Monitoring report form (Version 03.1)

Monitoring report

Title of the project activity	Incauca S.A. fuel switch from coal to green harvest residues CDM
Reference number of the project activity **Version number of the monitoring report**	1770 1.0
Completion date of the monitoring report	06/02/2013
Registration date of the project activity	16/10/2008
Monitoring period number and duration of this monitoring period	Monitoring period #1 (15/10/2009 - 31/12/2012)
Project participant(s)	Ingenio del Cauca S. A. Corporación Andina de Fomento
Host Party(ies)	Colombia
Sectoral scope(s) and applied methodology(ies)	Sectoral scope(s): 1 : Energy industries (renewable - / non-renewable sources) 4 : Manufacturing industries Methodology applied: AM0036 - Fuel switch from fossil fuels to biomass residues in boilers for heat generation. Version 01
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	113,026 tCO2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	69,721 tCO2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

The proposed project activity aims to reduce the greenhouse gases emission (mainly carbon dioxide) through the installation of a new biomass residue usage system at Incauca sugar mill, in Colombia. As a result the project reduces significantly the fossil fuel usage in heat generation (mainly coal) at the boilers while more heat is generated using additional biomass residues.

In the situation that would continue in the absence of the proposed project activity, the sugar mill would continue using both fossil fuel (coal) and certain quantity of biomass residues (bagasse) for the production of heat for its internal consumption. This situation is in compliance with the regulations and corresponds to the Business as Usual scenario, which is the baseline scenario identified during validation.

Since a technical point of view, the proposed project activity considers the installation of a new system to collect the additional biomass available at the fields (during harvest of the sugar cane) manually and mechanically, an equipment to prepare the biomass residues (chopping to comply with the quality requirements for biomass to be feed in the boilers) and a modernized boilers feed system (by retrofit). The biomass residues are increased to cover completely the internal demand of heat at the project site at the same time that fossil fuel usage is reduced.

After the project implementation some mechanical systems remain in operation mainly to prepare the biomass for the project using equipment existing in the sugar mill.

A.2. Location of project activity

The Project is located in the sector called El Ortigal, municipality of Miranda in the department of Cauca, Colombia. Its geographical coordinates are: latitude 3° 15' North, longitude 76° 15' West (50 km to the south-east of the City of Santiago de Cali). All equipment and boilers of the project are within the facilities of Ingenio del Cauca S.A. (INCAUCA S.A.) and corresponds to the coordinates mentioned above.

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 if the Party involved wishes to be considered as project participant (Yes/No)
Colombia (host)	Private entity: Ingenio del Cauca S. A.	NO
The Netherlands	Multilateral Public entity: Corporación Andina de Fomento (CAF) acting as trustee for the government of The Netherlands represented by its Ministry of Housing, Spatial Planning and the Environment.	YES

A.4. Reference of applied methodology

The following approved baseline and monitoring methodology was applied to the project activity:

- For the fuel switching system, the baseline methodology applied to the project is AM0036 "Fuel switch from fossil fuels to biomass residues in boilers for heat generation"- version 01.

A.5. Crediting period of project activity

15 Oct 09 - 14 Oct 16 (Renewable)
Changed from: 16 Oct 08 - 15 Oct 15

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

The project was modified from its original concept described at the registered PDD, due to the relocation of the waste grinder and the technical upgrading of some components of the collection and transportation system (including their power supply system). The main changes are as follows:

Collection and transportation system (field activities):

After evaluating the three alternatives raised by INCAUCA for the collection of the residual biomass, were identified two efficient ways for collecting and transporting residues. The two ways are called hand-picking and mechanical harvesting (each of the identified sources has its own operating processes which comprise the collection and transportation of the residues from each of the lots designated by the company, until their delivery at the plant for processing).

- Hand-picking: Corresponds to the collection of residual biomass manually by people living in the influence area of the sugar mill. These people have been trained and equipped with tools for their work. The biomass transport from the working lots at the field to the processing facilities is made with animal-drawn vehicles.
- Mechanical harvesting: Corresponds to the collection of residual biomass mechanically using a lifting device. The biomass transport from the working lots at the field to the processing facilities is made using tractors (with their respective wagons). This activity is performed with their own machinery and with a contractor who provides the service (in both cases the technology is similar).

Biomass residues preparation (chopping line):

This process is developed with a set of equipment that operates in line at the same time to obtain the best quality of chopped. The machinery is located in the yard 3. The chopped is made by a chopper fixed to a rotor blade, an adjustable anvil in steel material where the blades are located, and which spin at high speed to generate the cut o chopped material. This chopper consists of the following elements:

- Leveler – 15 HP Engine
- Drum feeder – 18 HP Engine
- Upper Front Roller – 25 HP Engine
- Lower Front Roller – 25 HP Engine
- Upper Back Roller – uses the same engine of the Upper Front Roller of 25 HP
- Lower Back Roller – uses the same engine of the Upper Back Roller of 25 HP
- Chopper of agricultural residues of sugarcane – 300 HP Engine
- Fixed Blade rotor
- Adjustable steel anvil

The load of biomass residues of sugarcane is transported through two (2) strip conductors:

- Strip Conductor 1 – 18 HP Engine: Carries the load of biomass residues through the leveler, drum feeder and delivery the load to the feeding roller. So that, it can be sent in a controlled manner to the chopper machine.
- Strip Conductor 2 - 40 HP Engine: Carries the load of agricultural residues from the output of the chopper to the wagon or otherwise to the yard where the agricultural residues can be storage for its final disposition.

The feeding of the strip conductor 1 is performed with a loader (diesel tractor with hydraulic lift system). The project that is running consist in the installation of a table for unload of the agricultural residues and a transverse conductor. This equipment will be actuated by a 50HP and an 18HP engines. This element will allow reducing the operational cost because it would operate without using the loader to feed the chopper machine

System to feed boilers(feeders):

The boilers feeding process has its starting point at the output of the chopping line. The chopped biomass is transported by an overturning system (tractor with a wagon with hydraulic turning system) until bagasse storage site. At this point, the biomass is collected and transported to the boiler by conductors (to transport and feed agricultural residual biomass, the conductors and boilers feeders were modified by a retrofit).

The project implementation has been developed in phases as follows:

- Pre-processing composting chopper installation (June 2008 – August 2008)
- Main equipment assembly - chopper machine in yard 3 (January 2009 – March 2009)
- Testing period, changes and adjustments (March 2009 – March 2010)

- Conductors and boilers retrofit (January 2011)
- Operation starting date - chopper machine in yard 3 (May 2011)

Since May 2011 to date the project operation has been constant however has been observed a decrease of agricultural residues during winter times where the biomass collection is limited because their conditions make it unsuitable for use in boilers.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology

There are no temporary deviations from registered monitoring plan or applied methodology during this monitoring period.

B.2.2. Corrections

There are no corrections to the project information or parameters determined at validation stage.

B.2.3. Permanent changes from registered monitoring plan or applied methodology

There are no permanent changes from the registered monitoring plan or applied methodologies approved / submitted during this monitoring period.

B.2.4. Changes to project design of registered project activity

There are no changes to the project design of the project activity approved or submitted during this monitoring period.

B.2.5. Changes to start date of crediting period

The start date of crediting period has been changed during this monitoring period, passing of 16/10/2008 to 15/10/2009.

B.2.6. Types of changes specific to afforestation or reforestation project activity

The project does not correspond to afforestation or reforestation activities

SECTION C. Description of monitoring system

A Management Monitoring System has been implemented to ensure that the provisions in the approved monitoring methodology AM0036 version 01 and the applicable tools have been correctly implemented in order to enable an accurate and transparent determination of the emissions reductions.

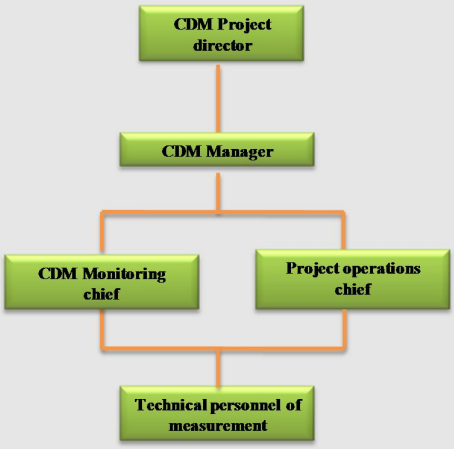
The Management Monitoring System implemented by INCAUCA contains the procedures, documents, records and other supports necessary to meet the requirements defined in the monitoring plan detailed in the approved PDD. As a starting point, INCAUCA has an internal server (called AGROCAUCA03) in which are willing rules, procedures, forms, and records that support the enterprise management systems. In this server, all processes are coded and classified in several folders that allow a clear identification where only authorized personnel can handle the documents. For the monitoring of the CDM component has been created the folder 950 “Monitoreo Proyecto MDL” in which can be found two types of procedures, P and V (the CDM Monitoring Manager is the only authorized to manipulate this information).

The procedures P establish general conditions for the administration and implementation of the monitoring and the definition of the administrative structure and support for compliance with the minimum requirements of measurement of each parameter, periodic review and continuous improvement.

The procedures V defining operational conditions to develop the measurements of each parameter, determining the method, the minimum quality conditions (QA/QC) and establishing the records of information and the data treatment until its use in the calculation of the emission reductions achieved.

For proper implementation of the monitoring plan, was adopted an organizational structure that permits to manage each monitoring processes being carried out. For such administration have been defined

responsibilities, authorities and interrelationships of all personnel involved with the project monitoring. The personnel responsible for project monitoring implemented at INCAUCA is as follows:



CDM Project director: It's the maximum authority in the project monitoring (the "Energy Business Manager" of INCAUCA has been appointed for this position) and is in charge to inform the Board of Directors regarding of overall monitoring of the CDM project, related activities and the administrative organization. In addition, must provide evidence of the commitment of the INCAUCA´s Management with the development and implementation of the CDM monitoring system and the continuous improvement of its effectiveness through the following mechanisms:

- Communicating the organization about the importance of fulfil all monitoring requirements according to the methodology AM0036
- Ensuring compliance of the project monitoring objectives;
- Carrying out management reviews;
- Ensuring the availability of resources;

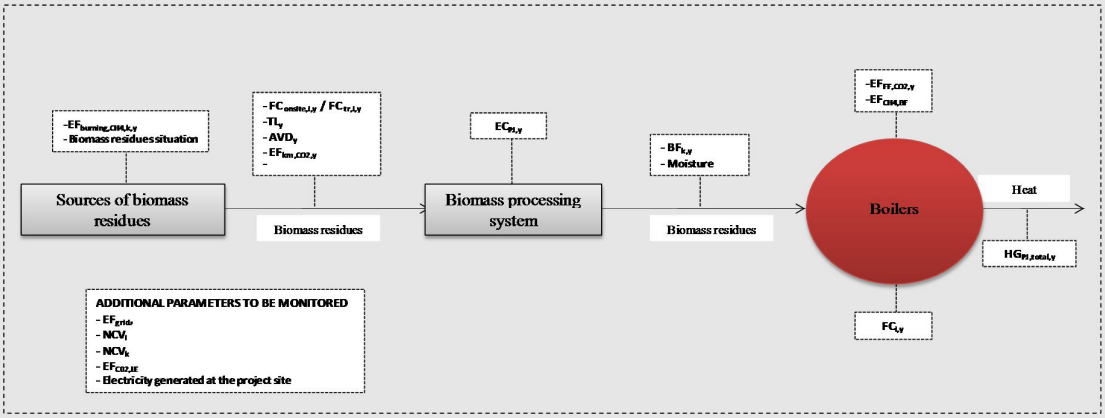
CDM Manager: It´s responsible for overseeing the implementation of the Management Monitoring System (the "Director of energy generation" of INCAUCA has been appointed for this position) and provides information to the CDM Project director regarding the performance of the entire monitoring system.

CDM Monitoring chief: It´s responsible for the CDM monitoring implementation (the "Monitoring analyst" of INCAUCA has been appointed for this position) and supervision of the project monitoring development preparing all documents required for project verification. He will be responsible for preparing and checking documents required for CDM verification. In addition is in charge of managing and processing of information resulting from monitoring of the project parameters, and perform the corresponding reports to verify that the monitoring plan implemented is in line with the provisions stated in the PDD and the estimates of emission reductions are correct.

Technical personnel of measurement (monitoring staff): It´s responsible for monitoring the project operation and report aspects related with monitoring matters directly to the CDM Monitoring chief. The monitoring staff have responsibilities for checking instrumentation, record keeping, data handling and data processing, filing, reporting, organizing repair and maintenance of monitoring equipment and ensuring that monitoring is adhered to as indicated in the approved monitoring plan.

In general terms, overall management structure for project monitoring is as follows:

- **On-line / off-line monitoring system:** Some instruments and equipment required determining greenhouse gases emissions and emission reductions is operated and monitored from a central control point at the sugar mill which record meters readings at a pre-determined conditions and interval as specified in the technical project documents. These data are used to continually update total emission reductions as long as the feedback of the operation. Key meters and parameters are controlled as it is defined in the monitoring manual. For monitoring the parameters according to the monitoring plan, the following monitoring points are considered:



- **Data recording system:** For the project has been implemented a data recording system (in some cases manually to act as a back-up for the on-line system). This system involves completion of a daily log sheet that will record the readings from the start of the day (which is also the end of the previous day) until the end of the day. Spot readings of other values are also recorded periodically for the CDM parameters. At least one set of manual readings are being taken directly from the meters each day, and are used to do a cross-check of other readings. These log sheets are acting as a back-up for the project monitoring and a means of estimating other essential data in the event of a prolonged failure of the on-line system. A prolonged failure constitute more than 24 hours (cumulative) without on-line monitoring.
- **Management of the essential and non-essential data:** The monitoring system is recording "essential" and some "non-essential" data. The last one is termed non-essential because it is not listed directly in the monitoring methodology, but it constitutes a means of corroborating the monitoring results (in specific cases). The essential and non-essential data includes measurements of the parameters determined in the monitoring plan, support documents (registers) and any other data considered relevant for the project activity.
- **Archiving of data:** The monitoring system considers the archive of data periodically (automatically when the on-line system is used) in a secure and retrievable storage format. The other records are stored in an accessible electronic format (in the server defined above). These data are stored and will be kept until 2 years after the end of the crediting period.
- **Treatment of data during contingencies:** When data in the monitoring system are corrupted or missing, the missing data are being estimated by taking the lower value of the average value for the parameter in question in the hour before the error arose or the hour immediately after the monitoring system came on-line again. If there is evidence to suggest that both of these values are un-representative, the average from the previous 48 hours is used. The error is recorded in the daily log sheet and the occurrence of the error is investigated and rectified as soon as possible. If the monitoring system is compromised for more than 48 hours, all data are manually recorded (specially applied for the on-line monitoring) according to the procedures, however the emission reductions due to the project activity cannot be claimed until all requirements for monitoring of emission reductions have been re-established.
- **Document Control:** A document control system has been implemented to ensure that the current versions of necessary documents are available at the point of use. The CDM Monitoring manual and their respective procedures have been developed to guarantee the best practice and results in the monitoring implementation.
- **Accuracy and calibration of instruments:** All meters installed in the project are maintained as specified in the management procedures (e.g. according to the manufacturer specifications). All key meters are being subject to a quality control regime which includes regular maintenance and calibration. A record of this maintenance is kept showing the location and unique identification number of each meter, the calibration status (indicating the last calibration and when will be the next one), the equipment maintenance (e.g. indicating who performs the calibration), among others. Calibration certificates for all meters are kept until two years after the end of the crediting period.
- **Calculation of avoided emissions:** The data required for calculating baseline and project emissions are validated to be fed into a data processor (spreadsheet application predefined) to calculate the emission reductions according to the formulae described by the methodology applied using default values where it is applicable and monitored parameters. Access to the spreadsheet is controlled for

security of the results. The calculation process is audited to ensure that the project and the monitoring plan are operating correctly.

- **Audit function and management review:** The personnel in charge coordinates an audit of the CDM monitoring system periodically (at least once per year). The auditor is not involved in the daily operation of the project and may be sourced from a third party (if is necessary). The auditor is assessing the implementation of the monitoring procedure and the preparation of the monitoring report. Audit findings, and steps taken to address findings are recorded and reviewed in a management review meeting (convened at least annually) at which time the effectiveness of these procedures are reviewed and necessary changes implemented.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data / Parameter:	**$FC_{i,y\ (coal)}$**
Unit:	t
Description:	Quantity of fossil fuel type i fired in all boilers at the project site during the year y.
Source of data:	On-site measurements.
Value(s) applied):	Coal in 2004: 150,360 Coal in 2005: 161,275 Coal in 2006: 161,982
Purpose of data:	Is used to determine the total historical annual heat generation from firing biomass residues and fossil fuels in boilers at the project site.
Additional comment:	Parameter fixed at the registration of the PDD.

Data / Parameter:	**$\eta_{boiler(s),FF}$**
Unit:	-
Description:	Average net efficiency of heat generation in the boiler(s) when fired with fossil fuels.
Source of data:	Three years (2004 to 2006) weighted average of directly measured efficiency in the boiler co-firing coal and Bagasse.
Value(s) applied):	68.9%
Purpose of data:	Is used to determine baseline emissions from fossil fuel combustion for heat generation in the boiler(s).
Additional comment:	Parameter fixed at the registration of the PDD.

Data / Parameter:	**$BF_{k,y\ (bagasse)}$**
Unit:	t of dry matter
Description:	Quantity of bagasse residue type k fired in all boiler(s) at the project site during the historical year n, n-1 or n-2, where n corresponds to the year prior to implementation of the project activity.
Source of data:	On-site measurements.
Value(s) applied):	Bagasse in 2004: 767,841 Bagasse in 2005: 726,046 Bagasse in 2006: 775,554
Purpose of data:	Is used to determine the historical annual heat generation from firing biomass residues in boilers at the project site.
Additional comment:	Parameter fixed at the registration of the PDD.

D.2. Data and parameters monitored

Data / Parameter:	$EF_{FF,CO2,y\ (coal)}$
Unit:	tCO2e/GJ
Description:	CO2 emission factor of the fossil fuel displaced by biomass residues for the year y.
Measured / Calculated / Default:	Default.
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Default values - lower limits of the 95% confidence intervals).
Value(s) of monitored parameter:	0.0895 (coal displaced).
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring / Reading / Recording Frequency:	According to the internal procedure applied, one of the following options should be selected to establish the emission factor: a. Every six months, measurements performed using accredited laboratories, or b. Yearly, a review of accurate and reliable local or national source of data. The option b has been selected, thus an IPCC default value for coal was applied.
Calculation method (if applicable):	-
QA/QC procedures:	Yearly a review of IPCC default values is performed to compare its consistency with the values monitored.
Purpose of data:	Is used to determine the baseline emissions.
Additional comment:	An internal specific procedure V-950.012 has been applied.

Data / Parameter:	$HG_{PJ,total,y}$
Unit:	GJ/yr
Description:	Total heat generated in all boilers at the project site, firing both biomass residues and coal, during the year y.
Measured / Calculated / Default:	Measured / Calculated
Source of data:	Documents: Reporte I/A, Sotfware / Informe "Calor Total Generado por Calderas" RAC Fabrica.
Value(s) of monitored parameter:	

Monitoring period June 1, 2011 to December 31, 2011	Jun	487,930
	Jul	595,604
	Aug	611,789
	Sep	594,992
	Oct	552,136
	Nov	447,674
	Dec	411,794

Monitoring period Jan 1, 2012 to December 31, 2012	Jan	435,318
	Feb	515,638
	Mar	513,868
	Apr	338,963
	May	467,233
	Jun	536,261
	Jul	563,694
	Aug	541,274
	Sep	523,767

		Oct	426,493
		Nov	402,486
		Dec	262,552
Monitoring equipment:	Equipment: Flow meter by differential pressure Manufacturer: Foxboro Internal ID: C1_FT_102, C2_FT_102 , FT_302 , C4_FT_102 Accuracy: +/- 0.2% Calibration frequency: 1 year		
Measuring/ Reading/ Recording frequency:	Measuring frequency: Continuous Reading frequency: Daily Recording frequency: Aggregated monthly (with annual chance).		
Calculation method (if applicable):	According to the internal procedure applied, the heat generation at the project site will be determined as the difference of the enthalpy of the steam generated by the boilers minus the enthalpy of the feed-water, the boilers blow-down and any condensate return. The data of temperature and pressure of water and steam are taken every two hours for process control; with this information is obtained a monthly average used to calculate a monthly enthalpy for water and steam boilers, 4 using the steam tables in the thermodynamics book, Cengel, Yunus and Michael Boles. Vol 1. 4 ed. Mexico: Mac Graw Hill., 2002. 828 p. The flow meter readings of water flow and steam of boilers Distral # 3 and # 4 are registered daily in the Software I / A Foxboro directly from the instrument. With the information collected above is calculated on a monthly basis the energy of steam, fuel and water.		
QA/QC procedures:	Yearly, the consistency of the measurements is checked by comparison of the results of the net heat generation with an annual energy balance which is based on the quantity of biomass and/or fossil fuels fired (the thermal efficiency is compared to the values obtained in the previous years). For those measurement that results different from data compared, is used the most conservative value.		
Purpose of data:	Is used to determine heat generated with incremental biomass residues as a result of the project activity.		
Additional comment:	An internal specific procedure V-950.007 has been applied.		

Data / Parameter:	**$BF_{k,y\ (Barbojo)}$**		
Unit:	t of dry matter		
Description:	Quantity of biomass residue type k (barbojo) fired in all boiler(s) at the project site during the year y.		
Measured/ Calculated/ Default:	Measured / Calculated		
Source of data:	Document: Informe Parámetros MDL RAC Ingresado / SIAGRI		
Value(s) of monitored parameter:	Monitoring period June 1, 2011 to December 31, 2011	Jun	142
		Jul	342
		Aug	470
		Sep	611
		Oct	560
		Nov	403
		Dec	514
	Monitoring period Jan 1, 2012 to December 31, 2012	Jan	423
		Feb	549
		Mar	895
		Apr	560

		May	769
		Jun	757
		Jul	898
		Aug	916
		Sep	1307
		Oct	683
		Nov	1054
		Dec	446

Monitoring equipment:	Equipment: Weight meters Manufacturer: Fairbanks Internal ID: Weighbridge #1, weighbridge #6 Accuracy: +/- 30kg Calibration frequency: 1 year
Measuring/ Reading/ Recording frequency:	Measuring frequency: Continuous (Automatic in SIAGRI for each load) Reading frequency: Continuous (Automatic in SIAGRI for each load) Recording frequency: Aggregated monthly (with annual chance).
Calculation method (if applicable):	With the data provided by SIAGRI (net weight of biomass residues undiscounted moisture) and measurement of MCk (biomass residues moisture) is applied the following calculation method (included in the "Monthly CDM Monitoring report"): BFk = Trac * (100- Hrac)/100 Where: Trac: Total tonnes of biomass residues entered (agricultural waste) - (SIAGRI) Hrac: Moisture content of biomass residues admitted (agricultural waste) - (SIGIND)
QA/QC procedures:	Yearly, the consistency of the measurements is checked by comparing the monitoring results with an annual energy balance that is based on purchased quantities and stock changes. For those measurement that results different from data compared, is used the most conservative value.
Purpose of data:	Is used to determine heat generation from using biomass residues in boilers.
Additional comment:	An internal specific procedure V-950.001 has been applied.

Data / Parameter:	**$BF_{k,y\ (Bagasse)}$**
Unit:	t of dry matter
Description:	Quantity of biomass residue type k (bagasse) fired in all boiler(s) at the project site during the year y.
Measured/ Calculated/ Default:	Measured / Calculated
Source of data:	Document: Boilers production report

Value(s) of monitored parameter:

Monitoring period June 1, 2011 to December 31, 2011	Jun	34.518
	Jul	46.311
	Aug	50.464
	Sep	46.104
	Oct	41.584
	Nov	36.209
	Dec	29.134

Monitoring period Jan 1, 2012 to December 31, 2012	Jan	34.512
	Feb	41.468
	Mar	35.395

		Apr	24.076
		May	34.594
		Jun	39.178
		Jul	45.419
		Aug	47.642
		Sep	40.499
		Oct	28.944
		Nov	23.185
		Dec	15.775

Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	Measuring frequency: Daily (Automatic in SIAGRI) Reading frequency: Daily (Automatic in SIAGRI) Recording frequency: Aggregated monthly (with annual chance).
Calculation method (if applicable):	With the data provided by SIAGRI is applied the following calculation method (included in the "Monthly CDM Monitoring report"): Equation # 1 Total bagasse production = Cane crushed + Maceration water - Diluted juice. Bagasse consumed by the boilers is determined as follows: Equation # 2 Bagasse consumed in boilers = Total bagasse production - Bagasse to Propal - Bagasse to compost + Bagasse in stock Note: To ensure that application of the formulas contains reliable data, the cane crushed is measured in scales, water and juice are measured by flow meters (volume), both delivered bagasse to Propal and to compost is measured in scales and the stock of bagasse is calculated.
QA/QC procedures:	Yearly, the consistency of the measurements is checked by comparing the monitoring results with an annual energy balance that is based on purchased quantities and stock changes. For those measurement that results different from data compared, is used the most conservative value.
Purpose of data:	Is used to determine heat generation from using biomass residues in boilers.
Additional comment:	An internal specific procedure V-950.002 has been applied.

Data / Parameter:	**Moisture content of the biomass residues (barbojo)**
Unit:	% (water content)
Description:	Moisture content of each biomass residue type k (barbojo)
Measured/ Calculated/ Default:	Measured / Calculated
Source of data:	Document: Informe Parámetros MDL / SIGIND - Informe Mensual Carbón y Biocombustibles (Calidad y conformidad)
Value(s) of monitored parameter:	

Monitoring period June 1, 2011 to December 31, 2011	Jun	56.3
	Jul	56.3
	Aug	55.72
	Sep	54.25
	Oct	60.61

		Nov	65.64
		Dec	63.74
	Monitoring period Jan 1, 2012 to December 31, 2012	Jan	58.78
		Feb	57.19
		Mar	53.58
		Apr	50.86
		May	52.92
		Jun	54.7
		Jul	42.44
		Aug	44.92
		Sep	50
		Oct	54.89
		Nov	55.09
		Dec	58.33

Monitoring equipment:	Equipment: Dryer Manufacturer: Tecnal Internal ID: 90015027 Accuracy: 1°C Calibration frequency: 6 months Equipment: Analytical balance Mettler PB 3002 - S Manufacturer: Toledo Internal ID: 73003015 Accuracy: - Calibration frequency: 6 months
Measuring/ Reading/ Recording frequency:	Measuring frequency: Daily Reading frequency: Daily Recording frequency: Aggregated monthly (with annual chance).
Calculation method (if applicable):	-
QA/QC procedures:	Yearly, an accredited external laboratory (in this case the laboratory of Universidad del Valle) is used to develop measurements in order to compare the consistency of the monitoring results.
Purpose of data:	Is used to determine the quantity of biomass residue in dry basis.
Additional comment:	An internal specific procedure V-950.003 has been applied. Measurement developed considering provisions in the internal procedure C-270001 "Analysis and Sampling Sugar"; Chapter 6 "Analysis of Materials in Process" 6.2.2 BAGASSE ANALYSIS.

Data / Parameter:	**Moisture content of the biomass residues (bagasse)**
Unit:	% (water content)
Description:	Moisture content of each biomass residue type k (bagasse)
Measured/ Calculated/ Default:	Measured / Calculated.
Source of data:	SIGIND

Value(s) of monitored parameter:

Monitoring period June 1, 2011 to December 31, 2011	Jun	48.8
	Jul	49.9
	Aug	48.8
	Sep	48.6
	Oct	49.1
	Nov	49.5
	Dec	50.5

	Monitoring period Jan 1, 2012 to December 31, 2012: Jan 48.4; Feb 48.7; Mar 49.0; Apr 48.2; May 47.6; Jun 46.4; Jul 46.7; Aug 46.3; Sep 48.1; Oct 48.5; Nov 47.1; Dec 47.2
Monitoring equipment:	Equipment: Dryer Manufacturer: Tecnal Internal ID: 90015027 Accuracy: 1°C Calibration frequency: 6 months Equipment: Analytical balance Mettler PB 3002 - S Manufacturer: Toledo Internal ID: 73003015 Accuracy: - Calibration frequency: 6 months
Measuring/ Reading/ Recording frequency:	Measuring frequency: Daily (for each load) Reading frequency: Daily (for each load) Recording frequency: Aggregated monthly (with annual chance)
Calculation method (if applicable):	-
QA/QC procedures:	Yearly, an accredited external laboratory (in this case the laboratory of Universidad del Valle) is used to develop measurements in order to compare the consistency of the monitoring results.
Purpose of data:	Is used to determine the quantity of biomass residue in dry basis.
Additional comment:	An internal specific procedure V-950.004 has been applied. Measurement developed considering provisions in the internal procedure C-270001 "Analysis and Sampling Sugar"; Chapter 6 "Analysis of Materials in Process" 6.2.2 BAGASSE ANALYSIS).

Data / Parameter:	**$FC_{i,y\,(coal)}$**
Unit:	t
Description:	Quantity of fossil fuel type i fired in all boilers at the project site during the year y.
Measured/ Calculated/ Default:	Measured.
Source of data:	Document: Reporte Diario I/A Calderas
Value(s) of monitored parameter:	Monitoring period June 1, 2011 to December 31, 2011: Jun 11,591.4; Jul 9,629.9; Aug 8,288.5; Sep 9,685.6; Oct 9,827.3; Nov 9,151.1; Dec 10,762.1

	Monitoring period Jan 1, 2012 to December 31, 2012	Jan	8,080.3
		Feb	7,605.2
		Mar	9,667.2
		Apr	6,233.0
		May	7,981.9
		Jun	6,272.9
		Jul	6,471.1
		Aug	5,705.9
		Sep	5,694.7
		Oct	8,456.5
		Nov	8,241.9
		Dec	5,435.3

Monitoring equipment:	Equipment: Belt scale Manufacturer: Merrick Internal ID: 00403001 Accuracy: +/- 2% Calibration frequency: 1 year
Measuring/ Reading/ Recording frequency:	Measuring frequency: Continuous (Automatic for each load) Reading frequency: Continuous (Automatic for each load) Recording frequency: Aggregated monthly (with annual chance).
Calculation method (if applicable):	-
QA/QC procedures:	Yearly, the consistency of the measurements is checked by comparing the measurement results with an annual energy balance that is based on purchased quantities and stock changes. For those measurement that results different from data compared, is used the most conservative value.
Purpose of data:	Is used to determine heat generation from using biomass residues and fossil fuels in boilers.
Additional comment:	An internal specific procedure V-950.008 has been applied.

Data / Parameter:	**$FC_{on-site,i,y}$**
Unit:	t
Description:	Quantity of fossil fuel type i combusted at the project site for other purposes than heat generation as a result of project activity during the year y.
Measured/ Calculated / Default:	Measured / Calculated
Source of data:	Fossil fuel purchase invoices / Report for productive hours for machinery in yard (chopped process).

Value(s) of monitored parameter:

Monitoring period June 1, 2011 to December 31, 2011	Jun	2.34
	Jul	2.71
	Aug	2.92
	Sep	1.88
	Oct	2.27
	Nov	3.61
	Dec	3.92

Monitoring period Jan 1, 2012 to December 31, 2012	Jan	3.01
	Feb	3.72
	Mar	4.69
	Apr	2.08
	May	2.36

		Jun	2.62
		Jul	3.44
		Aug	3.61
		Sep	4.23
		Oct	3.70
		Nov	3.38
		Dec	1.96

Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency:-
Measuring/ Reading/ Recording frequency:	Measuring frequency: Daily (for each shift) Reading frequency: Daily (for each shift) Recording frequency: Aggregated monthly (with annual chance).
Calculation method (if applicable):	According to the internal procedure applied, the fossil fuel consumed at the project site for other purposes than heat generation as a result of project activity will be measured using volume meters and fuel purchase receipts (if available). The measurements are aggregated annually.
QA/QC procedures:	Yearly, the consistency of the measurements is checked by comparing the monitoring results with fuel purchase receipts (only where the fossil fuel has been bought). For those measurement that results different from data compared, is used the most conservative value.
Purpose of data:	Is used to determine CO_2 emissions from on-site fossil fuel consumption as a consequence of the project activity.
Additional comment:	An internal specific procedure V-950.009 has been applied.

Data / Parameter:	**$FC_{TR,i,y}$**
Unit:	t
Description:	Fuel consumption of fuel type i in trucks for transportation of biomass residues to the project site.
Measured/ Calculated / Default:	Measured / Calculated
Source of data:	Fossil fuel purchase invoices / Tanking report.

Value(s) of monitored parameter:

Monitoring period June 1, 2011 to December 31, 2011	Jun	0.00
	Jul	0.00
	Aug	1.72
	Sep	3.19
	Oct	2.12
	Nov	1.64
	Dec	2.09

Monitoring period Jan 1, 2012 to December 31, 2012	Jan	2.92
	Feb	3.28
	Mar	3.65
	Apr	3.18
	May	3.20
	Jun	5.85
	Jul	3.90
	Aug	5.30
	Sep	7.18
	Oct	5.04
	Nov	6.44

		Dec	3.35

Monitoring equipment:	Equipment: Horometer Manufacturer: - Internal ID: - Accuracy: - Calibration frequency:-
Measuring/ Reading/ Recording frequency:	Measuring frequency: Daily (for each shift) Reading frequency: Daily (for each shift) Recording frequency: Aggregated monthly (with annual chance).
Calculation method (if applicable):	According to the internal procedure applied, the fossil fuel consumed at the project site for other purposes than heat generation as a result of project activity will be measured using volume meters and fuel purchase receipts (if available). The measurements will be aggregated annually.
QA/QC procedures:	Yearly, the consistency of the measurements is checked by comparing the monitoring results with fuel purchase receipts (only where the fossil fuel has been bought). For those measurement that results different from data compared, is used the most conservative value.
Purpose of data:	Is used to determine CO2 emissions from transportation of biomass residues to the project site.
Additional comment:	An internal specific procedure V-950.010 has been applied.

Data / Parameter:	**$EC_{PJ,y}$**
Unit:	MWh
Description:	On-site electricity consumption attributable to the project activity during the year y.
Measured/ Calculated/ Default:	Measured.
Source of data:	Electric consumption records (chopper).
Value(s) of monitored parameter:	

Monitoring period June 1, 2011 to December 31, 2011	Jun	5.09
	Jul	5.15
	Aug	8.82
	Sep	10.22
	Oct	9.61
	Nov	5.52
	Dec	7.62

Monitoring period Jan 1, 2012 to December 31, 2012	Jan	5.52
	Feb	9.09
	Mar	7.88
	Apr	4.35
	May	4.34
	Jun	4.41
	Jul	4.87
	Aug	4.40
	Sep	4.04
	Oct	6.30
	Nov	2.43
	Dec	1.99

Monitoring equipment:	Equipment: Monitor PML 3710 Manufacturer: Power Measurement Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	Measuring frequency: Continuous (Automatic in real time) Reading frequency: Daily (data acquisition software "Pegasys") Recording frequency: Aggregated monthly (with annual chance).
Calculation method (if applicable):	-
QA/QC procedures:	Yearly, the consistency of the measurements will be checked by comparing the measurement results with the invoices for purchased electricity (only where the energy has been bought). For those measurement that results different from data compared, is used the most conservative value.
Purpose of data:	Is used to determine CO2 emissions from on-site electricity consumption as a consequence of the project activity.
Additional comment:	An internal specific procedure V-950.011 has been applied.

Data / Parameter:	**$EG_{,m,y}$**
Unit:	MWh
Description:	Net electricity generated by power units m in year *y.*
Measured/ Calculated/ Default:	Calculated.
Source of data:	National dispatch center (CND) of Colombia part of XM (Compañía de Expertos en Mercados S.A. E.S.P.). System NEON http://sv04.xm.com.co/neonweb/PrinNeon.asp
Value(s) of monitored parameter:	<table><tr><td>Year</td><td>2008</td><td>2009</td><td>2010</td></tr><tr><td>Electricity generation – power units m (MWh)</td><td>8,128,306.238</td><td>14,964,392.812</td><td>16,068,817.265</td></tr></table> Note: The information is based on the 3-year generation.
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	Measuring frequency: once at the start of the project activity Reading frequency: once at the start of the project activity Recording frequency: once at the start of the project activity
Calculation method (if applicable):	-
QA/QC procedures:	In all cases the consistency of the results will be supported by relevant documents.
Purpose of data:	Is used to determine the grid emission factor.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	**$EG_{,k,y}$**
Unit:	MWh
Description:	Net electricity generated by power units k in year y.
Measured/	Calculated.

Calculated/ Default:	
Source of data:	National dispatch center (CND) of Colombia part of XM (Compañía de Expertos en Mercados S.A. E.S.P.). System NEON http://sv04.xm.com.co/neonweb/PrinNeon.asp
Value(s) of monitored parameter:	<table><tr><th>Year</th><th>2008</th><th>2009</th><th>2010</th></tr><tr><td>Electricity generation – power units k (MWh)</td><td>46,304,225.011</td><td>40,974,680.276</td><td>40,731,236.779</td></tr></table> Note: The information is based on the 3-year generation.
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	Measuring frequency: once at the start of the project activity Reading frequency: once at the start of the project activity Recording frequency: once at the start of the project activity
Calculation method (if applicable):	-
QA/QC procedures:	In all cases the consistency of the results will be supported by relevant documents.
Purpose of data:	Is used to determine the grid emission factor.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	**$EF_{EL,m,y}$**
Unit:	tCO2/MWh
Description:	Emission factor of power units m in year y.
Measured/ Calculated/ Default:	Calculated.
Source of data:	National dispatch center (CND) of Colombia part of XM (Compañía de Expertos en Mercados S.A. E.S.P.). System NEON http://sv04.xm.com.co/neonweb/PrinNeon.asp
Value(s) of monitored parameter:	<table><tr><th>Year</th><th>2008</th><th>2009</th><th>2010</th></tr><tr><td>Emission factor – power units m (tCO2/MWh)</td><td>0.632</td><td>0.628</td><td>0.661</td></tr></table> Note: The information is based on the 3-year generation.
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	Measuring frequency: once at the start of the project activity Reading frequency: once at the start of the project activity Recording frequency: once at the start of the project activity
Calculation method (if applicable):	Obtained multiplying the fossil fuel consumption of each thermal power plant m (reported in the information system NEON which is an official

	source) with the net calorific value and the CO_2 emission factor of each fossil fuel type consumed by each plant (obtained from IPCC 2006 Guidelines for National Greenhouse Gas Inventories using default values - lower limits of the 95% confidence intervals).
QA/QC procedures:	In all cases the consistency of the results will be supported by relevant documents.
Purpose of data:	Is used to determine the grid emission factor.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	**$EF_{EL,k,y}$**
Unit:	tCO_2/MWh
Description:	Emission factor of power units k in year y.
Measured/ Calculated/ Default:	Calculated.
Source of data:	National dispatch center (CND) of Colombia part of XM (Compañía de Expertos en Mercados S.A. E.S.P.). System NEON http://sv04.xm.com.co/neonweb/PrinNeon.asp
Value(s) of monitored parameter:	<table><tr><th>Year</th><th>2008</th><th>2009</th><th>2010</th></tr><tr><td>Emission factor – power units k (tCO2/MWh)</td><td>0</td><td>0</td><td>0</td></tr></table> Note: The information is based on the 3-year generation.
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	Measuring frequency: once at the start of the project activity Reading frequency: once at the start of the project activity Recording frequency: once at the start of the project activity
Calculation method (if applicable):	Obtained multiplying the fossil fuel consumption of each thermal power plant k (reported in the information system NEON which is an official source) with the net calorific value and the CO_2 emission factor of each fossil fuel type consumed by each plant (obtained from IPCC 2006 Guidelines for National Greenhouse Gas Inventories using default values - lower limits of the 95% confidence intervals).
QA/QC procedures:	In all cases the consistency of the results will be supported by relevant documents.
Purpose of data:	Is used to determine the grid emission factor.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	**$EF_{grid,OMadj,y}$**
Unit:	tCO_2/MWh
Description:	Simple adjusted operating margin emission factor in year y.
Measured/ Calculated/ Default:	Calculated.
Source of data:	Project developer.
Value(s) of monitored parameter:	0.55843
Monitoring equipment:	Equipment: - Manufacturer: -

	Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	Measuring frequency: once at the start of the project activity Reading frequency: once at the start of the project activity Recording frequency: once at the start of the project activity
Calculation method (if applicable):	The Operating Margin was calculated according to the guidelines provided in the "Tool to calculate the emission factor for an electricity system" version 3.0.0, using official and public information. The calculation is based on the 3-year generation-weighted average using the most recent data available. The calculation is available on the spreadsheet (310113_Emission Factor Calculation 2010 V3-Exante.xls).
QA/QC procedures:	In all cases the consistency of the results will be supported by relevant documents.
Purpose of data:	Is used to determine the grid emission factor.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	**$EF_{grid,BM,y}$**
Unit:	tCO2/MWh
Description:	Build margin emission factor in year y.
Measured/ Calculated/ Default:	Calculated.
Source of data:	Project developer.
Value(s) of monitored parameter:	0.20387
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	Measuring frequency: once at the start of the project activity Reading frequency: once at the start of the project activity Recording frequency: once at the start of the project activity
Calculation method (if applicable):	The Operating Margin was calculated according to the guidelines provided in the "Tool to calculate the emission factor for an electricity system" version 3.0.0, using official and public information. The calculation is based on the 3-year generation-weighted average using the most recent data available. The calculation is available on the spreadsheet (310113_Emission Factor Calculation 2010 V3-Exante.xls).
QA/QC procedures:	In all cases the consistency of the results will be supported by relevant documents.
Purpose of data:	Is used to determine the grid emission factor.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	**$EF_{CO2,i\ y}$**
Unit:	kg CO_2/TJ
Description:	CO_2 emission factor for each fuel type i used.
Measured/ Calculated/ Default:	Default.
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Default values - lower limits of the 95% confidence intervals).
Value(s) of monitored parameter:	CO2 Emission Factor Fuel Oil: 75,500 Kg/TJ CO2 Emission Factor Diesel Oil: 72,600 Kg/TJ

	CO2 Emission Factor Natural Gas: 54,300 Kg/TJ CO2 Emission Factor Coal (Sub-bituminous): 92,800 Kg/TJ
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	Measuring frequency: once at the start of the project activity Reading frequency: once at the start of the project activity Recording frequency: once at the start of the project activity
Calculation method (if applicable):	-
QA/QC procedures:	In all cases the consistency of the results will be supported by relevant documents.
Purpose of data:	Is used to determine the grid emission factor.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	**$EF_{grid,y}$ / $EF_{grid,CM,y}$**
Unit:	tCO_{2e}/MWh
Description:	Combined margin emission factor in year y.
Measured/ Calculated/ Default:	Calculated.
Source of data:	Project developer.
Value(s) of monitored parameter:	0.38115
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	Measuring frequency: once at the start of the project activity Reading frequency: once at the start of the project activity Recording frequency: once at the start of the project activity
Calculation method (if applicable):	The emission factor is calculated as the weighted average of the Operating Margin (OM) and the Build Margin (BM) emissions factors according to the procedures described in the "Tool to calculate the emission factor for an electricity system" version 3.0.0, using official and public information. The calculation is available on the spreadsheet (310113_Emission Factor Calculation 2010 V3-Exante.xls).
QA/QC procedures:	In all cases the consistency of the results will be supported by relevant documents.
Purpose of data:	Is used to determine the grid emission factor.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	**$NCV_{i\ (coal)}$**
Unit:	GJ/t
Description:	Net calorific value of fossil fuel type I.
Measured/ Calculated/ Default:	Default.
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Default values - lower limits of the 95% confidence intervals).
Value(s) of	

monitored parameter:	19.9 (coal)
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	According to the procedure a yearly consultation of the national default values (for the CO_2 emission factors) for each fuel consumed on transportation is applied,
Calculation method (if applicable):	-
QA/QC procedures:	Yearly a review of IPCC default values is performed to compare its consistency with the values monitored.
Purpose of data:	Is used to determine project emissions for biomass residues transportation.
Any comment:	An internal specific procedure V-950.005 has been applied.

Data / Parameter:	**$NCV_{i\ (diesel)}$**
Unit:	GJ/t
Description:	Net calorific value of fossil fuel type I.
Measured/ Calculated/ Default:	Default.
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Default values - lower limits of the 95% confidence intervals).
Value(s) of monitored parameter:	41.4 (diésel)
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring/ Reading/ Recording frequency:	According to the procedure a yearly consultation of the national default values (for the CO_2 emission factors) for each fuel consumed on transportation is applied,
Calculation method (if applicable):	-
QA/QC procedures:	Yearly a review of IPCC default values is performed to compare its consistency with the values monitored.
Purpose of data:	Is used to determine project emissions for biomass residues transportation.
Any comment:	An internal specific procedure V-950.005 has been applied.

Data / Parameter:	**$NCV_{k\ (barbojo)}$**
Unit:	GJ/t (of dry matter)
Description:	Net calorific value of biomass residue type k (barbojo).
Measured/ Calculated/ Default:	Measured / Calculated.
Source of data:	Document: Informe Parámetros MDL / SIGIND - Informe Mensual Carbón y Biocombustibles (Calidad y conformidad).
Value(s) of monitored parameter:	Monitoring period June 1, 2011 to December 31, 2011: May 8.141; Jun 8.141; Jul 8.141

		Aug	8.141
		Sep	8.141
		Oct	8.141
		Nov	8.141
		Dec	8.141
	Monitoring period Jan 1, 2012 to December 31, 2012	Jan	8.141
		Feb	8.141
		Mar	8.141
		Apr	8.141
		May	8.141
		Jun	8.141
		Jul	8.141
		Aug	8.141
		Sep	8.141
		Oct	8.141
		Nov	8.141
		Dec	8.141

Monitoring equipment:	Equipment: Heat pump PARR 1261 isoperibol Manufacturer: PARR Internal ID: 73015022 Accuracy: +/- 100 Calibration frequency: Monthly Equipment: Analytical balance Mettler AB 204 Manufacturer: Toledo Internal ID: 73003009 Accuracy: - Calibration frequency: 6 months
Measuring/ Reading/ Recording frequency:	Measuring frequency: Weekly Reading frequency: Weekly Recording frequency: Aggregated monthly (with annual chance).
Calculation method (if applicable):	Every six months, for each type of biomass residues, measurements are performed under international standards using accredited laboratories, taking at least three samples for each measurement.
QA/QC procedures:	The consistency of the measurements and values from local/national data are checked by comparing with default values (obtained from IPCC 2006 Guidelines for National Greenhouse Gas Inventories using default values - lower limits of the 95% confidence intervals). For those measurement that results different from data compared, is used the most conservative value.
Purpose of data:	Is used to calculate baseline and project emissions from biomass residues consumed at the project site.
Additional comment:	An internal specific procedures (V-950.006) have been applied (measurement developed considering provisions in the internal procedure C-270001 "Analysis and Sampling Sugar"; Chapter 6 "Analysis of Materials in Process" 6.2.7 CALORIFIC VALUE OF BAGASSE).

Data / Parameter:	**$NCV_{k\ (bagasse)}$**
Unit:	GJ/t (of dry matter)
Description:	Net calorific value of biomass residue type k (bagasse).
Measured/ Calculated/ Default:	Measured / Calculated.

<table>
<tr><td>Source of data:</td><td>Document: Informe Parametros MDL / SIGIND - Informe Mensual Carbon y Biocombustibles (Calidad y conformidad).</td></tr>
<tr><td>Value(s) of monitored parameter:</td><td>
<table>
<tr><td rowspan="8">Monitoring period June 1, 2011 to December 31, 2011</td><td>May</td><td>9.071</td></tr>
<tr><td>Jun</td><td>9.071</td></tr>
<tr><td>Jul</td><td>9.071</td></tr>
<tr><td>Aug</td><td>9.071</td></tr>
<tr><td>Sep</td><td>9.071</td></tr>
<tr><td>Oct</td><td>9.071</td></tr>
<tr><td>Nov</td><td>9.071</td></tr>
<tr><td>Dec</td><td>9.071</td></tr>
</table>
<table>
<tr><td rowspan="12">Monitoring period Jan 1, 2012 to December 31, 2012</td><td>Jan</td><td>9.071</td></tr>
<tr><td>Feb</td><td>9.071</td></tr>
<tr><td>Mar</td><td>9.071</td></tr>
<tr><td>Apr</td><td>9.071</td></tr>
<tr><td>May</td><td>9.071</td></tr>
<tr><td>Jun</td><td>9.071</td></tr>
<tr><td>Jul</td><td>9.071</td></tr>
<tr><td>Aug</td><td>9.071</td></tr>
<tr><td>Sep</td><td>9.071</td></tr>
<tr><td>Oct</td><td>9.071</td></tr>
<tr><td>Nov</td><td>9.071</td></tr>
<tr><td>Dec</td><td>9.071</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment:</td><td>Equipment: Heat pump PARR 1261 isoperibol
Manufacturer: PARR
Internal ID: 73015022
Accuracy: +/- 100
Calibration frequency: Monthly

Equipment: Analytical balance Mettler AB 204
Manufacturer: Toledo
Internal ID: 73003009
Accuracy: -
Calibration frequency: 6 months</td></tr>
<tr><td>Measuring/ Reading/ Recording frequency:</td><td>Measuring frequency: Weekly
Reading frequency: Weekly
Recording frequency: Aggregated monthly (with annual chance).</td></tr>
<tr><td>Calculation method (if applicable):</td><td>Every six months, for each type of biomass residues, measurements are performed under international standards using accredited laboratories, taking at least three samples for each measurement.</td></tr>
<tr><td>QA/QC procedures:</td><td>The consistency of the measurements and values from local/national data are checked by comparing with default values (obtained from IPCC 2006 Guidelines for National Greenhouse Gas Inventories using default values - lower limits of the 95% confidence intervals). For those measurement that results different from data compared, is used the most conservative value.</td></tr>
<tr><td>Purpose of data:</td><td>Is used to calculate baseline and project emissions from biomass residues consumed at the project site.</td></tr>
<tr><td>Additional comment:</td><td>An internal specific procedures (V-950.006) have been applied (measurement developed considering provisions in the internal procedure C-270001 "Analysis and Sampling Sugar"; Chapter 6 "Analysis of Materials in Process" 6.2.7 CALORIFIC VALUE OF BAGASSE).</td></tr>
</table>

Data / Parameter:	$EF_{CO2,FF,y\ (diesel)}$
Unit:	tCO2/GJ
Description:	CO2 emission factor for fossil fuel type i.
Measured / Calculated / Default:	Default
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Default values - lower limits of the 95% confidence intervals).
Value(s) of monitored parameter:	0.0726 (diesel)
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring / Reading / Recording Frequency:	According to the procedure a yearly consultation of the national default values (for the CO_2 emission factors) for each fuel consumed on transportation is applied,
Calculation method (if applicable):	-
QA/QC procedures:	Yearly a review of IPCC default values is performed to compare its consistency with the values monitored.
Purpose of data:	Is used to determine project emissions for biomass residues transportation.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	$EF_{CH4,BF\ (biomass)}$
Unit:	tCH4/GJ
Description:	CH4 emission factor for the combustion of the biomass residues in the boilers
Measured / Calculated / Default:	Default.
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Default values - lower limits of the 95% confidence intervals) volume 2, chapter2, tables 2.2 to 2.6.
Value(s) of monitored parameter:	0.0000411 (biomass)
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring / Reading / Recording Frequency:	According to the internal procedure applied quarterly a review of accurate and reliable local, national source of data or IPCC default values.
Calculation method (if applicable):	-
QA/QC procedures:	The consistency of the measurements and values from local/national data are checked by comparing with default values (obtained from IPCC 2006 Guidelines for National Greenhouse Gas Inventories using default values - lower limits of the 95% confidence intervals). For those measurement that results different from data compared, is used the most conservative value.
Purpose of data:	Is used to determine the baseline emissions.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	$EF_{burning,CH4,k,y\ (biomass)}$
Unit:	tCH_4/GJ
Description:	CH_4 emission factor for uncontrolled burning of the biomass residue type k during the year y.
Measured / Calculated / Default:	Default.
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Default values - lower limits of the 95% confidence intervals).
Value(s) of monitored parameter:	0.00197 tCH4/t biomass (agricultural residues)
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring / Reading / Recording Frequency:	According to the internal procedure applied yearly a review of accurate and reliable source (IPCC default values).
Calculation method (if applicable):	0.00197 tCH4/t biomass is divided by the NCV of the biomass type k (agricultural residues) to get the value for the CH_4 emission factor for uncontrolled burning of this type of biomass.
QA/QC procedures:	The consistency of the measurements and values from local/national data are checked by comparing with default values (obtained from IPCC 2006 Guidelines for National Greenhouse Gas Inventories using default values - lower limits of the 95% confidence intervals). For those measurement that results different from data compared, is used the most conservative value.
Purpose of data:	Is used to determine the baseline emissions.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	$EF_{C02,LE\ (coal)}$
Unit:	tCO2/GJ
Description:	CO_2 emission factor of the most carbon intensive fuel used in the country.
Measured / Calculated / Default:	Default.
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Default values - lower limits of the 95% confidence intervals).
Value(s) of monitored parameter:	0.0895 (coal)
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring / Reading / Recording Frequency:	According to the internal procedure applied yearly a review of accurate and reliable source (IPCC default values).
Calculation method (if applicable):	-
QA/QC procedures:	In all cases the consistency of the results are supported by relevant documents.
Purpose of data:	Is used to determine the baseline emissions.
Additional comment:	An internal specific procedure V-950.013 has been applied.

Data / Parameter:	**-**
Unit:	-
Description:	Demonstration that the biomass residue type k from a specific source would continue not to be collected or utilized.
Measured / Calculated / Default:	Measured.
Source of data:	Harvest annual report.
Value(s) of monitored parameter:	-
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring / Reading / Recording Frequency:	According to the internal procedure applied for the leakage determination, an assessment of the situation of the biomass residues before the project implementation was developed (for each site providing biomass residues). Yearly, an assessment of the current situation of the biomass residues is developed for each site providing biomass residues.
Calculation method (if applicable):	-
QA/QC procedures:	In all cases the consistency of the results are supported by relevant documents.
Purpose of data:	Is used to determine leakages.
Additional comment:	An internal specific procedure V-950.015 has been applied.

Data / Parameter:	**-**
Unit:	MWh
Description:	Electricity generation during the year y at the project site.
Measured / Calculated / Default:	Measured.
Source of data:	-
Value(s) of monitored parameter:	<table><tr><td rowspan="3">Monitoring period June 1, 2011 to December 31, 2011</td><td>Total generation</td><td>138,963.345</td></tr><tr><td>Power bought/received from the national grid</td><td>1,179.023</td></tr><tr><td>Power delivered to the national grid (Diceler)</td><td>36,771.298</td></tr></table> <table><tr><td rowspan="3">Monitoring period Jan 1, 2012 to December 31, 2012</td><td>Total generation</td><td>216,696.547</td></tr><tr><td>Power bought/received from the national grid</td><td>1,545.904</td></tr><tr><td>Power delivered to the national grid (Diceler)</td><td>63,701.544</td></tr></table>
Monitoring equipment:	Equipment: - Manufacturer: - Internal ID: - Accuracy: - Calibration frequency: -
Measuring / Reading / Recording Frequency:	According to the area responsible for the energy, is measure the power generated at the project site using power meters and will report the following items: • Total power generated at the project site during the year, • The power generated by each generation facility, • Power bought/received from the national grid,

	• Power delivered to the national grid, • Equipment and specific measurement methods used for the measurement.
Calculation method (if applicable):	-
QA/QC procedures:	In all cases the consistency of the results are supported by relevant documents.
Purpose of data:	-
Additional comment:	An internal specific procedure V-950.014 has been applied.

D.3. Implementation of sampling plan

No parameter has been determined by means of a sampling plan.

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

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

According to the methodology AM0036 version 01 baseline emissions include CO_2 emissions from fossil fuel combustion in the boilers and CH_4 emissions from the treatment of the biomass residues in absence of the project activity; and are calculated as follows:

$$BE_y = BE_{HG,y} + BE_{BF,y}$$

Where:
BE_y = Baseline emissions during the year y (tCO_2e/yr)
$BE_{HG,y}$ = Baseline emissions from fossil fuel combustion for heat generation in the boiler(s) (tCO_2/yr)
$BE_{BF,y}$ = Baseline emissions due to uncontrolled burning or decay of the biomass residues (tCO_2e/yr)

As the PDD includes into the project boundary emissions from the treatment of the biomass residues in absence of the project activity, the baseline emissions due to uncontrolled burning or decay of the biomass residues ($BE_{BF,y}$) are included.

a) Baseline emissions from fossil fuel combustion in boiler(s) for heat generation ($BE_{HG,y}$)

Emissions from fossil fuel combustion in the boiler(s) were determined multiplying the heat generated with fossil fuels that are displaced by biomass residues with the CO_2 emission factor of the least carbon-intensive fossil fuels that would be used in the absence of the project activity (in the project scenario the only fossil fuel displaced is coal) and by dividing by the average net efficiency of heat generation in the boiler(s); and are calculated as follows:

$$BE_{HG,y} = \frac{HG_{PJ,biomass,y} \cdot EF_{FF,CO2,y}}{\eta_{boiler,FF}}$$

Where:
$BE_{HG,y}$ = Baseline emissions from fossil fuel combustion for heat generation in the boiler(s) (tCO_{2e}/yr)
$HG_{PJ,biomass,y}$ = Heat generated with incremental biomass residues used as a result of the project activity during the year y (GJ/yr)
$EF_{FF,CO2,y}$ = CO_2 emission factor of the fossil fuel type displaced by biomass residues (tCO_{2e}/GJ)
$\eta_{boiler,FF}$ = Average net efficiency of heat generation in the boiler(s) when fired with fossil fuels

For the project activity the least carbon intensive fuel type used in boilers at the project site during the most recent three years prior to the implementation is coal. The average net efficiency has been fixed at the beginning of the project activity suing the most recent data according to the PDD. For information regarding baseline emissions calculation and their results please review the file "310113 Emission reductions_Incauca - V1.0_Revision 1" data sheet "BEHG".

In determination of $HG_{PJ,biomass,y}$ was considered that biomass residues have already been used for heat generation at the project site prior to the implementation of the project activity and most plausible baseline scenario is that heat would continue to be generated partly with fossil fuels and partly with biomass residues. This condition corresponds to the case B of methodology (Case B: Use of some biomass residues for heat generation in the absence of the project activity).

As in the case B, $HG_{PJ,biomass,y}$ refers to the additional (to the baseline scenario) quantity of heat generated from the combustion of biomass residues as a result of the CDM project activity.

According to the methodology, as the level of biomass residue use in the absence of the project activity is associated with significant uncertainty, as a conservative approach, for $HG_{PJ,biomass,y}$ must be selected the minimum value among the difference between the total quantity of heat generated from biomass residues in all boilers at the project site in the year (determined by measuring of parameters) and the highest annual historical heat generation with biomass residues among the most recent three years prior to the implementation of the project activity (values determined during validation of PDD) and the difference between the total quantity of heat generated from biomass residues in all boilers in the year and the total heat generation during the year (determined by measuring of parameters) multiplied with the highest historical fraction of heat generation with biomass residues from the most recent three years (values determined during validation of PDD).

According to the assessment, the $HG_{PJ,biomass,y}$ was calculated using the first option as follows:

$$HG_{PJ,biomass,y} = HG_{PJ,biomass,total,y} - MAX\left\{HG_{biomass,historic,n}; HG_{biomass,historic,n-1}; HG_{biomass,historic,n-2}\right\}$$

Where:

$HG_{PJ,biomass,y}$	=	Heat generated with incremental biomass residues used in the project activity during the year y (GJ/yr)
$HG_{PJ,biomass,total,y}$	=	Total heat generated from firing biomass residues in all boilers at the project site during the year y (GJ/yr)
$HG_{biomass,historic,n}$	=	Historical annual heat generation from firing biomass residues in boilers at the project site during the year n (GJ/yr)
n	=	Year prior to the implementation of the project activity

For information regarding $HG_{PJ,biomass,y}$ calculation and their results please review the file "310113 Emission reductions_Incauca - V1.0_Revision 1" data sheet "HGPJ,biomass,y".

b) Baseline emissions from fossil fuel combustion in boiler(s) for heat generation ($BE_{BF,y}$)

Baseline emissions due to uncontrolled burning or decay of the biomass residues are determined consistent with the most plausible baseline scenario for the use of the biomass residues according to the baseline scenario. As project biomass residues have been used for heat generation at the project site prior to the implementation of the project activity and the most plausible baseline scenario is that heat would continue to be generated partly with fossil fuels and partly with biomass residues (where only the use of biomass residues over historical use levels can be attributed to the project activity), the quantity of biomass residue used for heat generation as a result of the project activity ($BF_{PJ,k,y}$) is determined as follows:

$$\sum_k BF_{PJ,k,y} \cdot NCV_k = \sum_k BF_{k,y} \cdot NCV_k \cdot \frac{HG_{PJ,biomass,y}}{HG_{PJ,biomass,total,y}}$$

Where:

$BF_{PJ,k,y}$	=	Quantity of biomass residue type k used for heat generation as a result of the project activity during the year y (tons of dry matter or liter)[4]
$BF_{k,y}$	=	Quantity of biomass residue type k fired in all boiler(s) at the project site during the year y (tons of dry matter or liter)[4]
NCV_k	=	Net calorific value of the biomass residue type k (GJ/ton of dry matter or GJ/liter)
$HG_{PJ,biomass,y}$	=	Heat generated with incremental biomass residues used as a result of the project activity during the year y (GJ/yr)
$HG_{PJ,biomass,total,y}$	=	Total heat generated from firing biomass residues in all boilers at the project site during the year y (GJ/yr)

For information regarding $BF_{PJ,k,y}$ calculation and their results please review the file "310113 Emission reductions_Incauca - V1.0_Revision 1" data sheet "BEBF,y".

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

According to the methodology AM0036 version 01 project emissions include CO_2 emissions from on-site fossil fuel combustion by the project, CO_2 emissions from on-site electricity consumption by the project, CO_2 emissions from off-site transportation of biomass residues to the project site and CH_4 emissions from

combustion of biomass residues in the project boiler(s); and are calculated as follows:

$$PE_y = PE_{CO2,FF,y} + PE_{CO2,EC,y} + PE_{CO2,TR,y} + GWP_{CH4} \cdot PE_{CH4,BF,y}$$

Where:

PE_y	=	Project emissions during the year y (tCO_2/yr)
$PE_{CO2,FF,y}$	=	CO_2 emissions from on-site fossil fuel combustion attributable to the project activity (tCO_2/yr)
$PE_{CO2,EC,y}$	=	CO_2 emissions from on-site electricity consumption attributable to the project activity (tCO_2/yr)
$PE_{CO2,TR,y}$	=	CO_2 emissions from off-site transportation of biomass residues to the project site (tCO_2/yr)
GWP_{CH4}	=	Global Warming Potential of methane valid for the commitment period (tCO_2e/tCH_4)
$PE_{CH4,BF,y}$	=	CH_4 emissions from combustion of biomass residues in the boiler(s) (tCH_4/yr)

As the project activity considers the use of fossil fuels and electricity for their process the $PE_{CO2,FF,y}$, $PE_{CO2,EC,y}$ and $PE_{CO2,TR,y}$ are included. In addition, as the project boundary include emissions from combustion of biomass residues for heat generation the $PE_{CH4,BF,y}$ is considered.

a) Calculation of CO_2 emissions from on-site fossil fuel combustion ($PE_{CO2,FF,y}$)

In the project, some equipment using fossil fuels (mainly diesel) are used for on-site transportation of biomass residues (barbojo) along the process (e.g. to feed the chopper), thus their emissions are considered. To determine these emissions the following formula is applied:

$$PE_{CO2,FF,y} = \sum_i FC_{on-site,i,y} \cdot NCV_i \cdot EF_{CO2,FF,i}$$

Where:

$PE_{CO2,FF,y}$	=	CO_2 emissions from on-site fossil fuel combustion attributable to the project activity (tCO_2/yr)
$FC_{on-site,i,y}$	=	Quantity of fossil fuel type i combusted at the project site for purposes other than heat generation as a result of the project activity during the year y (mass or volume unit)[5]
NCV_i	=	Net calorific value of the fossil fuel type i (GJ / mass or volume unit)
$EF_{CO2,FF,i}$	=	CO_2 emission factor for fossil fuel type i (tCO_2/GJ)

For information regarding project emissions calculation and their results please review the file "310113 Emission reductions_Incauca - V1.0_Revision 1" data sheet "PECO2,FF".

b) Calculation of CO_2 emissions from on-site electricity consumption ($PE_{CO2,EC,y}$)

In the project, some equipment using electricity (mainly from the grid) are used for biomass residues (barbojo) preparation along the process (e.g. to pre-treat biomass), thus their emissions are considered. To determine these emissions the following formula is applied:

$$PE_{CO2,EC,y} = EC_{PJ,y} \cdot EF_{grid,y}$$

Where:

$PE_{CO2,EC,y}$	=	CO_2 emissions from on-site electricity consumption attributable to the project activity (tCO_2/yr)
$EC_{PJ,y}$	=	On-site electricity consumption attributable to the project activity during the year y (MWh)
$EF_{grid,y}$	=	CO_2 emission factor for electricity used from the grid (tCO_2/MWh). Use ACM0002 to calculate the grid emission factor. If electricity consumption ($EC_{PJ,y}$) is less than 15 GWh/yr, the average grid emission factor (including all grid-connected power plants) may be used.

According to methodology ACM0002 the grid emission factor must be calculated using the latest version of the "Tool to calculate the emission factor for an electricity system", in this case version 03.0.0. For information regarding grid emission factor calculation "310113_Emission Factor Calculation 2010 V3-Exante_Revision 1".

In addition, for information regarding project emissions calculation and their results please review the file "310113 Emission reductions_Incauca - V1.0_Revision 1" data sheet "PECO2,EC".

c) Calculation of CO_2 emissions from transportation of biomass residues to the project site ($PE_{CO2,TR,y}$)

As the biomass residues are not generated directly at the project site, in the context of the project part of the biomass residues are transported using vehicles consuming fossil fuels (the other part is transported by

people living in the influence area using animal-drawn vehicles free of GHG emissions). To determine these emissions the following formula is applied (for monitoring has been selected an option 2 of methodology which is based on fuel consumption):

$$PE_{CO2,TR,y} = \sum_i FC_{TR,i,y} \cdot NCV_i \cdot EF_{CO2,FC,i}$$

Where:

$PE_{CO2,TR,y}$ = CO_2 emissions from off-site transportation of biomass residues to the project site (tCO_2/yr)

$FC_{TR,i,y}$ = Fuel consumption of fuel type *i* in trucks for transportation of biomass residues during the year *y* (mass or volume unit)[5]

$EF_{CO2,FF,i}$ = CO_2 emission factor for fossil fuel type *i* (tCO_2/GJ)

For information regarding project emissions calculation and their results please review the file "310113 Emission reductions_Incauca - V1.0_Revision 1" data sheet "PECO2,TR".

d) Calculation of CH_4 emissions from combustion of biomass residues in the boiler(s) ($PE_{CH4,BF,y}$)

As the project boundary include emissions from combustion of biomass residues for heat generation, the emission from the use of barbojo as a consequence of the project activity are considered. To determine these emissions the following formula is applied:

$$PE_{CH4,BF,y} = EF_{CH4,BF} \cdot \sum_k BF_{PJ,k,y} \cdot NCV_k$$

Where:

$PE_{CH4,BF,y}$ = CH_4 emissions from combustion of biomass residues in the boiler(s) (tCH_4/yr)

$EF_{CH4,BF}$ = CH_4 emission factor for the combustion of the biomass residues in the boilers (tCH_4/GJ)

$BF_{PJ,k,y}$ = Quantity of biomass residue type *k* used for heat generation as a result of the project activity during the year *y* (tons of dry matter or liter)[4]

NCV_k = Net calorific value of the biomass residue type *k* (GJ/ton of dry matter or GJ/liter)

For information regarding project emissions calculation and their results please review the file "310113 Emission reductions_Incauca - V1.0_Revision 1" data sheet "PECH4,BF".

E.3. Calculation of leakage

According to the approach for the leakage assumption, based on scenarios B1 and B3, is consider the leakage consideration L1: "*Demonstrate that at the sites where the project activity is supplied from with biomass residues, the biomass residues have not been collected or utilized (e.g. as fuel, fertilizer or feedstock) but have been dumped and left to decay, land-filled or burnt without energy generation (e.g. field burning) prior to the implementation of the project activity. Demonstrate that this practice would continue in the absence of the CDM project activity, e.g. by showing that in the monitored period no market has emerged for the biomass residues considered or by showing that it would still not be feasible to utilize the biomass residues for any purposes (e.g. due to the remote location where the biomass residue is generated).*"

For those biomass residues type k (barbojo) being used in the project and for which it cannot be ruled out leakage effects with the approach above, leakage effects for the period are calculated as follows:

$$LE_y = EF_{CO2,LE} \cdot \sum_n BF_{LE,n,y} \cdot NCV_n$$

Where:

LE_y = Leakage emissions during the year *y* (tCO_2/yr)

$EF_{CO2,LE}$ = CO_2 emission factor of the most carbon intensive fuel used in the country (tCO_2/GJ)

$BF_{LE,n,y}$ = Quantity of biomass residue type *n* used for heat generation as a result of the project activity during the year *y* and for which leakage can not be ruled out using one of the approaches L_1. L_2. L_3 or L_4 (tons of dry matter or liter)[4]

NCV_n = Net calorific value of the biomass residue type *n* (GJ/ton of dry matter or GJ/liter)

n = Biomass residue type *n* for which leakage can not be ruled out using one of the approaches L_1. L_2. L_3 or L_4

For biomass residues (barbojo) from the sites supplying the project activity, it has been demonstrated that prior to the project implementation the biomass was left to decay at the fields without any use or treatment. This condition can be seen at the "periodic harvest report".

In addition, during the monitoring period has been developed an assessment of the current situation of the biomass residues for each site providing biomass residues, proving that no market has emerged for the biomass residues. This monitoring was developed according to the internal specific procedure PM-218-INC.

Considering the above the $BF_{LE,n,y}$ is zero, therefore there are no leakage effects to be considered (LE_y=0). For further information please review the file "310113 Emission reductions_Incauca - V1.0_Revision 1" data sheet "LEy".

E.4. Summary of calculation of emission reductions or net anthropogenic 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)	Emission reductions or net anthropogenic GHG removals by sinks (t CO_2e)
Total	76,312	6,591	0	69,721

E.5. Comparison of actual emission reductions or net anthropogenic 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)	113,026	69,721

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

There are no increase in the actual GHG emission reductions achieved during this monitoring period, thus it is no necessary to explain any difference.

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO_2e)	69,721	0

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Document information

Version	*Date*	*Description*
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 anthropogenic 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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