Monitoring report form for CDM programme of activities
(version 01.0)

Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form for CDM programme of activities" at the end of this form.

MONITORING REPORT		
Title of the programme of activities (PoA)	Tanzania Renewable Energy Programme	
UNFCCC reference number of the PoA	9904	
Version number(s) of the PoA-DD(s)applicable to this monitoring report	Version 08 dated 23/04/2014	
Coordinating/managing entity (CME)	Rural Energy Agency (REA)	
Version number of this monitoring report	01	
Completion date of this monitoring report	09/03/2017	
Monitoring period number and dates covered by this monitoring report	First monitoring period from 08/05/2014 to 31/12/2016 (first and last days included)	
Monitoring report number for this monitoring period	01 (Single monitoring report for 05 CPAs in the PoA covered during this monitoring period)	
Host Party(ies)	Host Party(ies) of the PoA	Is this a host Party to a specific-case CPA covered in this monitoring report? (yes/no)
	United Republic of Tanzania	Yes
Sectoral scope(s)	01 - Energy Industries (renewable/non-renewable sources)	
Selected methodology(ies)	• AMS I.D. Grid connected renewable electricity generation, Version 17 • AMS I.F. Renewable electricity generation for captive use and mini-grid, Version 02	
Selected standardized baseline(s)	Not applicable	
Total amount of GHG emission reductions or net GHG removals by sinks for all specific-case CPAs in the PoA covered in this monitoring report	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	0 tCO_2e	16,861 tCO_2e

PART I - Programme of activities

SECTION A. Description of PoA

A.1. Brief description of the PoA

Tanzania has, over the years, strived to create an appropriate policy environment to attract private investments to the renewable energy generation sector. The National Energy Policy 2003 sets national energy objectives to ensure availability of reliable and affordable energy supplies and to promote efficient energy in order to support national development goals. The policy recognizes that, the main thrust should be private initiatives and investments for exploring the local energy sources. The policy sets an entirely new approach to modern energy in rural areas of Tanzania and the government has committed itself to develop and implement the new strategy to address modern energy needs of over 85% of Tanzanians living in rural areas.

For these reasons, the Rural Energy Board (REB), the Rural Energy Agency (REA), and the Rural Energy Fund (REF) were established and entrusted with the role of promoting, stimulating and facilitating improved access to modern energy services in rural areas through empowering both public and private sector initiatives in rural energy.

The main objective of this programme of activities (PoA) is to increase the access to modern energy services in Tanzania by promoting both off-grid (isolated mini-grid) and national grid renewable energy projects in the country using photovoltaic, wind, hydro and biomass technologies for electricity generation. This programme to promote renewable energy projects is fully in line with the Government's strategy for the energy sector.

REA, under the Ministry of Energy and Minerals (MEM) of the United Republic of Tanzania, is the nodal agency to promote rural electrification projects in Tanzania. REA is responsible for implementing the PoA and acts as the coordinating and managing entity (CME).

REA, with assistance of a World Bank project, is supporting small rural and renewable energy initiatives in several ways. They are: (i) through an enabling policy and regulatory framework, including standardized power purchase agreements and simplified regulatory rules which reduce some of the transaction costs for small renewable power projects, (ii) through a subsidy scheme for new connections in rural areas (performance grants) and technical assistance/pre-investment support (matching grants) for the project developers; and (iii) through a line of credit (LOC) to the Tanzanian financial institutions for long-term lending to small renewable energy projects.

As the CME for the registered small-scale PoA, REA performs the following main activities: (i) coordinating the implementation of the PoA, (ii) screening and accepting the CPAs under the programme, (iii) supporting the effective commercialization of CERs, (iv) liaising with the project developers to maintain the required database for verification, (v) any other functions that need to be performed as per the PoA rules.

The CPAs were implemented by the project developers, building on REA's existing relationship with the individual project developers. REA entered into a contractual agreement with each of the individual power projects (CPAs). The signed contracts give REA the legal rights to deal with the carbon credits that are generated from these projects and monitor the project implementation and all necessary parameters that are required for calculating the emission reductions from each CPA.

This is the first monitoring report of the PoA from 08/05/2014 to 31/12/2016 (first and last days included). The cumulative net electricity exported to grid and mini-grids during the monitoring period is 22,350 MWh. Certified Emission Reductions (CERs) generated during this monitoring period is 16,861 tCO_2e.

A.1.1. Generic CPA(s)

Title, identification/reference number and/or version number of the generic CPA(s) of the PoA	Sectoral scope(s)	Applied methodology(ies) or combination of methodologies and/or standardized baseline(s)
CPA category 1 as per Part II of PoA "Tanzania Renewable Energy Programme", Version 08 dated 23/04/2014	01 - Energy Industries (Renewable / Non-renewable sources)	AMS I.D. Grid connected renewable electricity generation, Version 17[1].
CPA category 2 as per Part II of PoA "Tanzania Renewable Energy Programme", Version 08 dated 23/04/2014		AMS I.F. Renewable electricity generation for captive use and mini-grid, Version 02[2].
CPA category 3 as per Part II of PoA "Tanzania Renewable Energy Programme", Version 08 dated 23/04/2014		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.

A.1.2. Specific-case CPA(s) covered in this monitoring report

Reference number of the specific-case CPA included in the PoA as of the end of this monitoring period	Title, identification/reference number and version number of the generic CPA to which the specific-case CPA applies	Crediting period dates of the specific-case CPA	Is this specific-case CPA covered in this monitoring report? (yes/no)
9904-0001	CPA category 3 as per Part II of the PoA "Tanzania Renewable Energy Programme", Version 08 dated 23/04/2014	01/01/2015-31/12/2021	No[3]
9904-0002	CPA category 2 as per Part II of the PoA "Tanzania Renewable Energy Programme", Version 08 dated 23/04/2014	04/06/2014-03/06/2021	No[4]
9904-0003	CPA category 2 as per Part II of the PoA "Tanzania Renewable Energy Programme", Version 08 dated 23/04/2014	01/12/2015-30/11/2022	Yes

[1] https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK

[2] https://cdm.unfccc.int/methodologies/DB/9KJWQ1G0WEG6LKHX21MLPS8BQR7242

[3] Project is delayed

[4] Project is delayed

9904-0004	CPA category 1 as per Part II of the PoA "Tanzania Renewable Energy Programme", Version 08 dated 23/04/2014[5]	01/12/2015-30/11/2022	Yes
9904-0005	CPA category 3 as per Part II of the PoA "Tanzania Renewable Energy Programme", Version 08 dated 23/04/2014	01/12/2015-30/11/2022	Yes
9904-0006	CPA category 3 as per Part II of the PoA "Tanzania Renewable Energy Programme", Version 08 dated 23/04/2014	01/11/2016-31/10/2023	No[6]
9904-0007	CPA category 2 as per Part II of the PoA "Tanzania Renewable Energy Programme", Version 08 dated 23/04/2014	01/09/2016-31/08/2023	Yes
9904-0008	CPA category 3 as per Part II of the PoA "Tanzania Renewable Energy Programme", Version 08 dated 23/04/2014	14/10/2016-13/10/2023	Yes

A.2. Contact information of the coordinating/managing entity (CME) and/or responsible persons(s)/entity(ies)

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SECTION B. Implementation of PoA

B.1. Implementation of the management system of the PoA

The management system is developed in accordance with the "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities", Version 3, EB74.

REA is the PoA managing entity. The operational and management arrangements established by the REA for the implementation of the PoA are described below.

The operational and management structure provides information and data flow channel between the CME and the CPA implementer. At CPA level, REA ensures the actual involvement of field personnel (power plant operators/technicians) in the monitoring, data collection and record keeping activities. REA requests each CPA to designate a CPA manager at the project developer head office and an engineer in-charge of the power plant operation.

[5] This CPA was registered under category 2 – power supply to TANESCO mini-grid. But during actual implementation, it is supplying to TANESCO national grid. Hence, it comes under CPA category 01. A PRC is proposed for this.

[6] Project is not yet commissioned

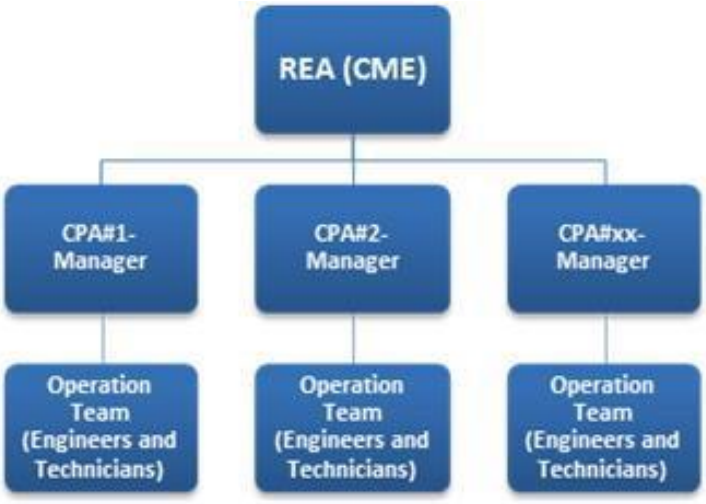

Figure 1: Implementation structure

Operation and management plan

The operation and management plan is described below.

(i) *A record keeping system for each CPA under the PoA*

A record keeping system is established by REA, which contains the following details providing the unique identity for each SSC-CPA. The details include, but are not limited to:

- Name of the CPA
- CPA number, (REA reference number)
- Name of CPA implementer
- Contact details of the Implementing entity (Address/Contact person/Phone/e-mail/fax)
- Location of the CPA (e.g., GPS coordinates of the power house and the water intake for a hydro power plant)
- Type of renewable energy source
- Installed capacity of the CPA
- The record on technical specification of each renewable energy plant participating in the PoA
- Type and name of the grid (national grid, TANESCO mini-grid, existing isolated grid, new isolated grid) fed by the project
- Gross electricity generation
- Net electricity generation and electricity sales
- Meter calibration
- Commissioning date

Two databases are developed by REA for record keeping at the CPA level and at the PoA level.

At the CPA level, the CPA implementer is responsible for managing the records and the data associated with each SSC-CPA. They maintain a proper electronic database for these records. A hard copy backup of all these records is also made available. In case of failure in the electronic data transfer system, manually recorded project details at the site are collected and compiled, which is sent to REA. The record keeping is carried out using the field instruments, hardware and software installed at every project site and/or manual data recording in the log book. The recorded data is submitted to REA, which is responsible to archive the data as per individual CPA.

At the PoA level, REA manages and maintains a record of complete database on all CPAs and the entire PoA. REA cross-checks the data from all the CPAs to ensure completeness, accuracy and

consistency. The PoA level database is obtained from the CPA level database after REA's own review work.

Paper and electronic records will be kept during the entire crediting period for each CPA and for additional two years after the crediting period.

(ii) *Records of arrangements for training and capacity development for personnel*

REA is responsible for keeping the record on training and capacity development activities provided to the relevant personnel. The record includes:

- Date, time and venue of each training and capacity development event
- Participants record for each event
- Agenda for each training and capacity development event
- Manuals and training materials for each training and capacity development event

All relevant project staff are trained in various aspects of the CPA operation and management. Operators also pursued on-site training.

(iii) *Measures for continuous improvements of the PoA management system*

The Project Manager of the PoA will organize a meeting with all his/her staff and CPA personnel to review the performance of the PoA management system to identify issues to be addressed, to obtain continuous improvements of the PoA management system.

B.2. Implementation of single sampling plan(s)

Not applicable.

SECTION C. Post-registration changes to the PoA (including the generic CPA(s))

C.1. Corrections

Not applicable.

C.2. Inclusion of a monitoring plan to the registered PoA-DD (including its generic CPA-DD(s)), if a monitoring plan was not included at the time of registration

Not applicable.

C.3. Permanent changes to the monitoring plan as described in the registered PoA-DD, applied methodology, or applied standardized baseline

Not applicable.

C.4. Changes to the programme design of the registered PoA-DD (including corresponding changes to project design of the generic CPA-DD(s)) and updates to the eligibility criteria for inclusion of specific-case CPAs in the PoA

Not applicable.

C.5. Types of changes specific to afforestation and reforestation activities

Not applicable.

PART II- Specific-case component project activity(ies)

SECTION D. Description of specific-case CPA(s)

D.1. Brief description of implemented specific-case CPA(s)

Currently 8 CPAs are included in this PoA. The details of CPAs considered in the report are provided in Table 1.

Table 1: CPAs of the PoA

CPA reference no.	CPA name[7]	Registered / Included[8]	Capacity	Project Implementer
9904-0001	Mapembasi hydro power project, Njombe district	08/05/2014	10.71 MW	Mapembasi Hydropower Company Limited
9904-0002	NextGen solar project, Kigoma region	05/08/2014	5 MW	NextGen Solawazi Limited
9904-0003	Mbinga hydroelectric project	06/11/2015	1.12 MW	Andoya Hydroelectric Power Company Limited
9904-0004	Yovi small hydro power project	06/11/2015	2.3 MW	Yovi Hydro Power Company Limited
9904-0005	Tulila hydroelectric plant	06/11/2015	7.5 MW	Tulila Hydroelectric Plant Company Limited
9904-0006	Maguta small hydro power project	07/07/2016	2.4 MW	Lungali Natural Resources Company Limited
9904-0007	Ngombeni biomass power plant project	11/08/2016	2.5 MW	Ngombeni Power Limited
9904-0008	Ikondo micro hydro power plant	14/10/2016	430 kW	Matembwe Village Company Limited

This report is prepared as a single monitoring report for the 05 CPAs (Mbinga, Yovi, Tulila, Ngombeni and Ikondo) for the first monitoring period under the registered PoA. Major milestones during project implementation of these CPAs are furnished in table 2.

Table 2: Timeline of the CPA implementation

Description	Mapembasi	NextGen	Mbinga	Yovi	Tulila	Maguta	Ngombeni	Ikondo
CPA start date	15/05/14	15/03/14	22/10/12	19/07/12	11/10/13	22/10/12	31/01/12	19/12/13

[7] For simplicity, in this monitoring report these CPAs are shortly referred to as Mapembasi, NextGen, Mbinga, Yovi, Tulila, Maguta, Ngombeni and Ikondo respectively.

[8] https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/DEI4JOVUTN7A0936CP1WLMSGYB58ZF/viewCPAs

Description	Mapembasi	NextGen	Mbinga	Yovi	Tulila	Maguta	Ngombeni	Ikondo
CPA inclusion date	08/05/14	05/08/14	06/11/15	06/11/15	06/11/15	07/07/16	11/08/16	14/10/16
Start date of the first crediting period	01/01/15	04/06/14	01/12/15	01/12/15	01/12/15	01/11/16	01/09/16	14/10/16
Commissioning date	Not yet	Not yet	19/03/15[9]	06/11/15[10]	12/09/15[11]	Not yet	27/01/14[12]	26/01/16[13]

Technical description of the CPA

Mapembasi:

This CPA will supply power to both national grid and isolated mini-grids and comes under CPA category 03.

The Mapembasi hydro power project is a run-of-the-river type hydroelectric generation. The system design consists of a weir, intake, canal, forebay, penstock pipe, power house and electromechanical equipment for 3 generating units of 3.57 MW each (total installed capacity of 10.71 MW). The power generated should be supplied to 33kV for the grid interconnection and 11kV for the local distribution network to 5 villages around Igominyi Division.

Table 3 shows the technical features of the small hydro power plant.

[9] Andoya commission report dated 29/04/2015

[10] Yovi-TANESCO interconnection report dated 26/11/2015

[11] Date as per TANESCO interconnection certificate

[12] Ngombeni-TANESCO interconnection report dated 04/02/2014

[13] Provisional acceptance certificate

Table 3: Technical specifications of Mapembasi

Parameter	Unit	Value
Turbine		
Number of units		3
Model/Type	-	Francis
Rated Head	m	36
Rated Flow	m^3/s	10 (per unit)
Rated Output	MW	3 x 3.238
Rated Model Design Efficiency	%	91.7%
Generator		
Number of units	-	3
Rated Power	MVA/MW	3 x 4.2 MVA / 3 x 3.57 MW
Rated Voltage	kV	6.3
Rated Rotation Speed	rpm	428
Efficiency	%	96.1%
Power factor	-	85%

The Mapembasi hydro power plant is not yet commissioned. The installation is delayed. It is expected that the plant will be commissioned before 01/01/2019.

NextGen:

This CPA will supply power to TANESCO mini-grid and comes under CPA category 02.

The CPA consists of the construction and operation of a 3 MW photovoltaic (PV) electricity generation power plant initially, and expanding it to 5 MW over a period of time.

Table 4 gives the technical specifications of the NextGen Solar Project.

Table 4: Specifications of NextGen

Item	Initial Plant	Final Plant (total)
Plant capacity, MW	3	5
Rated peak power of the solar module, Wp	245	245
Type (a-Si, crystalline Si, etc)	Mono-crystalline Si	Mono-crystalline Si

Open circuit voltage (V)	37.2	37.2
Short Circuit current (A)	8.44	8.44
Vmax (V)	30.2	30.2
Imax (A)	7.96	7.96
Number of modules	12,300	20,500

The NextGen solar power plant is not yet commissioned. The installation is delayed. It is expected that the plant will be commissioned before 01/03/2018.

Mbinga:

This CPA supplies power to isolated mini-grids and comes under CPA category 02.

This CPA is a run-of-the-river hydroelectric power plant with a capacity of 1.12 MW (560 kW x 2) installed in two phases. The plant design consists of a weir, intake, desilting bay, canal, forebay, penstock pipe, power house, electromechanical machines, controls, step up transformer and transmission line to Mbinga township being the main line. A medium voltage line to Mbangamao, Lifakara and Kilimani villages will branch from the main line. The plant design also includes improvement of 12 km and 2 km new stretch. The technical specifications for Phase 2 is similar to the Phase 1 unit.

The technical specifications of installed phase 1 plant are given in table 5 and 6.

Table 5: Specification of installed power plant for phase 1

Turbine	Type	Horizontal Francis Turbine
	Rated speed	750 RPM
	Rated capacity	550 kW
Generator	Frequency	50 Hz
	Rated voltage	400 V
	Rated capacity	700 kVA (560 kW)
	Power factor	0.8 PF

Table 6: Generation power loss

Generation losses	Value
Turbine speed	750 RPM
Generator efficiency	98%
Net electric power generated	495 kW at power station

Generation losses	Value
Transformer efficiency	97%
Line efficiency	98%
Available power at user end	470 kW
Installed output capacity	4,117 MWh
Delivered output estimates	3,293 MWh
Operating days/year	80%
Losses in the distribution	0.543% = 179 MWh
Net saleable electricity	3,114 MWh/year

Yovi:

This CPA supplies power to TANESCO grid and comes under CPA category 01.

Yovi CPA is a run-of-the-river hydroelectric power plant with a capacity of 2.3 MW (1 MW + 1.3 MW) installed in two phases. The hydropower plant utilizes a natural head in the Yovi river. The powerhouse will be constructed in a flat area at an elevation of 867 m height above mean sea level (AMSL) near the right bank of the river and will be a one floor building with a pitched roof, that will lodge the Pelton turbines and all the related electrical and mechanical equipment. The total installation of 2.3 MW will be achieved in two phases. In first phase, a 1 MW Pelton turbine was installed and an isolated mini grid (33 kV transmission and LV distribution) was constructed to serve the project area. In the next phase, additional 1.3 MW Pelton turbine will be installed later. The main features of the 2.3 MW hydro power plant are given in table 7.

Table 7: Specification of 2.3 MW hydro power plant

Water level at the diversion weir (minimum)	1,225.01 m above mean sea level (AMSL)
Water level in the fore bay	1,224.30 m AMSL
Powerhouse elevation	867.00 m AMSL
Tail water level	864.48 m AMSL
Head	357.30 m
Plant flow	360 l/s - 520 l/s
Mean flow	360 l/s - 520 l/s
Installed Capacity	2.3 MW
Penstock diameter	600 mm

Penstock length	1,725 m
Expected generation	15.1 GWh per year

The technical specification of installed 1 MW hydro power plant is given in table 8.

Table 8: Specification of installed power plant for phase 1

Turbine	Type	Horizontal Pelton Turbine
	Rated speed	1,000 RPM
	Rated capacity	995 kW
Generator	Frequency	50 Hz
	Rated voltage	3,000 V
	Rated capacity	1,800 kVA
	Power factor	0.8 PF

Tulila:

This CPA supplies power to national grid and isolated mini-grids and comes under CPA category 03.

The CPA is a run-of-the-river hydroelectric power plant with an installed capacity of 7.5 MW (5 MW + 2.5 MW) in two phases. The power plant uses the natural base slope of the Ruvuma river at Tulila. It is constructed as a run-of-the-river hydroelectric power plant with earth fill dam and a weir system to divert the water to the power plant and utilize the naturally available high head. The surface area of the reservoir created by permanent impoundment is about 74,000 m^2. Water depth at the intake is 7.5 m which results in a total gross head of around 22.5 m.

The plant design consists of headworks including weirs, dams and intake, the tailworks, electromechanical machines and the powerhouse equipped with governors, transformers, medium voltage switchgear, indoor crane, drainage and dewatering system, control, monitoring and communication systems and an emergency power unit.

The whole weir system including dams and intake structure is constructed. The powerhouse will be equipped with three equisized turbines and is located at about 190 m downstream of the intake structure. It is connected to the intake structure by three separate penstocks in staggered diameters 2.3 / 2.5 m each. Due to the short distance, a surge shaft is not necessary. Having passed the turbines, the water is diverted back to the Ruvuma river by a 100 m long tailrace channel. An existing branch of the river can be used for this purpose.

In phase 1, two turbine-generator units and two penstocks were installed and the generated power was fed into the Songea mini-grid. In phase 2, third identical turbine-generator unit and a penstock will be installed and will be connected to national grid through the interconnection of Songea mini-grid to the Makambako – Songea 132 kV transmission line which is expected to be completed by the end of 2017. Following the interconnection with the main grid, generated energy from the three identical turbines will be fed into the connected national grid. The main features of the power plant are given in table 9.

Table 9: Technical specification of power plant

Parameter	Value
Turbine specifications	
Turbine type	Kaplan, axial flow with vertical axis
Rated output	2,581 kW (3 units; 2 in phase 1 and 1 in phase 2)
Rated speed	375 rpm
Rated efficiency	92%
Generator specifications	
Generator type	Synchronous
Generator capacity	3.044 MVA (3 units; 2 in phase 1 and 1 in phase 2)
Power factor	0.8
Generation voltage	6.6 kV
Efficiency	96%

Maguta:

This CPA will supply power to national grid and isolated mini-grids and comes under CPA category 03.

The Maguta small hydro power project will comprise of a storage weir with a height of 12.50 m and a steel penstock of 800 m long providing a net head of 104 m. These attributes will feed two Pelton wheel turbines and synchronous generators would be installed in the power house. The surface mounted (above ground) hydropower plant has been completed entailing the construction and completion of the dam, civil works, penstock and the main inlet valves for the two units. The civil work for installation of 2 turbines-generators, each with an installed capacity of 1.2 MW is in the final stages. The work includes the installation of one 2 MVA 3.3/15 kV step up transformer. Phase 2 comprises only the installation of a second unit of turbine with a capacity of 1,200 kW and a second 2 MVA 3.3/15 kV step up transformer. The Maguta hydro power plant is still under installation. The power plant is expected to be commissioned during June 2017.

The main features of the proposed plant are provided in table 10.

Table 10: Specifications of Maguta

Generator	
Type	Synchronous, three-phase
Number of units	2

Nominal power	1,600 kVA
Active power	1,280 kW
Power factor	0.8
Nominal Voltage Vn	3.3 kV
Rated Frequency Fn	50 Hz
Speed	428 rpm
Turbine	
Type	V axis Pelton 5 jets
Number of units	2
Speed	428 rpm

Ngombeni:

This CPA supplies power to TANESCO mini-grid and comes under CPA category 02.

Ngombeni CPA is a 2.5 MW biomass power project, which covers an area of about 7,000 acres of land in Mafia Island. The area is comprised of sawmill, log yard, workshop, one office building and two staff houses nearby. 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.

The feed stock from the chipper machine passes through the fire box in the boiler, which is burnt to generate heat. The heat generated boils the water in the boiler to produce steam at a pressure of 27–30 bar and at 280-300 ˚C. The produced steam is then introduced into the turbine and is converted into mechanical energy through expansion in steam turbine. The mechanical energy rotates the generator, which in turn produces desired electric power.

The main features of the installed power plant are provided in table 11.

Table 11: Technical specification of power plant

Boiler capacity	10 ton/hr
Turbine capacity	2,500 kW
Generator capacity	3,125 kVA
Plant load factor	0.8
Expected electricity generation	15,023 MWh/yr

Ikondo:

This CPA supplies power to both national grid and isolated mini-grid and comes under CPA category 03.

Ikondo CPA is a run-of-the-river hydroelectric power plant with an installed capacity of 430 kW (80 kW + 350 kW), where water is diverted from Kyepa River and channeled through a 300 m long concrete lined canal into the head tank which has been located at the hill which enables the water to move downwards to the 22 m penstock effortlessly. The total amount of power generated in the hydroelectric power plant depends on the height of head tank and the amount of water flowing through the penstock. The flow from the penstock is forced into the turbine and the electricity is produced in the generator. At the end of the process, the utilized water from the power plant is normally released through a tailrace channel back into the Kyepa River.

The generated electricity is directed into the step-up transformer and fed into the distribution grid of Medium Voltage (MV) Lines and then supplied to the consumers.

Main technical features of the installed power plant are provided in the table 12.

Table 12: Technical specification of power plant

Key design parameter	Value
Penstock material	Steel
Penstock diameter	32 inches
Turbine type	Francis
Shaft orientation	Vertical
Speed	500 rpm
Net head	17 m
Maximum flow rate (Q)	2.3 m^3/s
Mechanical power	350 kW
Minimum global efficiency at 80% of the flow rate	92 %
Nominal electrical power	450 kVA
Power factor	0.85
Excitation	Brushless

Net GHG emission reduction:

In the registered PoA, 08 CPAs are included and are covered under this monitoring period. Currently, the CPAs, Mapembasi, NextGen and Maguta are still under implementation and not yet commissioned. Apart from that, the other 05 CPAs (Mbinga, Yovi, Tulila, Ngombeni and Ikondo) are commissioned and operated normally during the monitoring period without any special events or situations which may impact the applicability of the methodology.

Therefore, the emission reductions from the CPAs under implementation are not considered and only 5 CPAs which have been commissioned are included in this monitoring period. Ngombeni power plant is facing some performance issues and therefore, is running at very low utilization capacity

The net emission reduction achieved in each CPA during this monitoring period is given in the table 13.

Table 13: Net emission reduction of each CPA

No.	CPA	Actual net emission reduction achieved (tCO_2e)
1	Mapembasi	0
2	NextGen	0
3	Mbinga	2,009
4	Yovi	1,998
5	Tulila	12,765
6	Maguta	0
7	Ngombeni	48
8	Ikondo	41

It is also confirmed here that the power plant electricity export readings for each month are metered and the meter values are supported by monthly invoices for each CPA. Hence, the double counting of power generation and emission reduction is avoided.

D.2. Geographical references or other means of identification of the location of the specific-case CPA(s)

Detail	Mbinga	Yovi	Tulila	Ngombeni	Ikondo
Host party	United Republic of Tanzania				
Region / State / Province, etc.	Ruvuma	Morogoro	Ruvuma	Pwani	Njombe
City / Town / Community, etc.	Mbinga district	Msolwa village, Kilosa district	Mpepai-Tulila village, Mbinga / Songea district	Ngombeni, Dundani, Minaki, Chunguruma , Ras Mbisi Estates Village, Mafia district	Ikondo village, Njombe district
Geographical reference of project site					
Latitude (ºS)	11.2708	7.1934	11.0947	7.6555	9.0754
Longitude (ºE)	35.5875	36.7141	35.2769	39.6608	35.233

The location maps of the respective CPAs are shown in Figure 2.

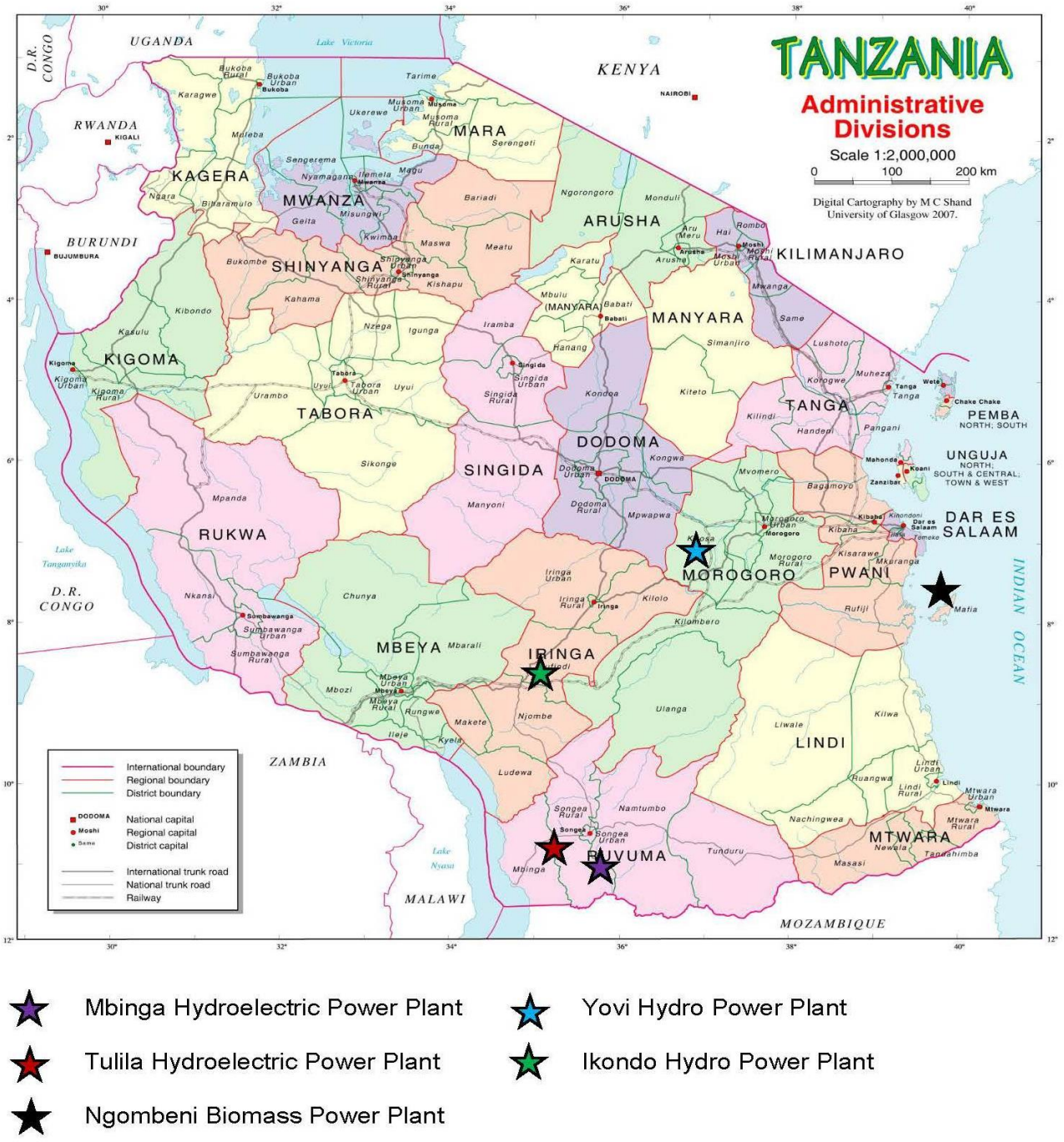

Figure 2: CPA Location Map

SECTION E. Post-registration changes to specific-case CPA(s)

E.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

Not applicable.

E.2. Corrections

Not applicable.

E.3. Changes to the start date of the crediting period of the specific-case CPA(s)

Mapembasi CPA:

Start date of crediting period for this CPA was expected on 01/01/15. However, the plant is still not commissioned. Hence the start date of crediting period for this CPA need to be revised to 01/01/2019. A post registration change (PRC) request will be submitted for this aspect.

NextGen CPA:

Start date of crediting period for this CPA was expected on 04/06/2014. However, the plant is still not commissioned. Hence the start date of crediting period for this CPA need to be revised to 01/03/2018. A post registration change (PRC) request will be submitted for this aspect.

E.4. Inclusion of a monitoring plan into the specific-case CPA(s) that was not included at registration

Not applicable.

E.5. Permanent changes to the monitoring plan as described in the registered specific-case CPA-DD(s), applied methodology or standardized baseline

Not applicable.

E.6. Changes to project design of the specific-case CPA(s)

Yovi CPA:

This CPA was registered under category 02 – power supply to TANESCO mini-grid. However, during actual implementation, the power is supplied to TANESCO national grid. A post registration change (PRC) request will be submitted for this aspect.

E.7. Types of changes specific to afforestation and reforestation specific-case CPA(s)

Not applicable.

SECTION F. Description of the monitoring system of specific-case CPA(s)

The monitoring plan of the PoA is consistent with the methodology AMS-I.D. (version 17) and AMS-I.F. (Version 02). The monitoring structure and plan for a SSC-CPA is an integrated part of the management and monitoring plan of the PoA as described in section C and section B.7.2 (Part II) of the PoA.

The management system is developed in accordance with the “Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities”.

Various parameters with respect to the project category were monitored in the power plants. Various data used for the estimation of emission reduction were also monitored. The data are archived electronically and will be stored for additional 2 years after the end of the crediting period of the CPA. REA as the CME, has supervised the implementation of the monitoring plan. REA also ensured that all the relevant staff of the CPAs as well as their own personnel are trained adequately in this task.

To ensure that the data is reliable and transparent, the CME also established quality assurance and quality control (QA & QC) measures to effectively control and manage the data reading, recording, auditing as well as archiving data and all relevant documents.

Project Category

Category 1 - Grid connected power projects
Category 2 - Mini-grid connected power projects
Category 3 - Power projects connected to both grid and mini-grid

Monitoring data

The following are the parameters to be monitored by each CPA:

Table 14: Parameters to be monitored by each CPA

Parameter	Mbinga	Yovi	Tulila	Ngombeni	Ikondo
Net electricity generation supplied to the national grid		✓	✓		✓
Net electricity supplied to the mini-grids	✓		✓	✓	✓
Quantity of biomass consumed in a year				✓	
Net calorific value of the biomass				✓	

The above parameters were monitored by the plant operators at their project site and were entered in data sheets.

Monitoring procedure

The gross electricity generation, if possible, and the quantity of net electricity supplied to the grid were continuously measured using the energy meters with a maximum rated error of 0.5% as mandated by Energy and Water Utilities Regulatory Authority (EWURA).

Cumulative measurements were entered into an electronic database at the end of each month. Any problems occurring with the monitoring equipment were also captured. CPA implementers produced the reports containing the monthly monitoring data files and details of any equipment faults and/or loss of data. The reports were submitted to the CME and project participants for review and acceptance. All records will be retained for at least two years after the end of the crediting period.

The following measures were taken relating to the monitoring equipment owned by the CPA implementer, its installation and operation:

- All meters are designed and manufactured to the accepted standards (Regulatory standards shall be followed for each electricity meter). Each CPA shall provide all information regarding the metering devices including accuracy class and calibration frequency required, at least annually.
- All monitoring equipment should be located in secure locations free from the possibility of accidental damage.

- Routine maintenance and calibration of all monitoring equipment will be performed in accordance with the utility standards, regular standards or the manufacturer's specification, whenever applicable, to ensure that the data remains accurate.

When all the generated electricity was delivered to the national grid, then the emission reduction (ER) was calculated based on the amount of electricity measured by the buyer. The project records were used primarily for cross-checking and secondarily for ERs calculation in case the Buyer could not measure the purchased electricity. In all cases, the agreed amount of electricity used for billing purpose were the main base for ER calculation.

The technical specifications of power meters installed at each power plants are provided in following tables.

Table 15: Technical details of the power meters installed at the mini-grid export point in Mbinga

Parameter	Main meter	Check meter
Model	EDMI	EDMI
Type	Mk10E	Mk10E
Accuracy	0.5 S	0.5 S
Serial number	211108423	211108415
Calibration date	19/03/2015	19/03/2015

Table 16: Technical details of the power meters installed at the grid export point in Yovi

Parameter	Main meter	Check meter
Model	EDMI	EDMI
Type	Mk6N Genius	Mk6N Genius
Accuracy	0.5 S	0.5 S
Serial number	208304008	208302546
Calibration date	06/11/2015	06/11/2015

Table 17: Technical details of the power meters installed at the mini-grid export point in Tulila

Parameter	Main meter	Check meter
Model	EDMI	EDMI
Type	Mk10E	Mk10E
Accuracy	0.5 S	0.5 S
Serial number	211112553	211112571

Parameter	Main meter	Check meter
Calibration date	14/09/2015	14/09/2015

Table 18: Technical details of the power meters installed at the mini-grid export point in Ngombeni

Parameter	Main meter	Check meter
Model	EDMI	EDMI
Type	Mk10E	Mk10E
Accuracy	0.5 S	0.5 S
Serial number	211108280	211108294
Calibration date	27/01/2014	27/01/2014

Table 19: Technical details of the power meters installed at the grid export point in Ikondo

Parameter	Main meter	Check meter
Model	EDMI	EDMI
Type	Mk10E	Mk10E
Accuracy	0.5 S	0.5 S
Serial number	212556509	212556508
Calibration date	11/11/2016	11/11/2016

Quality assurance and quality control

QA & QC procedures for recording, maintaining and archiving data were implemented as a part of this CDM project activity. The CPA owner implemented QA & QC measures to calibrate and guarantee the accuracy of metering (for meters under his responsibility) and safety of project operation.

Data collection, reporting, archiving and preparation for periodic verification

Data was recorded daily by the plant operator and any data outages were recorded in an operational log and reported to the plant engineer. The Plant engineer at each project site has prepared a report consisting of the above parameters in electronic format. Both, the hard copy of data as well as the electronic report, were forwarded to the CPA Manager, who manages the database for CPAs in line with the CDM requirements under the supervision of REA.

After the quality control, the CPA manager has sent the consolidated data collected to REA. Being the CME, REA is responsible for the management of records and data associated with each SSC-CPA. REA maintains the overall programme database for these records. The Project Manager of the PoA is responsible for the overall programme database and maintains the records of all the CPAs under this programme. The operation and management structure for the monitoring is shown in the figure 3.

To ensure the quality of the recorded data, all the personnel were trained in accordance with this monitoring plan.

If applicable, the net electricity supplied to a grid was cross checked as gross energy generation in the project activity power plant minus the auxiliary/station electricity consumption, technical losses and electricity import from the grid to the project power plant measured at the grid interface/connection used for billing purposes.

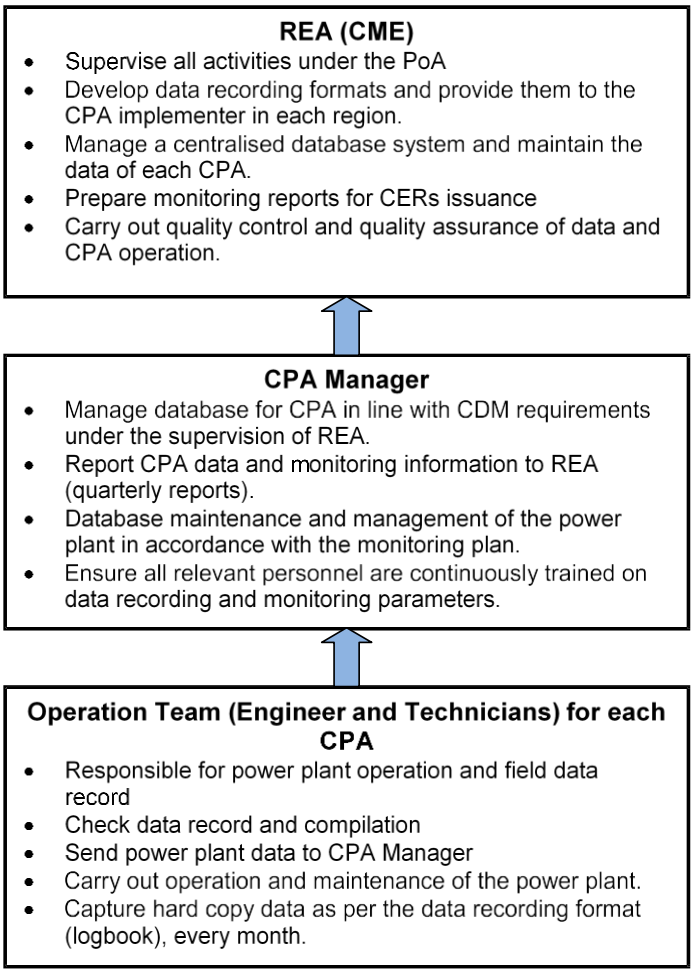

Figure 3: Operational and management structure for monitoring

SECTION G. Data and parameters

G.1. Data and parameters fixed ex ante, at registration, inclusion or renewal of crediting period

(Copy this table for each piece of data and parameter)

CPA Category 1 : CPAs supplying the national grid (AMS I.D. Grid connected renewable electricity generation)

Data / Parameter	**$EF_{CO2,grid,y}$**
Unit	tCO_2e/MWh
Description	CO_2 emission factor of the grid in year y

Source of data	Calculated as described in D.6.3. Details of Tanzania national grid obtained from TANESCO.
Value(s) applied	0.530
Choice of data or Measurement methods and procedures	The grid emission factor is calculated using the latest version of the "Tool to calculate the emission factor for an electricity system". The power generation data of Tanzania national grid for years 2012-14 is used. Details of calculation are provided in Section D.6.3.
Purpose of data	Calculation of baseline emissions
Additional comment	The value is fixed ex-ante for the first crediting period.

Data / Parameter	**$EF_{CO2,m,i,y}$**
Unit	tCO_2/GJ
Description	CO_2 emissions factor of fossil fuel type i used in power unit m in year y
Source of data	IPCC default values at the lower limit of uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Vol.2 (Energy) of the 2006 IPCC Guidelines on National GHG inventories
Value(s) applied	Gas Oil/Diesel Oil - 0.0726 tCO_2/GJ Natural Gas - 0.0543 tCO_2/GJ
Choice of data or Measurement methods and procedures	No data for the fuels used in Tanzania is available. Hence IPCC defaults are used. For the calculation of the Simple Adjusted OM these figures shall be updated once, at the start of each crediting period in accordance with the applicable IPCC data at that time. For the BM, these figures shall be updated once, at the start of each crediting period with the applicable IPCC data at the time.
Purpose of data	Calculation of baseline emissions
Additional comment	Not applicable

Data / Parameter:	**$EF_{EL,m,y}$**
Data unit:	tCO_2/MWh
Description:	CO_2 emissions factor of power unit m considered in grid emission factor calculation in year
Source of data:	TANESCO
Value(s) applied:	

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 UGT1&2	0.57
SONGAS UGT3,4,5&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

Choice of data or Measurement methods and procedures:	Calculated based on the approach provided under Option A of the OM method, using annual electricity generation, fuel type and efficiency for each power unit, m.
Purpose of data	Calculation of baseline emissions.

Additional comment:	This data will be used if available from TANESCO. Otherwise, it should be calculated.

Data / Parameter	$\eta_{m,y}$
Unit	-
Description	Average net energy conversion efficiency of power unit m in year y
Source of data	TANESCO and default values as per Appendix 1 of "Tool to calculate the emission factor for an electricity system", version 04.0.0
Value(s) applied	See table below
Choice of data or Measurement methods and procedures	Data from the Tanzania grid company are used as available. Default values are used for plants where data are not available.
Purpose of data	Calculation of baseline emissions
Additional comment	Not applicable

Plants	Type of fuels	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	38.00%
AGR(TG)	Diesel & Industrial Oil	Open Cycle	39.50%
AGR(UB)	Diesel & Industrial Oil	Open Cycle	39.50%
UGP 2	Natural Gas	Open Cycle	37.00%
SYMB UB GP	Natural Gas	Open Cycle	39.50%
SYMB UB JET A	Diesel & Industrial Oil	Open Cycle	39.50%
SYMB (AR)	Diesel & Industrial Oil	Open Cycle	39.50%
SYMB (DD)	Diesel & Industrial Oil	Open Cycle	39.50%

Efficiency factor of AGR and SYMB plants are taken from Appendix 1 of the "Tool to calculate the emission factor for an electricity system" for plant built after 2000.

Data / Parameter	$EG_{m,y}$
Unit	MWh
Description	Net quantity of electricity generated and delivered to the grid by power unit m in year y
Source of data	TANESCO
Value(s) applied	See grid emission factor calculation spreadsheet
Choice of data or Measurement methods and procedures	As per "Tool to calculate the emission factor for an electricity system" method for Simple OM.
Purpose of data	Calculation of baseline emissions
Additional comment	Not applicable

Data / Parameter	$EG_{k,y}$
Unit	MWh
Description	Net quantity of electricity generated and delivered to the grid by power unit k in year y (by low-cost/must-run power plants)
Source of data	TANESCO
Value(s) applied	See grid emission factor calculation spread sheet

Choice of data or Measurement methods and procedures	As per "Tool to calculate the emission factor for an electricity system" method for Simple OM.
Purpose of data	Calculation of grid emission factor
Additional comment	Not applicable

CPA Category 2: CPAs supplying to a mini-grid (AMS I.F. Renewable electricity generation for captive use and mini-grid)

Data / Parameter	**$EF_{CO2,y}$**
Unit	tCO_2e/MWh
Description	CO_2 emission factor for displacement of electricity in the grid, the mini-grid and/or the captive power plant.
Source of data	Table I.F.1. of AMS-I.F.
Value(s) applied	0.8
Choice of data or Measurement methods and procedures	The portion of electricity supplied to mini-grids replaces electricity production through diesel generators that would have been used in the absence of the project activity. As per AMS-I.F, for a mini-grid system where all the generators use exclusively fuel oil and/or diesel fuel, an emission factor for a modern diesel generating unit of the relevant capacity operating at optimal load as given in Table I.F.1 can be used. The installed capacity is larger than 200 kW. Thus, the value of 0.8 tCO_2e/MWh is used. This is the emission factor for a modern diesel generating unit of capacity larger than 200 kW.
Purpose of data	Calculation of baseline emissions
Additional comment	Not applicable

For Ngombeni CPA:

Data / Parameter	**$MC_{Biomass}$**		
Unit	% of water		
Description	Moisture content of the biomass (wet basis)- for coconut wood		
Source of data	Power for Mafia Island: An IPP proposal utilising Renewable Energy, September 2006		
Value(s) applied			
	Section of the stem	**Oven dry density (kg/m^3)**	**Moisture content (% of total green weight)**
	Bottom	600	36
	Middle	400 – 599	50
	Top	250 – 399	70
Choice of data or Measurement methods and procedures	On-site measurements. The moisture content of biomass of homogenous quality shall be determined ex ante.		
Purpose of data	Parameter listed ex-ante as per methodology and PoA DD. This parameter is not used in emission calculations.		
Additional comment	Not applicable		

CPA Category 3: CPAs using both AMS I.D. and AMS I.F.

All parameters mentioned above for the category 1 and 2 are also applicable for the category 3.

In addition to the parameters of category 3, the following parameters are applicable to Ikondo CPA.

Data/parameter	**$EG_{BL,existing,y,grid}$**
Unit	MWh
Description	Estimated net electrical energy that would have been produced and supplied to grid by existing units
Source of data	Ikondo 80kW power plant records for years 2010-2015
Value(s) applied	69
Choice of data or measurement methods and procedures	The annual average actual power produced from 80 kW unit was calculated from the historic data from 2010-2015. Similarly, the estimated electricity generation from the 80 kW unit was calculated using standard operating hours and plant load factor. The design factor that only 28.5% of electricity generated would be exported to grid is applied. As per methodology, the maximum of the two values, i.e., $EG_{estimated,y}$ is considered for $EG_{BL,existing,y,grid}$.
Purpose of data	Calculation of baseline emissions
Additional comments	Not applicable

Data/parameter	**$EG_{BL,existing,y,MG}$**
Unit	MWh
Description	Estimated net electrical energy that would have been produced and supplied to a mini-grid by the existing units
Source of data	Ikondo 80kW power plant records for years 2010-2015
Value(s) applied	175
Choice of data or measurement methods and procedures	The annual average actual power produced from the 80 kW unit was calculated from the historic data from 2010-2015. Similarly, the estimated electricity generation from the 80 kW unit was calculated using standard operating hours and plant load factor. The design factor that only 71.5% of electricity generated would be exported to the mini-grid is applied. As per methodology, the maximum of the two values, i.e., $EG_{estimated,y}$ is considered for $EG_{BL,existing,y,MG}$.
Purpose of data	Calculation of baseline emissions
Additional comments	Not applicable

G.2. Data and parameters monitored

(Copy this table for each piece of data and parameter)

CPA Category1: CPAs supplying the national grid alone (AMS-I.D. Grid connected renewable electricity generation)

Data / Parameter	$EG_{actual,y}$/ $EG_{BL,y(Category1)}$
Unit	MWh/year
Description	Quantity of net electricity supplied to the national grid in year y.
Source of data	Measured by energy meters.
Value(s) applied	

CPA	**Power supplied to the grid (MWh/year)**		
	2014	**2015**	**2016**
Yovi	NA	123.452	3,647.630

Measurement methods and procedures	Measurements are taken using energy meters. Bidirectional energy meters are installed so that any eventual electricity supplied by the grid to the project or to the communities is not included in the ERs calculation. Measurement results are cross checked with records for sold / purchased electricity (e.g., invoices/receipts). The net electricity export/supplied to a grid is the difference between the measured quantities of the grid electricity export and the import. Cross check is done on net electricity supplied to a grid as the gross energy generation in the project activity power plant minus the auxiliary/station electricity consumption, technical losses and the electricity import from the grid to the project power plant measured at the grid interface/connection used for billing purposes.
Monitoring frequency	Continuous monitoring, hourly measurement and at least monthly recording. The data will be archived for two years after the crediting period.
QA/QC procedures	The device was calibrated and tested as per the instructions (schedules, procedures) for QA of the technology provider and EWURA's standard. There was strict compliance with the maintenance schedule recommended by the technology provider and EWURA. The quality control was ensured by EWURA's SSPA that mandates monthly readings, with rated error no greater than 0.5%. Quality control and assurance was achieved through a monthly check of the monitoring log sheet, which was signed by plant staff to acknowledge that the parameters are correct.
Purpose of data	Calculation of baseline emissions
Additional comment	Not applicable.

CPA Category 2: CPAs supplying to a mini-grid alone (AMS-I.F. Renewable electricity generation for captive use and mini-grid)

Data / Parameter	$EG_{BL,y}$
Unit	MWh/year
Description	Quantity of net electricity displaced in year y
Source of data	Measured by energy meters.
Value(s) applied	**To TANESCO mini-grid** **CPA** / **Power supplied to mini grid (MWh/year)** **2014** / **2015** / **2016** Mbinga: NA / 41.298 / 2,433.169 Ngombeni: NA / NA / 60 **To Isolated mini-grid** **CPA** / **Power supplied to mini grid (MWh/year)** **2014** / **2015** / **2016** Mbinga: NA / 1.969 / 35.376
Measurement methods and procedures	Measurements were taken using energy meters. In the case of electricity sold to a third party, measurement results are cross-checked with records of sold / purchased electricity (e.g., invoices/receipts). The net electricity displaced is the gross energy generation by the project activity power plant minus the auxiliary/station electricity consumption.
Monitoring frequency	Continuous monitoring, hourly measurement and at least monthly recording.

QA/QC procedures	The device was calibrated and tested by CPA implementer as per the EWURA's standard. There was strict compliance with the maintenance schedule recommended by the technology provider and EWURA. The quality control was ensured by EWURA's SPPA that mandates monthly readings, with rated error no greater than 0.5%. Quality control and assurance was achieved through a monthly check of the monitoring log sheet, which was signed by plant staff to acknowledge that the parameters are correct.
Purpose of data	Calculation of baseline emissions
Additional comment	The data will be archived for two years after the crediting period.

For Ngombeni CPA, the parameter mentioned below was additionally monitored

Data / Parameter	Biomass Consumption
Unit	Tonnes/year
Description	Quantity of biomass consumed in year y
Source of data	The fuel consumed by the power plant will be measured at the fuel delivery system or taken from the plant records and log books.
Value(s) applied	The biomass consumed during the monitoring period of Sep – Dec 2016:

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

Measurement methods and procedures	Use mass or volume based measurements. If more than one type of biomass fuel was consumed, each was monitored separately.
Monitoring frequency	The quantity of biomass was measured in batches.
QA/QC procedures	Quality control and assurance was achieved through a daily check of the monitoring log sheet, which was signed by plant staff to acknowledge that the parameters are correct. Cross-check of the measurements with an annual energy balance that was done based on purchased quantities (e.g., with sales/receipts) and stock changes. The consistency of measurements ex post was checked with annual data on energy generation, biomass used and the efficiency of energy generation as determined ex ante. Here the amount of biomass brought into the power plant area is considered to be consumed for power generation.
Purpose of data	Parameter listed as per methodology and PoA DD. This parameter is not used in the emission calculation.
Additional comment	The monitoring will be done by means of a daily log sheet, on which the daily parameters will be recorded.

Data / Parameter	$NCV_{Biomass}$
Unit	MJ/kg
Description	Net calorific value of biomass type k
Source of data	Lab reports
Value(s) applied	

Biomass	**Calorific Value (MJ/kg)**
Coconut husk	9.8[14]
Mulch	19.40
Bush Chips	18.70

[14] Default value - Table 1-13, Revised 1996 IPCC Guidelines for National GHG inventories

Measurement methods and procedures	Measurement in the laboratories according to relevant national/international standards. NCV was measured based on dry biomass. For the coconut husk, NCV based on IPCC 2006 standards was used.
Monitoring frequency	Determined once in the first year of using the biomass and the value is being used for the rest of the crediting period
QA/QC procedures	Consistency of the measurements were checked by comparing the measurement results with relevant data sources (e.g., values in the literature, values used in the national GHG inventory, etc.) and default values by the IPCC.
Purpose of data	Parameter listed as per methodology and PoA DD. This parameter is not used in the emission calculations
Additional comment	The data will be archived for two years after the crediting period.

CPA Category 3: CPAs supplying to both the national grid and the mini-grid (TANESCO/Isolated)

Data / Parameter	$EG_{actual,y}/EG_{BL,y(Category1)}$
Unit	MWh/year
Description	Quantity of net electricity supplied to the national grid in year y.
Source of data	Measured by energy meters.
Value(s) applied	

CPA	**Power supplied to grid (MWh/year)**		
	2014	**2015**	**2016**
Tulila[14]	NA	0	0
Ikondo	NA	NA	2

Measurement methods and procedures	Measurements were taken using energy meters. Bidirectional energy meters were installed so that any eventual electricity supplied by the grid to the project or to the communities is not included in the ER calculation. Measurement results are cross checked with records for sold/purchased electricity (e.g., invoices/receipts). The net electricity exported/supplied to a grid is the difference between the measured quantities of the grid electricity export and the import. The net electricity supplied to a grid are cross checked with the gross energy generation in the project activity power plant minus the auxiliary/station electricity consumption, technical losses and electricity import from the grid to the project power plant measured at the grid interface/connection used for billing purposes.
Monitoring frequency	Continuous monitoring, hourly measurement and at least monthly recording. The data will be archived for two years after the crediting period.
QA/QC procedures	The device was calibrated and/or tested as per the instructions (schedules, procedures) for QA of the technology provider and/or EWURA's standard. There was compliance with the maintenance schedule recommended by the technology provider and/or EWURA. The quality control was ensured by EWURA's SSPA that mandates monthly readings, with rated error no greater than 0.5%. Quality control and assurance was achieved through a monthly check of the monitoring log sheet, which was signed by plant staff to acknowledge that the parameters were correct.

[15] Currently, Tulila CPA supplying power only to Sonega mini-grid and national grid is expected to established by end of 2017. Therefore, during this monitoring period there is no power supplied to national grid.

Purpose of data	Calculation of baseline emissions
Additional comment	Not applicable.

Data / Parameter	$EG_{BL,y}$
Unit	MWh/year
Description	Quantity of net electricity supplied to the mini-grid in year y.
Source of data	Measured by energy meters.
Value(s) applied	**To the TANESCO mini-grid** **CPA** | **Power supplied to mini grid (MWh/year)** | **2014** | **2015** | **2016** Tulila | NA | 508 | 15,448.490 **To the Isolated mini-grid** **CPA** | **Power supplied to mini grid (MWh/year)** | **2014** | **2015** | **2016** Ikondo | NA | 0 | 50
Measurement methods and procedures	Measurements were taken using energy meters. In the case of electricity sold to a third party, measurement results were cross-checked with records of sold/purchased electricity (e.g., invoices/receipts). The net electricity displaced was the gross energy generation by the project activity power plant minus the auxiliary/station electricity consumption.
Monitoring frequency	Continuous monitoring, hourly measurement and at least monthly recording.
QA/QC procedures	The device was calibrated and tested by the CPA implementer as per the instructions (schedules, procedures) for QA of the technology provider and/or EWURA's standard. There were compliance with the maintenance schedule recommended by the technology provider and/or EWURA. The quality control was ensured by EWURA's SPPA that mandates monthly readings, with rated error no greater than 0.5%. Quality control and assurance were achieved through a monthly check of the monitoring log sheet, which was signed by plant staff to acknowledge that the parameters are correct.
Purpose of data	Calculation of baseline emissions
Additional comment	The data will be archived for two years after the crediting period.

G.3. Implementation of specific-case CPA level sampling plan

Not applicable.

SECTION H. Calculation of GHG emission reductions or net GHG removals by sinks

H.1. Calculation of baseline emissions or baseline net GHG removals by sinks

CPA Category 1: For electricity supplied to the national grid (AMS-I.D. Grid connected renewable electricity generation)

For the part of electricity generated that was fed to the national grid, the CPA uses the AMS-I.D. (Version 17) and relevant equations.

Yovi:

Yovi small power plant is a green field project and supplies power to national grid.

Baseline emissions

As the Yovi CPA is a new power plant at the site where there was no renewable energy power plant operating prior to the implementation of the project activity (greenfield plant), the baseline emissions are calculated as follows:

$BE_{y,(Category1)} = EG_{BL,y,(Catogory1)} * EF_{CO2,grid,y}$

Where:

$BE_{y,(Category1)}$	=	Baseline emissions in year *y* (tCO_2) for electricity supplied to the national grid
$EG_{BL,y(Category\ 1)}$	=	Quantity of net electricity supplied to the national grid as a result of the implementation of the CDM project activity in year y (MWh)
$EF_{CO2,grid,y}$	=	CO_2 emission factor of the grid in year y (tCO_2/MWh)

The details of net electricity exported to the national grid is given in table 15.

Table 20: Net electricity exported to grid from Yovi

Time period		Electricity exported to grid	Electricity imported from grid	Net electricity exported $EG_{facility,y}$
From	To	(MWh)	(MWh)	(MWh)
		A	B	C=A-B
01/12/2015	31/12/2015	123.453	0.001	123.452
01/01/2016	31/01/2016	238.767	0.001	238.766
01/02/2016	29/02/2016	429.335	0.000	429.335
01/03/2016	31/03/2016	148.079	0.000	148.079
01/04/2016	30/04/2016	435.862	0.000	435.862
01/05/2016	31/05/2016	551.941	0.000	551.941
01/06/2016	30/06/2016	107.414	0.001	107.413
01/07/2016	31/07/2016	0.000	0.000	0.000
01/08/2016	31/08/2016	123.991	0.000	123.991
01/09/2016	30/09/2016	556.200	0.000	556.200
01/10/2016	31/10/2016	200.954	0.000	200.954
01/11/2016	30/11/2016	446.108	0.005	446.103

Time period		Electricity exported to grid	Electricity imported from grid	Net electricity exported $EG_{facility,y}$
From	To	(MWh)	(MWh)	(MWh)
		A	B	C=A-B
01/12/2016	31/12/2016	408.986	0.000	408.986
Total		**3,771.090**	**0.008**	**3,771.000**

CPA Category 2: For the CPAs supplying to a mini-grid (AMS-I.F. Renewable electricity generation for captive use and mini-grid)

For the electricity fed into the isolated/TANESCO mini-grids, the CPA should uses the methodology, AMS-I.F. (Version 02) and the relevant equations. Moreover, all the CPAs under this PoA are new power plants (greenfield projects).

Baseline emissions

For new power plants at the site where there was no renewable energy power plant operating prior to the implementation of the project activity (greenfield plant):

$BE_{y(Category2)} = EG_{BL,y(Category2)} \times EF_{CO2,y}$

Where:

$BE_{y(Category2)}$ = Baseline emissions in year *y* (tCO_2) for mini-grids

$EG_{BL,y(Category2)}$ = Quantity of net electricity supplied to the mini-grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{CO2,y}$ = CO_2 emission factor (tCO_2/MWh)

For the mini-grids, the emission factor is as of a modern diesel generating unit of the relevant capacity operating at optimal load as given in Table I.F.1. of AMS-I.F.

Mbinga:

Mbinga CPA is a greenfield power plant and supplies power to both TANESCO mini grid and isolated mini grid (villages).

The details of net power supplied to TANESCO mini grid is given in below table,

Table 21: Net electricity exported to mini-grid from Mbinga

Time period		Electricity supplied to TANESCO mini-grid	Electricity supplied to isolated mini grid (MWh)	Electricity imported from TANESCO mini-grid	Net electricity supplied $EG_{facility,y}$
From	To	(MWh)	(MWh)	(MWh)	(MWh)
		A	B	C	D=A+B-C
01/12/2015	31/12/2015	41.298	1.969	0.000	43.267
01/01/2016	31/01/2016	9.540	1.826	0.000	11.366
01/02/2016	29/02/2016	214.581	2.347	0.000	216.928
01/03/2016	31/03/2016	213.158	2.463	0.000	215.621
01/04/2016	30/04/2016	267.223	2.665	0.000	269.888
01/05/2016	31/05/2016	275.988	2.637	0.000	278.625
01/06/2016	30/06/2016	271.107	2.944	0.000	274.051
01/07/2016	31/07/2016	276.532	3.407	0.000	279.939
01/08/2016	31/08/2016	276.098	3.134	0.000	279.232
01/09/2016	30/09/2016	223.490	3.353	0.000	226.843
01/10/2016	31/10/2016	158.029	4.063	0.000	162.092
01/11/2016	30/11/2016	109.975	3.435	0.000	113.410
01/12/2016	31/12/2016	137.448	3.102	0.000	140.550
Total		**2,474.467**	**37.345**	**0.000**	**2,511.000**

Ngombeni:

Ngombeni CPA is a greenfield biomass power plant and supplies power to the TANESCO mini grid. The details of net power supplied to TANESCO mini grid is given in table 22.

Table 22: Net electricity exported to mini-grid from Ngombeni

Time period		Electricity supplied to TANESCO mini-grid	Electricity imported from TANESCO mini grid	Net electricity supplied $EG_{facility,y}$
From	To	(MWh)	(MWh)	(MWh)
		A	B	C=A-B
01/09/2016	30/09/2016	54.090	12.480	41.610
01/10/2016	31/10/2016	26.040	8.600	17.440
01/11/2016	30/11/2016	16.580	8.310	8.270
01/12/2016	31/12/2016	0.000	6.950	-6.950
Total		**96.710**	**36.340**	**60.000**

CPA Category 3: For CPAs supplying to both the national grid and the mini-grid (AMS-I.D. and AMS-I.F.)

All the procedures for baseline estimations of Category 1 and 2 (greenfield projects) are also applicable to Category 3.

Tulila:

Tulila hydroelectric power plant is a green field project and supplies power to the national grid as well as to the mini-grid. Currently, Tulila power plant is supplying power only to the mini-grid and it is expected to connect to the national grid by end of 2017[16] when the national grid extends to that location. The details of the net electricity supplied to TANESCO mini grid is given in the table 23.

Table 23: Net electricity exported to the mini-grid from Tulila

Time period		Electricity supplied to TANESCO mini-grid	Electricity imported from TANESCO mini-grid	Net electricity supplied $EG_{facility,y}$
From	To	(MWh)	(MWh)	(MWh)
		A	B	C=A-B
01/12/2015	31/12/2015	508.000	0.000	508.000
01/01/2016	31/01/2016	1,181.570	0.000	1,181.570
01/02/2016	29/02/2016	1,206.580	0.000	1,206.580
01/03/2016	31/03/2016	1,944.840	0.000	1,944.840

[16] Tulila CPA-DD, Version 2 dated 26/10/2015

Time period		Electricity supplied to TANESCO mini-grid	Electricity imported from TANESCO mini-grid	Net electricity supplied $EG_{facility,y}$
From	To	(MWh)	(MWh)	(MWh)
		A	B	C=A-B
01/04/2016	30/04/2016	1,869.330	0.000	1,869.330
01/05/2016	31/05/2016	2,064.070	0.000	2,064.070
01/06/2016	30/06/2016	1,938.450	0.000	1,938.450
01/07/2016	31/07/2016	1,365.960	0.000	1,365.960
01/08/2016	31/08/2016	1,262.690	0.000	1,262.690
01/09/2016	30/09/2016	928.010	0.000	928.010
01/10/2016	31/10/2016	601.750	0.000	601.750
01/11/2016	30/11/2016	266.890	0.000	266.890
01/12/2016	31/12/2016	818.350	0.000	818.350
Total		**15,956.490**	**0.000**	**15,956.000**

Ikondo:

Ikondo micro hydro power plant is a capacity addition project to the existing 80kW micro hydro power plant and supplies power to the national grid as well as to the mini-grid.

As the CPA is a renewable energy based capacity addition to an existing renewable energy power plant, the baseline emissions are calculated as per "*For capacity addition with renewable energy units other than photovoltaic, wind plants"* approach provided in the registered PoA DD, page 42.

a) For power supplied to the TANESCO grid:

The baseline emissions from the electricity supply to the grid are calculated as

$$BE_{Add,co2,y,grid}=(EG_{PJ,add,y,grid} - EG_{BL,exiting,y,grid}) * EF_{co2}$$

Where,

$EG_{PJ,add,y,grid}$ = The total net electrical energy supplied to a grid in year y by all units, existing and new project units; (MWh)

$EG_{BL,exiting,y,grid}$ = The estimated net electrical energy that would have been produced and supplied to a grid by existing units (installed before the project activity) in year y in the absence of the project activity; (MWh)

Where,

$$EG_{BL,existing,y,grid} = MAX\ (EG_{actual,y}\ or\ EG_{estimated,y})\ until\ DATE_{baselinecapacityaddition}$$

and

$EG_{BL,existing,y,grid}$ *is 0 on/after* $DATE_{baselinecapacityaddition}$

Where,

$EG_{actual,y}$ = The actual, measured net electrical energy produced and supplied to the grid by the existing units in year y (MWh)

$EG_{estimated,y}$ = The estimated net electrical energy produced and supplied to the grid by the existing units in year y (MWh)

The annual average actual power produced from 80 kW unit was calculated using the historic data from 2010-2015. Similarly, the estimated electricity generation from the 80 kW unit was calculated using the standard operating hours and the plant load factor. The values of power supply considering the grid export is given below:

Parameter	Total estimated (MWh)	Percentage supply to grid	Value to be considered (MWh)
$EG_{actual,y}$	79	28.5	22
$EG_{estimated,y}$	245		69

As per methodology, the maximum of the two values, i.e., $EG_{estimated,y}$ is considered for $EG_{BL,existing,y,grid}$= 69 MWh.

The existing 80 kW unit was installed in 2005. Considering the standard operating life of 25 years for hydro power plants, the $DATE_{baselinecapacityaddition}$ for existing 80 kW plant is 31/12/2024.

During the monitoring period, a separate energy meter was not installed to measure the power generation from the 80 kW unit. So as conservative measure, the estimated power supply from 80 kW unit to the grid, i.e., 69 MWh as per CPA DD is considered.

Table 24: Net electricity exported to grid from Ikondo

Time period		Electricity supplied to TANESCO mini-grid	Electricity imported from TANESCO mini grid	Net electricity supplied $EG_{facility,y}$
From	To	(MWh)	(MWh)	(MWh)
		A	B	C=A-B
01/11/2016	30/11/2016	6.610	5.750[17]	0.860
01/12/2016	31/12/2016	7.750	5.750	2.000
Total		**14.360**	**11.500**	**2.000**

b) For power supplied to the mini-grid

[17] 69 MWh for 12 months. For one month = 69/12 = 5.75 MWh

The baseline emissions from the electricity supplied to mini-grid are calculated as,
$BE_{Add,co2,y,MG} = \left(EG_{PJ,add,y,MG} - EG_{BL,exiting,y,MG}\right) * EF_{co2}$

Where,

$EG_{PJ,add,y,MG}$ = The total net electrical energy supplied to a mini-grid in year *y* by all units, existing and new project units; (MWh)

$EG_{BL,exiting,y,MG}$ = The estimated net electrical energy that would have been produced and supplied to a mini-grid by existing units (installed before the project activity) in year *y* in the absence of the project activity; (MWh)

Where,

$EG_{BL,existing,y,MG} = MAX\left(EG_{actual,y}\ or\ EG_{estimated,y}\right)\ until\ DATE_{baselinecapacityaddition}$

and

$EG_{BL,existing,y,MG}$ is 0 on/after $DATE_{baselinecapacityaddition}$

Where,

$EG_{actual,y}$ = The actual, measured net electrical energy produced and supplied to the mini-grid by the existing units in year *y* (MWh)

$EG_{estimated,y}$ = The estimated net electrical energy produced and supplied to the mini-grid by the existing units in year *y* (MWh)

The annual average actual power produced from 80 kW unit was calculated from the historic data from 2010-2015. Similarly, the estimated electricity generation from the 80 kW unit was calculated using standard operating hours and plant load factor. The values of power supply considering mini-grid export are given below:

Parameter	Total estimated (MWh)	Percentage supply to mini-grid	Value be considered (MWh)
$EG_{actual,y}$	79	71.50	57
$EG_{estimated,y}$	245		175

As per methodology, the maximum of the two values, i.e., $EG_{estimated,y}$ is considered for $EG_{BL,existing,y,MG}$ = 175 MWh.

During the monitoring period, a separate energy meter was not installed to measure the power generation from the 80 kW unit. So as conservative measure, the estimated power supply from 80 kW unit to mini-grid i.e., 175 MWh as per CPA DD is considered.

The details of net electricity exported to mini-grid is given in the table 25.

Table 25: Net electricity exported to mini-grid from Ikondo

Time period		Electricity exported to mini-grid	Electricity generation from 80 kW unit	Net electricity generation $EG_{facility,y}$
From	To	(MWh)	(MWh)	(MWh)
		A	H	C=A - H
14/10/2016	31/10/2016	24.845	7.292	17.553
01/11/2016	30/11/2016	32.949	14.583	18.366
01/12/2016	31/12/2016	28.841	14.583	14.257
Total		**86.635**	**36.458**	**50.000**

The baseline emissions for each of the CPA based on the supply to grid or mini-grid is summarised as in table 26.

Table 26. Baseline Emission

Time period		Net electricity generation $EG_{facility,y}$	Grid emission factor	Baseline Emission BE_y
From	To	(MWh)	(tCO_2/MWh)	(tCO_2)
		C	D	E = C*D
Mbinga				
01/12/2015	31/12/2016	2,511	0.8	2,009
Yovi				
01/12/2015	31/12/2016	3,771	0.53	1,998
Tulila				
01/12/2015	31/12/2016	15,957	0.8	12,765
Ngombeni				
01/09/2016	31/12/2016	60	0.8	48
Ikondo				
14/10/2016	31/12/2016	2	0.53	1
14/10/2016	31/12/2016	50	0.8	40

Total baseline emissions	16,861

H.2. Calculation of project emissions or actual net GHG removals by sinks

All the CPAs generating power from hydro sources are run-of-the-river type power projects. Hence, the project emission is considered as zero.

$PE_{y(Category1)} = 0$

There is no project emissions ($PE_{y(Category2)}$) from the operation of Ngombeni biomass power project. Hence, it is considered as zero.

$PE_{y(Category2)} = 0$

H.3. Calculation of leakage

(i) CPA Category 1: For electricity supplied to the national grid (AMS-I.D. Grid connected renewable electricity generation)

As per AMS-I.D., Version 17, leakage has to be considered, if there is any energy generating equipment transfer from another activity. The Yovi CPA under this PoA did not involve any transfer of equipment from another project activity. This CPA uses only the newly procured equipment. Hence, the leakage emission (LE_y) due to equipment transfer was not considered for the CPA.

$LE_{y(Category1)} = 0$

(ii) CPA Category 2: For CPAs supplying a mini-grid (AMS-I.F. Renewable electricity generation for captive use and mini-grid)

As per AMS-I.F., leakage has to be considered if there is any energy generating equipment transfer from another activity. The Mbinga CPA under this PoA did not involve any transfer of equipment from another project activity. Hence, the leakage emission was not considered for the CPAs under this PoA.

For Ngombeni biomass power project:

African industries face several challenges including poor access to funding, capital, credit, technical capabilities, etc. For start-up industries, buying new equipment may be a choice but it is just not a practical reality in Africa. To minimize the financial risks and increase the cash flow, industries are forced to purchase used equipment, which is readily available than the new ones. This is the most common practice prevailing among the African countries[18].

The power plant equipment for this project was purchased from salvaged unit in Mauritius[19]. This did not affect the operation of any existing plant. It is justified that there was no transfer of equipment from other ongoing activity. Hence, no leakage is considered.

$LE_{y(Category2)} = 0$

(iii) CPA Category 3: For CPAs supplying both national grid and mini-grid (AMS-I.D. and AMS-I.F.)

[18] http://constructionreviewonline.com/2016/07/new-or-used-equipment/
[19] Omnicane Milling Operations Limited: Closure of Union St-Aubin Sugar Mill - Environmental Impact Assessment (June 2011)

As per AMS-I.D. and AMS-I.F., leakage has to be considered, if there is any energy generating equipment transfer from another activity. The CPAs (Mapembasi, Tulila, Maguta and Ikondo) under this PoA were not involved any transfer of equipment from another activity. All systems have comprised only newly procured equipment. Hence, the leakage emission due to equipment transfer was not considered for the CPAs under this PoA.

$LE_{y(Category3)} = 0$

(iv) Leakage due to biomass fuel usage

As per "Definition of renewable biomass", EB 23, Annex 18, the biomass fuel used in this project are "biomass residues" as the fuel used is coconut tree wastes that have outlived their economic life.

Methodological tool: leakage in biomass small-scale project activities, version 04, EB 83 states only one emission source for biomass residues usage which is the "competing use of biomass". It states that "*The project participant shall evaluate ex ante if there is a surplus of the biomass in the region of the project activity, which is not utilised. If it is demonstrated (e.g., using published literature, official reports, surveys, etc.) at the beginning of each crediting period that the quantity of available biomass in the region (e.g., 50 km radius), is at least 25% larger than the quantity of biomass that is utilised including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions.*"

The availability of biomass in Mafia Island is calculated based on the data provided in Section 6. Sustainable biomass of report "Power for Mafia Island - An IPP proposal utilising Renewable Energy". The details are listed as below:

A. Annual biomass requirement	**Value**	**Unit**	**Source**
Annual power generation	15,023	MWh	ER calculation
Biomass required per kWh generation	1.3	kg of biomass	Weblink[20]
Annual biomass required	19,530,420	kg of biomass	
B. Biomass availability in Mafia island			
Total coconut trees	150,000	Nos	Power plant proposal
Average weight of tree (air dried)	1,640	kg	Power plant proposal
Total available biomass	246,000,000	kg	
Biomass availability for power generation	12.60	years	
C. Biomass required for 4 years of operation alone (before yield from energy plantations)			
Biomass requirement	78,121,680	kg	
Percentage of excess biomass available	215	%	

[20] http://www.bioenergyindia.in/attachment/rura-energy-from-biomass.pdf

The above estimation shows that there is sufficient biomass available in the Mafia Island to run the Ngombeni power plant for 12.6 years. However, it is also to be noted that the project participant plans to go for energy plantations in the areas where the old coconut trees are cut. The energy plantation will start yielding after 4 years. With such a scenario, it can be clearly seen that the excess biomass available in Mafia Island is around 215%, which is clearly above the 25%, the quantity required by CDM. Hence, there is no leakage calculated.

When the project starts utilising the biomass from the energy plantations, then the project emission and leakages shall be calculated as per the methodological tool for "Project and leakage emissions from biomass", as applicable to project conditions.

H.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Specific-case CPA reference number	Baseline emissions or baseline net GHG removals by sinks (tCO_2e)	Project emissions or actual net GHG removals by sinks (tCO_2e)	Leakage (tCO_2e)	GHG emission reductions or net GHG removals by sinks (tCO_2e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
9904-0001	0	0	0	0	0	0
9904-0002	0	0	0	0	0	0
9904-0003	2,009	0	0	0	2,009	2,009
9904-0004	1,998	0	0	0	1,998	1,998
9904-0005	12,765	0	0	0	12,765	12,765
9904-0006	0	0	0	0	0	0
9904-0007	48	0	0	0	48	48
9904-0008	41	0	0	0	41	41
Total	**16,861**	**0**	**0**	**0**	**16,861**	**16,861**

H.5. Comparison of GHG emission reductions or net GHG removals by sinks with estimates in the included CPA-DD(s)

Specific-case CPA reference number	Value estimated in exante calculation in the included CPA-DD(s)	Actual values achieved by the specific-case CPA(s) during this monitoring period
9904-0001	56,642	0
9904-0002	24,668	0

9904-0003	5,190	2,009
9904-0004	12,633	1,998
9904-0005	25,686	12,765
9904-0006	1,076	0
9904-0007	4,006	48
9904-0008	354	41
Total	**130,255**	**16,861**

H.6. Remarks on difference from the estimated value in the included CPA-DD(s)

The overall CER generated during the reported monitoring period is 87% less than the estimated CERs from the registered CPAs.

Appendix 1. Contact information of coordinating/managing entity and/or responsible persons/entities

Coordinating/managing entity and/or responsible person/entity	☒ Coordinating/managing entity ☐ Person/entity responsible for completing the CDM-MR-FORM
Organization name	Rural Energy Agency (REA)
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Coordinating/managing entity and/or responsible person/entity	☐ Coordinating/managing entity ☐ Person/entity responsible for completing the CDM-MR-FORM
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Coordinating/managing entity and/or responsible person/entity	☐ Coordinating/managing entity ☐ Person/entity responsible for completing the CDM-MR-FORM
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CPA implementer and/or responsible person/ entity	☒ CPA implementer(s) ☐ Responsible person/ entity for completing the CDM-SSC-CPA-DD-FORM
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Document information

Version	*Date*	*Description*
01.0	1 April 2015	Initial publication.

Decision Class: Regulatory
Document Type: Form
Business Function: Issuance
Keywords: monitoring report, programme of activities