

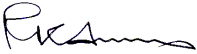


**Verification and certification report form for
CDM programme of activities
(version 02.0)**

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

BASIC INFORMATION

Title and UNFCCC reference number of the programme of activities (PoA)	Tanzania Renewable Energy Programme (Ref. no. 9904)	
Version number(s) of the PoA-DD(s) to which this report applies	Version 08 dated 23/04/2014	
Version number of the verification and certification report	02.2	
Completion date of the verification and certification report	22/11/2018	
Monitoring period number and duration of this monitoring period	First monitoring period From 08/05/2014 to 31/12/2016 (first and last days included)	
Number and version number of the monitoring report to which this report applies	Monitoring Report number 01, version number 06	
Coordinating/managing entity (CME)	Rural Energy Agency (REA)	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	United Republic of Tanzania	Yes
Applied methodologies and standardized baselines	AMS I.D. Grid connected renewable electricity generation, Version 17 AMS I.F. Renewable electricity generation for captive use and mini-grid, Version 02	
Mandatory sectoral scopes linked to the applied methodologies	01 - Energy Industries (renewable / non-renewable sources)	
Conditional sectoral scopes linked to the applied methodologies, if applicable	Not Applicable	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	35,236 tCO ₂ e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	14,838 tCO ₂ e	
Name and UNFCCC reference	Bureau Veritas (India) Pvt Ltd	

number of the DOE	Ref. no. E-0009
Name, position and signature of the approver of the verification and certification report	 RAJENDRA SHARMA Global Accreditation Manager

SECTION A. Executive summary

Bureau Veritas India Pvt Ltd has conducted the 1st periodic verification of the PoA “Tanzania Renewable Energy Programme”; UNFCCC reference number 9904. The PoA is coordinated and managed by the Rural Energy Agency (REA) and is located in the United Republic of Tanzania. The PoA aims to increase access to modern energy services in Tanzania by promoting both the off-grid (isolated mini-grid) and national grid connected renewable energy projects, within the country. The technologies promoted by the PoA include: photovoltaic, wind, hydro and biomass technologies for electricity generation. The PoA applies the following two methodologies: AMS.I-D “Grid connected renewable electricity generation”, Version 17 and AMS.I-F “Renewable electricity generation for captive use and mini-grid”, Version 02. CPAs can be included into the PoA in any one of the following three categories of generic CPAs, by fulfilling the requirements therein:

- a) CPA Category 1: this comprises installation of one or more renewable energy technologies (hydro, wind, biomass or PV) not exceeding 15 MW, and supply the generated electricity to the main national grid. The CPAs are required to comply with the requirements of methodology AMS-I.D version 17.
- b) CPA Category 2: this comprises installation of one or more renewable energy technologies (hydro, wind, biomass or PV) not exceeding 15 MW, and supply the generated electricity to an existing mini-grids being operated by the national utility (TANESCO), or to new isolated mini-grids to serve new areas. The CPAs are required to comply with the requirements of methodology AMS-I.F version 02.
- c) CPA Category 3: This comprises installation of one or more renewable energy technologies (hydro, wind, biomass or PV) not exceeding 15 MW, and supply the generated electricity to the main national grid and an existing mini-grids being operated by the national utility (TANESCO), and/or to new isolated mini-grids to serve new areas. The CPAs are required to comply with the requirements of both methodology AMS-I.D version 17 and AMS-I.F version 02.

Monitoring of the PoA for this period has been reported in two separate monitoring reports (monitoring report number 01 and monitoring report number 02). This verification and certification report covers the first of the two monitoring reports (i.e. monitoring report number 01), that comprises a single batch of the following four CPAs, included in the PoA, in their respective categories:

- a) Mbinga hydroelectric project, UNFCCC reference number 9904-0003; a CPA in category 2
- b) Tulila hydroelectric plant, UNFCCC reference number 9904-0005; a CPA in category 3
- c) Ngombeni biomass power plant project, UNFCCC reference number 9904-0007; a CPA in category 2
- d) Ikondo micro hydro power plant, UNFCCC reference number 9904-0008, a CPA in category 3

The verification scope is defined as a periodic independent review and ex post determination, by the Designated Operational Entity, of the monitored reductions in GHG emissions during the defined verification period, and consisted of the following three phases:

- i) Desk review of the PoA and CPA design documents, the baseline, monitoring plan, reported parameters and ER calculations;
- ii) Onsite observations, crosschecks with plant logs and follow-up interviews with PoA stakeholders;

iii) Resolution of outstanding issues and the issuance of the final verification report and opinion.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

The overall verification, from Contract Review to Verification Report and Opinion, was conducted using Bureau Veritas India Pvt Ltd internal procedures. The first output of the verification process is a list of Clarification Request, Corrective Actions Requests, Forward Actions Requests (CL, CAR and FAR), presented in Appendix 4.

In summary, Bureau Veritas India Pvt Ltd confirms that the PoA is implemented as planned and described in the validated and registered PoA design documents, and in the respective CPA design documents and the revised approved CPA-DD version 06, dated 14/07/2018 (in the case of CPA reference number 9904-0007) for the single batch of four CPAs mentioned above. Installed equipment, in the four CPAs mentioned above, being essential for generating emission reduction runs reliably, with the exception of CPA reference number 9904-0007 which was noted to be running at a very low efficiency. The monitoring system is in place and the four CPAs are generating GHG emission reductions.

Bureau Veritas India Pvt Ltd has determined that the GHG emission reductions are calculated without material misstatements, applying most conservative approach. The emission reductions verified totalize **14,838 tCO₂e** for the four CPAs. Our opinion relates to the PoA's resulting GHG emission reductions for the first monitoring report (report number 01) comprising a single batch of four CPAs mentioned above; and related to the valid and registered baseline, approved monitoring plan and its associated documents for the batch of CPAs.

CPA no.	Reporting period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Emission Reductions (tCO ₂ e)
9904-0003	01/12/2015 - 31/12/2016	1,995	0	0	1,995
9904-0005	01/12/2015 - 31/12/2016	12,754	0	0	12,754
9904-0007	01/09/2016 - 31/12/2016	48	0	0	48
9904-0008	14/10/2016 - 31/12/2016	41	0	0	41
Total	08/05/2014 - 31/12/2016	14,838	0	0	14,838

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	IR	Onsongo	Samuel	Bureau Veritas (India) Pvt Ltd	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	IR	Chirchir	James	Bureau Veritas (India) Pvt Ltd
2.	Support Technical Reviewer	IR	Patankar	Sanjay	Bureau Veritas (India) Pvt Ltd
3.	Approver	IR	Pednekar	Sapana	Bureau Veritas (India) Pvt Ltd

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

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.	<i>Human error in the quantification of emissions</i>	<i>medium</i>	<p>Likelihood – may occur if personnel are not trained on monitoring requirements.</p> <p>Impact – Unreliable data, hence ERs claimed may not be verifiable</p>	Through an onsite assessment the DOE checked information flow, retracing the reported information to source. The DOE will also evaluate the CME's proposed QA/QC procedures.
2.	<i>Reliance on a poorly designed information system</i>	<i>Medium</i>	<p>Likelihood – may occur due to the use of excel spreadsheet without adequate controls</p> <p>Impact – over estimation of ERs claimed.</p>	The DOE carried out an independent calculation using the verified data and following the formulae indicated in the included in the respective CPA-DDs and monitoring methodologies

C.2. Consideration of materiality in conducting the verification

The PoA was initially assessed based on CDM validation and verification standard version 09.0; however due to a post registration change in one of the CPA (reference no 9904-0007), the DOE has re-verified the PoA based on CDM validation and verification standard for programmes of activities version 01.0. to ensure that the request for issuance is consistence with the notification for post registration change for the CPA.

In line with the CDM PoA-VVS version 01.0, the DOE has re-verified the PoA, applying the concept of materiality. Consideration of materiality began by determining the materiality threshold to be applied. The DOE used a threshold of 10% as provided for in paragraph 307 (e) of the standard.

The DOE assessed the risks indicated in section C.1 above, applying the materiality threshold of 10% for each CPA as follows:

Risk no 1: The DOE had already carried out a risk based audit during the onsite assessment conducted between 19/04/2017 and 27/04/2017. During the audit, the DOE was able to retrace the reported values to plant logs. The DOE was also provided with evidence of training of CPA implementers, on CDM, monitoring requirements and records keeping. All sets of data were traceable to the plant logs and no error was noted. However, for the CPA (reference no. 9904-0007- Ngombeni biomass power plant project) the CPA implementer had used renewable biomass (coconut husks, mulch and wood chips) for which percentage moisture content had not been reported ex-ante or included as monitored parameter, in the registered CPA-DD. This did not affect Emission Reductions (ERs) calculation as the parameter is not used for ER calculation but rather for energy balance. This did not constitute material error. The CME has made correction through post registration change that has been positively validated and approved (refer to PRC-9904-002). The set of data is now acceptable.

Risk 2: The DOE has carried out an independent calculation of the ER claimed by each of the four CPAs and confirms that the calculation has been done without material miss statement or omissions.

SECTION D. Means of verification

D.1. Desk/document review

The assessment of the PoA documentation provided by the project participant is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report submitted to the DOE. Qualitative information comprises information on internal management controls, calculation procedures, and procedures for transfer of data, frequency of emissions reports, review and internal audit of calculations.

The monitoring report (MR) version 01 dated 09/03/2017 (refer to doc 1 in Appendix 3) submitted by the project participant was web hosted on the UNFCCC-CDM web site on 23/03/2017 and thus, was available in the public domain. The report consisted of five CPAs; however, due to post registration change in design for one CPA, the CME opted to prepare two separate reports; Monitoring report number 01 covering 4 CPAs (9904-0003, 9904-0005, 9904-0007 and 9904-0008) and monitoring report number 02 covering only one CPA (9904-0004).

In addition to the monitoring documentation provided by the project participants, the DOE reviewed:

- The registered PoA (refer to doc 3 Appendix 3), including the monitoring plan and the corresponding validation report (doc 4 in Appendix 3);
- the applied methodologies (refer to doc 5 in Appendix 3 and doc 6 in Appendix 3)
- Specific case CPA-DDs and their corresponding validation reports (docs 7, 8, 9, 10, 11,12, 13 and 14 in Appendix 3)
- Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board; (PRC-9904-002)
- Emission reduction calculation spreadsheet version 01 dated 09/03/2017 and the subsequent revision version 06 dated 01/11/2018 (refer to doc 2 and 21 respectively in Appendix 3).
- Any other information and references relevant to the project activity's resulting emission reductions (e.g. IPCC reports, data on electricity generation and calibration).

A full list of documents and records reviewed is provided in Appendix 3

D.2. On-site inspection

Duration of on-site inspection: 19/04/2017 to 27/04/2017				
No.	Activity performed on-site	Site location	Date	Team member
1.	a) Interview with CME representative on: - PoA implementation, operation, monitoring and reporting b) Interview the manager of Ngombeni Power Ltd, the CPA implementer for Ngombeni biomass power plant project (CPA 9904-0007) c) Ngombeni Power Ltd Plant tour d) Assessment of data logging e) Assessment of data transmission and reporting f) assessment of meter and scales calibration	Mafia Island	19/04/2017	Samuel Onsongo
2	a) Interview the manager of Matembwe Village Company Limited, the CPA implementer for Ikondo micro hydro power plant (CPA 9904-0008)	Ikondo, Njombe	24/04/2017	Samuel Onsongo

Duration of on-site inspection: 19/04/2017 to 27/04/2017				
No.	Activity performed on-site	Site location	Date	Team member
	b) Tour of the Ikondo micro hydro power plant c) Assessment of data logging d) Assessment of data transmission and reporting e) assessment of meter calibration			
3.	a) Interview the manager of Tulila Hydroelectric Plant Company Limited, the CPA implementer for Tulila hydroelectric plant (CPA 9904-0005) b) Tour of the Tulila hydroelectric plant c) Assessment of data logging d) Assessment of data transmission and reporting e) assessment of meter calibration	Tulila, Mbinga/Songea	26/04/2017	Samuel Onsongo
4.	a) Interview the manager of Andoya Hydroelectric Power Company Ltd , the CPA implementer for Mbinga hydroelectric project (CPA 9904-0003) b) Tour of the Andoya Hydroelectric Power plant c) Assessment of data logging d) Assessment of data transmission and reporting e) assessment of meter calibration	Mbinga	27/04/2017	Samuel Onsongo

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Krishnan	Balasankari	The World Bank Group (PP)	Various dates	- Compliance with CDM rules. - PoA implementation, operation Monitoring Plan and management procedures - Data collection - QA/QC - ER calculations - Monitoring reports - Changes to PoA/CPAs	Samuel Onsongo
2.	Rusule	Duncan	REA (CME)	19/04/2017 to 27/04/2017	PoA implementation	Samuel Onsongo
3.	Mbwilo	Sayuni	REA/The World Bank Group (CME)	19/04/2017 to 27/04/2017	- Assessment of data transmission and reporting - Assessment of meter calibration - QA/QC	Samuel Onsongo
4.	Riggall	Jem	Ngombeni Power Ltd (CPA implementer)	19/04/2017	- CPA implementation - Implemented technology and its efficiency - Biomass availability - Normal and abnormal Plant operation - Data logging - Calibration of measuring equipment - Training on CDM	Samuel Onsongo

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
5.	Bongi	Samuel	Ngombeni Power Ltd (CPA implementer)	19/04/2017	- Record keeping procedure - Training on CDM	Samuel Onsongo
6.	Kamonga	Johannes	Matembwe Village Co. Ltd. (CPA implementer)	24/04/2017	- CPA implementation - Implemented technology and its efficiency - Normal and abnormal Plant operation - Data logging - Calibration of measuring equipment - Training on CDM	Samuel Onsongo
7.	Mkombwe	Ismael	Matembwe Village Co. Ltd. (CPA implementer)	24/04/2017	- Record keeping procedure - Training on CDM	Samuel Onsongo
8.	Mapunda	Jane	Tulila Hydro-Electric Plant Co. Ltd. (CPA Implementer)	26/04/2017	- CPA implementation - Implemented technology and its efficiency - Normal and abnormal Plant operation - Data logging - Calibration of measuring equipment - Training on CDM	Samuel Onsongo
9.	Chiwinga	Richardis	Tulila Hydro-Electric Plant Co. Ltd. (CPA Implementer)	26/04/2017	- Normal and abnormal Plant operation - Data logging	
10.	Mahundi	Christopher	TANESCO (Other Stakeholder)	26/04/2017	- Data logging - Calibration of measuring equipment	Samuel Onsongo
11.	Andoya	Alex	AHEPO CO. Ltd (CPA implementer)	27/04/2017	- CPA implementation - Implemented technology and its efficiency - Normal and abnormal Plant operation - Data logging - Calibration of measuring equipment - Training on CDM	Samuel Onsongo
12.	Haule	John	AHEPO CO. Ltd (CPA implementer)	27/04/2017	- Record keeping procedure - Training on CDM	Samuel Onsongo
13.	Bubelwa	Jasper	AHEPO CO. Ltd (CPA implementer)	27/04/2017	- Normal and abnormal Plant operation - Data logging - Calibration of measuring equipment	Samuel Onsongo

D.4. Sampling approach

Not applicable. All CPAs included in the monitoring report were verified.

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General			
Compliance of the monitoring report with the monitoring	1	2	

report form			
Remaining forward action requests from validation and/or previous verification			
CPA(s) considered for verification and covered in this report			
Programme of activities			
Compliance of the programme implementation with the registered PoA-DD	1		
Implementation and operation of the management system			
Post-registration changes			
<ul style="list-style-type: none"> Temporary deviations from the registered monitoring plan, applied methodology or applied standardized baseline 			
<ul style="list-style-type: none"> Corrections 			
<ul style="list-style-type: none"> Inclusion of a monitoring plan 			
<ul style="list-style-type: none"> Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools 			
<ul style="list-style-type: none"> Changes to the programme design or project design 			
<ul style="list-style-type: none"> Change of coordinating/managing entity 			
<ul style="list-style-type: none"> Changes specific to afforestation and reforestation activities 			
Component project activities			
Compliance of the CPA implementation with the included CPA design document			
Post-registration changes			
<ul style="list-style-type: none"> Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline 			
<ul style="list-style-type: none"> Corrections 			
<ul style="list-style-type: none"> Changes to the start date of the crediting period of component project activities 			
<ul style="list-style-type: none"> Inclusion of a monitoring plan 			
<ul style="list-style-type: none"> Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools 			
<ul style="list-style-type: none"> Changes to the programme design of project design 			
<ul style="list-style-type: none"> Changes specific to afforestation and reforestation component project activities 			
Compliance of the registered monitoring plan with the methodology including applicable tool(s) and standardized baseline			
Compliance of monitoring activities with the registered monitoring plan			
<ul style="list-style-type: none"> Data and parameters fixed ex ante or at renewal of crediting period 			
<ul style="list-style-type: none"> Data and parameters monitored 	1		
<ul style="list-style-type: none"> Implementation of sampling plan 			
Compliance with the calibration frequency requirements for measuring instruments			
Assessment of data and calculation of emission reductions or net removals		1	
<ul style="list-style-type: none"> Calculation of baseline GHG emissions or baseline net GHG removals by sinks 			
<ul style="list-style-type: none"> Calculation of project GHG emissions or actual net GHG removals by sinks 			

• Calculation of leakage GHG emissions			
• Summary of calculation of GHG emission reductions or net GHG removals by sinks			
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	1		
• Remarks on difference from estimated value in included CPA			
Assessment of reported sustainable development co-benefits			
Global stakeholder consultation			
Others (Appendix 1)	1		
Total	5	3	

SECTION E. Verification findings

E.1. General

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

Means of verification	Document reviewed: The monitoring report version 01 dated 09/03/2017 and subsequent revisions of the report was reviewed against the current valid forms in the UNFCCC CDM website and compliance with instructions for filling in monitoring report forms contained therein.
Findings	It was noted that the CME had not complied with instruction for filling in monitoring report form; two CARs and a CL were raised as a result. Refer to CAR 1, CAR 2 and CL 2 in Appendix 4
Conclusion	Bureau Veritas India Pvt Ltd hereby confirms that the final Monitoring report version 06, dated 01/11/2018 provided by the CME after addressing the CL and CARs, complies with the latest form and the guidelines therein.

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

No FARs were raised at validation (refer to PoA and CPA DD and validation reports - doc 3, 4, 7, 8, 9, 10, 11, 12, 13 and 14 in Appendix 3)

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)
Mapembasi Hydro Power Project, Njombe District 9904-0001	No	08/05/2014	Version 08	N/A
NextGen Solar Project, Kigoma Region 9904-0002	No	05/08/2014	Version 08	N/A

Mbinga Hydroelectric Project 9904-0003	Yes	06/11/2015	Version 08	N/A
Yovi Small Hydro Power Project 9904-0004	No	06/11/2015	Version 08	N/A
Tulila Hydro-electric Plant 9904-0005	Yes	06/11/2015	Version 08	N/A
Maguta Small Hydro Power Project 9904-0006	No	07/07/2016	Version 08	N/A
Ngombeni Biomass Power Plant Project 9904-0007	Yes	11/08/2016	Version 08	N/A
Ikondo Micro Hydro Power Plant 9904-0008	Yes	14/10/2016	Version 08	N/A

E.2. Programme of activities

E.2.1. Compliance of the programme implementation with the registered programme design document

Means of verification	Document review, Onsite inspection and interview with stakeholders: The DOE reviewed the registered PoA-DD version 08, the Monitoring Report, and on various dates, between 19/04/2017 to 27/04/2017, the DOE held interviews with the CME's representatives, the PP representatives and the CPA implementers for the four CPAs (CPA 9904-0003 (Mbinga), 9904-0005 (Tulila), 9904-0007 (Ngombeni) and 9904-0008 (Ikondo)) included in this monitoring report to confirm the implementation structure, the management and operation plan; and reporting structure of the PoA. The DOE further conducted an onsite assessment during the same period, as mentioned herein, to ascertain that all physical features (technology, project equipment, and monitoring and metering equipment) for the four CPAs were in place and that the CPAs had been operated as per their respective CPA-DDs.											
Findings	A clarification request and corrective action request arose as a result of the onsite assessment. Refer to CL 1 and CAR 2 in Appendix 4											
Conclusion	Bureau Veritas India Pvt Ltd hereby confirms that the program has been implemented in accordance with the registered PoA-DD as follows: a) The implementation status of the PoA is that, it was registered on 08/05/2014 and since registration until 31/12/2016 (the end of this monitoring period), 8 CPAs have been included into the PoA in accordance with the established PoA management structure. The implementation timelines for the CPAs is as follows: <table><tr><td>CPA reference number</td><td>Implementation status</td></tr><tr><td>9904-0001</td><td>The CPA is not included for verification. Implementation of the CPA has been delayed.</td></tr><tr><td>9904-0002</td><td>The CPA is not included for verification. Implementation of the CPA has been delayed.</td></tr><tr><td>9904-0003</td><td>It was proposed that the CPA will be implemented in two phases. In this monitoring period. Phase 1, constituting 560 kW hydro-power plant, has been implemented. The project was commissioned on 19/03/2015</td></tr><tr><td>9904-0004</td><td>It was proposed that the CPA be implemented in two phases.</td></tr></table>		CPA reference number	Implementation status	9904-0001	The CPA is not included for verification. Implementation of the CPA has been delayed.	9904-0002	The CPA is not included for verification. Implementation of the CPA has been delayed.	9904-0003	It was proposed that the CPA will be implemented in two phases. In this monitoring period. Phase 1, constituting 560 kW hydro-power plant, has been implemented. The project was commissioned on 19/03/2015	9904-0004	It was proposed that the CPA be implemented in two phases.
CPA reference number	Implementation status											
9904-0001	The CPA is not included for verification. Implementation of the CPA has been delayed.											
9904-0002	The CPA is not included for verification. Implementation of the CPA has been delayed.											
9904-0003	It was proposed that the CPA will be implemented in two phases. In this monitoring period. Phase 1, constituting 560 kW hydro-power plant, has been implemented. The project was commissioned on 19/03/2015											
9904-0004	It was proposed that the CPA be implemented in two phases.											

		Phase 1 was to constitute installation 1 MW hydro-power plant and Phase 2 to increase the capacity by 1.3 MW. Phase 1 has been implemented, however monitoring and reporting for the CPA is separate and is not part of this assessment.										
	9904-0005	It was proposed that the CPA be implemented in two phases. Phase 1 was to constitute installation 5 MW hydro-power plant and Phase 2 to increase the capacity by 2.5 MW. Phase 1 has been implemented as planned. The project was commissioned on 12/09/2015										
	9904-0006	The CPA is not included for verification. Implementation of the CPA has been delayed.										
	9904-0007	The CPA constitutes an installation of 2.5 MW biomass power plant. This has been implemented in full as planned. The project was commissioned on 27/01/2014.										
	9904-0008	The CPA constitutes addition of capacity by 350 kW to an existing 80 kW hydro-power plant. This has been implemented in full as planned. The project was commissioned on 26/01/2016.										
b) The operation of the four CPAs: 9904-0003, 9904-0005, 9904-0007 and 9904-0008, included in the monitoring period, is in accordance with their respective registered CPA-DDs as follows:												
<table><tr><th>CPA reference number</th><th>Operation</th></tr><tr><td>9904-0003</td><td>During the period 01/12/2015 - 31/12/2016 the CPA has supplied power to both a mini-grid operated by TANESCO and directly to villages through another isolated mini-grid.</td></tr><tr><td>9904-0005</td><td>Though the CPA was designed to supply electricity to both the nation grid and to an isolate mini-grid, the CPA has not been connected to the national grid and thus no electricity was supplied to the national grid. During the period 01/12/2015 - 31/12/2016 the CPA has supplied power to TANESCO mini-grid only.</td></tr><tr><td>9904-0007</td><td>During the period 01/09/2016 - 31/12/2016 the CPA has supplied power to TANESCO mini-grid except in December where net electricity was negative, meaning the CPA imported electricity from the mini-grid. The CPA is located on an island (Mafia Island) and is designed to produces electricity from renewable biomass and feed it into an existing mini-grid operated by TANESCO. Instances when the plant is not operational, the mini-grid is fed through the fossil fuel based generators and thus the other facilities, operated by the CPA implementer, imports electricity from the mini-grid. The amount of electricity imported from the mini-grid has been accounted for in ER calculations.</td></tr><tr><td>9904-0008</td><td>During the period 14/10/2016 - 31/12/2016 the CPA has supplied power to both the national grid (Operated by TANESCO) a net amount of 2 MWh and an isolated mini-grid a net amount 50 MWh for the isolated mini-grid (operated by Matembwe Village Company Limited).</td></tr></table>			CPA reference number	Operation	9904-0003	During the period 01/12/2015 - 31/12/2016 the CPA has supplied power to both a mini-grid operated by TANESCO and directly to villages through another isolated mini-grid.	9904-0005	Though the CPA was designed to supply electricity to both the nation grid and to an isolate mini-grid, the CPA has not been connected to the national grid and thus no electricity was supplied to the national grid. During the period 01/12/2015 - 31/12/2016 the CPA has supplied power to TANESCO mini-grid only.	9904-0007	During the period 01/09/2016 - 31/12/2016 the CPA has supplied power to TANESCO mini-grid except in December where net electricity was negative, meaning the CPA imported electricity from the mini-grid. The CPA is located on an island (Mafia Island) and is designed to produces electricity from renewable biomass and feed it into an existing mini-grid operated by TANESCO. Instances when the plant is not operational, the mini-grid is fed through the fossil fuel based generators and thus the other facilities, operated by the CPA implementer, imports electricity from the mini-grid. The amount of electricity imported from the mini-grid has been accounted for in ER calculations.	9904-0008	During the period 14/10/2016 - 31/12/2016 the CPA has supplied power to both the national grid (Operated by TANESCO) a net amount of 2 MWh and an isolated mini-grid a net amount 50 MWh for the isolated mini-grid (operated by Matembwe Village Company Limited).
CPA reference number	Operation											
9904-0003	During the period 01/12/2015 - 31/12/2016 the CPA has supplied power to both a mini-grid operated by TANESCO and directly to villages through another isolated mini-grid.											
9904-0005	Though the CPA was designed to supply electricity to both the nation grid and to an isolate mini-grid, the CPA has not been connected to the national grid and thus no electricity was supplied to the national grid. During the period 01/12/2015 - 31/12/2016 the CPA has supplied power to TANESCO mini-grid only.											
9904-0007	During the period 01/09/2016 - 31/12/2016 the CPA has supplied power to TANESCO mini-grid except in December where net electricity was negative, meaning the CPA imported electricity from the mini-grid. The CPA is located on an island (Mafia Island) and is designed to produces electricity from renewable biomass and feed it into an existing mini-grid operated by TANESCO. Instances when the plant is not operational, the mini-grid is fed through the fossil fuel based generators and thus the other facilities, operated by the CPA implementer, imports electricity from the mini-grid. The amount of electricity imported from the mini-grid has been accounted for in ER calculations.											
9904-0008	During the period 14/10/2016 - 31/12/2016 the CPA has supplied power to both the national grid (Operated by TANESCO) a net amount of 2 MWh and an isolated mini-grid a net amount 50 MWh for the isolated mini-grid (operated by Matembwe Village Company Limited).											
c) Information (data and variables) reported are lower than projected in the respective CPA-DDs for the CPAs indicated in b) above. Appropriate emission factors have been used as per the included CPA DDs and revised approved CPA-DD (for the case of CPA-9904-0007). For instance the CPA 9904-008 (Ikondo) – the only CPA that supplied electricity to both the national grid and isolated mini-grid during the monitoring period– ERs have been calculated as follow: for the portion of electricity supplied to the national grid, the grid emission factor 0.53 tCO ₂ e/MWh determined and fixed ex ante has been used and for the portion of electricity supplied to the mini-grid a default emission factor of 0.8 tCO ₂ e/MWh has been applied as provided for in the methodology AMS-I.F. This has not caused any												

	<p>increase in the estimated emission reductions in the current monitoring period.</p> <p>d) There is no increase in the actual GHG emission reductions achieved by the four included CPAs in the current monitoring period as compared to the ex-ante estimates.</p>
--	---

E.2.2. Implementation and operation of the management system

Means of verification	<p>Document review, Onsite inspection and interview with stakeholders:</p> <p>The DOE reviewed documents including the registered PoA-DD version 08, validation reports for the PoA and the CPA-DDs for the following four CPAs: 9904-0003, 9904-0005, 9904-0007 and 9904-0008 and their respective validation reports</p> <p>On various dates between 19/04/2017 to 27/04/2017, the DOE held interviews with the CME representatives, the PP representatives and implementers of the four CPAs included in this monitoring period; to confirm the implementation structure, the management and operation plan; and reporting structure of the PoA.</p>
Findings	Compliant
Conclusion	<p>The management system in the registered PoA-DD has been implemented as follows:</p> <p>a) Since the registration of the PoA on 08/05/2014 until 31/12/2016 (the end of this monitoring period), eight (8) CPAs have been included into the PoA in accordance with the established Operational and management plan. This is confirmed through the validation reports for the four CPAs included in the monitoring report version 06 dated 01/11/2018 for this first monitoring period. Further, during onsite assessment, it was confirmed that the operation structure is implemented; where REA is the CME and each implemented CPA has a manager with responsibilities as described in the registered PoA-DD. Records are kept as proposed in the PoA-DD</p> <p>b) REA (the CME) has carried out training and kept relevant records which were made available onsite including: CDM operators manual and PPT slides for CPA level CDM Operations. The CPA managers also confirmed they had received training on CDM and CPA operation.</p> <p>c) It was also confirmed through interviews with the CME, PP representative and CPA implementers, that the meetings for the purpose of improving the management system have been conducted for the four CPAs mentioned.</p> <p>Bureau Veritas India Pvt Ltd hereby confirms that the CME has implemented and operated the management system described in the registered PoA-DD.</p>

E.2.3. Post-registration changes

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

There were no post registration changes

E.2.3.2. Corrections

There were no post registration changes

E.2.3.3. Inclusion of a monitoring plan

There were no post registration changes

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

There were no post registration changes

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

There were no post registration changes

E.2.3.6. Change of coordination/managing entity

There were no post registration changes

E.2.3.7. Changes specific to afforestation and reforestation activities

There were no post registration changes

E.3. Component project activities**E.3.1. Compliance of the CPA implementation with the included CPA design document**

Section E is not repeated for each CPA, since assessment of the CPAs has been made as a single group of all the four CPAs included in the monitoring report. The CPAs comprise:

- a) Category 2 CPAs that involve Power plants supplying power only to a mini-grid (isolated mini-grids operated by TANESCO and/or others mini-grids not operated by TANESCO). They include the following two CPAs: CPA 9904-0003 (referred to as Mbinga in the monitoring report) and CPA 9904-0007 (referred to as Ngombeni in the monitoring report)
- b) Category 3 CPAs that involve Power plants supplying power to both the TANESCO national grid and mini-grids (Isolated mini-grids operated by TANESCO and/or other mini-grids not operated by TANESCO). They include the following two CPAs: CPA 9904-0005 (referred to as Tulila in the monitoring report) and CPA 9904-0008 referred to as Ikondo in the monitoring report)

Means of verification	Onsite inspection and interview with stakeholders for the CPA 9904-0003 (Mbinga), CPA 9904-0005 (Tulila), CPA 9904-0007 (Ngombeni) and CPA 9904-0008 (Ikondo) To ascertain that all physical features (technology, project equipment, and monitoring and metering equipment) of the included CPAs are in place and that the CPAs' implementers have operated the CPAs as per the registered CPA-PDD and revised approved CPA-DD (for the case of CPA 9904-0007 (Ngombeni)), the DOE conducted an onsite assessment for each of these CPAs on the following dates:		
	CPA number	Onsite assessment date	Location
	9904-0003	27/04/2017	Mbinga
	9904-0005	26/04/2017	Tulila
	9904-0007	19/04/2017	Mafia Island
	9904-0008	24/04/2017	Ikondo
Findings	Compliant		
Conclusion	Bureau Veritas India Pvt Ltd hereby confirms that each of the CPA 9904-0003, CPA 9904-0005, and CPA 9904-0008 has been implemented in accordance with its CPA-DD and revised approved CPA-DD (for the case of CPA-9904-0007) as follows: a) The implementation status of each of the CPAs is as follows:		
	CPA number	Implementation status	
	9904-0003	It was proposed that the CPA will be implemented in two phases. In this monitoring period only phase 1, constituting 560 kW hydro-power plant, has been implemented. The project was commissioned on 19/03/2015. The DOE was informed that the CPA implementer has not raised financial capital to implement Phase 2.	
	9904-0005	It was proposed that the CPA be implemented in two phases. Phase 1 was to constitute installation 5 MW hydro-power plant and Phase 2 to increase the capacity by 2.5 MW. Phase 1 has been implemented as planned. The project was commissioned on 12/09/2015. Implementation of Phase 2 is still within the plan.	

	9904-0007	The CPA constitutes an installation of 2.5 MW biomass power plant. This has been implemented in full as planned. The project was commissioned on 27/01/2014. Reporting of emissions reduction begins from 01 Sep 2016, the start of crediting period to end of monitoring period 31 Dec 2016, .
	9904-0008	The CPA constitutes addition of capacity by 350 kW to an existing 80 kW hydro-power plant. This has been implemented in full as planned. The project was commissioned on 26/01/2016.
	b) The operation of the CPAs is in accordance with their respective registered CPA-DDs and revised approved CPA-DD (for the case of CPA-9904-0007) as follows:	
	CPA reference number	Operation
	9904-0003	During the period 01/12/2015 - 31/12/2016 the CPA has supplied power to the TANESCO mini-grid and directly to villages through an isolated mini-grid
	9904-0005	During the period 01/12/2015 - 31/12/2016 the CPA has supplied power to TANESCO mini-grid only. No electricity was supplied to the TANESCO nation grid in the monitoring period.
	9904-0007	During the period 01/09/2016 - 31/12/2016 the CPA has supplied power to TANESCO mini-grid except in December where net electricity was negative meaning the CPA imported electricity from the mini-grid. The CPA has operated at a very low efficiency than was projected in the revised approved CPA-DD.
	9904-0008	During the period 14/10/2016 - 31/12/2016 the CPA has supplied power to both the national grid (TANESCO) and an isolated mini-grid (operated by Matembwe Village Company Limited)
	c) The information (i.e. Net electricity supplied to the mini-grids) in case of CPA 9904-0003 and CPA 9904-0007; and in case of CPA 9904-0005 and CPA 9904-0008, the Net electricity supplied to the mini-grids and the national grid, provided in the monitoring report that is different from that stated in the respective CPA-DDs and revised approved CPA-DD (for the case of CPA-9904-0007), has not caused any increase in estimates of the emission reductions in the current monitoring period. The information reported is as follows:	
	CPA reference number	Information (data and variables) reported
	9904-0003	The amount reported is 2,494 MWh (after applying calibration error). This amount is lower than 3,373 MWh (obtained from extrapolation) if the included CPA was to operate only phase 1 (560kWh) for the monitoring period.
	9904-0005	- The amount electricity supplied to the national as verified is 0 MWh same is the projected the CPA-DD. - The amount supplied to the TANESCO mini-grid as verified is 15,943 MWh (after applying calibration error); which less than 32,108 MWh estimated in the CPA-DD in the monitoring period.
	9904-0007	The amount reported is 60MWh which is less than in the revised approved CPA-DD where it is estimated to be 5,008 MWh for the monitoring period.
	9904-0008	- The amount electricity supplied to the national grid, as verified, is 2 MWh, which is less than 140 MWh (obtained from extrapolation) of the estimates in the CPA-DD for the monitoring period. - The amount supplied to the isolated mini-grid, as verified is 50 MWh; which less than 350 MWh (obtained from extrapolation) of the estimates in the CPA-DD for the monitoring period.

	d) There is no increase in the actual GHG emission reductions achieved by the each of the four CPAs i.e. CPA 9904-0003, CPA 9904-0005, CPA 9904-0007 and CPA 9904-0008, in the current monitoring period as compared to the estimation in the respective CPA-DD for the period.
--	---

E.3.2. Post-registration changes

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

There were no post registration changes

E.3.2.2. Corrections

The CME has made a correction to one of the CPA's included in the monitoring report. The CPA is Ngombeni Biomass CPA, reference no. 9904-0007. The correction addresses a gap in information required to be reported ex ante or monitored. A notification for the change has been submitted and approved, please refer to PRC-9904-002 published on 21/08/2018.

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

There were no post registration changes

E.3.2.4. Inclusion of a monitoring plan

There were no post registration changes

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

There were no post registration changes

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

There were no post registration changes

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

There were no post registration changes

E.3.3. Compliance of the registered monitoring plan with the methodology including applicable tool(s) and standardized baseline

Means of verification	Document review Review of CPA-DDs for CPA 9904-0003, CPA 9904-0005, CPA 9904-0008 and the revised approved CPA-DD version 06 dated 14/07/2018 for CPA 9904-0007 (refer to doc 7, 8, 9 and 10 in Appendix 3) and the applied methodologies (refer to doc 5 and 6 in Appendix 3), to establish whether the monitoring plan in each of the CPAs is in line with the monitoring methodologies.
Findings	Compliant
Conclusion	Bureau Veritas India Pvt Ltd has verified the monitoring plans, including the data and parameters required to be monitored, measurement procedures, monitoring frequency and QC/QA procedures as described in the respective CPA-DDs for the CPA 9904-0003, CPA 9904-0005, and CPA 9904-0008, and the revised approved CPA-DD for CPA 9904-0007; and concludes that: a) For CPAs in category 2 (CPA 9904-0003 and CPA 9904-0007) the monitoring plan is in accordance with the applied methodology AMS-I.F version 02. b) For CPAs in category 3 (CPA 9904-0005 and CPA 9904-0008) the monitoring plan is in accordance with the applied methodologies AMS-I.D version 17 and AMS-I.F version 02 Corresponding to the paragraph 388 of CDM PoA-VVS version 01.0, the Bureau

Veritas India Pvt Ltd confirms that the monitoring plans in the included CPAs are in accordance with the approved methodologies applied by each of the CPAs in their respective categories.

E.3.4. Compliance of monitoring activities with the registered monitoring plan

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

Means of verification	<p>Document review:</p> <p>For the parameters determined and fixed ex ante, the DOE has crosschecked the values as reported in the monitoring report version 01 and subsequent revisions of the report (ref doc 1 in Appendix 1 and doc 22 in Appendix 3) with values provided in the respective CPA-DDs for CPA 9904-0003, CPA 9904-0005, CPA 9904-0008 and the revised approved CPA-DD for CPA 9904-0007; and also IPCC default values. The DOE also assessed the application of the values in calculation of emission reductions (refer to doc 2 and 21 in Appendix 3).</p>																				
Findings	Refer resolution of CL 3																				
Conclusion	<p><u>For category 2 CPAs (CPA 9904-0003 and CPA 9904-0007)</u></p> <p>The following parameter were fixed ex ante at the time of inclusion of the CPAs and have been reported correctly:</p> <ul style="list-style-type: none"> - EF_{CO₂,y} (CO₂ emission factor for displacement of electricity in the mini-grid and/or the captive power plant). The value reported in the monitoring report version 06 dated 01/11/2018 and applied in ER calculations has been crosschecked with the value in the CPA-DDs (including the revised approved CPA-DD for CPA 9904-0007) and found to be correct. The value reported is 0.8 tCO₂e/MWh <p><u>For category 3 CPAs (CPA 9904-0005 and CPA 9904-0008)</u></p> <p>The following parameters were fixed ex ante at the time of inclusion of the CPAs and have been reported correctly:</p> <ul style="list-style-type: none"> - EF_{CO₂,grid,y} (CO₂ emission factor of the grid in year y). The value reported in the monitoring report version 06 dated 01/11/2018 and applied in ER calculations has been crosschecked with the value in the CPA-DDs and found to be correct. The value 0.530 tCO₂e/MWh is reported correctly. - EF_{CO₂,m,i,y} (CO₂ emissions factor of fossil fuel type i used in power unit m in year y). The values reported in the monitoring report version 06 dated 01/11/2018 have been crosschecked with the value in the CPA-DDs and found to be correct. The parameter is not used for direct ER calculation but rather for the determination of the grid emission factor (EF_{CO₂,grid,y}). The following values are reported correctly: Gas Oil/Diesel Oil - 0.0726 tCO₂/GJ and Natural Gas - 0.0543 tCO₂/GJ - EF_{EL,m,y} (CO₂ emissions factor of power unit m considered in grid emission factor calculation in year). The values reported in the monitoring report version 06 dated 01/11/2018 have been crosschecked with the value in the CPA-DDs and found to be correct. The parameter is not used for direct ER calculation but rather for the determination of the grid emission factor (EF_{CO₂,grid,y}). The following values are reported: <table border="1"> <thead> <tr> <th>Plants</th><th>Emission Factor EF_{EL,m,y} (tCO₂/MWh)</th></tr> </thead> <tbody> <tr> <td>Zuzu</td><td>0.69</td></tr> <tr> <td>Tegeta Gas Plant (TGP)</td><td>0.46</td></tr> <tr> <td>Ubungo Gas Plant (UGP)</td><td>0.45</td></tr> <tr> <td>SONGAS UGT 1 & 2</td><td>0.57</td></tr> <tr> <td>SONGAS UGT 3, 4, 5 & 6</td><td>0.54</td></tr> <tr> <td>IPTL</td><td>0.70</td></tr> <tr> <td>NYAKATO</td><td>0.69</td></tr> <tr> <td>AGR (TG)</td><td>0.66</td></tr> <tr> <td>AGR (UB)</td><td>0.66</td></tr> </tbody> </table>	Plants	Emission Factor EF _{EL,m,y} (tCO ₂ /MWh)	Zuzu	0.69	Tegeta Gas Plant (TGP)	0.46	Ubungo Gas Plant (UGP)	0.45	SONGAS UGT 1 & 2	0.57	SONGAS UGT 3, 4, 5 & 6	0.54	IPTL	0.70	NYAKATO	0.69	AGR (TG)	0.66	AGR (UB)	0.66
Plants	Emission Factor EF _{EL,m,y} (tCO ₂ /MWh)																				
Zuzu	0.69																				
Tegeta Gas Plant (TGP)	0.46																				
Ubungo Gas Plant (UGP)	0.45																				
SONGAS UGT 1 & 2	0.57																				
SONGAS UGT 3, 4, 5 & 6	0.54																				
IPTL	0.70																				
NYAKATO	0.69																				
AGR (TG)	0.66																				
AGR (UB)	0.66																				

UGP 2	0.53
SYMB UB GP	0.49
SYMB UB JET A	0.66
SYMB (AR)	0.66
SYMB (DD)	0.66

- $\eta_{m,y}$ (Average net energy conversion efficiency of power unit m in year y). The values reported in the monitoring report version 06 dated 01/11/2018 have been crosschecked with the value in the CPA-DDs and found to be correct. The parameter is not used for direct ER calculation but rather for the determination of the grid emission factor ($EF_{CO_2,grid,y}$). The following values have been reported correctly:

Plants	Type of fuel	Technology used	Efficiency (%)
Zuzu	Diesel & Industrial oil	Open cycle	37.8%
Tegeta Gas Plant (TGP)	Natural Gas	Open cycle	42.4%
Ubungo Gas Plant (UGP)	Natural Gas	Open cycle	43.0%
SONGAS UGT1&2	Natural Gas	Open cycle	34.1%
SONGAS UGT3,4,5&6	Natural Gas	Open cycle	36.4%
IPTL	HFO	Open cycle	39.0%
NYAKATO	Diesel & Industrial oil	Open cycle	38.0%
AGR (TG)	Diesel & Industrial oil	Open cycle	39.5%
AGR (UB)	Diesel & Industrial oil	Open cycle	39.5%
UGP 2	Natural Gas	Open cycle	37.0%
SYMB UB GP	Natural Gas	Open cycle	39.5%
SYMB UB JET A	Diesel & Industrial oil	Open cycle	39.5%
SYMB (AR)	Diesel & Industrial oil	Open cycle	39.5%
SYMB (DD)	Diesel & Industrial oil	Open cycle	39.5%

- $EG_{m,y}$ (Net quantity of electricity generated and delivered to the grid by power unit m in year y). The parameter has been reported in the monitoring report version 06 dated 01/11/2018 in accordance with the CPA-DDs and found to be correct. Values are in the Excel spreadsheet and have been reviewed and found to be correct. Refer to the excel sheet "Grid emission factor".

- $EG_{k,y}$ (Net quantity of electricity generated and delivered to the grid by power unit k in year y (by low-cost/must-run power plants)). The parameter has been reported in the monitoring report version 06 dated 01/11/2018 in accordance with the CPA-DDs and found to be correct. Values are in the Excel spreadsheet and have been reviewed and found to be correct. Refer to the excel sheet "Grid emission factor"

In addition of these parameters, the following additional parameters were fixed for CPA 9904-0008:

- $EG_{BL,existing,y,grid}$ (Estimated net electrical energy that would have been produced and supplied to grid by the existing units). The value reported in the monitoring report version 06 dated 01/11/2018 and applied in ER calculations has been crosschecked with the value in the CPA-DD and found to be correct. The value 69 MWh is reported correctly.

- $EG_{BL,existing,y,MG}$ (Estimated net electrical energy that would have been produced and supplied to a mini-grid by the existing units). The value reported in the monitoring report version 06 dated 01/11/2018 and applied in ER calculations has been crosschecked with the value in the CPA-DD and found to be correct. The value 175 MWh is reported correctly.

Bureau Veritas India Pvt Ltd confirms that the parameters fixed ex ante have been correctly reported and applied in emission reductions calculation

E.3.4.2. Data and parameters monitored

Means of verification	<u>For category 2 CPAs (CPA 9904-0003 and CPA 9904-0007)</u>
-----------------------	--

Parameter 1: $EG_{BL,y}$ (Quantity of net electricity displaced in year y)

MoV: Onsite review of records (i.e. plant logs) and monthly energy reports for the entire monitoring period (refer to 23 in Appendix 3). The DOE also crosschecked the data against invoices to TANESCO for electricity fed into TANESCO's mini-grid, and bills (invoices) for electricity supplied to consumers in the Isolated mini-grid in the case of CPA 9904-0003 (Mbinga). The following values are reported and have been correctly applied in baseline emissions calculation:

Quantity of net electricity displaced in year y at TANESCO mini-grids (These are Isolated mini-grids operated by TANESCO)

CPA	Quantity of net electricity displaced in the mini grid (MWh/year)		
	2014	2015	2016
CPA 9904-0003 (Mbinga)	NA	41.298	2,433.169
CPA 9904-0007 (Ngombeni)	NA	NA	60

Quantity of net electricity displaced in year y at an Isolated mini-grid (This is an Isolated mini-grid operated by Andoya Hydro Electric Power Co. Ltd.)

CPA	Power supplied to the mini grid (MWh/year)		
	2014	2015	2016
CPA 9904-0003 (Mbinga)	NA	1.969	35.376

For CPA 9904-0007 (Ngombeni) – which is a biomass power plant, the following additional parameters are monitored, but are not applied in ER calculations:

Parameter 2: Biomass Consumption (Quantity of biomass consumed in year y)

MoV: Onsite review of records (log sheets and receipts) for the entire monitoring period (doc 8 in Appendix 3). The following values are reported and have been correctly applied in baseline emissions calculation:

Biomass	Quantity of consumption (tonnes)		
	2014	2015	2016
Coconut husk	NA	NA	318
Mulch			0
Bush chips			1,350
Total			1668

Parameter 3: $MC_{Biomass}$

MoV: The parameter $MC_{Biomass}$ (Moisture content of the biomass (wet basis) - for coconut wood and bushchips) has been revised in a post registration change as indicated in E.3.2.2 above. The values reported in the monitoring report version 06 dated 01/11/2018 have been crosschecked with the value in lab reports from a third party (ALS Analysis and Inspection Durban (Pty) Ltd) commissioned by the CPA 9904-0007 implementer. The DOE has further cross checked the valued with IPCC valued and other independent sources and consider the reported values as acceptable. The following values are reported:

Biomass	$MC_{Biomass}$
Coconut husk	39%
Bush Chips	44%

Parameter 4: $NCV_{Biomass}$ (Net calorific value of biomass type k)

MoV: Onsite and offsite review of records (lab reports ref doc 24 in Appendix 3) and comparison with IPCC default values. The following values are reported and have been correctly applied in baseline emissions calculation:

Biomass	Calorific Value (MJ/kg)
Coconut husk	7.63
Bush Chips	12.28

The DOE has further checked the energy balance for the CPA 9904-0007 (Ngombeni). Though the monitoring period for the CPA is from September 2016, the energy balance calculation has been done using the whole period of 2016 based on the data that was available for the period. The energy balance shows that in the year 2016, the plant consumes more biomass to generate a small amount of electricity compared to the estimates in the revised approve CPA-DD. The CPA implementer attributed the low efficiency to technical challenges with the plant boiler.

For category 3 CPAs (CPA 9904-0005 and CPA 9904-0008)

Parameter 1: $EG_{actual,y/EBL,y}$ (Quantity of net electricity supplied to the national grid in year y)

MoV: Onsite review of records (i.e. plant logs) and monthly energy reports for the entire monitoring period (refer to 24 in Appendix 3). The DOE also crosschecked the data against invoices to TANESCO for electricity fed into TANESCO's national grid. During this monitoring period the CPA 9905-0005 did not supply electricity to the national grid since the national grid has not reached the location of the CPA, thus the values to the national grid are reported are zero. Since its inclusion in 2016, the CPA 9904 -0008 has supplied both the national grid and mini-grid. The table below shows the portion of electricity supplied to the national grid. The following values are reported and have been correctly applied in baseline emissions calculation:

CPA	Power supplied to the grid (MWh/year)		
	2014	2015	2016
Tulila	NA	0	0
Ikondo	NA	NA	2

Parameter 2: $EG_{BL,y}$ (Quantity of net electricity supplied to the mini-grid in year y)

MoV: Onsite review of records (i.e. plant logs) and monthly energy reports for the entire monitoring period (refer to 24 in Appendix 3). The DOE also crosschecked the data against invoices to TANESCO for electricity fed into TANESCO's mini-grid in the case of CPA 9904-0005 (Tulila), and bills (invoices) for electricity supplied to consumers in the Isolated mini-grid (Isolated mini-grid operated by Matembwe Village Company Limited) in the case of CPA 9904-0008 (Ikondo). The following values are reported and have been correctly applied in baseline emissions calculation:

To TANESCO mini-grid (This is an Isolated mini-grid operated by TANESCO)

CPA	Power supplied to the mini grid (MWh/year)		
	2014	2015	2016
Tulila	NA	508	15,448.49

To Isolated mini-grid (This is a mini-grid operated by Matembwe Village Company Limited)

CPA	Power supplied to the mini grid (MWh/year)		
	2014	2015	2016
Ikondo	NA	0	50

Findings	A clarification request was on CPA 9904-0007, with respect to the use of energy balance for cross-check. Refer to CL 3
Conclusion	Corresponding to the paragraph 348 of CDM PoA-VVS version 01.0, Bureau Veritas India Pvt Ltd can confirm that: - The monitoring has been carried out in accordance with the monitoring plan

	<p>contained in the registered PDD.</p> <p>- All parameters required by the monitoring plan have been sufficiently monitored and correctly listed. The monitored data for required parameters have been verified by checking the whole information flow.</p> <p>In line with paragraph 349 of CDM PoA-VVS version 01.0, the parameters are listed and the means of verification indicated as above.</p>
--	---

E.3.4.3. Implementation of sampling plan

Means of verification	N/A
Findings	N/A
Conclusion	N/A

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

Means of verification	Review of documents (CPA-PDDs), followed by onsite assessment and review of records (including calibration certificates) to determine whether the CME has calibrated the monitoring equipment at the required frequency.				
Findings	Compliant				
Conclusion	<p>Bureau Veritas India Pvt Ltd confirms that calibration has been conducted. Calibration was done on various dates in 2016 as confirmed by interviews with CPA implementers during onsite assessment. The entity authorized to perform the calibration (TANESCO) provided a letter dated 03/03/2017 indicating the results of the calibration exercise but did not indicate the exact date each meter was calibrated.</p> <p>The CME has opted to apply the date on the letter as the calibration date; and based on this date, the CME has applied the maximum permissible error where the situation indicates delayed calibration as provided for in paragraph 351 a) and the Appendix to the CDM validation and verification standard for programmes of activities Version 01.0</p> <p>The DOE assessed this approach and considered it to be a conservative approach. The calibration for the monitoring equipment for the respective CPAs is as follows:</p>				
	CPA	CPA 9904-0003 (Mbinga)	CPA 9904-0005 (Tulila)	CPA 9904-0007 (Ngombeni)	CPA 9904-0008 (Ikondo)
	Main meter SN	211108423	211112553	211108280	212556508
	Check meter SN	211108415	211112571	211108294	212556509
	Initial Calibration date	19/03/2015	12/09/2015	27/01/2014	11/11/2016*
	Re-calibration date	03/03/2017	03/03/2017	03/03/2017	03/03/2017
	Delayed?	Yes	Yes	Yes	No
	Calibration results				
	Main meter	0.79%	0.37%	0.109%	-0.62%
	Error applied	0.79%	0.5%	0.5%	none
	<i>*Since its commissioning in 26/01/2016, the Ikondo CPA was supplying to the mini-grid. The end consumers in the mini-grid were provided with the energy meters during commissioning of the plant starting from 26/01/2016. They had calibration validity until 25/01/2017. Therefore, the calibration validity is covered for the entire reported monitoring period for both mini-grid & grid-supply and hence, no calibration error is applied in this CPA</i>				
	<p>Additional measuring equipment for the CPA 9904-0007 (Ngombeni) for measure the quantity of biomass entering the biomass plant, is a weighbridge with scale no. NPL/WB/01/YHL 50. The scale had been calibrated and calibration certificate cert no. 29223 was available as evidence.</p>				

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

Means of verification	Document review:
-----------------------	------------------

	Verification was done by crosschecking information in the registered CPA-DDs and revised CPA-DD (for the case of CPA 9904-0007), the values reported in the monitoring report as indicated in section E.3.4 and following up the CME's calculations in the ER calculation spread sheets.			
Findings	Compliant			
Conclusion	i) For CPAs supplying electricity to the TANESCO national grid i.e. CPA 9904-0005 (Tulila) and CPA 9904-0008 (Ikondo), the baseline emission for the portion of electricity displace from the grid is calculated as: Baseline Emissions = Net electricity supplied to the grid x grid emission factor The following value are reported:			
	CPA	Net electricity supplied to the grid (MWh)	Grid emission factor (tCO2/MWh)	Baseline emissions
	9904-0005 (Tulila)	0	0.53	0
	9904-0008 (Ikondo)	2	0.53	1
	ii) For CPAs supplying electricity to a mini-grid (either TANESCO or Isolated) i.e. all the CPAs included in the monitoring report, the baseline emission for the portion of electricity displaced from the mini-grids is calculated as: Baseline emissions = Net electricity supplied to the mini-grid x a default emission factor for a mini-grid			
	CPA	Net electricity supplied to the mini-grid (MWh)	Grid emission factor (tCO ₂ /MWh)	Baseline emissions tCO ₂ e
	CPA 9904-0003 (Mbiga)	2,494 (adjusted for calibration error)	0.8	1,995
	CPA 9904-0005 (Tulila)	15,943 (adjusted for calibration error)	0.8	12,754
	CPA 9904-0007 (Ngombeni)	60 (adjusted for calibration error)	0.8	48
	CPA 9904-0008 (Ikondo)	50	0.8	40
Bureau Veritas India Pvt Ltd hereby confirms that a complete set of verifiable data was available and the CME has applied the appropriate methods and formulae for calculating baseline GHG emissions.				

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

Means of verification	<p>Document review: Verification was done by crosschecking information in the respective CPA-DDs DDs (CPA 9904-0003, CPA 9904-0005 and CPA 9904-0008) and revised CPA-DD for the case of CPA 9904-0007, against values reported in the monitoring report as indicated in section E.3.4 above; and following up the CME's calculations in the ER calculation spread sheets. Onsite assessment was also done, to determine if there are any possible sources of project emissions</p>
Findings	Compliant
Conclusion	<p>The CPAs, as designed and operated do not have any project emissions. Project emissions in the CPA-DDs and their respective validation reports are indicated as zero. During onsite assessment, the DOE did not come across any indication that deviates from the conclusions in the validation reports for the respective CPAs.</p> <p>Bureau Veritas India Pvt Ltd hereby confirms that the conclusion on project GHG emissions has been applied correctly.</p>

E.3.5.3. Calculation of leakage GHG emissions

Means of verification	Document review: Verification was done by crosschecking information in the respective CPA-DDs (CPA 9904-0003, CPA 9904-0005 and CPA 9904-0008) and revised CPA-DD for the case of CPA 9904-0007, against the values reported in the monitoring report
------------------------------	---

	Onsite assessment was also performed, to determine if there are any possible sources of leakage emissions
Findings	Compliant
Conclusion	<p>The CPAs, as designed and operated do not have any leakage emissions. Leakage emissions in the CPA-DDs and their respective validation reports are indicated as zero. During onsite assessment, the DOE did not come across any indication that deviates from the conclusions in the validation reports for the respective CPAs.</p> <p>Bureau Veritas India Pvt Ltd hereby confirms that the conclusion on project GHG emissions has been applied correctly.</p>

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

Means of verification	Verification was done by crosschecking information in the respective CPA (CPA 9904-0003, CPA 9904-0005 and CPA 9904-0008) and revised CPA-DD for the case of CPA 9904-0007,, against the values reported in the monitoring report as indicated in section E.3.4 above and following up the CME's application of the values in the formulae for calculating emission reductions.
Findings	Compliant
Conclusion	<p>The emission reductions have been calculated as follows for each of the four CPAs (CPA 9904-0003, CPA 9904-0005, CPA 9904-0007 and CPA 9904-0008):</p> <p>Emission reduction = baseline emissions – project emissions – leakage</p> <p>Bureau Veritas India Pvt Ltd hereby confirms that :</p> <p>(a) All data for the four CPAs (CPA 9904-0003, CPA 9904-0005, CPA 9904-0007 and CPA 9904-0008) was available for this monitoring period</p> <p>(b) Crosschecks have been done on the values used in ER calculation with the respective sources of the data (refer to section E.3.4 above).</p> <p>(c) Appropriate methods and formulae for calculating GHG emission reductions have been followed;</p> <p>(d) Assumptions, emission factors and default values that have been applied in the calculations have been justified;</p> <p>(e) A pro-rata approach was correctly applied to the calculations of GHG emission reductions;</p> <p>(f) The first day, for each of the four CPAs, in which CERs are being claimed has been correctly specified.</p>

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
CPA 9904-0003	1,995	0	0	0	1,995	1,995
CPA 9904-0005	12,754	0	0	0	12,754	12,754
CPA 9904-0007	48	0	0	0	48	48
CPA 9904-0008	41	0	0	0	41	41
Total	14,838	0	0	0	14,838	14,838

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

Means of verification	Document review Comparison of emission reductions in the respective CPA-DDs (CPA 9904-0003, CPA 9904-0005 and CPA 9904-0008) and revised CPA-DD for the case of CPA 9904-0007, for the monitoring period and the actual emission reduction realised as reported in the monitoring period.										
Findings	Compliant										
Conclusion	<p>The combined estimated ex ante emission reductions for this monitoring period, for the four CPAs according to the respective CPA-DDs is 35,236 tCO₂e. The corresponding actual emission reduction in the monitoring period as reported in the monitoring report and verified by the DOE is 14,838 tCO₂e. This is represent 58% less emission reductions than projected in the included CPA-DDs, and is a reasonable conservative estimate. The table below shows the causes for the reduced emission reduction compared to the estimates in the CPA-DDs:</p> <table border="1"> <thead> <tr> <th>CPA</th><th>Reason</th></tr> </thead> <tbody> <tr> <td>CPA 9904-0003 (Mbinga)</td><td>Mbinga CPA consisted of two phases of 520 kW each. Currently only one phase of 520 kW is installed. Phase 2 was expected to be installed in Jan 2016. But the implementation is delayed.</td></tr> <tr> <td>CPA 9904-0005 (Tulila)</td><td>In Tulila CPA the CPA implementer indicated that they faced technical challenges in synchronization between the mini-grid and the power plant. The plant was not running at the full capacity, as a result.</td></tr> <tr> <td>CPA 9904-0008 (Ngombeni)</td><td>In Ngombeni CPA, PP and CPA implementer indicated that the Plant faced technical challenges with the boiler equipment. The plant did not run at its rated capacity, hence reduced output.</td></tr> <tr> <td>CPA 9904-0008 (Ikondo)</td><td>Ikondo CPA was expected to generate 552 MWh during the monitoring period. But only 52 MWh was generated. There CPA implementer indicated that they faced technical challenges when 340 kW and 80 kW units were linked together. Due to these challenges the plant was not running at the full capacity.</td></tr> </tbody> </table>	CPA	Reason	CPA 9904-0003 (Mbinga)	Mbinga CPA consisted of two phases of 520 kW each. Currently only one phase of 520 kW is installed. Phase 2 was expected to be installed in Jan 2016. But the implementation is delayed.	CPA 9904-0005 (Tulila)	In Tulila CPA the CPA implementer indicated that they faced technical challenges in synchronization between the mini-grid and the power plant. The plant was not running at the full capacity, as a result.	CPA 9904-0008 (Ngombeni)	In Ngombeni CPA, PP and CPA implementer indicated that the Plant faced technical challenges with the boiler equipment. The plant did not run at its rated capacity, hence reduced output.	CPA 9904-0008 (Ikondo)	Ikondo CPA was expected to generate 552 MWh during the monitoring period. But only 52 MWh was generated. There CPA implementer indicated that they faced technical challenges when 340 kW and 80 kW units were linked together. Due to these challenges the plant was not running at the full capacity.
CPA	Reason										
CPA 9904-0003 (Mbinga)	Mbinga CPA consisted of two phases of 520 kW each. Currently only one phase of 520 kW is installed. Phase 2 was expected to be installed in Jan 2016. But the implementation is delayed.										
CPA 9904-0005 (Tulila)	In Tulila CPA the CPA implementer indicated that they faced technical challenges in synchronization between the mini-grid and the power plant. The plant was not running at the full capacity, as a result.										
CPA 9904-0008 (Ngombeni)	In Ngombeni CPA, PP and CPA implementer indicated that the Plant faced technical challenges with the boiler equipment. The plant did not run at its rated capacity, hence reduced output.										
CPA 9904-0008 (Ikondo)	Ikondo CPA was expected to generate 552 MWh during the monitoring period. But only 52 MWh was generated. There CPA implementer indicated that they faced technical challenges when 340 kW and 80 kW units were linked together. Due to these challenges the plant was not running at the full capacity.										

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 9904-0003	5,190	1,995
CPA 9904-0005	25,686	12,754
CPA 9904-0007	4,006	48
CPA 9904-0008	354	41
Total	35,236	14,838

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

Means of verification	Document review Review of CME's remarks in the monitoring report
Findings	Compliant
Conclusion	Bureau Veritas India Pvt Ltd considers the reason provided for the difference in the actual ERs achieved and the estimates in the respective CPA-DDs to be justifiable.

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

Means of verification	N/A
Findings	N/A
Conclusion	N/A

E.3.7. Global stakeholder consultation

Means of verification	N/A
Findings	N/A
Conclusion	N/A

SECTION F. Internal quality control

The verification report underwent an Internal Technical Review (ITR) before requesting issuance of CERs for the four CPAs in the PoA.

The ITR is an independent process performed to examine thoroughly that the process of verification has been carried out in conformance with the requirements of the verification scheme as well as internal Bureau Veritas India Pvt Ltd procedures.

The Lead Verifier provides a copy of the verification report to the reviewer, including any necessary verification documentation. The reviewer reviews the submitted documentation for conformance with the verification scheme. This will be a comprehensive review of all documentation generated during the verification process.

When performing an Internal Technical Review, the reviewer ensures that the verification activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.

The review encompasses all aspects related to the program which includes program design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the CME as well as the component project activities, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the verification exercise, and review of sample documents.

The reviewer compiles clarification questions for the Lead Verifier; and Verification Team and discusses these matters with Lead Verifier.

After the agreement of the responses on the 'Clarification Request' from the Lead Verifier as well as the CME/PP(s) the finalized verification report is accepted for further processing such as uploading on the UNFCCC webpage.

SECTION G. Verification opinion

Bureau Veritas India Pvt Ltd has conducted the 1st periodic verification, for the first batch of monitoring report, of the PoA "Tanzania Renewable Energy Programme"; UNFCCC reference number 9904. The PoA is coordinated and managed by the Rural Energy Agency (REA) and is located in United Republic of Tanzania. The PoA aims to increase access to modern energy services in Tanzania by promoting both the off-grid (isolated mini-grid) and national grid renewable energy projects within the country using photovoltaic, wind, hydro and biomass technologies for electricity generation. The PoA Applies the following two methodologies: AMS.I-D "Grid connected renewable electricity generation", Version 17 and AMS.I-F "Renewable electricity generation for captive use and mini-grid", Version 02. CPAs can be included into the PoA in any one of the following three categories, by fulfilling the requirements therein:

a) CPA Category 1: this comprises installation of one or more renewable energy technologies (hydro, wind, biomass or PV) not exceeding 15 MW, and supply the generated electricity to the main national grid. The CPAs are required to comply with the requirements of methodology AMS-I.D version 17.

b) CPA Category 2: this comprises installation of one or more renewable energy technologies (hydro, wind, biomass or PV) not exceeding 15 MW, and supply the generated electricity to an existing mini-grids being operated by the national utility (TANESCO), or to new isolated mini-grids to serve new areas. The CPAs are required to comply with the requirements of methodology AMS-I.F version 02.

c) CPA Category 3: This comprises installation of one or more renewable energy technologies (hydro, wind, biomass or PV) not exceeding 15 MW, and supply the generated electricity the main national grid and an existing mini-grids being operated by the national utility (TANESCO), and/or to new isolated mini-grids to serve new areas. The CPAs are required to comply with the requirements of both methodology AMS-I.D version 17 and AMS-I.F version 02.

The first batch of the monitoring report (monitoring report number 01, version 06 dated 01/11/2018), covers the period from 08/05/2014 to 31/12/2016 and comprises a single set of the following four CPAs (as included in the PoA in their respective categories):

- a) Mbinga hydroelectric project, UNFCCC reference number 9904-0003, a CPA in category 2
- b) Tulila hydroelectric plant, UNFCCC reference number 9904-0005, a CPA in category 3
- c) Ngombeni biomass power plant project, UNFCCC reference number 9904-0007, a CPA in category 2
- d) Ikondo micro hydro power plant, UNFCCC reference number 9904-0008, a CPA in category 3

The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The Rural Energy Agency (the CME) is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the four CPAs in the PoA, on the basis set out within the PoA and respective CPAs' Monitoring Plan as indicated in the registered design documents. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the CPAs, and is the responsibility of the management of the project.

Bureau Veritas India Pvt Ltd confirms that the project is implemented as described in validated and registered PoA design document and with the corresponding CPAs design documents; including the revised CPA-DD version 06 dated 14/07/2018 for CPA 9904-0007 (Ngombeni Biomass Power Plant Project). Installed equipment being essential for generating emission reduction runs reliably, with the exception of CPA reference number 9904-0007 which was noted to be running at a very low efficiency. The monitoring system is in place and the CPAs are generating GHG emission reductions.

Bureau Veritas India Pvt Ltd confirms that, in this PoA there was a post registration change to one of the CPAs, CPA reference number 9904-0007. The post registration change has been validated by Bureau Veritas India Pvt Ltd, and has resulted in a positive validation opinion. The post registration change was notified to the Secretariat and an approval received. Please refer to PRC-9904-002 published on 21/08/2018. .

It is Bureau Veritas India Pvt Ltd opinion that the GHG emission reductions are calculated without material misstatements, applying most conservative approach. The emission reductions verified totalize **14,838 tCO₂e** for the four CPAs. Our opinion relates to the PoA's resulting GHG emission reductions for the single batch of four CPAs mentioned above (as reported in monitoring report number 01); and related to the valid and registered baseline, approved monitoring plan and its associated documents for the batch of CPAs.

SECTION H. Certification statement

Bureau Veritas India Pvt Ltd has conducted the 1st periodic verification, for the first batch of monitoring report, of the PoA “Tanzania Renewable Energy Programme”; UNFCCC reference number 9904. The PoA is coordinated and managed by the Rural Energy Agency (REA) and is located in United Republic of Tanzania. The PoA aims to increase access to modern energy services in Tanzania by promoting both the off-grid (isolated mini-grid) and national grid renewable energy projects within the country using photovoltaic, wind, hydro and biomass technologies for electricity generation. The PoA applies the following two methodologies: AMS.I-D “Grid connected renewable electricity generation”, Version 17 and AMS.I-F “Renewable electricity generation for captive use and mini-grid”, Version 02. CPAs can be included into the PoA in any one of the following three categories, by fulfilling the requirements therein:

- i) Category 1 involves CPAs with Renewable energy technology (hydro, wind, biomass or PV) connected to the national utility main grid
- ii) Category 2 involves CPAs with Renewable energy technology (hydro, wind, biomass or PV) connected to existing or new isolated mini-grids
- iii) Category 3 involves CPAs with Renewable energy technology (hydro, wind, biomass or PV) supplying electricity to both national grid and existing or new isolated mini-grids.

This verification and certification report covers the first monitoring report (i.e. monitoring report number 01), that comprises a single set of the following four CPAs, included in the PoA, in their respective categories:

- a) Mbinga hydroelectric project, UNFCCC reference number 9904-0003, a CPA in category 2
- b) Tulila hydroelectric plant, UNFCCC reference number 9904-0005, a CPA in category 3
- c) Ngombeni biomass power plant project, UNFCCC reference number 9904-0007, a CPA in category 2
- d) Ikondo micro hydro power plant, UNFCCC reference number 9904-0008, a CPA in category 3

The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The Rural Energy Agency (the CME) is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the four CPAs in the PoA, on the basis set out within the PoA and respective CPAs’ Monitoring Plan as indicated in the registered design documents. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the CPAs, and is the responsibility of the management of the project.

For the first Monitoring Report (report number 01, version 06 dated 01/11/2018), covering the period from 08/05/2014 to 31/12/2016, Bureau Veritas India Pvt Ltd confirms that the project is implemented as described in validated and registered PoA design document and with the corresponding CPAs design documents. Installed equipment being essential for generating emission reduction runs reliably, with the exception of CPA reference number 9904-0007 which was noted to be running at a very low efficiency. The monitoring system is in place and the CPAs are generating GHG emission reductions.

CDM-PoA-VCR-FORM

Bureau Veritas India Pvt Ltd confirms that the GHG emission reductions are calculated without material misstatements, applying most conservative approach. The emission reductions verified totalize **14,838** tCO₂e for the four CPAs. Our opinion relates to the PoA's resulting GHG emission reductions for the single batch of four CPAs mentioned above (as reported in monitoring report number 01); and related to the valid and registered baseline, approved monitoring plan and its associated documents for the batch of CPAs.

Based on the evidence and information that is considered necessary to guarantee that GHG emission reductions are appropriately calculated, Bureau Veritas India Pvt Ltd confirms the following:

CPA no.	Reporting period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Emission Reductions (tCO ₂ e)
9904-0003	01/12/2015 - 31/12/2016	1,995	0	0	1,995
9904-0005	01/12/2015 - 31/12/2016	12,754	0	0	12,754
9904-0007	01/09/2016 - 31/12/2016	48	0	0	48
9904-0008	14/10/2016 - 31/12/2016	41	0	0	41
Total	08/05/2014 - 31/12/2016	14,838	0	0	14,838



Mr. Samuel Mayieko

Team Leader

22/11/2018



Mr. James Chirchir

Internal Technical Reviewer

22/11/2018

Appendix 1. Abbreviations

Abbreviations	Full texts
BVI	Bureau Veritas India Pvt Ltd
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM POA-PCP	CDM project cycle procedure for programmes of activities
CDM-PS	CDM project standard for programmes of activities
CDM PoA-VVS	CDM validation and verification standard for programmes of activities
CER	Certified Emission Reductions
CL	Clarification Request
CME	Coordinating / Managing Entity
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DOC/doc	Document
DOE	Designated Operational Entity
ERs	Emission Reductions
FAR	Forward Action Request
GHG	Green House Gas(es)
MoV	Means of Verification
MR	Monitoring report
PDD	Project design document
PP	Project Participant
PRC	Post-Registration Change
REA	Rural Energy Agency
SSC	Small Scale
TANESCO	Tanzania Electric Supply Company Limited
UNFCCC	United Nations Framework Convention on Climate Change

Appendix 2. Competence of team members and technical reviewers

Mr. Samuel Onsongo	Bureau Veritas India Pvt Ltd, Kenya	Team Leader, Climate Change Lead Verifier, He has a degree in Physics with over 7 years experience in renewable energy and climate change out of which 5 years have been in CDM. He has been trained on CDM verification, QMS (ISO 9001) and EMS (ISO 14001), as Lead auditor. He has been involved in validation and verification of CDM and Gold Standard projects covering sectoral scope 1 and 3.
Mr. James Chirchir	Bureau Veritas India Pvt Ltd, Kenya	Technical Reviewer, Climate Change Lead Verifier, James Chirchir – holds a Bachelor's degree in Chemical and Process Engineering and had 4 years experience in manufacturing before joining Bureau Veritas. He is an ISO 9001 and ISO 14000 Lead Auditor and a trained CDM Verifier. He has been involved in validation and verification of over 5 projects.

Mr. Sanjay Patankar	Bureau Veritas India Pvt Ltd, India	<p>Technical Specialist supporting Technical Reviewer, Climate Change Lead Verifier.</p> <p>Educational qualifications: B.E. (Mech.) M.E. (Mech.) He has over 20 years of experience in engineering manufacturing industry covering various functions like enterprise management, product design, engineering, tool & die design, improvements in the production shop, quality assurance & control and systems planning and implementation, including ISO 9001 based quality management systems.</p> <p>Working for the last 11 years in Bureau Veritas Certification (India) Pvt. Ltd. As Lead Auditor for ISO 9001, 14001 and OHSAS 18001 standards/specifications. Has undergone training related to Clean Development Mechanism and is currently involved in validation and verification of CDM project activities.</p>
---------------------	-------------------------------------	---

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	REA	Monitoring report version 01	09/03/2017	CME
2	REA	Emission reduction calculation spreadsheet version 01	09/03/2017	CME
3	REA	Tanzania Renewable Energy Programme Version 08	23/04/2014	UNFCCC
4	AENOR	Small-Scale PoA CDM Validation Report: "Tanzania Renewable Energy Programme"	06/05/2014	UNFCCC
5	EB 61	AMS I.D. Grid connected renewable electricity generation, Version 17	03/06/2011	UNFCCC
6	EB 61	AMS I.F. Renewable electricity generation for captive use and mini-grid, Version 02	03/06/2011	UNFCCC
7	REA	CPA-DD: Mbinga Hydroelectric Project version 03	25/10/2015	UNFCCC
8	REA	CPA-DD: Tulila Hydro-electric Plant version 02	26/10/2015	UNFCCC
9	REA	CPA-DD: Ikondo Micro Hydro Power Plant version 05	08/09/2016	UNFCCC
10	REA	CPA-DD: Ngombeni Biomass Power Plant Project version 06	14/07/2018	UNFCCC
11	AENOR	Validation report MBINGA version 02	26/10/2015	UNFCCC
12	AENOR	Validation report-Tulila version 02	27/10/2015	UNFCCC
13	AENOR	Ngombeni Validation report version 02	10/08/2016	UNFCCC
14	AENOR	Ikondo Validation report version 02	12/10/2016	UNFCCC
15	REA	Emission reduction calculation spreadsheet version 02	5/29/2017	CME
16	REA	Monitoring report version 02	29/05/2017	CME
17	REA	Monitoring report version 03	11/09/2017	CME
18	REA	Emission reduction calculation spreadsheet version 03	11/09/2017	CME

19	REA	Monitoring report version 04	27/03/2017	CME
20	REA	CPA-DD: Ngombeni Biomass Power Plant Project version 05	11/12/2017	CME
21	REA	Emission reduction calculation spreadsheet version 06	01/11/2018	CME
22	REA	Monitoring report version 06	01/11/2018	CME
23	DOE	List of other onsite documents reviewed (invoices, bill, plant logs, etc.)	28/04/2017	DOE
24	ALS Analysis and Inspection Durban (Pty) Ltd	Lab report for coconut husk and Excel sheet of NCV and moisture content for mulch and bush chips as provided by EPC contractor	11/06/2018	CME

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

Table 1. Remaining FARs from validation and/or previous verification

FAR ID	xx	Section no.	Date: DD/MM/YYYY
Description of FAR			
CME response			Date: DD/MM/YYYY
Documentation provided by the CME			
DOE assessment			Date: DD/MM/YYYY

Table 2. CLs from this verification

CL ID	CL 1	Section no.	A.1	Date: 18/05/2017
Description of CL				
Only one monitoring report was published covering 5 CPAs. However, after site visit, the CME opted for multiple monitoring reports for the monitoring period. The CME is thus requested to provide the monitoring reports in accordance with the CDM Project Cycle Procedure version 01.0				
CME response				Date: 01/06/2017
Two monitoring reports will be provided for the PoA monitoring period from 08/05/2014 to 31/12/2016.				
a) Monitoring report number 01 will cover the following CPAs:				
<ul style="list-style-type: none"> Mbinga hydroelectric project (9904-0003) Tulila hydroelectric plant (9904-0005) Ngombeni biomass power plant project (9904-0007) Ikondo micro hydro power plant (9904-0008) 				
b) Monitoring report number 02 will be for Yovi small hydro power project (9904-0004).				
As suggested, the above mentioned 2 monitoring reports are prepared in accordance with the CDM PCP version 01.0.				
Documentation provided by the CME				

<ul style="list-style-type: none">Monitoring report number 01, version 02 covering 4 CPAs (9904-0003, 9904-0005, 9904-0007 and 9904-0008)ER sheet for the above monitoring report, version 02Monitoring report number 02, version 01 covering 1 CPA (9904-0004)ER sheet for the above monitoring report, version 01	
DOE assessment	Date: 14/07/2017
The DOE has reviewed the responses from the CME and the revised documents and finds the response acceptable. The CL is closed.	

CL ID	CL 2	Section no.	F.1	Date: 18/05/2017
Description of CL				
<i>A monitoring system is described. However it does not include line diagrams. The CME is requested to provide line diagrams showing relevant monitoring point for each CPA or provide justification as to why that is not appropriate.</i>				
CME response				Date: 01/06/2017
The line diagrams showing relevant monitoring points for each CPA is now added in Section F of the revised monitoring reports. Please refer figures 3, 4, 5 and 6 in the monitoring report number 01 and figure 3 in the monitoring report number 02.				
Documentation provided by the CME				
<ul style="list-style-type: none"> Monitoring report number 01, version 02 covering 4 CPAs (9904-0003, 9904-0005, 9904-0007 and 9904-0008) Monitoring report number 02, version 01 covering 1 CPA (9904-0004) 				
DOE assessment				Date: 14/07/2017
The DOE has reviewed the responses from the CME and the revised documents and finds the response acceptable. The CL is closed.				

CL ID	CL 3	Section no.	G.2	Date: 25/08/2017
Description of CL				
<i>For Ngombeni CPA it is indicated under parameter Biomass Consumption, that Cross-check of the measurements with an annual energy balance was done based on purchased quantities, however this is not visible anywhere in the monitoring report or ER calculation spreadsheets</i>				
CME response				Date: 11/09/2017
<p>The cross check of annual energy balance is done informally at plant operation level. Since the biomass from the own plantations are used, there is no invoice bill or payment record. The only available documentation is plant record for bringing in the biomass from plantations to the power plant. The same is used for CER estimations. This is also the reason that the complete biomass brought into the plant has been taken into account.</p> <p>For estimation, the energy balance cross check of expected energy available, electricity generation from the biomass consumed and the actual electricity generation is provided in the ER sheet now. Please refer work sheet "Energy balance for Ngombeni" in the revised ER sheet version 03. The results show that the energy generated is not more than the energy from the biomass consumed.</p> <p>Also, it shows that the power plant is running at very low efficiency due to issues with the boiler. It is also to be noted the total quantity of biomass consumed is taken for analysis. The actual consumption will be lower than this. The inference of the crosschecking is also updated in revised MR, version 03 now in parameter table of "biomass consumption" under section G.2. Data and parameters monitored.</p>				
Documentation provided by the CME				
Monitoring report version 03				
ER sheet version 03				
DOE assessment				Date: 24/11/2017

Revised monitoring report has been reviewed; however the revision does not address the gap affirmatively. Please note that the implementer has used biomass for which the moisture content was not reported ex-ante as required and this constitutes a deviation. Is the deviation permanent or temporary? Please also confirm is the 513.73 MWh the total amount of electricity generated by Ngombeni from January to December 2016?

CME response	Date: 11/09/2017
---------------------	-------------------------

In section A.5 of the registered CPA DD, it is already stated that "The project is designed to use various biomass such as coconut palm tree wastes, different species of trees, bushes, etc. which are readily available as the main feed stock for electricity generation. The feed stock in general is derived from the discarded section of the coconut palm, trees, bushes, off-cuts, sawmill wastes, etc.". By this it was already clarified that the biomass used in the CPA is all kinds of biomass waste available from the coconut plantations.

In that sense, during the monitoring year, the plant was running on the wastes such as bush chips, coconut husks, etc. Hence, the power plant has not deviated from use of fuels mentioned in the registered CPA.

In section D.6.2. Data and parameters fixed ex-ante, the % moisture content of coconut tree waste is provided as it is the major portion of biomass waste expected from the plantations. It may not be practical to foresee each and every specific type of biomass (coconut husk, coconut trunk, coconut coir, bush chips, mulches, etc.) that would be present in the biomass waste from the plantations. It is to be noted here that, it would have been sufficient if the project developer has monitored all wastes as under single type - "coconut plantation wastes". In that case, the NCV and moisture content would be referred to that. However, the project developer has done monitoring at each sub-types of biomass wastes - which is more than the accuracy required by the registered monitoring plan.

In summary,

1. The project developer has implemented more accurate monitoring than required - measuring tons of each sub-types of biomass wastes and NCV values for the same.

2. The moisture content provided ex-ante in the registered CPA DD is to represent all such biomass wastes from the coconut plantations only and no other biomass other than the ones stated in registered CPA DD was used in the CPA.

Based on above facts, we are of the opinion that there is no deviations from the CPA design and monitoring plan in terms of assessment of the fuel moisture content.

Regarding the other query on 513.73 MWh generation, yes it is. The power generation of 513.730 MWh is for Jan - Dec 2016 only. For your information, this value is used only for the estimation of the plant performance during that year and not for CER estimation.

Documentation provided by the CME
--

None

DOE assessment	Date: 01/12/2017
-----------------------	-------------------------

The DOE wishes to clarify that the issue is not the use of different types of biomass, but rather the use of values for fixed parameters (in this case % of moisture content) that were not reported in the CPA-DD at the time of CPA inclusion. As a verifying DOE we can only accept values that have been approved, when such parameters are not monitored.

CME response	Date: 12/12/2017
---------------------	-------------------------

It is now considered that a single type of biomass - i.e., any biomass from the coconut plantations is the fuel used in the power plant. The moisture content is fixed ex-ante with the value 30 - 70% covering all types of biomass residues available from the coconut plantations.

Based on the current view, only one type of biomass fuel is used by the power plant, i.e., the biomass from the coconut plantations. This approach is applied in all places of the CPA DD and the MR. Relevant changes have been made in other sections of the CPA DD and MR.

Documentation provided by the CME
--

Monitoring report version 04

Revised CPA-DD version 05

DOE assessment	Date: 02/01/2018
-----------------------	-------------------------

The DOE has reviewed the responses from the CME and the correction in the the revised documents and finds the response acceptable. The DOE has performed a validation of the post registration change made and has come to a positive conclusion. Please refer to PRC report version 01 dated 01/03/2018. The CL is closed.

CL ID	CL 4	Section no.	H.5 & H.6	Date: 25/08/2017
Description of CL				
<i>Section H.5 & H.6 provides a comparison of actual emission reductions achieved versus PDD estimates. While it is stated that the emission reductions were 58% lower than estimates, no explanation for the same is provided. It is not known, for example, why the biomass plant (Ngombeni) despite being 2.5 MW in capacity, has not generated any electricity from Jan 16 to Aug 16. Even in section D.1 there is no explanation that would enable understating of events that took place during implementation that would lead to the CPAs not achieving the estimated generation capacity.</i>				
CME response				Date: 11/09/2017
<p>The reasons for low CER generation in CPA are:</p> <ul style="list-style-type: none"> • Mbinga CPA consisted of two phases of 520 kW each. Currently only one phase of 520 kW is installed. Phase 2 was expected to be installed in Jan 2016. But the implementation still delayed. • In Tulila CPA, the power generation from phase 1 power plant of 2.5 MW was only 15,956 MWh against the expected 34,465 MWh per year. There were technical issues on synchronization between the grid and the power plant because of which the plant was not running at the full capacity. • In Ngombeni CPA, there were some technical issues with the boiler equipment which could not run at its rated capacity. • Ikondo CPA was expected to generate 552 MWh during the monitoring period. But only 52 MWh was generated. There were some software/technical issues when 340 kW and 80 kW units were linked together because of which plant was not running at the full capacity. <p>In case of Ngombeni CPA, its crediting period started only from Sep 2016. The power generation after start of crediting period is mentioned in the ER sheet.</p>				
Documentation provided by the CME				
Monitoring report version 03				
DOE assessment				Date: 13/09/2017
The DOE has reviewed the responses from the CME and the revised documents and finds the response acceptable. The CL is closed.				

CL ID	CL 5	Section no.	Appendix 1	Date: 25/08/2017
Description of CL				
<i>It is noted that CME's contact person is different from the registered PoA-DD, has an MOC been submitted for the change? If so please provide</i>				
CME response				Date: 11/09/2017
Activity already initiated. Copy will be attached.				
Documentation provided by the CME				
N/A				
DOE assessment				Date: 13/09/2017
The CME is requested to follow the PoA-PCP for the change.				

Table 3. CARs from this verification

CAR ID	CAR 1	Section no.	Part II	Date: 18/05/2017
Description of CAR				
<i>It indicated that the report has been prepared as a single report for the 05 CPAs. However information provided also included Specific-case CPAs 9904-0001, 9904-0002 and 9904-0006 which are not included in this batch of the of monitoring report. The CME is requested to comply with para 315 (b) of the CDM Project Standard version 01.0</i>				
CME response				Date: 01/06/2017
<p>Noted. Now two monitoring reports are prepared (one covering 4 CPAs: 9904-0003, 9904-0005, 9904-0007, 9904-0008 and the other covering 1 CPA: 9904-0004) for the same monitoring period from 08/05/2014 to 31/12/2016.</p> <p>Also, the details of other specific CPAs namely, 9904-0001, 9904-0002 and 9904-0006, which are not covered in both the reports are removed now. The monitoring report is in compliance with para 315 (b) of the CDM Project Standard version 01.0.</p>				

Documentation provided by the CME	
<ul style="list-style-type: none"> Monitoring report number 01, version 02 covering 4 CPAs (9904-0003, 9904-0005, 9904-0007 and 9904-0008) Monitoring report number 02, version 01 covering 1 CPA (9904-0004) 	
DOE assessment	Date: 14/07/2017
The DOE has reviewed the corrective action from the CME and the revised documents and finds the action acceptable. The CAR is closed.	

CAR ID	CAR 2	Section no.	G.2	Date: 18/05/2017
Description of CAR				
<i>Reporting of monitored data and parameters has been done using tables. However the tables used do not have a row for "Monitoring equipment. The CME is requested to use the correct version of the monitoring report form and follow the instruction for completing the form provided therein.</i>				
CME response				Date: 01/06/2017
The monitoring report was already prepared in the latest PoA MR template only (version 01 published in 01 April 2015). However, the row "monitoring equipment" was missed out earlier in tables of section G.2. The row "monitoring equipment" is now added and updated in tables of section G.2. The reports are now in line with the instruction for completing the form.				
Documentation provided by the CME				
<ul style="list-style-type: none"> Monitoring report number 01, version 02 covering 4 CPAs (9904-0003, 9904-0005, 9904-0007 and 9904-0008) Monitoring report number 02, version 01 covering 1 CPA (9904-0004) 				
DOE assessment				Date: 14/07/2017
<i>The accuracy of energy meters is mentioned as "rated error not more than 0.5%" but for the biomass plant (Ngombeni), there is no indication of the accuracy of measurement of the weighbridge used for biomass quantity measurement</i>				
CME response				Date: 11/09/2017
The weigh bridge was calibrated on 11/02/2017. The accuracy was found to be 0.05% (readability of 5kg out of 10,000 kg). The same is updated in the revised MR, version 03 now in the parameter table "biomass consumption" under section G.2. Data and parameters monitored. The calibration certificate is provided in the Attachment A1				
Documentation provided by the CME				
Monitoring report version 03				
Ngombeni Weighbridge calibration certificate				
DOE assessment				Date: 13/09/2017
The DOE has reviewed the corrective action from the CME and the revised documents and finds the action acceptable. The CAR is closed.				

CAR ID	CAR 3	Section no.	G.2	Date: 25/08/2017
Description of CAR				
<i>The abbreviations for each monitoring parameter shown in the CER spread sheet (e.g. for Tulila, EGBL,y) is not indicated</i>				
CME response				Date: 11/09/2017
The abbreviations of each monitoring parameter is now clearly added in all places in the revised ER sheet, version 03. For Tulila, the parameter reference is corrected as EGBL,y in the work sheet "ER calc - Cat 3" of the revised ER sheet, version 03.				
Documentation provided by the CME				
Revised ER sheet, version 03.				
DOE assessment				Date: 13/09/2017
The DOE has reviewed the corrective action from the CME and the revised documents and finds the action acceptable. The CAR is closed.				

Table 4. FARs from this verification

FAR ID	N/A	Section No.		Date: DD/MM/YYYY
Description of FAR				

CME response	Date: DD/MM/YYYY
Documentation provided by the CME	
DOE assessment	Date: DD/MM/YYYY

- - - - -

Document information

Version	Date	Description
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0).
01.0	5 June 2015	Initial publication.
Decision Class: Regulatory		
Document Type: Form		
Business Function: Issuance		
Keywords: programme of activities, verifying and certifying		