whether all parameters fixed ex-ante for the crediting period have been applied correctly.</p> <p>The following list of ex-ante fixed parameters have been applied:</p>				
	Nbr.	Parameter abbreviation	Description	Value	Unit
	1.	$B_{y, hh}$	Mass of fuelwood consumed per household per year in the baseline	6.15	Tonnes/household/year
	2.	$EF_{projected\_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers	81.6	tCO <sub>2</sub> /TJ
	3.	$\eta_{old}$	Efficiency of the system being replaced (conventional stove)	0.1	-
	4.	$LE_y$	Leakage related to the non-renewable woody biomass saved by the project activity	0.95	-
	5.	$f_{NRB}$	Fraction of non-renewable biomass in year y	0.88	-
	6.	$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted	0.015	TJ/Ton
<p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> </ul>					

	<ul style="list-style-type: none"> <li>• /AMS/</li> <li>• /CPA-DD/</li> <li>• /ER/</li> <li>• /PoA-DD/</li> <li>• /PS/</li> <li>• /VVS/</li> <li>• /unfccc/</li> </ul>	
<b>Findings</b>	<input checked="" type="checkbox"/>	The MR and the ER calculation have considered the parameters fixed ex-ante for the crediting period correctly, no deviations have been observed.
	<input type="checkbox"/>	The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification: N/A
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: N/A
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs / CLs / FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs / CLs / FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The data and parameters listed in the section E.1 of MR was cross checked with the applied methodology, revised CPA-DD, ER and are consistent.	

**E.3.4.2. Data and parameters monitored**

<b>Means of verification</b>	<p>During the verification all monitoring parameters listed in Section E.2 of MR were compared with section B.5.1 of the CPA-DD have been verified with regard to the:</p> <ul style="list-style-type: none"> <li>(i) appropriateness of the applied measurement / determination method,</li> <li>(ii) the correctness of the values applied for ER calculation,</li> <li>(iii) the accuracy, and applied QA/QC measures.</li> </ul>				
	<b>Nbr.</b>	<b>Parameter abbreviation</b>	<b>Description</b>	<b>Value</b>	<b>Unit</b>
	1.	N <sub>d</sub>	Full-time equivalent digesters in the monitoring period	5,479.32	Unit-Years
	2.	UF <sub>d</sub>	Fraction of digesters found to be operational during the monitoring period	0.77	-
<b>Findings</b>	CL 02, CAR 04, & CAR 05				
<b>Conclusion</b>	<input type="checkbox"/>	No CARs / CLs / FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.			
	<input checked="" type="checkbox"/>	The raised CARs / CLs / FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.			
	<p>The revised MP under the CPA-DD is aligned with PoA-DD. During the verification all relevant monitoring parameters (as listed in chapter B.5.1 of the revised CPA-DD) 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.</p> <p>Out of 4,812 digesters installed under the CPA in 2015 and 2016, only 4,097 digesters had a unique identifier as required by the CPA in the form of a serial</p>				

	<p>number, and/or GPS coordinates, or unique end-user information. The digesters without a unique identifier were excluded from consideration during this monitoring period in order to comply with the methodology and to improve accuracy of claimed emission reductions.</p> <p>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.</p>
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### E.3.4.3. Implementation of sampling plan

<b>Means of verification</b>	<p>The verification team has been checked whether the PPs have applied a sampling approach to determine the monitored values.</p> <p>Further it has been checked whether the PPs have correctly applied the implemented sampling plan including</p> <ul style="list-style-type: none"> <li>(i) description of the implemented sampling design</li> <li>(ii) collected data</li> <li>(iii) analysis of collected data</li> <li>(iv) demonstration on whether the required confidence/precision has been met.</li> </ul> <p>The following sources of information have been used in this context.</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /ER/</li> <li>• /PoA-DD/</li> <li>• /BUS/</li> <li>• /IM01/</li> <li>• /IM02/</li> </ul>								
<b>Findings</b>	<input type="checkbox"/>	The PPs have not applied sampling approaches for the parameters monitored.							
	<input checked="" type="checkbox"/>	The PPs have applied sampling approaches for the following parameters monitored.							
		1	<table border="1"> <tr> <td>Parameter:</td><td>UF<sub>d</sub></td></tr> <tr> <td>Name:</td><td>Fraction of digesters found to be operational during the monitoring period</td></tr> <tr> <td>Description on how the sampling efforts and survey comply with the validated sampling plan:</td><td>See chapter D.3 of this report</td></tr> </table>	Parameter:	UF <sub>d</sub>	Name:	Fraction of digesters found to be operational during the monitoring period	Description on how the sampling efforts and survey comply with the validated sampling plan:	See chapter D.3 of this report
		Parameter:	UF <sub>d</sub>						
		Name:	Fraction of digesters found to be operational during the monitoring period						
		Description on how the sampling efforts and survey comply with the validated sampling plan:	See chapter D.3 of this report						
		2	<table border="1"> <tr> <td>Parameter:</td><td></td></tr> <tr> <td>Name:</td><td></td></tr> <tr> <td>Description on how the sampling efforts and survey comply with the validated sampling plan:</td><td></td></tr> </table>	Parameter:		Name:		Description on how the sampling efforts and survey comply with the validated sampling plan:	
	Parameter:								
	Name:								
	Description on how the sampling efforts and survey comply with the validated sampling plan:								
<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:								
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs / CLs / FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.							
	<input type="checkbox"/>	The raised CARs / CLs / FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.							
	Refer to section D.3 of this report								

### E.3.4.4. Compliance with the calibration frequency requirements for measuring instruments

<b>Means of verification</b>	During the verification, it was established that no specific calibration requirements
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	are necessary for the project bio-digesters and its peripheral components. The bio-digesters only need to meet the required quality and warranty requirements as set out by the ministry. The following sources of information have been used in this context:
	<ul style="list-style-type: none"> <li>• /MR/</li> <li>• /ER/</li> <li>• /PoA-DD/</li> <li>• /CPA-DD/</li> <li>• /IM01/</li> </ul>
<b>Findings</b>	<input type="checkbox"/> Inconsistencies of the calibration information with calibration reports.
	<input type="checkbox"/> Based on the assessment and information as per appendix 5 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration. From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions. For details please refer to appendix 6
	<input type="checkbox"/> The metering diagram reflects the actual situation and is in line with the registered PDD and with the requirements of the applied methodology
	<input type="checkbox"/> In this context the following CARs, CLs, FARs have been raised:
<b>Conclusion</b>	<input checked="" type="checkbox"/> No CARs / CLs / FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/> The raised CARs / CLs / FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Calibration for the biogas pressure gauges is not required

### E.3.5. Assessment of data and calculation of emission reductions or net removals

#### E.3.5.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

<b>Means of verification</b>	<p>During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> <li>• <i>Transparency:</i> It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.</li> <li>• <i>Parameter consistency:</i> It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.</li> <li>• <i>Correctness:</i> It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology.</li> <li>• <i>Completeness:</i> It has been checked whether all calculations are complete and without omissions.</li> </ul> <p>The equation applied for the determination of baseline GHG emissions is consistent with the updated generic CPA-DD and methodology:</p> <p>The number of digesters installed in 2015 and 2016 is 4,812. The final figure after excluding units that did not have complete information, that is, unique identification (SNs and/or GPS) is 4,097 units.</p> <p>As the monitoring period covers more than 365 days and biogas digesters are</p>
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	<p>constructed continuously throughout the monitoring period, the number of full-time operational biogas digesters was determined from the number of units commissioned. The number of unit-days is then divided by 365 to represent fulltime equivalent in years.</p> <p>To account for lag time, project digesters are deemed to start operation from the start of the following month. Due to the different Ethiopian calendar year that starts in September, some units could not be determined which month they were installed, or the records were not completed. Therefore, crediting starts the following year (see CL 01).</p> <p>Therefore, from the total operational days, the biogas digester unit years = Units installed prior and during this MP determined by the duration of operation in this MP (2 years) = 7,116 Unit-years</p> <p>Baseline emissions for the monitoring period were calculated as follows:</p> <p>The number of full-time equivalent digesters in the monitoring period for all the four regions is now calculated as equivalent of 7,116 unit-years.</p> <p>The operational fraction from the validated BUS Report is 0.77 for digesters of installed in 2015 and 2016.</p> <p>Therefore, parameter <math>N_d</math> is further adjusted as follows:</p> <p><math>N_d = 7,116 \text{ unit-years} * 0.77 = 5,479.32 \text{ unit-years}</math></p> <p>The quantity of woody biomass saved is calculated as follows, accounting for possible leakage:</p> $B_y = B_{y,hh} * N_d * L_y$ $= 6.15 \text{ tonnes/household/year} * 5,479.32 \text{ unit-years} * 0.95$ $= 32,011 \text{ tonnes}$ <p>Emission reductions are hence calculated as follows:</p> $ER_y = B_y * f_{NRB,y} * NCV_{\text{biomass}} * EF_{\text{projected\_fossilfuel}} - PE_{BC,y}$ $= (32,011 \text{ tonnes/year}) * 88\% * 0.015 \text{ TJ/tonne} * 81.6 \text{ tCO}_2/\text{TJ} - 0 \text{ tCO}_2$ $= \mathbf{34,480 \text{ tCO}_2e}$ <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /ER/</li> <li>• /CPA-DD/</li> <li>• /PoA-DD/</li> <li>• /IM01/</li> </ul>				
Findings	<table border="1"> <tr> <td> <input type="checkbox"/> </td> <td> <p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information has been identified.</p> </td> </tr> <tr> <td> <input type="checkbox"/> </td> <td> <p>The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.</p> </td> </tr> </table>	<input type="checkbox"/>	<p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information has been identified.</p>	<input type="checkbox"/>	<p>The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.</p>
<input type="checkbox"/>	<p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information has been identified.</p>				
<input type="checkbox"/>	<p>The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.</p>				

	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR 01, and CAR 04
<b>Conclusion</b>	<input type="checkbox"/>	No CARs / CLs / FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs / CLs / FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		<ol style="list-style-type: none"> <li>1. The information provided in the monitoring report has been cross-checked with other sources such biogas database, user agreements and payment forms from the respective Regional Biogas Program Coordination Units. The values from the protocols were applied for the baseline emissions calculation in accordance to the revised PoA-DD and CPA-DD.</li> <li>2. The calculations of baseline GHG emissions have been carried out in accordance with the equations and methods described in the proposed monitoring plan and applied methodology and section B.4.1 of CPA-DD.</li> <li>3. The default factors for all biogas units applied in the ex-ante emission reductions are still valid for the 1<sup>st</sup> crediting period.</li> <li>4. Any assumptions used in emission or removal calculations have been justified.</li> <li>5. It can be confirmed that the baseline (and leakage) calculation is overall correct.</li> </ol>

### E.3.5.2. Calculation of project GHG emissions or actual net GHG removals by sinks

<b>Means of verification</b>	<p>During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> <li>• Transparency: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.</li> <li>• Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.</li> <li>• Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology.</li> <li>• Completeness: It has been checked whether all calculations are complete and without omissions.</li> </ul> <p>According to the applied methodology, and the registered CPA-DD, there are no project emissions since in the deployment of the domestic biogas technology, no biomass is sourced from dedicated plantations. Therefore, PE<sub>y</sub> = 0</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /CPA-DD/</li> <li>• /AMS/</li> </ul>	
<b>Findings</b>	<input checked="" type="checkbox"/>	<p>The calculation of the project emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>
	<input type="checkbox"/>	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.

	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs / CLs / FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs / CLs / FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	There are no project emissions in line with the applied methodology and registered CPA-DD	

**E.3.5.3. Calculation of leakage GHG emissions**

<b>Means of verification</b>	<p>During the verification it has been checked whether leakage emissions have to be considered and, in cases where leakage emissions have to be calculated, the respective calculation of leakage GHG emissions has been checked. In such cases the same verification principles have been considered as for the baseline and project emissions calculation.</p> <p>According to the applied methodology and the registered CPA-DD, the parameter <math>B_y</math> is multiplied by a net to gross adjustment factor of 0.95 to account for leakages instead of surveys. Therefore, leakage is not calculated separately.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /CPA-DD/</li> <li>• /AMS/</li> <li>• /XLS/</li> </ul>	
<b>Findings</b>	<input type="checkbox"/>	No leakage emissions were to be considered (LE = 0).
	<input checked="" type="checkbox"/>	<p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2).</p> <p>The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>
	<input type="checkbox"/>	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs / CLs / FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs / CLs / FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	CME has considered leakage in line with §19 of the applied and applicable methodology	

**E.3.5.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks**

<b>Means of verification</b>	<p>The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately</p> <ul style="list-style-type: none"> <li>- Total baseline emissions,</li> <li>- Total project emissions,</li> </ul>
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	<ul style="list-style-type: none"> <li>- Total leakage,</li> <li>- Total emission reductions.</li> </ul> <p>It has been assessed whether the values are correct or need to be revised as a consequence of issues identified above</p> <p>Section F.4 of MR demonstrate the summary of GHG emission reductions for the monitoring period and calculated according to the applied methodology AMS-III.AR version 5.0 as follows:</p> $ER_y = BE_y - PE_y - LE_y$ $= 34,480 \text{ tCO}_2\text{e} - 0 - 0$ $= \mathbf{34,480 \text{ tCO}_2\text{e}}$	
<b>Findings</b>	<input checked="" type="checkbox"/>	Section F.4 of the MR includes in a summary table of the emission reductions calculation.
	<input checked="" type="checkbox"/>	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.
	<input type="checkbox"/>	The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in the ER calculation.
	<input checked="" type="checkbox"/>	During the verification, issues with impact on the ER calculation have been identified.
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CL 01, CL 02
<b>Conclusion</b>	<input type="checkbox"/>	No CARs / CLs / FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs / CLs / FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The summary table in the MR has been filled correctly and the values are in line with the related emissions reduction spreadsheet after corrections.	

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (tCO <sub>2</sub> e)	Leakage (tCO <sub>2</sub> e)	GHG emission reductions or net GHG removals by sinks (tCO <sub>2</sub> e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
10285-0001	34,480	0	0	0	34,480	34,480
Total	34,480	0	0	0	34,480	34,480

#### E.3.5.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA

<b>Means of verification</b>	<p>The verification team has checked if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD.</p> <p>Section F.5 of the MR includes a comparison of the calculated actual emission reductions with the ex-ante calculated values in the registered PDD.</p> <p>For this monitoring period from 01/04/2016 to 31/03/2018 (both days included) the project achieved <b>34,480 tCO<sub>2</sub>e</b> of GHG emission reductions.</p> <p>The estimated ex-ante GHG emission reductions in the registered CPA-DD for this monitoring period are <b>43,915 tCO<sub>2</sub>e</b>.</p> <p>Therefore, the actual emission reduction was <b>21%</b> lower than the estimated ex-ante</p>
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	emission reductions in the registered PDD It has further checked which of the below listed cases is applicable for the calculated ER of the current monitoring period.	
<b>Findings</b>	<input checked="" type="checkbox"/>	Case 1: The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.
	<input type="checkbox"/>	Case 2: The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	<input type="checkbox"/>	Case 3: The ex-ante estimated value was found to be proportionally lower than the ex-post determined value.
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs / CLs / FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs / CLs / FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The ex-ante estimated value was found to be proportionally higher than the ex-post determined value.	

Title and UNFCCC reference number of the CPA	Value estimated in ex ante calculation in the included CPA-DD(s)	Actual values achieved by the CPAs during this monitoring period
CPA-10268-0001	43,915 tCO <sub>2</sub> e	34,480 tCO <sub>2</sub> e
<b>Total</b>	<b>43,915 tCO<sub>2</sub>e</b>	<b>34,480 tCO<sub>2</sub>e</b>

#### E.3.5.6. Remarks on difference from estimated value in included CPA

<b>Means of verification</b>	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered PDD the verification team has checked whether (in case 3) an appropriate explanation is included in the MR. For this monitoring period, the actual emission reductions were found higher than the estimated emission reductions in the registered PDD.	
<b>Findings</b>	<input checked="" type="checkbox"/>	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	<input type="checkbox"/>	For case 3: The PP has provided a related justification in the MR. The reasons for the increase are as follows:
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs / CLs / FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs / CLs / FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The ex-post ERs are lower than ex-ante estimation. No justification is necessary	

#### E.3.6. Assessment of reported sustainable development co-benefits

<b>Means of verification</b>	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	<input type="checkbox"/>	The project participants have monitored the sustainable development co-benefits of the registered CDM project activity, and requested the DOE to verify them. The following sources of information have been used in this context: <ul style="list-style-type: none"> <li>• /MR/</li> </ul>

		<ul style="list-style-type: none"> <li>• /CPA-DD/</li> <li>• /unfccc/</li> <li>• /IM01/</li> </ul>
<b>Findings</b>	<input checked="" type="checkbox"/>	N/A – as the CME has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	<input type="checkbox"/>	<p>Therefore, the DOE has assessed and confirms that:</p> <p>(a) The monitoring has been carried out in accordance with the document for monitoring sustainable development co-benefits, if such document was developed and published on the UNFCCC CDM website in accordance with the “CDM project standard for project activities”;</p> <p>(b) The reported monitoring results correspond to the sustainable development co-benefits of the project activity as observed by the DOE.</p>
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.

### E.3.7. Global stakeholder consultation

<b>Means of verification</b>		<p>In accordance with the PCP the DOE has submitted the initial version of the monitoring report provided by the PP for this monitoring period to be published on the UNFCCC webpage.</p> <p>The monitoring report has been published for the period 24/07/2018 to 07/08/2018</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /unfccc/</li> </ul>
<b>Findings</b>	<input checked="" type="checkbox"/>	No comments have been received on the published monitoring report for this monitoring period.
	<input type="checkbox"/>	Comments have been received and the DOE has concluded that comments are related to issues outside the CDM rules and requirements. Please refer to the list provided under Conclusion of this Section below for related information.
	<input type="checkbox"/>	<p>Comments have been received.</p> <p>The DOE has</p> <ul style="list-style-type: none"> <li>- requested further information from the submitters of the comments</li> <li>- informed the project participants of the comments received, and requested their feedback within a specified timeframe,</li> <li>- considered the input received and has assessed whether such comments are relevant to the CDM project activity,</li> <li>- acknowledged receipt of all submitted comments on the MR of the proposed CDM project activity,</li> <li>- assessed whether the comments are related to the CDM rules and requirements (if so related findings have been raised as per below),</li> <li>- used all possible means to determine the authenticity of the name and contact details of the individual or organization on whose behalf the comments have been submitted,</li> <li>- contacted the secretariat to make them publicly available (if only addressed to the DOE),</li> <li>- determined whether authentic and relevant comments in the global</li> </ul>

		stakeholder consultation were taken into due account in the PDD of the proposed CDM project activity.		
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised, i.e. as the DOE concludes that the comments are related to the CDM rules and requirements:		
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
	As the DOE has concluded that comments are related to issues outside the CDM rules and requirements the comments and information gathered are listed as follows:			
	<b>Nbr.</b>	<b>Original comment received</b>	<b>Feedback by the PP</b>	<b>Statement by DOE</b>
	1			
	2			

## SECTION F. Internal quality control

Before the submission of the final verification report a technical review of the whole verification procedure was carried out. The technical reviewers are competent GHG auditors being appointed for the scope this project falls under. The technical reviewers are 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 have been confirmed or revised. Furthermore, reporting improvements might have been achieved.

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

After this step the submission for requesting for issuance is conducted.

**SECTION G. Verification opinion**

The International Bank for Reconstruction and Development (IBRD) as trustee of the Carbon Initiative for Development (Ci-Dev) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1st periodic verification of the PoA: **“Ethiopia – Clean Cooking Energy Program”**, with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions through the dissemination of domestic biogas plants to mainly household throughout Ethiopia. This verification covers the period from 01/04/2016 to 31/03/2018 (including both days).

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. 6.0.
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The CPA-10268-0001 has generated GHG emission reductions.

As the result of this periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **34,480 tCO<sub>2</sub>e**

**SECTION H. Certification statement**

As a duly accredited DOE, TÜV NORD CERT confirms that the PoA

**“Ethiopia – Clean Cooking Energy Program”**

registered under

UNFCCC-No.: **10268**

has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities during the current monitoring period

MP-No.: 1.0

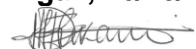
from: 01/04/2016

to: 31/03/2018

(including both days) as follows:

Emission reductions: **34,480 tCO<sub>2</sub>e**

**Kigali, 16/10/2019**



Lubanga, David  
TÜV NORD JI/CDM CP  
Verification Team Leader




## Appendix 1. Abbreviations

Abbreviations	Full texts
BCE	Biogas construction enterprise
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CPA	Component Project Activity
CPA-DD	Component Project Activity Design Document
CER	Certified Emission Reduction
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> eq	Carbon dioxide equivalent
CL	Clarification Request
DBE	Development Bank of Ethiopia
DBP	Domestic Biogas Plant
DOE	Designated Operating Entity
DVerR	Draft Verification Report
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IM	Interview Memo
IPCC	Intergovernmental Panel on Climate Change
MFI	Microfinance Institution
MP	Monitoring Plan
MoWIE	Ministry of Water, Irrigation, and Electricity
MR	Monitoring Report
NBPCU	National Biogas Program Coordination Unit
NBPE	National Biogas Program of Ethiopia
PA	Project Activity
PO	Partner Organization
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document

<b>PDD</b>	<b>Project Design Document</b>
<b>PP</b>	<b>Project Participant</b>
<b>PRC</b>	<b>Post Registration Changes</b>
<b>PS</b>	<b>CDM project standard for project activities</b>
<b>QA/QC</b>	<b>Quality Assurance / Quality Control</b>
<b>RBPCU</b>	<b>Regional Biogas Program Coordination Unit</b>
<b>REB</b>	<b>Regional Energy Bureau</b>
<b>SN</b>	<b>Serial Number</b>
<b>SNNPRG</b>	<b>Southern Nations, Nationalities &amp; Peoples Regional Government/State</b>
<b>TN</b>	<b>TÜV NORD</b>
<b>UNFCCC</b>	<b>United Nations Framework Convention on Climate Change</b>
<b>VVS</b>	<b>Validation and Verification Standard</b>
<b>WEO</b>	<b>Woreda Energy Office</b>
<b>WFO</b>	<b>Woreda Finance Office</b>

## Appendix 2. Competence of team members and technical reviewers



**Statement of Competence**  
Appointment and authorization according to the procedures  
of the TUV NORD J/CDM Certification Program

**Mr. David Lubanga**


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2021-10-20
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2021-10-20

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand
13.2	Manure

251 - Rev. 7, Date: 2018-10-19

251\_501-VA060-F20\_2018-10-19\_rev7.doc      501-VA060-F20 rev3 / 2012-10-25



**Statement of Competence**  
Appointment and authorization according to the procedures  
of the TUV NORD J/CDM Certification Program

**Ms. Xue Jiao Fancy Zhao**

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-11-01
VCS / ISO 14064-2	Senior Assessor	2019-11-01

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy Demand
8.1	Mining and mineral production
13.1	Solid waste and wastewater
13.2	Manure

230- Rev. 8, Date: 2018-06-06

230\_501-VA060-F20\_2018-06-06\_rev8.doc      501-VA060-F20 rev3 / 2012-10-25

### Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1.	UNFC CC	/AMS/	AMS-I.E: Switch from non-renewable biomass for thermal applications by the user, version 6.0	<a href="https://cdm.unfccc.int/methodologies/SSCmethodologies/approved">https://cdm.unfccc.int/methodologies/SSCmethodologies/approved</a>	Other
2.	CME	/BUS/	- BUS survey report 'Report on National Biogas Users' Survey', dated 2018		CME
3.	CME	/CPA-DD/	CPA-DD titled ' <i>NBP Ethiopia Domestic Biogas Plants CPA 1</i> ' CPA-0001: - version 4.0, dated 11/11/2015 - version 5.0, dated 26/09/2017 - version 6.0, dated 09/04/2018 - version 7.0, dated 25/05/2019 - version 8.0, dated 25/05/2019		CME
4.	CME	/PoA-DD/	PoA DD - version 5.0, dated 11/11/2015 - version 6.0, dated 26/09/2017 - version 7.0, dated 22/07/2018 - version 8.0, dated 22/11/2018 - version 9.0, dated 25/05/2019		CME
5.		/ER/	Emission Reduction Calculation for Monitoring Report • Version 1.0 • Version 2.0 • Version 3.0		CME
6.		/VVS/	CDM validation and verification standard for programmes of Activities, version 2.0	<a href="https://cdm.unfccc.int/Reference/Standards/index.html">https://cdm.unfccc.int/Reference/Standards/index.html</a>	Other
7.		/PS/	CDM project standard for programmes of Activities, version 2.0	<a href="https://cdm.unfccc.int/Reference/Standards/index.html">https://cdm.unfccc.int/Reference/Standards/index.html</a>	Other
8.	DOE	/VAL/	PoA Validation report titled 'Ethiopia – Clean Cooking Energy Program', version 2.0, dated 03/03/2016  CPA Validation report titled 'NBP Ethiopia Domestic biogas plants CPA 1', version 2.0, dated 03/03/2016  CPA Validation report version 3.0, dated 13/06/2016		Other
9.	DOE	/PRC/	PoA PRC Assessment report titled 'Ethiopia – Clean Cooking Energy Program', version 3.0, dated 15/11/2017  CPA PRC Assessment report titled 'NBP Ethiopia Domestic biogas plants CPA 1', version 1.0, dated 14/02/2018  PoA PRC Assessment report titled 'Ethiopia – Clean Cooking Energy		DOE

			<p>Program', version 1.0, dated 10/01/2019</p> <p>PoA PRC Assessment report titled 'Ethiopia – Clean Cooking Energy Program', version 2.0, dated 29/05/2019</p> <p>CPA PRC Assessment report titled 'NBP Ethiopia Domestic biogas plants CPA 1', version 1.0, dated 10/01/2019</p> <p>CPA PRC Assessment report titled 'NBP Ethiopia Domestic biogas plants CPA 1', version 2.0, dated 27/05/2019</p>		
10.	DOE	/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)		DOE
11.	IPCC	/IPCC/	<ol style="list-style-type: none"> <li>1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book</li> <li>2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book</li> </ol>	<a href="http://www.ipcc-nggip.iges.or.jp">www.ipcc-nggip.iges.or.jp</a>	Other
12.	UNFCCC	/KP/	Kyoto Protocol (1997)	<a href="http://unfccc.int/kyoto_protocol/items/2830.php">http://unfccc.int/kyoto_protocol/items/2830.php</a>	Other
13.	UNFCCC	/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)	<a href="http://cdm.unfccc.int/Reference/COPMOP/index.html">http://cdm.unfccc.int/Reference/COPMOP/index.html</a>	Other
14.	UNFCCC	/MRT/	Monitoring Report Form (CDM-MR-FORM), Version 02.0	<a href="https://cdm.unfccc.int/Reference/PDDs_Forums/index.html">https://cdm.unfccc.int/Reference/PDDs_Forums/index.html</a>	Other
15.	CME	/MR/	<ul style="list-style-type: none"> <li>- Monitoring Report titled 'Ethiopia – Clean Cooking Energy Program, version 1.0, dated 23/07/2018</li> <li>- Monitoring Report titled 'Ethiopia – Clean Cooking Energy Program, version 2.0, dated 16/11/2018</li> <li>- Monitoring Report titled 'Ethiopia – Clean Cooking Energy Program, version 3.0, dated 26/11/2018</li> <li>- Monitoring Report titled 'Ethiopia – Clean Cooking Energy Program, version 4.0, dated 10/01/2019</li> <li>- Monitoring Report titled 'Ethiopia – Clean Cooking Energy Program, version 4.0, dated 23/01/2019</li> <li>- Monitoring Report titled 'Ethiopia – Clean Cooking Energy Program, version 5.0, dated 27/05/2019</li> <li>- Monitoring Report titled 'Ethiopia – Clean Cooking Energy Program, version 5.0, dated 30/09/2019</li> </ul>		CME
16.	UNFCCC	/SS/	Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, version 07.0	<a href="https://cdm.unfccc.int/Reference/Standards/index.html">https://cdm.unfccc.int/Reference/Standards/index.html</a>	Other
17.	DOE	/PTO/	Photos of sample records (User Agreements) taken at the RBPCU offices		Other
18.	CME	/DB/	User databases for the 4 regions		CME
<b>Websites</b>					

**CDM-PoA-VCR-FORM**

1.	UNFCCC	/unfccc/	UNFCCC	<a href="http://cdm.unfccc.int">http://cdm.unfccc.int</a>	Other
2.	IPCC	/ipcc/	IPCC publications	<a href="http://www.ipcc-nggip.iges.or.jp">www.ipcc-nggip.iges.or.jp</a>	Other
3.	MEFCC	/dnaHP/	DNA of Ethiopia (Ministry of Environment, Forest and Climate Change, Ethiopia - MEFCC)	<a href="http://mefcc.gov.et/">http://mefcc.gov.et/</a>	Other
4.	DBE	/dbe/	Development Bank of Ethiopia	<a href="http://www.dbe.com.et/homenew/">http://www.dbe.com.et/homenew/</a>	Other

## Appendix 4. Clarification requests, corrective action requests and forward action requests

**Table 3. Remaining FARs from validation and/or previous verification**

<b>FAR ID</b>	N/A	<b>Section no.</b>		<b>Date: DD/MM/YYYY</b>
<b>Description of FAR</b>				
N/A				
<b>CME response</b>				<b>Date: DD/MM/YYYY</b>
<b>Documentation provided by CME</b>				
<b>DOE assessment</b>				<b>Date: DD/MM/YYYY</b>

**Table 4. CLs from this verification**

<b>CL ID</b>	01	<b>Section no.</b>	C.1	<b>Date:</b>	12/11/2018	
<b>Description of CL</b>						
MR version 1.0, Section C.1: SNNPR Regional Biogas Program Coordination Unit finding During the office audit: Actual installations could be confirmed through available paper trail from user agreements to payment by the regional biogas office. However, the data recorded and presented for verification was undermined by erroneous or mismatched serial numbers with user names, incomplete data and wrong or missing dates. For instance, some date of inspection, and start of construction was not distinguished from actual date of actual commissioning. Nonetheless, most names were correct when checked against the payment request forms. From this observation, please clarify how start date of operations of individual units is accurately determined for this verification.						
<b>Project participant response (1<sup>st</sup> round)</b>					<b>Date:</b>	22/11/2018
For all digesters without an installation month, the digesters are deemed operational from the following year. Prior to the site visit this approach was applied to digesters in the Amhara region as well as 32 digesters in the Tigray region for which no installation month was provided in 2016. This same approach is not used in the SNNPR region for digesters installed in 2016.						
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>						
<input type="checkbox"/>	Changes in the PDD	Section(s):		New version No.:		
<input checked="" type="checkbox"/>	Changes in MR	Section(s): C.1		New version No.: 2.0		
<input type="checkbox"/>	Changes in XLS	Worksheet(s):		New version No.:		
<input type="checkbox"/>	Other:					
<b>DOE assessment (1<sup>st</sup> round)</b>					<b>Date:</b>	26/11/2018
MR version 2.0, Section C.1: Biogas ddigesters without installation month details are deemed operational from the following year. This is the best and conservative approach. The same was applied to digesters in the Amhara region as well as the 32 digesters in the Tigray region missing installation month was provided in 2016. The calculations reflected accordingly						
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed				

<b>CL ID</b>	02	<b>Section no.</b>		<b>Date:</b>	16/10/2018
<b>Description of CL</b>					

MR version 1.0, Section C.1:			
The following was observed during the Audit of data in the Amhara Regional Biogas Program Coordination Unit office			
<ol style="list-style-type: none"> <li>1. The soft copy totals for 2015&amp;2016 presented to the auditor by the RBPCU manager were identical to the data availed for verification. All data matched names and unique identification. However, sample check of some hard copy records using GPS coordinates for consistency with excel database records indicated a few hard copy records were not entered into the database</li> <li>2. Data was captured only in years. However, the Ethiopian calendar year starts in September. How has this data been handled to distinguish especially between 2014 and 2015 data and accounted for in the calculation of unit years</li> </ol>			
<b>Project participant response (1<sup>st</sup> round)</b>			<b>Date:</b> 22/11/2018
<ol style="list-style-type: none"> <li>1. Some hard copy records were for digesters installed prior to the start date of the CPA and as such are not included under the CPA.</li> <li>2. The installation dates were recorded in either Gregorian calendar or the Ethiopian calendar. Some hard copy records reviewed only had dates as per the Ethiopian calendar. The CME used mobile phone applications to convert Ethiopian calendar dates to Gregorian calendar dates and report the Gregorian installation year for the purposes of emission reductions.</li> </ol>			
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>			
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:
<input checked="" type="checkbox"/>	Changes in MR	Section(s): C.1	New version No.: 2.0
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/>	Other:		
<b>DOE assessment (1<sup>st</sup> round)</b>			<b>Date:</b> 26/11/2018
MR version 2.0, Section C.1:			
<ol style="list-style-type: none"> <li>1. Clarified that some of the records were prior to the start date of the CPA and recorded in Ethiopian calendar</li> <li>2. OK as clarified. Some of the dates were not converted to the standard calendar since they are not subject to DOE/CDM interest</li> </ol>			
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed	

Table 5. CARs from this verification

<b>CAR ID</b>	<b>01</b>	<b>Section no.</b>	<b>Title Page &amp; section F.5</b>	<b>Date:</b>	<b>12/11/2018</b>
<b>Description of CAR</b>					
MR version 1.0, Title Page & section F.5:					
Ex-ante ER value is not correct. A clarification is requested					
<b>Project participant response (1<sup>st</sup> round)</b>					<b>Date:</b> 22/11/2018
This value has been updated to reflect the correct ERs.					
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>					
<input type="checkbox"/>	Changes in the PDD	Section(s): E.3	New version No.:		
<input checked="" type="checkbox"/>	Changes in MR	Section(s): Title Page	New version No.:	2.0	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:		
<input type="checkbox"/>	Other:				
<b>DOE assessment (1<sup>st</sup> round)</b>					<b>Date:</b> 26/11/2018
MR version 2.0, Title Page:					
This value has been updated and deemed to be correct.					
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

<b>CAR ID</b>	<b>02</b>	<b>Section no.</b>	<b>A.1.1</b>	<b>Date:</b>	<b>12/11/2018</b>
<b>Description of CAR</b>					
MR version 1.0, A.1.1:					
To be completed as per the CDM-PoA-MR-FORM_v2.0 requirements					
<b>Project participant response (1<sup>st</sup> round)</b>					<b>Date:</b> 22/11/2018



This has been revised to reflect the correct number of methodologies under the CPAs and the correct version numbers.			
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>			
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:
<input checked="" type="checkbox"/>	Changes in MR	Section(s): A.1.1	New version No.: 2.0
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/>	Other:		
<b>DOE assessment (1<sup>st</sup> round)</b>			<b>Date:</b> 26/11/2018
MR version 2.0, A.1.1: Revisions have been carried out correctly			
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed	

<b>CAR ID</b>	<b>03</b>	<b>Section no.</b>	<b>Title Page</b>	<b>Date:</b>	<b>12/11/2018</b>
<b>Description of CAR</b>					
MR version 1.0, B.2.1: To be completed as per the CDM-PoA-MR-FORM_v2.0 requirements					
<b>Project participant response (1<sup>st</sup> round)</b>					<b>Date:</b> 22/11/2018
This has been revised to reflect the requirements of the CDM-PoA-MR form.					
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>					
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:		
<input checked="" type="checkbox"/>	Changes in MR	Section(s): B.2.1	New version No.: 2.0		
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:		
<input type="checkbox"/>	Other:				
<b>DOE assessment (1<sup>st</sup> round)</b>					<b>Date:</b> 26/11/2018
MR version 2.0, B.2.1: Please revise this section to reflect all corrections as per Appendix 7 of the PoA-DD					
<b>Project participant response (2nd round)</b>					<b>Date:</b> 26/11/2018
Section B.2.1 has been revised to reflect the revised Appendix 7 of the PoA-DD.					
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>					
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:		
<input checked="" type="checkbox"/>	Changes in MR	Section(s): B.2.1	New version No.: 3.0		
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:		
<input type="checkbox"/>	Other:				
<b>DOE assessment (2nd round)</b>					<b>Date:</b> 26/11/2018
MR version 3.0, B.2.1: Revised accordingly					
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

<b>CAR ID</b>	<b>04</b>	<b>Section no.</b>	<b>E.2</b>	<b>Date:</b>	<b>12/11/2018</b>
<b>Description of CAR</b>					
MR version 1.0, section E.2: Parameter N <sub>d</sub> . Transparency is requested on how the indicated value has been arrived at. Inconsistent with the calculations in section F.1 and the provided spreadsheet					
<b>Project participant response (1<sup>st</sup> round)</b>					<b>Date:</b> 22/11/2018
This value has been revised to reflect the number in the spreadsheet. The calculation in the spreadsheet has been revised to be more clear as well.					
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>					
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:		
<input checked="" type="checkbox"/>	Changes in MR	Section(s): E.2	New version No.: 2.0		
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:		

<input type="checkbox"/> Other:			
<b>DOE assessment (1<sup>st</sup> round)</b>		<b>Date:</b>	26/11/2018
MR version 2.0, Section E.2: The calculation of monitored parameter N <sub>d</sub> is now clear and transparent			
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

<b>CAR ID</b>	<b>05</b>	<b>Section no.</b>	<b>E.3</b>	<b>Date:</b>	<b>12/11/2018</b>
<b>Description of CAR</b>					
MR version 1.0, Section E.3: From the BUS report, the verification team validated the Survey design, Sampling approach, Procedures including equations and sources of equations applied, sample size and whether it meets the 95/10 confidence precision level.. However, the same is not included in the draft MR, in line with the template form requirements v2.0 (and §265 of the CDM PS)					
<b>Project participant response (1<sup>st</sup> round)</b>				<b>Date:</b>	22/11/2018
Section E.3 has been expanded upon to include information regarding the sample, size, confidence interval and calculations used in the BUS report to determine sampled parameters.					
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>					
<input type="checkbox"/>	Changes in the PDD	Section(s):		New version No.:	
<input checked="" type="checkbox"/>	Changes in MR	Section(s): E.3		New version No.: 2.0	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):		New version No.:	
<input type="checkbox"/>	Other:				
<b>DOE assessment (1<sup>st</sup> round)</b>				<b>Date:</b>	26/11/2018
MR version 2.0, Section E.3: Section E.3 has now been completed as required by template and PoA PS_v2.0					
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed				

Table 6. FARs from this verification

<b>FAR ID</b>	<b>01</b>	<b>Section no.</b>	<b>E.3</b>	<b>Date:</b>	<b>12/11/2018</b>
<b>Description of FAR</b>					
The BUS report shall include an appendix in the on all survey subjects contacted and reached with as much detail on them as possible, especially telephone numbers. Some Woredas can be too far or too big due to the size of the country to access in reasonable time. And providing contact details would enable the auditor to reach users that cannot be reached physically during an audit					
<b>CME response</b>				<b>Date:</b>	DD/MM/YYYY
<b>Documentation provided by CME</b>					
<b>DOE assessment</b>				<b>Date:</b>	DD/MM/YYYY
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input checked="" type="checkbox"/> Will be checked during next verification process				

## Appendix 5. Monitored Parameters

Table A-5: Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>A. N<sub>d</sub></b>		<b>Full-time equivalent digesters in the monitoring period</b>		
<p><b>a) Measurement / Determination method (VVS, §§ 346-350)</b></p> <p><i>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 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.</i></p>	<p>/IM01/ IM02/ /PoA-DD/ /CPA-DD/ /MR/ /DB/ /PRC/ /PTO/</p>	<p><i>Description:</i></p> <p>The number of biogas digesters constructed and commissioned are recorded and tracked through trained masons and biogas construction enterprises (BCEs).</p> <p>Therefore, the information flow is crucial in management of accuracy and quality of data. The end-user information is recorded by the biogas technician or mason at the time of installation/construction or commissioning. The information and carbon waiver form are collected by the technicians or mason and delivered to the Woreda energy office. The local Woreda office periodically transfers the hard copies of the end-user information and carbon waiver form to the regional biogas program coordination unit office (RBPCU).</p> <p>At the RBPCU, the information is stored electronically by biogas technicians in a format prescribed by the CME. The hard copies of the documents are filed and remain at the regional office. The electronic end-user information is sent by the regional offices to the National Biogas Program coordination office at the MoWIE where is is checked, cross-checked and compiled into a master file and sent to the CME where a second master file is maintained and accessible by MoWIE and the REBs.</p> <p><i>Verifier's action:</i></p> <p>The verification team pulled a random sample of hard copy end user records at the respective RBPCUs and compared the same with soft copy (excel) records entered into the consolidated regional database and subsequently transmitted to the national biogas office at the MoWIE and then to the CME to be applied in emission reduction calculations. The key details compared by the verification team were as follows: -</p>	OK	OK

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		<p>1. Unique identification (GPS or SNs)  2. Date of installation  3. End-user name  4. 2015 and 2016 totals</p> <p>Interviews were also conducted at all the regional biogas offices and the CME office.</p> <p><i>Conclusion:</i>  The way of recording all installed biogas unit is in line with the proposed monitoring plan and the applied methodology.</p>		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 351-357)</b>  <i>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.</i>  <i>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.</i>  <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	<p>/DB/  /PTO/  /MR/  /IM01/  /IM02/</p>	<p><i>Description:</i>  The number of constructed and completed units is ensured by a diligent paper trail that ensures proper information flow and management system from the Woreda Energy Offices to the regional biogas offices and onwards to the national Biogas program offices at the ministry. The paper trail include the completion form, inspection forms, user agreements as well as payment requests/forms.</p> <p><i>Verifier's action:</i>  The verifier cross-checked random sample documents at the Regional Biogas Offices and compared with details entered in the biogas databases. Furthermore, onsite interviews with key personnel such as the biogas head at the regional biogas coordination units, to biogas technicians and masons were conducted.</p> <p><i>Conclusion:</i>  No significant discrepancies in reported totals were noted. However, significant issues relating to incorrect entries, incomplete data were identified mainly at one of the regional offices. CL 01 &amp; CL 02 were raised accordingly</p>	<p>CL-01  CL-02  CAR  01  CAR  02  CAR  03  CAR  04</p>	OK
<p><b>c) Correctness (VVS, §§ 346-350)</b>  <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i>  <i>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.</i></p>	<p>/MR/  /DB/  /MC/  /XLS/</p>	<p><input checked="" type="checkbox"/> Correct      <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i>  The value given in the draft MR was found to be consistent with the annual totals as well as the total number of commissioned units under the CPAs in the ER calculation spread sheet.</p> <p><i>Verifier's action:</i>  The verification team compared the totals in the databases with</p>	OK	OK

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<i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>		information given in the MR  <i>Conclusion:</i> After corrections, the reported values are deemed as correct. Please refer CL 01 & CL 02.		
<b>Checklist Item</b> (incl. guidance for the verification team)	<b>Reference</b>	<b>Verification Team Comments</b> (Means and results of assessment)	<b>Draft Concl.</b>	<b>Final Concl.</b>
<b>B. UF<sub>d</sub></b>		<b>Fraction of digesters found to be operational during the monitoring period</b>		
<b>a) Measurement / Determination method (VVS, §§ 346-350)</b> <i>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 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.</i>	/IM01/ /PoA-DD/ /CPA-DD/ /PRC/ /XLS/	<i>Description:</i> The parameter accounts for the fraction of biogas units that are operational during the monitoring period. The survey was conducted by a third party contracted competitively to carry out the tasks.  <i>Verifier's action:</i> The verification team checked the applied methodology and the ER calculations.  <i>Conclusion:</i> The measurement approach is in line with the proposed monitoring plan and provisions of the applied methodology. However, CAR 05 was raised	CAR 05	OK
<b>b) Accuracy and QA/QC Procedure (VVS, §§ 351-357)</b> <i>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.</i>	/CAL/ /SS/	<i>Description:</i> As outlined in chapter D.3 of this report, the survey as detailed conforms 95/10 confidence / precision requirements for biennial inspection  Moreover, only bio-digesters with a unique identification have been counted as operating and in service.  <i>Verifier's action:</i> The verification team assessed the Biogas User's report and validated the survey protocol. The sampling approach, sampling design, the sampling frame and the confidence and precision levels were checked. Furthermore acceptance sampling of the CME's own sample was conducted as per the sampling standard  <i>Conclusion:</i> The parameter measurement is consistent with the proposed	OK	OK

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		monitoring and sampling plan of the updated CPA-DD and applied methodology.		
<b>c) Correctness</b> <b>(VVS, §§ 346-350)</b> 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.	/MR/ /AMS/ /XLS/ /PRC/ /CPA-DD/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The value of 77% usage rate applied can be deemed to be correct after validating the survey methodology in the BUS report. Additionally, DOE sampling during verification confirmed the results  <i>Verifier's action:</i> The methodology and calculations were checked  <i>Conclusion:</i> The application of the 77% value factor is correct. No findings were raised with regards to corrections.	OK	OK

## Appendix 6. Calibration dates and validity of installed monitoring equipment

**Table A-6:** Periodic Verification Checklist – Calibration details

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
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<input type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
-	-	-	-	-	-	-	-	<input type="checkbox"/> No <input type="checkbox"/> Yes	From: To:

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
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