



**Monitoring report form for CDM programme of activities
(Version 03.0)**

MONITORING REPORT		
Title of the PoA	Guacamaya Small Scale Hydropower Programme of Activities	
UNFCCC reference number of the PoA	8950	
Version numbers of the PoA-DD applicable to this monitoring report	7	
Version number of this monitoring report	3.0	
Completion date of this monitoring report	30/12/2019	
Monitoring period number	2	
Duration of this monitoring period	01/05/2017 – 31/08/2019 (including both dates)	
Monitoring report number for this monitoring period	1	
Coordinating/managing entity	Anaconda Carbon S.A.	
Host Parties	Host Party of the PoA	Is this the host Party of a CPA covered in this monitoring report? (yes/no)
	Honduras	Yes
	Nicaragua	No
	Costa Rica	No
Applied methodologies and standardized baselines	AMS- I.D., version 17- Grid connected renewable electricity generation.	
Sectoral scopes	1	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by all CPAs covered in this monitoring report in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	NA	68,459
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the CPA-DDs for the CPAs covered in this monitoring report	94,967	

PART I Monitoring of programme of activities (PoA)

SECTION A. Description of PoA

A.1. General description of PoA

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The Guacamaya Small Hydropower Programme of Activities supports the development of new small-scale hydropower projects in Honduras, Nicaragua and Costa Rica that supply electricity to the respective national grid. Each CPA under this PoA has a combined installed capacity of no more than 15 MW, the threshold for small-scale CDM projects. The PoA is a voluntary action being coordinated and managed by Anaconda Carbon S.A., which works closely with the developers of the hydropower plants and other organizations active in the hydropower sector in the host countries to facilitate the development of new power plants and their inclusion in this PoA.

A.1.1. Corresponding generic component project activities (CPAs)

Title and reference number of the corresponding generic CPA	Version of the PoA-DD	Sectoral scopes	Applied methodologies and standardized baselines
Title: "CPA Design Document 8950-####"	7	1	AMS- I.D., version 17- Grid connected renewable electricity generation.

A.1.2. CPAs included in the PoA

Title and UNFCCC reference number of the CPA	Version of the PoA-DD	Title and reference number of the corresponding generic CPA	Crediting period type and duration	Covered in this monitoring report? (yes/no)
San Alejo Hydroelectric Project 8950-0001	7	Title: "CPA Design Document 8950-####"	7 years twice renewable 01 June 2015 - 31 May 2022	No
Zinguizapa Small – Scale Hydropower Project 8950-0002	7	Title: "CPA Design Document 8950-####"	7 years twice renewable 28 June 2016 - 27 June 2023	Yes
Puringla Sazagua Small Scale Hydropower Project 8950-0003	7	Title: "CPA Design Document 8950-####"	7 years twice renewable 28 June 2016 - 27 June 2023	Yes

A.2. Coordinating/managing entity

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Anaconda Carbon S.A.

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SECTION B. Implementation of PoA**B.1. Description of implemented PoA**

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One monitoring report is prepared for the PoA.

Each CPA under this PoA has a combined installed capacity of no more than 15 MW, the threshold for small-scale CDM projects and is located in the project boundary of the PoA (Honduras, Nicaragua and Costa Rica).

The water from the river is to be turbinated and then generates electricity that is distributed to the national electrical grid of the host country.

The managing entity, Anaconda Carbon S.A. maintains an electronic database with the following information for each CPA subscribing to the PoA, and in line with the Operational Manual developed as per requirements of EB 70 annex 5, following features will be checked:

(a) A clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies;

The managing entity (CME) Anaconda Carbon S.A. has managed the relevant activities related to the registration and operation of the PoA. The competency check of any proposed new CPA is conducted by the CME in order to ensure that all eligibility criteria are met for inclusion into the PoA. The CME is also in charge of preparation of relevant reports required of monitoring and inclusion of CPAs.

(b) Records of arrangements for training and capacity development for personnel;

The project operators are responsible for the day to day activities of the CPA. The CME coordinates with the project operators which are on site for data monitoring, recording and assurance.

The CME is responsible for the preparation of the CDM documentation and to support the project owners during verifications and inclusions.

(c) Procedures for technical review of inclusion of CPAs;

A technical review process is undergone by the CME of all CPAs that are to be included in the PoA. Monitoring procedures, eligibility criteria, data collection are all reviewed to ensure conformity with PoA requirements.

(d) A procedure to avoid double counting (e.g. to avoid the case of including a new CPA that has already been registered either as a CDM project activity or a CPA of other PoA

A thorough due diligence of the project owners is undergone prior to inclusion in order to make certain that the project activity has not been included in another PoA or as a CDM project.

(e) Records and documentation control process for each CPA under the PoA;

The project operators provide the CME with electrical generation data periodically, as well as other parameters that are included in the monitoring plan. Each CPA has a defined contact person with the CME which is in charge of information gathering and sharing. Activities such as meter calibration are responsibility of the project owner.

(f) Measures for continuous improvements of the PoA management system;

As CME, Anaconda Carbon is committed to review and improve the PoA management system based on experiences in inclusions, monitoring and verifications. Overall the CME is satisfied with the implementation of the management system thus far.

There have been no events with any CPAs requesting emission reductions that affect the applicability of the methodology.

It should be noted that there has been no sampling of CPAs in this monitoring report, nor is there any sampling contemplated in the PoA Design.

B.2. Post-registration changes to PoA

B.2.1. Corrections

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NA

B.2.2. Inclusion of monitoring plan

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NA

B.2.3. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

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NA

B.2.4. Changes to programme design

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NA

B.2.5. Changes specific to afforestation or reforestation activities

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NA

PART II Monitoring of CPAs

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SECTION C. Implementation of CPAs

C.1. Description of implemented CPAs

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8950-0002:

The CPA is a run of river hydropower plant; it involves the construction of the intake structure, the water conveyance system and the powerhouse. The plant conforms to the NREL definition of run-of-the-river because it does not have a reservoir to store water and thus relies on the natural water flow of the river, greatly reducing the environmental impact of the site.

The turbine installed capacity would be of 3.276 MW generated from one Pelton Turbine that will produce an estimated 18,480 MWh annually. The generator installed capacity is of 2.899MW. A transmission line connects the powerhouse to a substation located in the community of El Volcan, in the Department of Comayagua This electricity would be supplied to ENEE (Honduran National Electricity Company) and displace electricity that is otherwise produced by coal and fossil fuels.

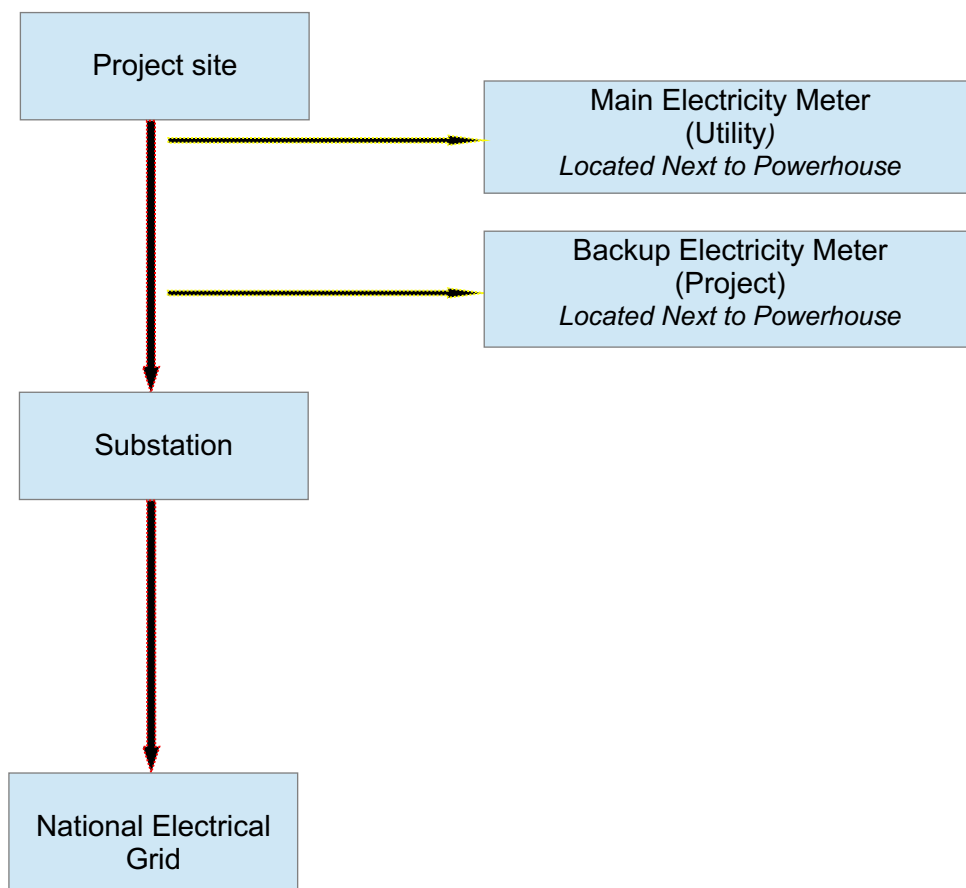
The construction includes: a bypass dam, conduction and pressure pipelines, a powerhouse with a control room, and transmission line that leads to the substation which then feeds electricity to the "Sistema Interconectado Nacional" of Honduras, (National Interconnected System) which is operated by ENEE. Water discharged from the powerhouse goes through an energy dissipation system before re-entering the river. All

of the electricity produced is measured on site with SCADA equipment and at the substation. The operational lifetime is expected to be of 30 years.

Below is a table with key dates for project development:

Milestone	Date
Order of the electromechanical equipment	October 27, 2011
Preliminary civil works	December 10, 2012
Financial Closure with bank	March 31, 2013

Below a is a line diagram describing the location of the electrical generation metering equipment:



8950-0003:

The CPA is a run of river hydropower plant; it involves the construction of the intake structure, the water conveyance system and the powerhouse. The plant conforms to the NREL definition of run-of-the-river because it does not have a reservoir to store water and thus relies on the natural water flow of the river, greatly reducing the environmental impact of the site. After the water is diverted from the Puringla and Sazagua rivers, it goes through three vertical axis Francis turbines and is subsequently discharged to the Puringla river, which later connects to the Sazagua river.

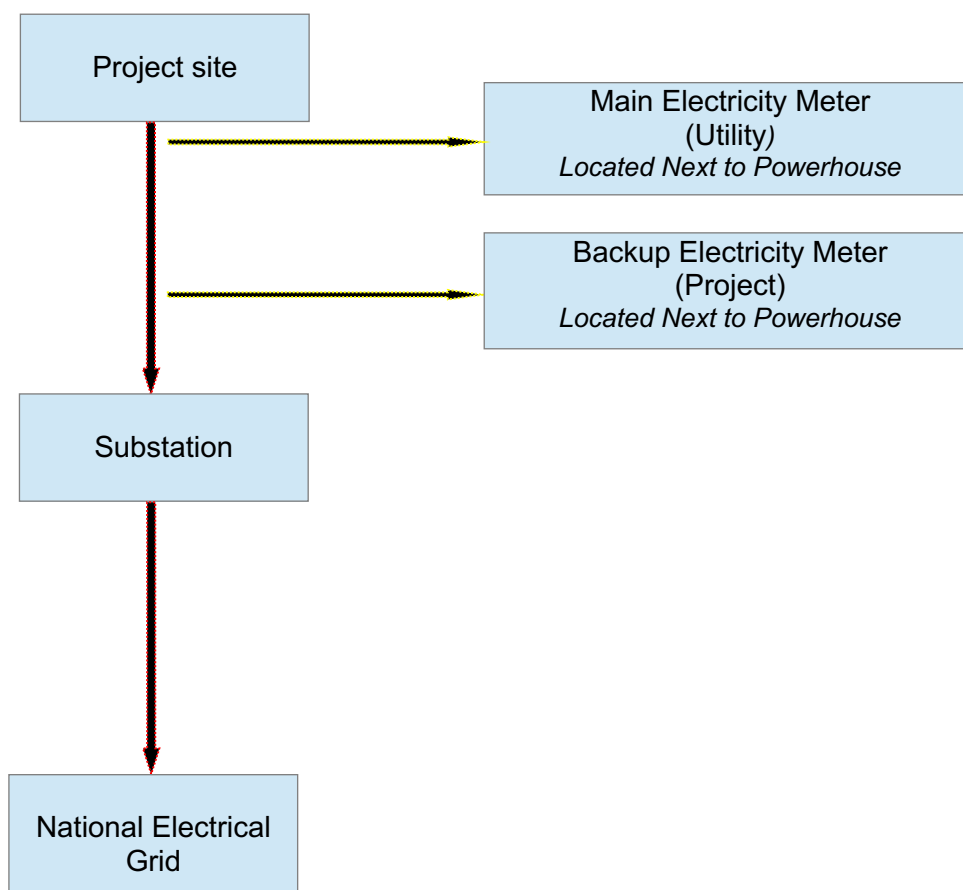
The installed capacity consists of three Francis turbines with individual capacity of 3.383 MW and three generators of 3.315 MW, totaling an installed capacity of 9.945 MW that are estimated to produce 46,900 MWh annually. This electricity is supplied to ENEE (Honduran National Electricity Company) and displace electricity that is otherwise produced by coal and fossil fuels. This electricity is supplied to the Honduran national grid via a 10 km long transmission line that is located near the city of Siguatepeque.

The construction includes: a bypass dam, conduction and pressure pipelines, a powerhouse with a control room, and transmission line. The operational lifetime is expected to be of 30 years.

Below is a table with key dates for project development:

Milestone	Date
Order of the electromechanical equipment	June 18, 2013
Preliminary civil works	October 11, 2012
Financial Closure with bank	September 28, 2012

Below a is a line diagram describing the location of the electrical generation metering equipment:



C.2. Location of CPAs

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8950-0002:

The project is located in the Singuizapa Village near the Municipalities of Cedros and Vallecillos in the Francisco Morazán Department, Honduras, specifically in the Zinguizapa River.

	Longitude	Latitude
Diversion Dam	-87.33308459814236	14.444683200681967
Powerhouse	-87.35398115540231	14.457961837948297

Below a map of the location of the project and the host country:



Below is a more detailed map with the project location within the host country:



8950-0003:

The project activity is located in the Municipality of Santiago de Puringla at the La Paz Department Honduras. More specifically in the confluence of the Puringla and Sazagua Rivers.

	Longitude	Latitude
Diversion Dam	-87.949725	14.370969
Powerhouse	-87.954713	14.383733

Below a map of the location of the project and the host country:



C.3. Post-registration changes to CPAs

C.3.1. Temporary deviations from the monitoring plans in the included CPA-DDs, applied methodologies, standardized baselines or other methodological regulatory documents

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NA

C.3.2. Corrections

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During the last verification CPA 0003 and CPA 0002 have had issuance track post registration changes approved to the CPA DDs. The CPA DD corrections are concerning the following matters:

CPA 0002:

- Installed capacity specifications
- Electricity meter locations
- Meter calibration frequency

CPA 0003:

- Installed capacity specifications
- Electricity meter locations
- Meter calibration frequency

C.3.3. Changes to the start date of the crediting period

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NA

C.3.4. Inclusion of monitoring plan

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NA

C.3.5. Permanent changes to the included monitoring plans, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

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During the last verification CPA 0003 and CPA 0002 have had issuance track post registration changes approved to the CPA DDs. The CPA DD corrections are concerning the following matters:

CPA 0002:

- Installed capacity specifications
- Electricity meter locations
- Meter calibration frequency

CPA 0003:

- Installed capacity specifications
- Electricity meter locations
- Meter calibration frequency

C.3.6. Changes to project design

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NA

C.3.7. Changes specific to afforestation or reforestation CPA

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NA

SECTION D. Description of monitoring system of CPAs

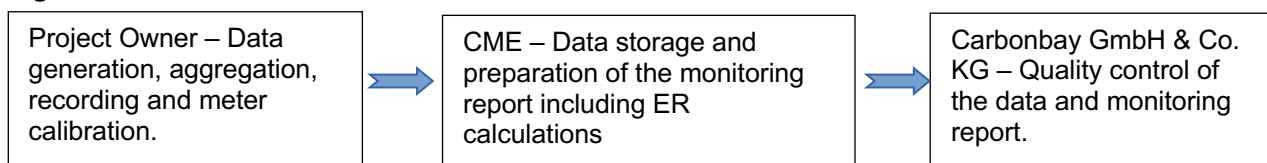
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Anaconda Carbon S.A. has developed a Management Plan, which is applied during verification activities to assure correctness of data management.

Monitoring consists of metering the electricity generated by the renewable technology.

Management Structure and Responsibilities Overall responsibility for daily monitoring and reporting lies with the project owner. The manager of the proposed project is responsible for the review of the monthly reported results/data and for checking the calibration certificates. The data is sent to the CME for storage and preparation of the monitoring report, the quality control and approval is performed by Carbonbay GmbH & Co. KG.

Organizational Chart:



Data Collection: The electricity supplied to the grid by the project activity is measured by calibrated electricity meters which are located at the project site, in the substation, or in the point of connection to the grid. Any electricity import is discounted to calculate the net electricity supplied to the grid. The parameter is monitored at the project site and crosschecked with the invoices of electricity sold. Data is monitored continuously, measured hourly and recorded monthly as required by the applicable methodology.

Data Recording: All data collected is recorded monthly into an electronic spreadsheet.

Data Calibration: All measurements are conducted with calibrated measurement equipment (electricity meters have a class of at least 0.15). Device calibration is carried out periodically in accordance with manufacturer specifications where available. A calibration is to take place in case one of the meters is not functioning properly, which is deemed the case if there is more than a 1% difference in readings between the project meter and the utility meter. Calibration interval will not exceed 3 years, as per CDM standards. The equipment used to monitor the electricity is described by the project owner, and evidences are provided to the CME.

Data Report: Data recorded (control value) and the invoices (main value) are consolidated on a monthly basis and are subject to quality control. If there is a discrepancy in the data, the source of the variation is identified, whatever is the main measured value or the control value. The data is compiled monthly in a report and verified by the Project Developer's Head Office.

Data Archives: The data recording, the data report and the invoices are archived, together with this monitoring plan. All data collected as part of monitoring is archived electronically and be kept at least for 2 years after the end of the last crediting period.

Data Quality Control: An internal procedure to ensure the correctness of data is employed. Data and reports are checked internally to ensure correctness of data. In case of mistakes, corrective actions are applied to avoid future similar mistakes. In case of erroneous measurements, the data is not taken into account for emission reduction purposes.

Training and Monitoring Personnel: All people that participate in the monitoring process are suitably qualified and trained in the operation and maintenance of the plant. They have all received instructions for the use of the monitoring plan.

Emission factor calculation: The combined margin emission factor is fixed for the first crediting period and updated when the crediting period of the PoA is renewed, using ex-ante data for OM and BM as described in the PoA-DD document.

Verification and Monitoring Results: The monitoring report is prepared by the managing entity. It contains the data report, the emission factor calculation and the results of the emissions reductions of the project for a certain period.

Leakage monitoring: No energy generating equipment is transferred from another activity to this project and there is no existing equipment to be transferred to another activity. The project activity involves electricity generation from hydro sources. The employed hydro energy generator can only convert hydro energy into electrical energy and cannot use any other input fuel for electricity generation. Thus, monitoring leakage from the project activity is not required.

A single monitoring report containing all monitoring results of all CPAs included in the PoA, clearly separating the monitoring results of individual CPAs has been prepared.

SECTION E. Data and parameters

E.1. Data and parameters fixed ex ante

Data/Parameter	EF_{grid,CM,y}
Unit	tCO ₂ e/MWh
Description	Emission factor of the grid where the hydropower is exporting the electricity to.
Source of data	Data officially approved by the Host country DNA

Value(s) applied	0.6223
Choice of data or measurement methods and procedures	The value is calculated with the latest data available at the start of the validation of the Guacamaya PoA.
Purpose of data/parameter	To calculate baseline emissions
Additional comments	NA

Data / Parameter	CAP_{BL}
Unit	W
Description	Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plants, this value is zero.
Source of data	Project site
Value(s) applied	0
Choice of data or Measurement methods and procedures	Not applicable
Purpose of data	To calculate the power density
Additional comment	Only applicable when the CPA involves reservoirs

Data / Parameter	A_{BL}
Unit	m ²
Description	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m2). For new reservoirs, this value is zero
Source of data	Project site
Value(s) applied	0
Choice of data or Measurement methods and procedures	Not applicable
Purpose of data	To calculate the power density
Additional comment	Only applicable when the CPA involves reservoirs

E.2. Data and parameters monitored

Data/Parameter	EG_y
Unit	MWh/y
Description	Quantity of net electricity supplied to the grid in year y.
Measured/calculated/default	Measured by electricity meter
Source of data	Electricity meters
Value(s) of monitored parameter	8950-0002: 35,171.03MWh 8950-0003: 74,841.13MWh

Monitoring equipment	<p>8950-0002: Main meter (ENEE) Schneider Electric ION 8650 Serial Number MW-1406A496-01 New Device installed on:26/11/2014 Device Calibrated on 11/10/2019 Class:0.2</p> <p>Backup meter (Zinguizapa HPP) Schneider Electric ION 8650 Serial Number MW-1409A770-01 New Device installed on:26/11/2014 Device Calibrated on 11/10/2019 Class:0.2</p> <p>8950-0003: Main meter (ENEE) Schneider Electric ION 8650 Serial Number MW-1409A771-01 New Device installed on:12/11/2014 Device Calibrated on 20/11/2019 Class:0.2</p> <p>Backup meter (Puringla Sazagua HPP) Schneider Electric ION 8650 Serial Number MW-1206A274-01 New Device installed on:15/11/2014 Device Calibrated on 20/11/2019 Class:0.2</p>
Measuring/reading/recording frequency	Measured continuously and recorded monthly
Calculation method (if applicable)	The net electricity generated is measured by a calibrated meter owned and operated by the project owner. This data is cross-checked with the meter owned by the Honduran utility (ENEE).
QA/QC procedures	Device calibration is carried out periodically in accordance with manufacturer specifications where available. A calibration is to take place in case one of the meters is not functioning properly, which is deemed the case if there is more than a 1% difference in readings between the project meter and the utility meter. Calibration interval will not exceed 3 years, as per CDM standards.
Purpose of data/parameter	Calculate the baseline emissions
Additional comments	<p>The meter readings are cross-checked with available internal and/or external information such as electricity invoices.</p> <p>During the last calibration, the backup meter for CPA 003 was found to have errors above the threshold of the 0.2%, which is the accuracy of the model of meter for this project. The highest error found during the calibration was applied to the ER calculations for this CPA (6.408%)</p> <p>It should be noted that the faulty meter for CPA 003 was discarded and replaced with a new meter of the same make and model.</p> <p>During the last calibration for CPA 002, the results were below the threshold of the accuracy class of the model of meter for the project activity (0.2%). Therefore, the accuracy class of the meter was taken into account when adjusting the ER calculations for this CPA during this monitoring period (0.2%).</p>

E.3. Implementation of sampling plan

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NA

SECTION F. Calculation of emission reductions or net anthropogenic removals**F.1. Calculation of baseline emissions or baseline net removals**

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Baseline emissions at CPA level are calculated as Metodolgoy AMS-I.D, Version 17, which multiplies electrical energy baseline $EG_{BL,y}$ (expressed in MWh of electricity produced by the CPA) by the grid emission factor.

$$BE_y = EG_{BL,y} * EF_{CO2,grid,y}$$

Where:

BE_y Baseline Emission in year y (tCO₂)

$EG_{BL,y}$ Quantity of net electricity supplied to the grid as a result of the implementation of the Project Activity(ies) under the CPA in year y (MWh)

$EF_{CO2,grid,y}$ CO₂ emission factor of the grid in year y (tCO₂/MWh)

The calculation of the grid emission factor is based on official data available at the time of the PoA Registration. The value of the grid emission factor is 0.6223 tCO₂/MWh, which is fixed ex-ante for the entire crediting period of the CPAs. The detailed grid emission factor calculation based on data available prior to publication of the PoA DD, is provided in section E.6.1 of the PoA DD. Hence, annual baseline emissions are calculated by multiplication of the annual quantity of net electricity supplied to the grid (as calculated above) with the grid emission factor. T

8950-0002:

$$\begin{aligned} BE_y &= EG_{BL,y} * EF_{CO2,grid,y} \\ &= 35,171.03MWh * 0.6223 \text{ tCO}_2\text{e/MWh} \\ &= 21,886 \text{ tCO}_2\text{e} \end{aligned}$$

8950-0003:

$$\begin{aligned} BE_y &= EG_{BL,y} * EF_{CO2,grid,y} \\ &= 74,841.13MWh * 0.6223 \text{ tCO}_2\text{e/MWh} \\ &= 46,573 \text{ tCO}_2\text{e} \end{aligned}$$

F.2. Calculation of project emissions or actual net removals

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No project emissions apply for the project activity as per the methodology

F.3. Calculation of leakage emissions

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No leakage is accounted for as per the methodology

F.4. Calculation of emission reductions or net anthropogenic removals

CPA UNFCCC reference number	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions (t CO ₂ e)	GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e)		
				Before 01/01/2013	From 01/01/2013	Total amount
8950-0002	21,886	0	0	0	21,886	21,886
8950-0003	46,573	0	0	0	46,573	46,573
Total	68,459	0	0	0	68,459	68,459

F.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the included CPA-DDs

CPA UNFCCC reference number	Amount achieved during this monitoring period (t CO ₂ e)	Amount estimated ex ante for this monitoring period in the CPA-DD (t CO ₂ e)
8950-0002	21,886	26,843
8950-0003	46,573	68,124
Total	68,459	94,967

F.5.1. Explanation of calculation of “amount estimated ex ante for this monitoring period in the CPA-DD”

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Ex ante estimation is based on CPA DD annual electrical generation values for each CPA.

F.6. Remarks on increase in achieved emission reductions

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NA – Values are below estimates calculated ex-ante in CPA DDs.

F.7. Remarks on scale of small-scale CPAs

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NA – Values are below estimates calculated ex-ante in CPA DDs.

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM project standard for programmes of activities” (CDM-EB93-A07-STAN); • Add a section on remarks on the observance of the scale limit of small-scale CPAs during the crediting periods; • Add "changes specific to afforestation or reforestation activities/CPA" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R PoAs between two commitment periods; • Make structural and editorial improvements.
02.0	7 June 2017	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 01.0 of the “CDM project standard for programmes of activities (CDM-EB93-A07-STAN); • Make editorial improvements.
01.0	1 April 2015	Initial publication.

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