**Monitoring report form**
**(Version 05.1)**

| MONITORING REPORT | | |
|---|---|---|
| **Title of the project activity** | Cote Small-Scale Hydropower Plant | |
| **UNFCCC reference number of the project activity** | 0251 | |
| **Version number of the monitoring report** | 3 | |
| **Completion date of the monitoring report** | 22/04/2016 | |
| **Monitoring period number and duration of this monitoring period** | 3rd Monitoring report covering 01/04/2010-31/12/2012 (both days included) | |
| **Project participant(s)** | 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 scope(s)** | Sectoral scope 1 | |
| **Selected methodology(ies)** | AMS-I.D.: Grid connected renewable electricity generation Version 17.0 | |
| **Selected standardized baseline(s)** | Not applicable | |
| **Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD** | 7,902 | |
| **Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period** | 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 |
| | 6,270 | 0 |

## SECTION A. Description of project activity

### A.1. Purpose and general description of project activity

>>
The project is a small hydropower plant located in Costa Rica, located over the Guanacaste and Alajuela Provinces, over the Tilatán (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 6,270 $tCO_2$ during this third monitoring period covering from 01/04/2010 to 31/12/2012 (both days included).

### A.2. Location of project activity

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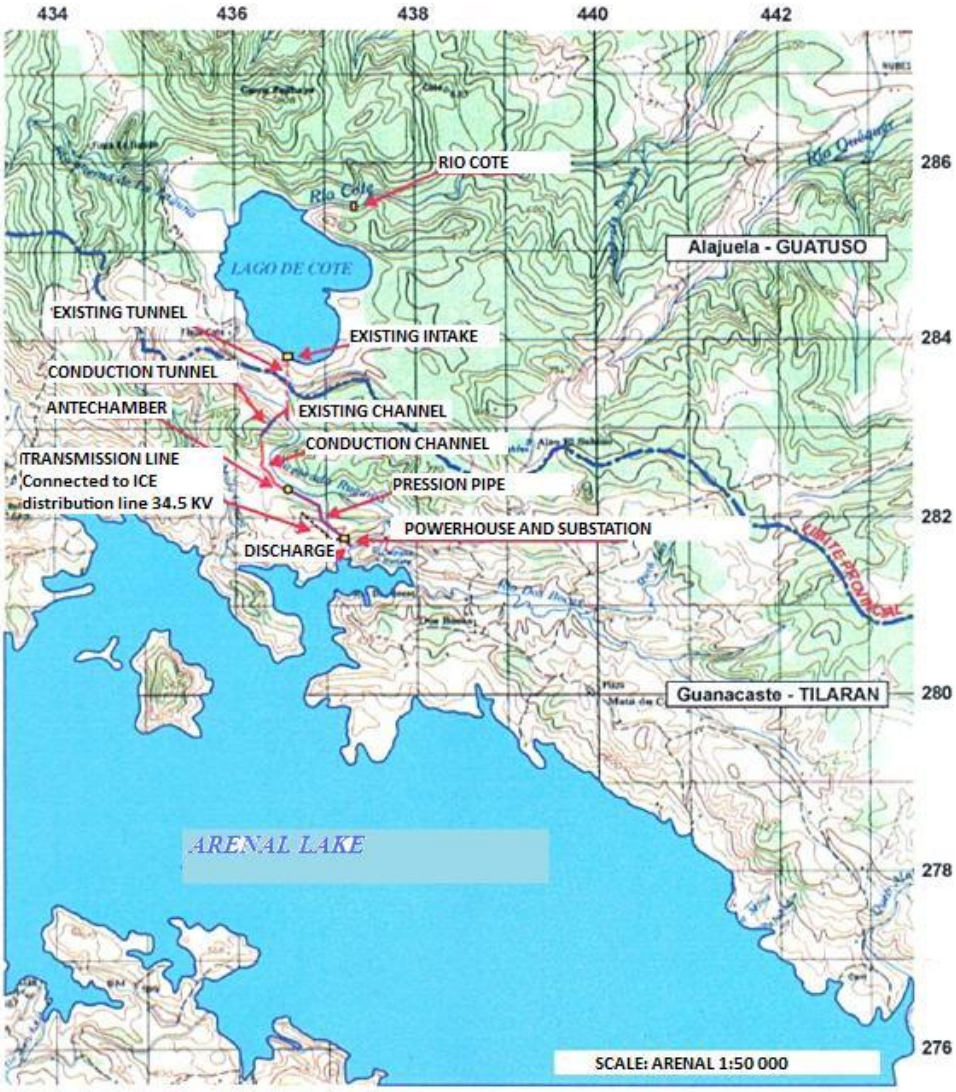
The project is a small hydropower plant located in Costa Rica, located over the Guanacaste and Alajuela Provinces, over the Tilatán (Guanacaste) and the Guatuso (Alajuela) Counties, over the Nuevo Arenal (in Tilarán) and Cote (in Guatuso) Districts.

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 participant(s)

| Party involved ((host) indicates a host Party) | Private and/or public entity(ies) project participants (as applicable) | Indicate whether 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 |

| Party involved ((host) indicates a host Party) | Private and/or public entity(ies) project participants (as applicable) | Indicate whether the Party involved wishes to be considered as project participant (yes/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 | Yes |
| 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 of applied methodology and standardized baseline

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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 of project activity

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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 the first 2 years and 9 months of the second crediting period, starting 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

### A.6. Contact information of responsible persons/entities

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This Monitoring Report has been prepared by ClimaLoop and the World Bank's Carbon Finance Unit. ClimaLoop is not a project participant. The responsible persons are Sergi Cuadrat, Climate Change Mitigation Consultant of ClimaLoop (sergi.cuadrat@climaloop.com) and Claudia Croce, Senior Carbon Finance Specialist at the World Bank (ccroce@worldbank.org).

## SECTION B. Implementation of project activity

### B.1. Description of implemented registered 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).

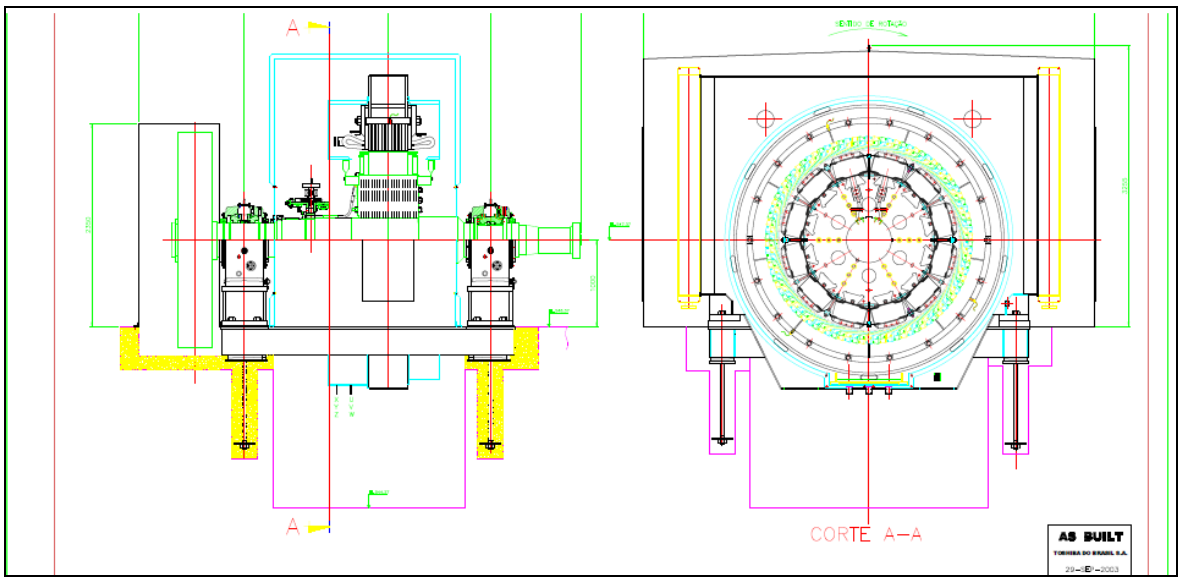
The powerhouse site, due to constructive needs, was slightly moved a few meters from its original position, but maintaining the structure and distribution unchanged, requiring an adjustment in the geometry of the discharge channel.

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 restore 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. CNFL's main meter is ION 8500, serial number AQ-0306A054-03; CNFL's back-up meter is ELSTER A3KLNQ-X, serial number 13102122. ICE's main meter is ELSTER A3KLNQ-X, serial number 1142671; ICE's back-up meter is ELSTER A3KLNQ-X, serial number 1101126. CNFL currently-installed main power meter ION 8500, serial number AQ-0306A054-03 was installed in substitution of the meter ION 8500 serial number AQ-306A048-03. Although the work order for this substitution was issued on 16/03/2010, the meters change took place on 19/03/2010. CNFL's back-up meter ELSTER A3KLNQ-X, serial number 13102122, was installed on 18/10/2012, and replaced the meter ABB A1RL+, serial number 04182262. This was installed on 04/12/2007, in substitution of the meter ABB A1RL+, serial number 03464814 operational since 08/01/2003. ICE's main meter ELSTER A3KLNQ-X, serial number 1142671, was installed on 21/07/2011 replacing the meter Quantum ST-Q200, serial number 859258, which had been installed on 08/01/2003. ICE's back-up meter ELSTER A3KLNQ-X, serial number 1101126, was installed on 08/07/2011 in substitution of the meter ELSTER A3KLNQ-X, serial number 1101076, which had been installed on 21/04/2011. The previously installed back-up meter of ICE was an ABB A1KL+, serial number 603 (installed on 08/01/2003).

| Meter No. | From | To |
|---|---|---|
| **CNFL Main meter (ION 8500)** | | |
| AQ-306A054-03 | 19/03/2010 | Till date |
| **CNFL Back up meter** | | |
| ELSTER A3KLNQ-X, serial number 13102122 | 18/10/2012 | Till date |
| ABB A1RL+, serial number 04182262 | 04/12/2007 | 18/10/2012 |
| ABB A1RL+, serial number 03464814 | 08/01/2003 | 04/12/2007 |
| **ICE Main meter** | | |
| ELSTER A3KLNQ-X, serial number 1142671<br>ST-Q200, serial number 859258 | 21/07/2011<br>08/01/2003 | Till date<br>21/07/2011 |
| **ICE Back up meter** | | |
| ELSTER A3KLNQ-X, serial number 1101126<br>ELSTER A3KLNQ-X, serial number 1101076 | 08/07/2011<br>27/04/2011 | Till date<br>08/07/2011 |
| ABB A1KL+, serial number 603 | 08/01/2003 | 27/04/2011 |

The following table shows the downtimes (i.e., number of hours during which the plant was not in operation) occurred in the plant during the reporting period:
Source: CNFL's own registry

| Year | | System Failure | Mechanic Failure | Electric Failure | Planned Maintenance | Total downtimes (hours) |
|---|---|---|---|---|---|---|
| From | To | | | | | |
| 01/04/2010 | 31/12/2010 | 78.38 | 6.07 | 30.39 | 301.07 | 415.91 |
| 01/01/2011 | 31/12/2011 | 40.650 | 8.940 | 1.200 | 813.500 | 864.29 |
| 01/01/2012 | 31/12/2012 | 32.850 | 0.450 | 92.470 | 1105.960 | 1,231.73 |
| **01/04/2010** | **31/12/2012** | 151.880 | 15.460 | 124.060 | 2,220.530 | 2,511.930 |

The main reasons for this downtime have been: lake recovery, minor electrical failures or system errors.

## B.2. Post-registration changes

### B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

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

### B.2.2. Corrections

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

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

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

### B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

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

### B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

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

### B.2.6. Changes to project design of registered project activity

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

### B.2.7. Types of changes specific to afforestation or reforestation project activity

>>
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. Details of the latest meters of CNFL and ICE are as below:

CNFL's main meter is ION 8500, serial number AQ-0306A054-03; CNFL's back-up meter is ELSTER A3KLNQ-X, serial number 13102122. ICE's main meter is ELSTER A3KLNQ-X, serial number 1142671; ICE's back-up meter is ELSTER A3KLNQ-X, serial number 1101126.The CNFL own meters laboratory is in charge of the calibration of the devices in the plant. This laboratory is certified under the norm INTE-ISO/IEC 17025:2005.

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.

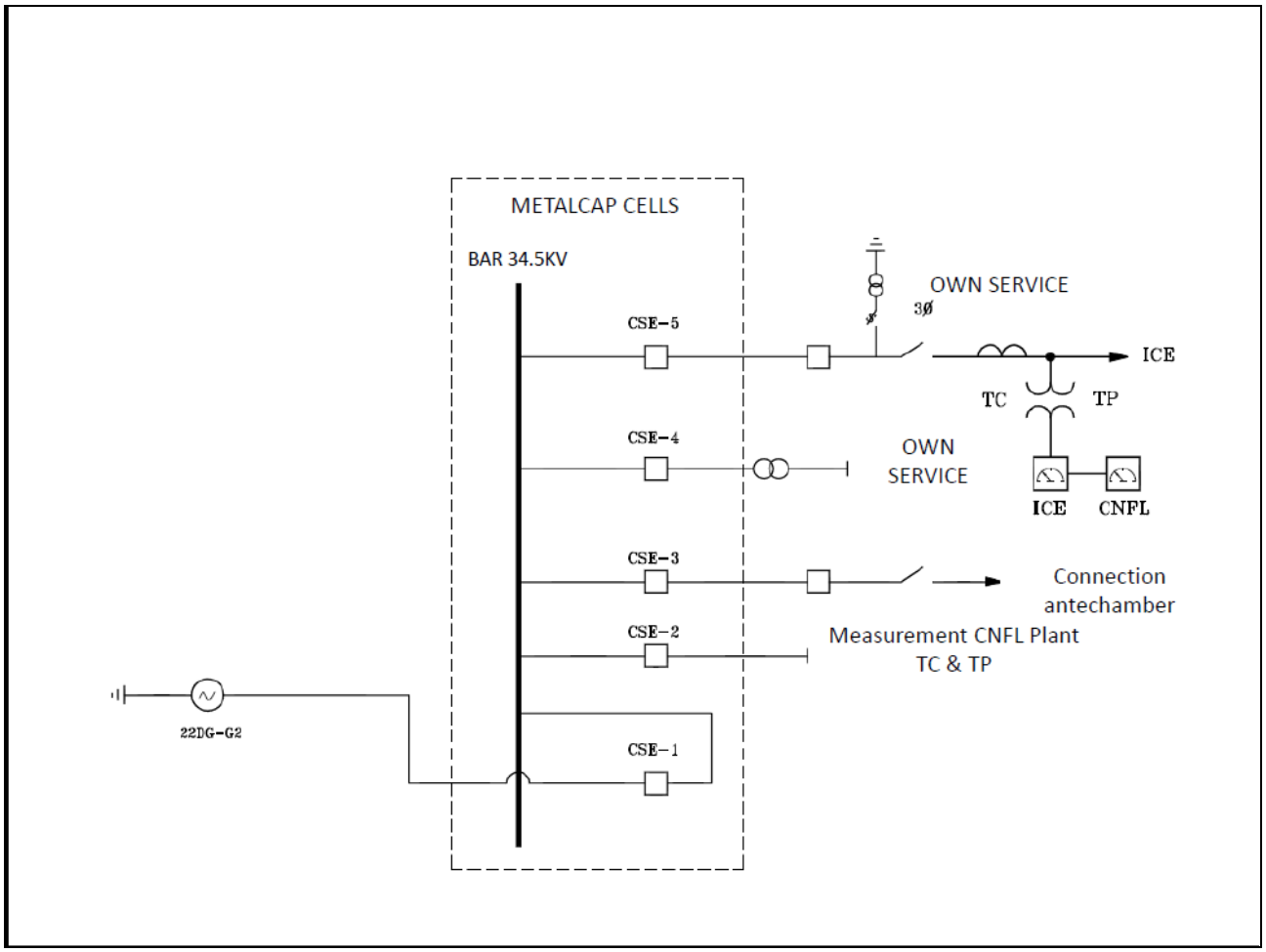
The project's generation registered by ICE's meter will be checked monthly against the project generation registered by the project's own meter in order to prevent failures in ICE's meter – this procedure will be performed by the ERCP Manager as directed in the ERCP Quality Control Procedure36. If deviation 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**[4]

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

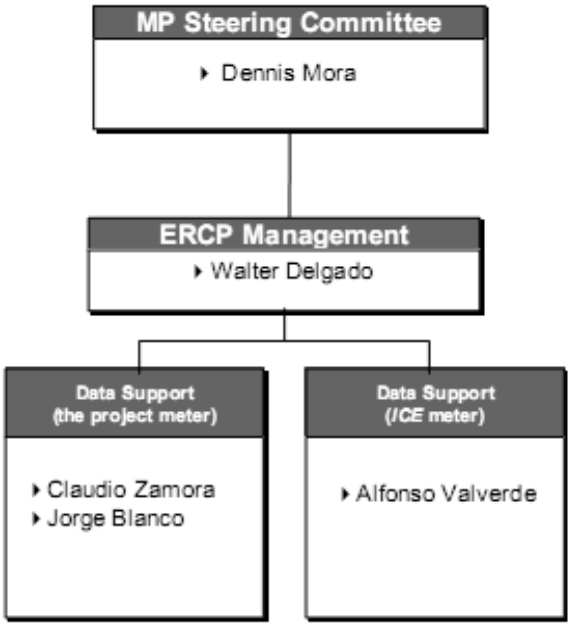



**Organizational, Operational and Monitoring Obligations**

**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.

[4] Source: CNFL




Monitoring Plan (MP) – Emissions Reductions Calculation Procedure

ERCP Quality Control

| | ICE Meter | | The Project Meter |
|---|---|---|---|
| | | ▸ *Monthly recording*<br>▸ *Check calibration of electricity meters, periodically*<br>▸ *Make coordination with ICE to be able to implement this document*<br>▸ *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<br>▸ By what means does it come? By E-mail/ CD<br>▸ How does it come? In Excel<br>▸ How frequently does it come? Monthly<br>▸ From whom does it come? From *ICE* meter<br>▸ To whom does it comes? Mr. Walter Delgado | | ▸ Which data comes? All of the above<br>▸ By what means does it come? By E-mail/ CD<br>▸ How does it come? In Excel<br>▸ How frequently does it come? Monthly<br>▸ From who does it come? From the project meter<br>▸ To whom does it comes? Mr. Walter Delgado |
| **Quality of Data Processing** | ▸ Original Data<br>▸ Organized Data<br>▸ Entered Data<br>▸ Processed Data<br>▸ Result | • Monthly calculation involves 5 steps<br>• All of it must be done in excel and documented with receipt of sales<br>• 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<br>▸ Keep all data for 2 years after the first crediting period (9 years) – assign a password to excel spreadsheets used for the ERCP<br>▸ Save the document with the last date in which an alteration was made, so that old versions are kept in disk<br>▸ 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<br>▸ Provide to the Verifier all calculations made (all steps of Data Processing) by showing all preliminary versions of spreadsheets saved in disk<br>▸ 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.<br>- Shall perform monthly calculation of ERs following the ERCP.<br>- Shall perform the annual report of ERs achieved to the verifier.<br>- 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 year5, 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 or at renewal of crediting period

| **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 | 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 | **31,026.817** MWh (for whole monitoring period. Please refer to Section E.1 for each year data) |

[5] For MP purposes: March 31st.

| | |
|---|---|
| Monitoring equipment | ICE's MAIN METER:<br>Meter Type: ELSTER A3KLNQ-X<br>Serial No: 1142671<br>Accuracy class: 0.2<br>Calibration frequency: N/A<br>Date of last calibration: 28/03/2011<br>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.<br>Status: operating<br><br>ICE's BACK-UP METER:<br>Meter Type: ELSTER A3KLNQ-X<br>Serial No: 1101126<br>Accuracy class: 0.2<br>Calibration frequency: N/A<br>Date of last calibration: 07/06/2011<br>Validity: Same as explained above.<br>Status: operating<br><br>CNFL's MAIN METER:<br>Meter Type: ION 8500<br>Serial No.:AQ-306A054-03<br>Accuracy class: 0.2<br>Calibration frequency: Once every 2 years.<br>Date of last calibration: 17th March, 2010<br>Validity: Up to 17th March 2012. CNFL calibrates its own meters once in two years following its internal standard practice.<br>Status: operating<br><br>CNFL's BACKUP METER:<br>Meter Type ELSTER A3KLNQ-X<br>Serial No. 13102122<br>Accuracy class: 0.2<br>Calibration frequency: Once every 2 years<br>Validity: The backup meter was not calibrated during the current monitoring period and no readings of this meter was used for emission reduction calculations<br>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.<br><br>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).<br><br>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: | 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 | 0.253 |
| 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: | 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: | Project emission calculation |
| Additional comments: | Not applicable. |

| **Data/parameter:** | $EF_{CO2,i,y}$ |
|---|---|
| Unit | $tCO_2/TJ$ |
| 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: | Project emission calculation |
| Additional comments: | Not applicable. |

## D.3. Implementation of sampling plan

>>

Not applicable.

## SECTION E. Calculation of emission reductions or GHG removals by sinks

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

>>

The baseline emission factor is calculated ex ante as a Combined Margin (CM), consisting of the 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 $KgCO_2/KWh$. 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 $KgCO_2/KWh$

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 baseline emissions are obtained from the following formula:

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

The following data is used in the calculation:

| From | To | *Ex Post* | | EGBL,y | *Ex Ante* EFCO2,grid,y | BEy |
|---|---|---|---|---|---|---|
| | | Gross electricity supplied to the grid | Electricity used from the grid | Quantity of net electricity supplied to the grid | Combined margin emission factor | Baseline emissions |
| | | (MWh) | (MWh) | (MWh) | (tCO2e/MWh) | (t CO2e) |
| 01/04/2010 | 31/12/2010 | 9,184.527 | 7.189 | 9,177.338 | 0.2022 | 1,855 |
| 01/01/2011 | 31/12/2011 | 11,159.214 | 6.446 | 11,152.768 | 0.2022 | 2,255 |
| 01/01/2012 | 31/12/2012 | 10,707.790 | 11.079 | 10,696.711 | 0.2022 | 2,162 |
| **01/04/2010** | **31/12/2012** | **31,051.531** | **24.714** | **31,026.817** | **0.2022** | **6,272** |

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

>>

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 ($PE_{FC,j}$):as calculated as follows:

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

.

| From | To | *Ex Post* FCj,y | | *Ex Ante* NCVj,y | *Ex Ante* EF CO2,i | PEy |
|---|---|---|---|---|---|---|
| | | 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 | kg | TJ/Gg | tCO2/GJ | (t CO2e) |
| 01/04/2010 | 31/12/2010 | 0.185 | 163.725 | 43.300 | 0.0748 | 1 |
| 01/01/2011 | 31/12/2011 | 0.068 | 60.534 | 43.300 | 0.0748 | 1 |
| 01/01/2012 | 31/12/2012 | - | - | 43.300 | 0.0748 | - |
| **01/04/2010** | **31/12/2012** | **0.253** | **224.259** | **43.300** | **0.0748** | **2** |

## E.3. Calculation of leakage

>>

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

| Item | Baseline emissions or baseline net GHG removals by sinks (t $CO_2e$) | Project emissions or actual net GHG removals by sinks (t $CO_2e$) | Leakage (t $CO_2e$) | GHG emission reductions or net GHG removals by sinks (t $CO_2e$) achieved in the monitoring period | | |
|---|---|---|---|---|---|---|
| | | | | Up to 31/12/2012 | From 01/01/2013 | Total amount |
| **Total** | 6,272 | 2 | 0 | 6,270 | 0 | 6,270 |

From 01/04/2010 to 31/12/2012 the Cote Hydropower Plant has reduced 6,270 tonnes of $CO_2$ by using renewable resources for the generation of electrical energy.

All Excel files are available to the verifier.

## E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

| Item | Values estimated in ex ante calculation of registered PDD | Actual values achieved during this monitoring period |
|---|---|---|
| Emission reductions or GHG removals by sinks (t $CO_2e$) | 7,902 | 6,270 |

## E.6. Remarks on difference from estimated value in registered PDD

>>

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.

# Appendix 1. Contact information of project participants and responsible persons/entities

| | |
|---|---|
| **Project participant and/or responsible person/ entity** | ☒ Project participant<br>☐ Person/entity responsible for completing the CDM-MR-FORM |
| **Organization name** | International Bank for Reconstruction and Development (IBRD) as Trustee of the Prototype Carbon Fund |
| **Street/P.O. Box** | 1818 H Street N.W. |
| **Building** | |
| **City** | Washington |
| **State/region** | D.C, |
| **Postcode** | 20433 |
| **Country** | United States |
| **Telephone** | +1-202-458-5051 |
| **Fax** | +1-202-522-7432 |
| **E-mail** | |
| **Website** | |
| **Contact person** | Jose Andreu |
| **Title** | Senior Carbon Finance Specialist |
| **Salutation** | Mr. |
| **Last name** | Andreu |
| **Middle name** | |
| **First name** | Jose |
| **Department** | Carbon Finance Unit |
| **Mobile** | |
| **Direct fax** | |
| **Direct tel.** | |
| **Personal e-mail** | ibrd-carbonfinance@worldbank.org |

| | |
|---|---|
| **Project participant and/or responsible person/ entity** | ☐ Project participant<br>☒ Person/entity responsible for completing the CDM-MR-FORM |
| **Organization name** | ClimaLoop |
| **Street/P.O. Box** | Travessera de Sant Pau, 1 |
| **Building** | |
| **City** | Reus |
| **State/region** | Tarragona / Catalunya |
| **Postcode** | 43202 |
| **Country** | Spain |
| **Telephone** | +34 877 012 827 |
| **Fax** | |
| **E-mail** | info@climaloop.com |
| **Website** | www.climaloop.com |
| **Contact person** | Sergi Cuadrat |
| **Title** | Climate Change Mitigation Consultant |
| **Salutation** | Mr. |
| **Last name** | Cuadrat |
| **Middle name** | |
| **First name** | Sergi |
| **Department** | |
| **Mobile** | +34 636 075 989 |
| **Direct fax** | |
| **Direct tel.** | +34 877 012 827 |
| **Personal e-mail** | sergi.cuadrat@climaloop.com |

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## Document information

| *Version* | *Date* | *Description* |
|---|---|---|
| 05.1 | 4 May 2015 | Editorial revision to correct version numbering. |
| 05.0 | 1 April 2015 | Revisions to:<br>• Include provisions related to delayed submission of a monitoring plan;<br>• Provisions related to the Host Party;<br>• Remove reference to programme of activities;<br>• Overall editorial improvement. |
| 04.0 | 25 June 2014 | Revisions to:<br>• Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0));<br>• Include provisions related to standardized baselines;<br>• Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1;<br>• Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*;<br>• 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 (EB70, 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 | 28 May 2010 | EB 54, Annex 34. Initial adoption. |

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