Monitoring report form for CDM project activity
(Version 06.0)

MONITORING REPORT		
Title of the project activity	Cote Small-Scale Hydropower Plant	
UNFCCC reference number of the project activity	0251	
Version number of the PDD applicable to this monitoring report	7	
Version number of this monitoring report	1	
Completion date of this monitoring report	01/02/2018	
Monitoring period number	4	
Duration of this monitoring period	01/01/2013-31/03/2017 (both days included)	
Monitoring report number for this monitoring report	1	
Project participants	Compañía Nacional de Fuerza y Luz (CNFL); International Bank for Reconstruction and Development (IBRD) as Trustee of the Prototype Carbon Fund (PCF); Fortum Corporation; Government of Finland - Ministry of Foreign Affairs of Finland; RWE Power AG; Chubu Electric Power Co., Inc; The Chugoku Electric Power Co., Inc.; Kyushu Electric Power Co., Inc.; Mitsubishi Corporation; Shikoku Electric Power Co., Inc.; Tohoku Electric Power Co.,Inc.; The Tokyo Electric Power Co., Inc.; Japan International Cooperation Agency (JICA); Mitsui & Co. Ltd.; Electrabel S.A.; Netherlands' Ministry of Infrastructure and the Environment (IenM); Netherlands' Ministry of Economic Affairs, Agriculture and Innovation (EL&I); Government of Norway – Ministry of Foreign Affairs; Norsk Hydro ASA; Statoil ASA; Swedish Energy Agency; Deutsche Bank AG; BP Alternative Energy International Ltd.; GDF SUEZ.	
Host Party	Costa Rica	
Sectoral scopes	1	
Applied methodologies and standardized baselines	AMS-I.D.: Grid connected renewable electricity generation Version 17.0	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	0	11,813

this monitoring period		
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	12,184	

SECTION A. Description of project activity

A.1. General description of project activity

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The project is a small hydropower plant located in Costa Rica, located over the Guanacaste and Alajuela Provinces, over the Tilarán (Guanacaste) and the Guatuso (Alajuela) Counties, over the Nuevo Arenal (in Tilarán) and Cote (in Guatuso) Districts.

The purpose of the project is renewable electricity generation to be supplied to Costa Rica's national electric grid named National Interconnected System ("NIS"). The project's installed capacity and projected yearly average generation are 6.786 Megawatts ("MW") and 13.2 Gigawatts hours ("GWh") respectively.

The project takes advantage of the infrastructure already installed to divert water from Cote Lake to the Rugama Creek that flows into the Instituto Costarricense de Electricidad ("ICE") Arenal Reservoir. In particular the project uses the existing water intake structure (a tunnel of 389 meter-length and a damn). The project's technology consists of an open channel, an additional conducting tunnel, an underground 789.35m – 1.8m diameter pressure pipe, a fore-bay, a powerhouse containing a 6.786 MW Francis Turbine (of horizontal axis and located at 547 meters above sea level), a substation located next to the powerhouse and a sluice leading to the Rugama Creek. The project takes water from the Cote River and transports it by way of the conducting tunnel and underground pressure pipe until the power house, where the water is turbinated and delivered in unaltered conditions to the Rugama Creek which flows into the Arenal Reservoir. The project has an 87.79 meters ("m") net head; with nominal water flow of 8.4 m3/s.

The project supplies electricity to the NIS through its own 200 meters ("m") – 34.5 Kilovolts ("KV") transmission line which connects to the closest distribution line that belongs to ICE. ICE is the distributor of the closest-to-the-project distribution system named Tilarán-Guatuso distribution circuit. Such distribution line owned by ICE will transport the electricity generated by the project until the Substation Arenal, which belongs to NIS. Substation Arenal will transform the energy from 34.5 KV to 120 KV and 240 KV. The state owned distributor Compañía Nacional de Fuerza y Luz ("CNFL") is the project's sponsor ("the sponsor"). The project is in compliance with all Costa Rican regulations for hydropower plants generation activities.

The plant started construction on 22/12/2000, was commissioned on 26/03/2003, and has been in operation since then.

The project activity achieved the reduction of 11,813 tCO2 during this fourth monitoring period covering from 01/01/2013 to 31/03/2017 (both days included)

A.2. Location of project activity

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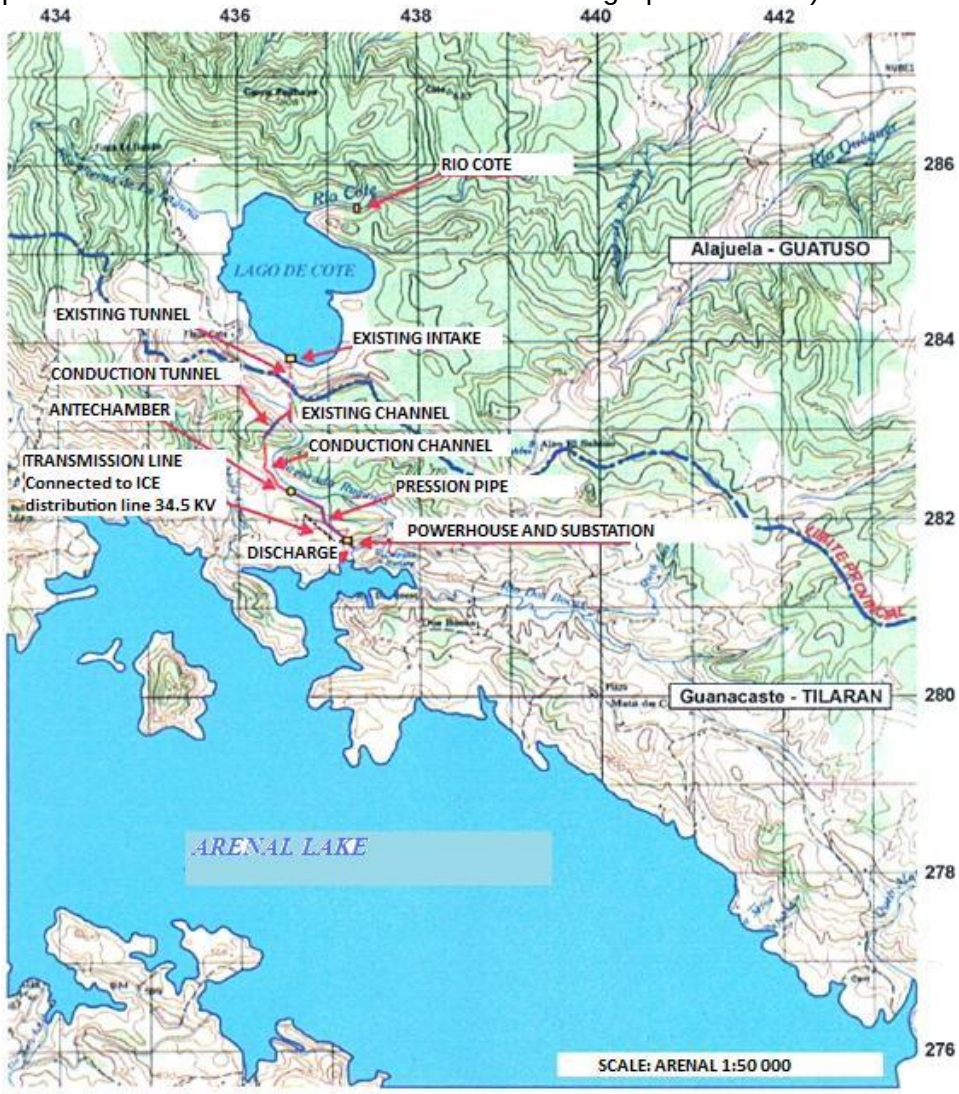
The project is a small hydropower plant located in Costa Rica, located over the Guanacaste and Alajuela Provinces, over the Tilarán (Guanacaste) and the Guatuso (Alajuela) Counties, over the Nuevo Arenal (in Tilarán) and Cote (in Guatuso) Districts.

The transmission line is located in Tilarán County. The project is approximately 3-km away from the closest population composed by the Nuevo Arenal District. The project is located approximately 4.5 hours driving from San José. The water intake is at 647.4 meters above sea level, the load chamber at 637.2 meters above sea level and the discharge channel to the Rugama Creek at 539 meters above sea level.

The plant is located between the following coordinates:

- 10º34'29,26" North – 84º54'58,30" West.
- 10º32'51,62" North – 84º54'58,12" West.
- 10º32'51,74" North – 84º53'52,33" West.
- 10º34'29,38" North – 84º53'52,51" West.

For illustration purposes, the scheme of the project is presented in the following graphic (based upon the map sheet Arenal I3247 IV from the National Geographic Institute):



A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Costa Rica (Host)	Compañía Nacional de Fuerza y Luz (CNFL)	No
Finland	International Bank for Reconstruction and Development (IBRD) as Trustee of the Prototype Carbon Fund (PCF); Fortum Corporation; Government of Finland - Ministry of Foreign Affairs of Finland	Yes
Germany	RWE Power AG	No
Japan	Chubu Electric Power Co., Inc; The Chugoku Electric Power Co., Inc.; Kyushu Electric Power Co., Inc.; Mitsubishi Corporation; Shikoku Electric Power Co., Inc.; Tohoku Electric Power Co.,Inc.; The Tokyo Electric Power Co., Inc.; Japan International Cooperation Agency (JICA); Mitsui & Co. Ltd.	No
Netherlands	Electrabel S.A.; Netherlands' Ministry of Infrastructure and the Environment (IenM); Netherlands' Ministry of Economic Affairs, Agriculture and Innovation (EL&I)	Yes
Norway	Government of Norway – Ministry of Foreign Affairs; Norsk Hydro ASA; Statoil ASA	No
Sweden	Swedish Energy Agency	Yes
United Kingdom of Great Britain and Northern Ireland	Deutsche Bank AG; BP Alternative Energy International Ltd.	No
France	GDF SUEZ	No

A.4. Reference to applied methodologies and standardized baselines

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The applied baseline and monitoring methodology for the project is:

- AMS-I.D.: Grid connected renewable electricity generation (version 17.0)[1].

The applied methodology refers to the latest versions of the following tools:

- "Tool to calculate the emission factor for an electricity system" Version 1[2].
- "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" Version 1[3]..

The project conforms with this because it is a hydropower plant that supplies electricity to a grid. The project installed capacity is 6.786 MW and will not increase its capacity beyond 15 MW, complying with the limits for small-scale activities every year over the 21-year crediting period.

A.5. Crediting period type and duration

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The first crediting period of the project started on 01/04/2003, and ended on 31/03/2010 (twice renewable). The present monitoring report covers from 01/01/2013 to 31/12/2015 (both days included) of the second crediting period, which starts on 01/04/2010 until 31/03/2017.

[1] http://cdm.unfccc.int/filestorage/V/9/L/V9LRSXKP24Q7YT6HZDUBO3C0ING8AJ.1/EB61_repan17_Revision_AMS-I.D_ver17.pdf?t=N1R8bmpvOWJjfDD6Rq1et5tzwzSRWxMInd7O

[2] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v1.pdf

[3] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v1.pdf

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

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The Cote Small-scale HydroPower Plant entered commercial operation on 01/04/2003, after a two years construction period. The construction and implementation of the project occurred basically in accordance with the project design established in the Feasibility Stage and as mentioned in the registered PDD, as far as power capacity and energy generation is concerned. However, there were some minor changes in the design of the powerhouse facility due to a land slide occurred in the early stages of the construction of the Cote Powerhouse. Due to this situation, it became necessary to relocate the arrival of the penstock and do some works to stabilize the slope behind the powerhouse.

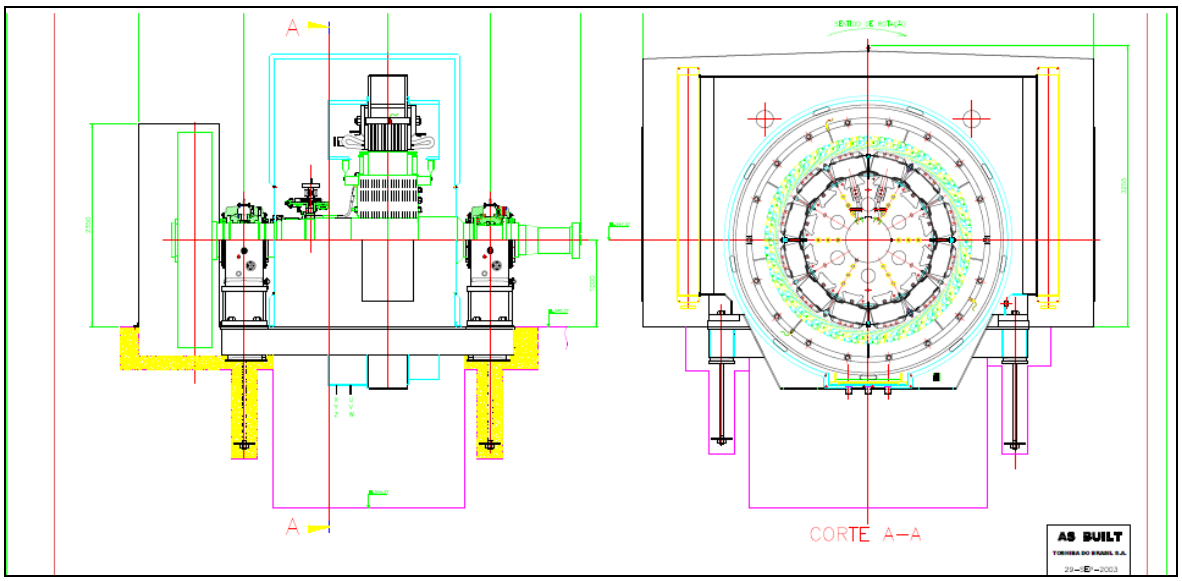
With respect to these works, the penstock was originally located above the slope in question, it was required to build a vertical shaft 3 meters in diameter and 40 meters in depth, as well as a 120 meters long tunnel to reach the powerhouse. A steel pipe was built within this underground excavation (a shielding that later was filled with concrete along the gap between the pipe and the excavation).

The powerhouse site, due to constructive needs, was slightly moved a few meters from its original position, but maintaining the structure and distribution unchanged, requiring an adjustment in the geometry of the discharge channel.

The slope stabilization works consisted in a tunnel 2.5 meters in diameter and 70 meters in length, used as a drainage gallery. In addition, it was necessary to restitute with concrete part of the slope, the placement of a riprap barrier and the construction of a ribbed structural screen anchored at the bottom.
In the upper part of the slope, a shotcrete treatment was applied along with anchorage bolts as a retaining wall for the main road located above the powerhouse area.

These entire works modified in some way the original designs of the Plant, but did not alter the installed hydro plant power capacity or any of its technical specifications.

Aside from using the already built water intake constructed for the Arenal hydroelectric project in 1982, the project's technology contains an open channel, an additional conducting tunnel, an underground 789.35m – 1.8m diameter pressure pipe, a fore-bay, a powerhouse containing a 6.786 MW Francis Turbine (of horizontal axis and located at 547 meters above sea level. Please see diagram below), a substation located next to the powerhouse and a sluice leading to the Rugama Creek.



The installed generator is a Toshiba Brazil, 7,250 kVA capacity, 60 Hz power, power factor 0.9. The powerhouse and substation occupy an area of 18.5 ha. on land already highly disturbed and altered as a result of the construction of the Arenal hydroelectric project. The powerhouse is 9.4m wide, 15.4m length and 7m height. The net head is 87.79m, nominal capacity losses are 3.66m, and the water flow is 8.4 m3/s. All turbinated water is discharged back to the existing Rugama Creek in unaltered conditions.

In terms of power meters currently there are four power meters installed and in operation: the two used to measure the energy trade-off (one from CNFL for energy delivery and one from ICE for energy reception) and their respective back-ups, as follows:

- CNFL's main meter is ION 8500, serial number AQ-0306A054-03 (calibrated on 07/10/10[4]), which was installed on 16/03/2010 and replaced on 25/04/2014 by the meter with serial number MW-1312A152-01 (calibrated on 21/03/2014[5])
- CNFL's back-up meter is ELSTER A3KLNQ-X, serial number 13102122 (calibrated on 15/12/2015[6]), which was installed on 18/10/2012 and replaced on 22/10/2015 by the meter with serial number 16438937 (calibrated on 12/11/2015[7]). The meter with serial number 16438937 was replaced on 02/11/2015 by the meter with serial number 18505937 (calibrated on 16/10/2015[8]).
- ICE's main meter is ELSTER A3KLNQ-X, serial number 1142671; was installed on 21/07/2011
- ICE's back-up meter is ELSTER A3KLNQ-X, serial number 1101126 was installed on 08/07/2011

[4] Certificate 999658

[5] Certificate 994623

[6] Certificate 993061

[7] Certificate 980088

[8] Certificate 914274

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies or standardized baselines

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Not applicable. This section has been left in blank on purpose.

B.2.2. Corrections

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Not applicable. This section has been left in blank on purpose.

B.2.3. Changes to the start date of the crediting period

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Not applicable. This section has been left in blank on purpose.

B.2.4. Inclusion of monitoring plan

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Not applicable. This section has been left in blank on purpose.

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

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Not applicable. This section has been left in blank on purpose.

B.2.6. Changes to project design

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Not applicable. This section has been left in blank on purpose.

SECTION C. Description of monitoring system

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As per the registered PDD, the ICE's electricity meter is used to account for ERs and CNFL's own meter is used to double check accuracy of the project electricity generation registered by ICE's meter. There are four main meters in the plant, the two used to measure the energy trade-off (one from CNFL for energy delivery and one from ICE for energy reception) and their respective back-ups.

Regarding the communication about energy reception by ICE, is important to underline that ICE sends registered generation and sales receipts on a monthly via email to the Energy Administration Section of the CNFL, which in turn organizes the information in spreadsheet. This information is crosschecked with the information provided by the CNFL meters in the plant.

The monitoring methodology and plan for the project ("the MP") follows the methodology AMS-ID definition, which states that: "The monitoring shall consist of metering the electricity generated by the renewable energy technology".

The project's baseline calculation follows methodology AMS-ID baseline definition for a system where not all generators use exclusively fuel oil and/or diesel fuel.

ICE's electricity meter will be used to account for ERs and project's own meter will be used to double check accuracy of the project electricity generation registered by ICE's meter. The calibration of this ICE's meter follows standard procedures established for all of ICE's meters across the Costa Rican national territory. This is to conduct the calibration when the client brings any inconsistency with the meter readings. The calibration of the project's own meters follows CNFL standard procedures (calibration at least once every two years), as well.

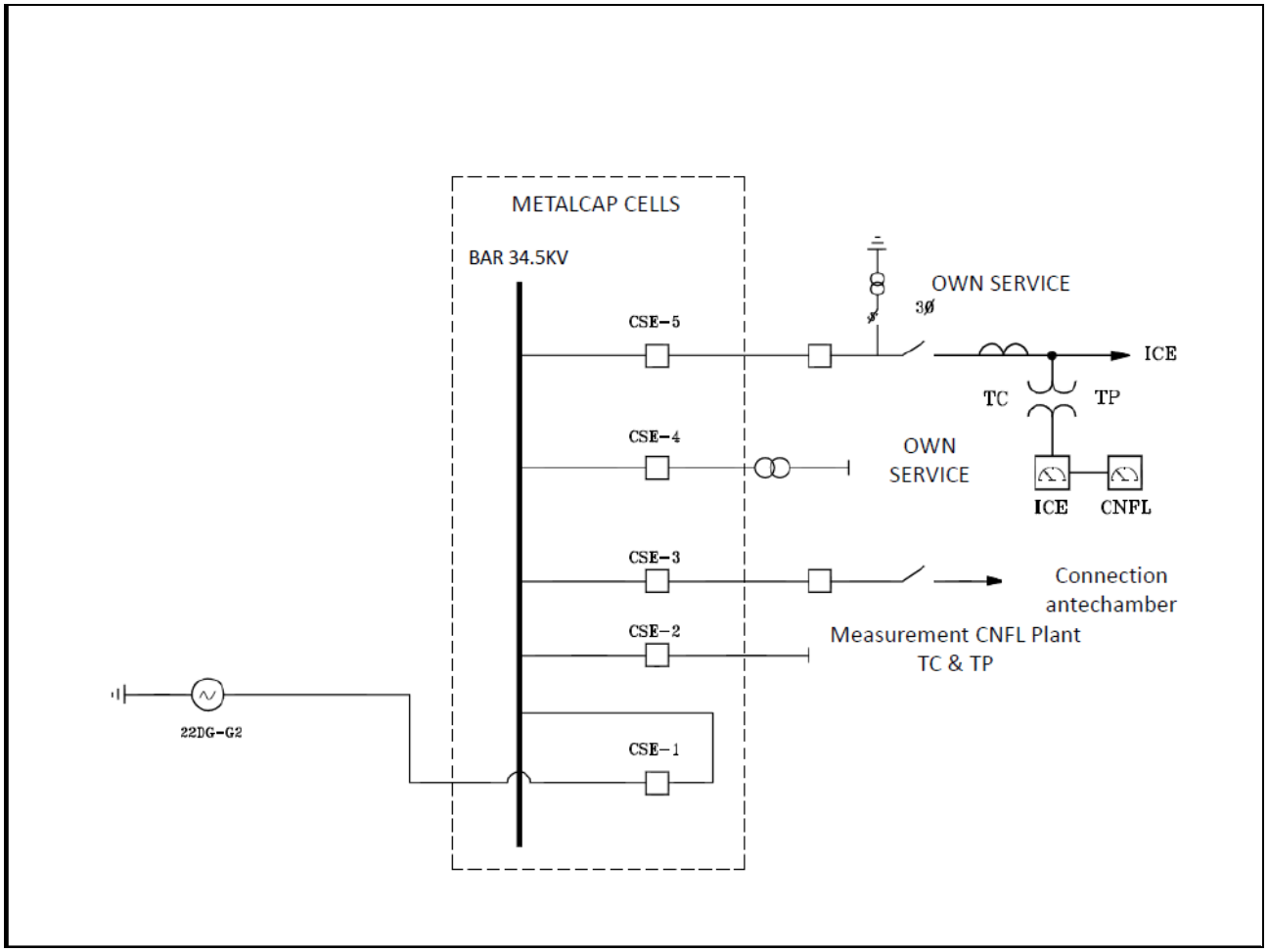
The project's generation registered by ICE's meter will be checked monthly against the project generation registered by the project's own meter in order to prevent failures in ICE's meter – this procedure will be performed by the ERCP Manager as directed in the ERCP Quality Control Procedure36. If deviation is higher than ±0.5% from one meter to another or higher than ±0.2% cumulatively, the ERCP manager will inform ICE to repair its meter – after checking that the project's own meter is in good standing. If failure is confirmed by ICE then during the failure period, the project's own meter registered generation will be taken to account for ERs, until ICE's meter is repaired. Evidence that ICE's meter underwent repairance should be made available to the verifier (if this case happens).

Every month, the ERCP manager will receive the project's registered generation from two sources: ICE's meter and the project's own meter, and double check accuracy. The ERCP Manager should perform monthly calculation of accounted ERs to be ready for the verifier visit in any time of the year.

Responsibilities in the ERCP have been established in an ERCP Organizational Structure 37, where a hierarchy is also established. The ERCP Quality Control Procedure 38 establishes steps to be taken in order to minimize errors in the ERCP.

Metering location[9]

The following diagram shows the meters located in the plant and are used to monitor the electricity generation and delivery to ICE:

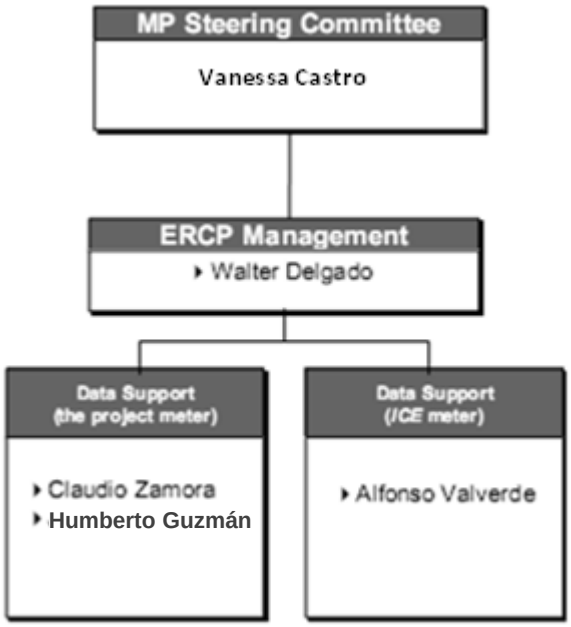


Organizational, Operational and Monitoring Obligations

A. Obligations of the Operator

Monitoring the project's performance in terms of ERs achievement requires the fulfilment of operational data collection and processing obligations from the operator. The operator has the primary obligation to calculate the project ERs based on the most recent available information, following the ERs Calculation Procedure ("ERCP") presented below and to abide to the ERCP Organizational Structure and the ERCP Quality Control Procedure presented in below.

[9] Source: CNFL



Monitoring Plan (MP) – Emissions Reductions Calculation Procedure

ERCP Quality Control

	ICE Meter		The Project Meter
		▸ *Monthly recording* ▸ *Check calibration of electricity meters, periodically* ▸ *Make coordination with ICE to be able to implement this document* ▸ *Only one person will be responsible for the ERCP: Mr. Walter Delgado*	
Data	▸ The project hourly generation that is registered by *ICE meter*		▸ The project hourly generation that is registered by the project meter
Quality of Data Collection	▸ Which data comes? All of the above ▸ By what means does it come? By E-mail/ CD ▸ How does it come? In Excel ▸ How frequently does it come? Monthly ▸ From whom does it come? From *ICE* meter ▸ To whom does it comes? Mr. Walter Delgado		▸ Which data comes? All of the above ▸ By what means does it come? By E-mail/ CD ▸ How does it come? In Excel ▸ How frequently does it come? Monthly ▸ From who does it come? From the project meter ▸ To whom does it comes? Mr. Walter Delgado
Quality of Data Processing	▸ Original Data ▸ Organized Data ▸ Entered Data ▸ Processed Data ▸ Result	• Monthly calculation involves 5 steps • All of it must be done in excel and documented with receipt of sales • Yearly consolidation of monthly calculation	▸ No processing needs to be made with this data, Except for when ICE meter fails.
Quality of Data Storage	▸ Prevent Excel versioning problem, by keeping "a new" Excel software package every year in PCs used for the ERs calculations ▸ Keep all data for 2 years after the first crediting period (9 years) – assign a password to excel spreadsheets used for the ERCP ▸ Save the document with the last date in which an alteration was made, so that old versions are kept in disk ▸ Keep all written documentation in a folder that will be provided to the verifier together with the data in excel collected		
Quality of Data Delivery	▸ Provide to the Verifier e-mails /CD through which Data Providers delivered the original data ▸ Provide to the Verifier all calculations made (all steps of Data Processing) by showing all preliminary versions of spreadsheets saved in disk ▸ Double check if deviation from both meters is unusual and inform ICE to repair/recalibrate its meter – after the project own meter has been confirmed/checked to be in good conditions.		

The ERCP Organizational Structure aims at showing that the ERCP Manager will be responsible for performing the ERCP (monthly), and the MP Steering Committee will be responsible for supervising the ERCP Manager monitoring work (monthly). The ERCP Manager will report to the MP Steering Committee (monthly); and both the ERCP Manager and MP Steering Committee co-ordinately will report to the verifier (when the verification takes place), allowing for a successful verification of the project's accounted ERs.

The ERCP Quality Control aims at providing guidance on how to handle monitoring data as to ensure that sufficient and accurate information is made available to the verifier, allowing for a successful verification of accounted ERs. It is responsibility of the operator to enter

into agreements with both sorts of data sources (NIS) to ensure that data is made available monthly to the ERCP Manager. To avoid conflict of interests, all data required for the MP will come from ICE through e-mail or CD.

It is believed that the MP approach presented here will result in an accurate, yet conservative calculation of ERs. However some uncertainties may lead to a deviation between monitored and verified ERs, especially errors in the data monitoring and processing system. The operator is expected to prevent such errors and the verification audits are expected to uncover any possible errors. The Certified Emissions Reductions ("CERs") would be granted post-verification.

B. Monthly Data Collection – parties involved and monitoring responsibilities

I. ICE – (DATA PROVIDER)	- Shall provide the operator with written proof of the project's monthly generation registered by ICE's meter (through e-mail) Frequency: Monthly
II. THE OPERATOR (DATA PROCESSOR)	- Shall keep receipt of sales. - Shall perform monthly calculation of ERs following the ERCP. - Shall perform the annual report of ERs achieved to the verifier. - Shall establish the necessary agreements with ICE to assure that ICE provides (monthly) the project's hourly generation registered by its meter.

C. Emissions Reductions Calculation Procedure and Required Spreadsheets:

The ERCP is the basic instrument for gathering, recording and processing information that will result in the measured ERs. The operator shall consider the project's ERCP as a manual. The ERCP should contain: i) data gathered from ICE meter, and ii) data processed by the operator. All data processing should be done in Excel. The ERCP is designed for monthly and yearly calculation, based on final monthly ICE meter reports. Filling data monthly in the required spreadsheets will provide time to review formulas, minimize errors and have data readily available for the verifier in any period of the year. There will be in only 1 spreadsheet to be reviewed by the verifier. The file is named Cote ERs at "yearly period in question".xls. However, as the verifier could require preliminary calculations, The ERCP responsible ("ERCP manager") should keep the name of the file and follow by the date at which the latest adjustment is made, every time he works on the file. This will allow saving old versions on disk and keeping them as a record to show to the verifier, if required.

When the ERs calculation for the month is completed, the file should be named Cote ERs at "month in question".xls, to allow differentiating scratch versions from the final monthly calculation. Likewise, after the calculation of the ERs of the last month of the year, the file should change its name to Cote ERs at "yearly period in question".xls.

The year for the MP will run from 1st of April to 31st of March. This monthly-filled file will be composed by 2 worksheets:

-Worksheet # 1: Original Data from ICE-(ICE's meter)
-Worksheet # 2: Organized Data, Processed Data and Result

- Worksheet #1: Should contain data as it was handed in, by ICE, through email or CD, regardless of how it comes i.e. arranged in hours or every 15 minutes or the final monthly project's generation figure. The ERCP manager should not

manipulate this data other than copy and paste it from the file it was handed in. The e-mail/CD through which data comes from provider should be kept as proof for the verifier.

- Worksheet # 2: The ERCP manager should put in one column, the hourly generation or quarter of-hour generation of the month of the project and sum it up to obtain the monthly project generation. In this same Worksheet, the ERCP manager should calculate monthly ERs (measured in tCO_2) by multiplying the generation in KWh (or MWh) times 0.2022 in $KgCO_2$/KWh (or tCO_2/MWh), which is the baseline emission factor for the project and will be used for the second crediting period (7 years). No rounding needs to be made per month when calculating monthly ERs - as this is only done to measure progress. However, resulting yearly ERs must be rounded down to the nearest integer. At the end of the year10, the ERCP manager should sum the resulting yearly ERs of the project to obtain the yearly project' ERs ready for verification. Once the yearly ERs calculation is completed in the Cote ERs at March.xls, this file should become Cote ERs at "yearly period in question".xls. Worksheet # 2 also allows the ERCP manager to calculate the cumulative generation and cumulative ERs along the year and be aware of the project's environmental benefits progresses regarding ERs.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	$EF_{CO2,grid,y}$
Unit	tCO_2/MWh
Description	Combined margin emission factor
Source of data	Calculated. Official statistics from ICE for electricity generation clustered by technology 2004, 2005, 2006, 2007, 2008
Value(s) applied	0.2022 tCO_2/MWh
Choice of data or measurement methods and procedures	This value was calculated according to "Tool to calculate the emission factor for an electricity system (version 02.2.1)." Applied value was calculated by referring to Official NIS Statistics for electricity generation (2004, 2005, 2006, 2007, 2008)
Purpose of data/parameter	Baseline emission calculations
Additional comments	The baseline emission factor was determined ex ante and will be used throughout the second crediting period.

D.2. Data and parameters monitored

Data/Parameter	$EG_{BL,y}$
Unit	MWh
Description	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)
Measured/calculated/ default	Measured
Source of data	ICE's electricity meter readings
Value(s) of monitored parameter	**58,835.858** MWh (for whole monitoring period. Please refer to Section E.1 for each year data)

[10] For MP purposes: March 31st

Monitoring equipment	CNFL's MAIN METER: Meter Type: ION 8500 Serial No.:AQ-306A054-03 Accuracy class: 0.2 Calibration frequency: Once every 2 years. Installation: 16/03/2010 Date of last calibration: 07/10/2010 Validity: Up to 06/10/2012. CNFL calibrates its own meters once in two years following its internal standard practice. Status: replaced CNFL's MAIN METER: Meter Type: ION 8650 Serial No.: 1312A152-01 Accuracy class: 0.2 Calibration frequency: Once every 2 years. Installation: 25/04/2014 Date of last calibration: 21/03/2014 Validity: Up to 20/03/2016. CNFL calibrates its own meters once in two years following its internal standard practice. Status: operating CNFL's BACKUP METER: Meter Type ELSTER A3KLNQ-X Serial No. 13102122 Accuracy class: 0.2 Calibration frequency: Once every 2 years Installation: 18/10/2012 Validity: Up to 17/10/2014 Status: replaced CNFL's BACKUP METER: Meter Type ELSTER A3KLNQ-X Serial No. 16438937 Accuracy class: 0.2 Calibration frequency: Once every 2 years Installation: 22/10/2015 Validity: Up to 21/10/2017 Status: replaced ICE's MAIN METER: Meter Type: ELSTER A3KLNQ-X Serial No: 1142671 Accuracy class: 0.2 Calibration frequency: N/A Date of last calibration: 28/03/2011 Validity: There are no calibration frequency requirements in the country; ICE calibrates meters only if the client brings its notice any discrepancy with meter readings; No such instances found with the project case till date. The calibration of ICE's meters is not within the control of CNFL. Status: operating ICE's BACK-UP METER: Meter Type: ELSTER A3KLNQ-X Serial No: 1101126 Accuracy class: 0.2 Calibration frequency: N/A Date of last calibration: 07/06/2011 Validity: Same as explained above. Status: operating

Measuring/reading/recording frequency	The electricity will be continuously measured and monthly recorded. Data will be archived for 2 years following the end of the crediting period by means of electronic and paper backup.
Calculation method (if applicable)	The ICE's electricity meter automatically measures the gross electricity supplied by the project activity. To the gross value, the amount of electricity used by the project has been subtracted to obtain the net electricity supplied to the grid.
QA/QC procedures	ICE's electricity meter will be used to account for ERs and project's own meter will be used to double check accuracy of the project electricity generation registered by ICE's meter. The calibration of this ICE's meter follows standard procedures established for all of ICE's meters across the Costa Rican national territory. The calibration of the project own meter follows CNFL standard procedures, as well. The calibration of ICE's meters is not within the control of CNFL. The project generation registered by ICE's meter will be checked monthly against the project generation registered by the project's own meter in order to prevent failures in ICE's meter – this procedure will be performed by the ERCP Manager as directed in the ERCP Quality Control Procedure. If deviation is higher than ±0.5% from one meter to another or higher than ±0.2% cumulatively, the ERCP manager will inform ICE to repair its meter – after checking that the project's own meter is in good standing. If failure is confirmed by ICE then during the failure period, the project's own meter registered generation will be taken to account for ERs, until ICE's meter is repaired. Evidence that ICE's meter underwent repairance should be made available to the verifier (if this case happens). Every month, the ERCP manager will receive the project's registered generation from two sources: ICE's meter and the project's own meter, and double check accuracy. Furthermore, power generation records will be double-checked against sales receipts. The ERCP Manager should perform monthly calculation of accounted ERs to be ready for the verifier visit in any time of the year.
Purpose of data/parameter	Baseline emission calculation
Additional comments	Not applicable

Data/Parameter	$FC_{i,j,y}$
Unit	Volume (m^3)
Description	Quantity of fuel type i combusted in process j during the year y
Measured/calculated/ default	Measured
Source of data	Plant records
Value(s) of monitored parameter	0.19374
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	When used
Calculation method (if applicable)	The data is recorded in a log book during emergency period and added up.
QA/QC procedures	The data recorded in a log book during emergency period is cross checked with the purchase receipts of diesel fuel.
Purpose of data/parameter	Project emission calculation
Additional comments	Not applicable

Data/Parameter	$NCV_{i,y}$
Unit	TJ/Gg

Description	Weighted average net calorific value of fuel type i in year y
Measured/calculated/ default	Default
Source of data	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.
Value(s) of monitored parameter	43.3
Monitoring equipment	Not applicable as the source of the data is IPCC default values.
Measuring/reading/recording frequency	Not applicable.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Not applicable.
Purpose of data/parameter	Project emission calculation
Additional comments	Not applicable.

Data/Parameter	EFCO2,i,y
Unit	tCO2/TJ
Description	Weighted average CO_2 emission factor of fuel type i in year y
Measured/calculated/ default	Default
Source of data	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.
Value(s) of monitored parameter	74.8
Monitoring equipment	Not applicable as the source of the data is IPCC default values.
Measuring/reading/recording frequency	Not applicable.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Not applicable.
Purpose of data/parameter	Project emission calculation
Additional comments	Not applicable.

D.3. Implementation of sampling plan

>>

Not applicable.

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

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as the weighted average of Operating Margin (OM) emission factor and Build Margin (BM) emission factors as described in the registered PDD.The CM was calculated as the simple average of both the resulting OM and the resulting BM. All margins expressed in KgCO2/KWh. The formula used for the CM was:

- CM = 0.25 x OM + 0.75 x BM
- CM = O.25 x (0.0602) + 0.75 x (0.2495) = 0.2022 KgCO2/KWh

The baseline emission factor, calculated ex ante, for the project activity is 0.2022 kgCO2/kWh and will remain throughout the second crediting period of the project activity.

According to the approved methodology used, the baseline emissions are calculated by multiplying the net electricity supplied by the project to the grid with the grid emission factor calculated as above. The following table shows the total net electricity supplied to the grid (MWh):

Month		Total net electricity supplied to the grid (MWh)			
From	To	ICE - Total	CNFL - Total	Difference (ICE-CNFL)	
		kWh	kWh	kWh	%
01/01/2013	31/01/2013	**922,367.000**	921,512.310	854.690	0.09%
01/02/2013	28/02/2013	**439,855.000**	439,453.980	401.020	0.09%
01/03/2013	31/03/2013	**623,588.000**	623,041.280	546.720	0.09%
01/04/2013	30/04/2013	**437,816.000**	437,452.210	363.790	0.08%
01/05/2013	31/05/2013	**521,000.000**	520,220.380	779.620	0.15%
01/06/2013	30/06/2013	**836,714.000**	835,905.980	808.020	0.10%
01/07/2013	31/07/2013	**1,496,909.000**	1,495,404.680	1,504.320	0.10%
01/08/2013	31/08/2013	**1,515,830.000**	1,514,515.250	1,314.750	0.09%
01/09/2013	30/09/2013	**1,440,243.000**	1,439,035.160	1,207.840	0.08%
01/10/2013	31/10/2013	**1,581,380.000**	1,580,025.800	1,354.200	0.09%
01/11/2013	30/11/2013	**1,304,550.000**	1,303,425.000	1,125.000	0.09%
01/12/2013	31/12/2013	**1,844,729.250**	1,843,076.070	1,653.180	0.09%
01/01/2014	31/01/2014	**169,615.950**	169,472.520	143.430	0.08%
01/02/2014	28/02/2014	**709,532.250**	706,294.840	3,237.410	0.46%
01/03/2014	31/03/2014	**246,255.450**	232,621.580	13,633.870	5.86%
01/04/2014	30/04/2014	**211,422.750**	210,894.450	528.300	0.25%
01/05/2014	31/05/2014	**343,930.650**	344,201.620	- 270.970	-0.08%
01/06/2014	30/06/2014	**1,515,048.150**	1,516,115.920	- 1,067.770	-0.07%
01/07/2014	31/07/2014	**3,183,968.550**	3,186,273.560	- 2,305.010	-0.07%
01/08/2014	31/08/2014	**1,437,269.400**	1,438,434.780	- 1,165.380	-0.08%
01/09/2014	30/09/2014	**1,253,582.400**	1,254,560.320	- 977.920	-0.08%
01/10/2014	31/10/2014	**1,247,142.750**	1,248,158.370	- 1,015.620	-0.08%
01/11/2014	30/11/2014	**1,344,350.700**	1,345,382.660	- 1,031.960	-0.08%
01/12/2014	31/12/2014	**1,957,525.500**	1,958,937.940	- 1,412.440	-0.07%
01/01/2015	31/01/2015	**2,107,306.950**	2,108,871.900	- 1,564.950	-0.07%
01/02/2015	28/02/2015	**1,393,676.550**	1,394,737.840	- 1,061.290	-0.08%
01/03/2015	31/03/2015	**750,598.800**	751,202.360	- 603.560	-0.08%
01/04/2015	30/04/2015	**658,009.800**	658,579.110	- 569.310	-0.09%
01/05/2015	31/05/2015	**1,221,366.300**	1,222,353.620	- 987.320	-0.08%
01/06/2015	30/06/2015	**2,047,881.150**	2,049,586.810	- 1,705.660	-0.08%
01/07/2015	31/07/2015	**2,324,766.150**	2,326,698.730	- 1,932.580	-0.08%
01/08/2015	31/08/2015	**1,776,130.650**	1,777,705.920	- 1,575.270	-0.09%
01/09/2015	30/09/2015	**1,156,751.400**	1,157,811.560	- 1,060.160	-0.09%
01/10/2015	31/10/2015	**944,232.450**	940,329.730	3,902.720	0.42%
01/11/2015	30/11/2015	**1,037,233.050**	1,038,208.180	- 975.130	-0.09%
01/12/2015	31/12/2015	**916,374.900**	917,227.740	- 852.840	-0.09%
01/01/2016	31/01/2016	**969,596.250**	970,496.814	- 900.564	-0.09%
01/02/2016	29/02/2016	**969,832.500**	970,688.710	- 856.210	-0.09%
01/03/2016	31/03/2016	**702,333.450**	703,056.691	- 723.241	-0.10%
01/04/2016	30/04/2016	**392,761.950**	393,162.837	- 400.887	-0.10%
01/05/2016	31/05/2016	**500,956.050**	501,477.775	- 521.725	-0.10%
01/06/2016	30/06/2016	**1,018,054.800**	1,019,094.644	- 1,039.844	-0.10%
01/07/2016	31/07/2016	**1,317,900.150**	1,319,232.684	- 1,332.534	-0.10%
01/08/2016	31/08/2016	**1,083,506.550**	1,097,265.069	- 13,758.519	-1.25%
01/09/2016	30/09/2016	**1,125,399.450**	1,126,631.735	- 1,232.285	-0.11%
01/10/2016	31/10/2016	**1,202,250.000**	1,203,565.293	- 1,315.293	-0.11%
01/11/2016	30/11/2016	**1,622,345.550**	1,624,020.002	- 1,674.452	-0.10%
01/12/2016	31/12/2016	**2,818,750.200**	2,821,632.210	- 2,882.010	-0.10%
01/01/2017	31/01/2017	**744,481.500**	745,285.703	- 804.203	-0.11%
01/02/2017	28/02/2017	**787,628.100**	788,506.639	- 878.539	-0.11%
01/03/2017	31/03/2017	**661,107.300**	661,826.455	- 719.155	-0.11%
01/01/2013	**31/03/2017**	**58,835,857.700**	**Total net electricity supplied to the grid (MWh)**		

The following data is used in the calculation:

From	To	*Ex Post*	*Ex Post*	*Ex Post*	*Ex Ante*	BEy
				EGBL,y	CM	
		Gross electricity supplied to the grid	Electricity used from the grid	Total net electricity supplied to the grid	Combined margin emission factor	Baseline emissions
		(MWh)	(MWh)	(MWh)	(tCO2e/MWh)	(t CO2e)
01/01/2013	31/12/2013	12,964.981	83.669	12,881.312	0.2022	2,604
01/01/2014	31/12/2014	13,619.645	87.894	13,531.750	0.2022	2,736
01/01/2015	31/12/2015	16,334.328	105.413	16,228.915	0.2022	3,281
01/01/2016	31/12/2016	13,723.687	88.566	13,635.121	0.2022	2,757
01/01/2017	31/03/2017	2,193.217	14.154	2,179.063	0.2022	440
01/01/2013	**31/12/2015**	**58,835.858**	**379.696**	**58,456.162**	**0.2022**	**11,818**

The baseline emissions are obtained from the following formula:

BEy = CM x EGm,y

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

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According to the approved methodology used for the project (AMS-I.D Ver 17.0), no Project Emissions is to be counted by the Project.

However, there is a small diesel generator installed in the plant (75 kW) to operate in emergency conditions. The set has only been operated very few hours during the monitoring period considered. The project emissions from fossil fuel combustion in process j (PEFC,j):as calculated as follows:

$PEy=PE_{FC,j} = FC_{j,y} * NCV_{j,y} * EF_{CO2,i}$

From	To	*Ex Post*	*Ex Ante*	*Ex Ante*	PEy
		FCj,y	NCVj,y	EF CO2,i	
		Quantity of fuel type i combusted in process j (Diesel)	Weighted average net calorific value of the fuel type i (Diesel)	Weighted average CO2 emission factor of fuel type (Diesel)	Project emissions
		(m3)	GJ/m3	tCO2/GJ	(t CO_2e)
01/01/2013	31/12/2013	0.04269	43.300	0.0748	1
01/01/2014	31/12/2014	0.04485	43.300	0.0748	1
01/01/2015	31/12/2015	0.05379	43.300	0.0748	1
01/01/2016	31/12/2016	0.04519	43.300	0.0748	1
01/01/2017	31/03/2017	0.00722	43.300	0.0748	1
01/01/2013	**31/03/2017**	**0.19374**	**43.300**	**0.0748**	**5**

E.3. Calculation of leakage emissions

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Because the project's existing equipment is neither transferred to another activity nor it comes from another activity, leakage is zero and does not need to be monitored.

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

	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)		
				Before 01/01/2013	From 01/01/2013	Total amount
Total	11,818	5	0	0	11,813	11,813

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO_2e)	Amount estimated ex ante (t CO_2e)
11,813	12,184

E.6. Remarks on increase in achieved emission reductions

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The actual emission reductions achieved during the current monitoring period have been lower than expected in the registered CDM-PDD.

The variation is mainly due to varying levels of water availability.

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Document information

Version	*Date*	*Description*
06.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Issuance
Keywords: monitoring report