Monitoring report form
(Version 03.2)

Monitoring report

Title of the project activity	Monte Rosa Bagasse Cogeneration Project (MRBCP)
Reference number of the project activity	0191
Version number of the monitoring report	Version 01
Completion date of the monitoring report	20/12/2013
Registration date of the project activity	22/06/2006 (Renewal date 22/11/2010)
Monitoring period number and duration of this monitoring period	3rd monitoring period of the second crediting period (30/05/2011 – 22/08/2013)
Project participant(s)	• Monte Rosa S.A. • Econergy Brasil Ltda
Host Party(ies)	Nicaragua
Sectoral scope(s) and applied methodology(ies)	• Scope 1 : Energy industries (renewable / non-renewable sources) • ACM0006 - “Consolidated methodology electricity generation from biomass residues”), version 09.
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	**240,217 tCO_2**
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	**216,782 tCO_2**
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	**124,958 tCO_2**
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	**91,824 tCO_2**

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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1. This project consists of increasing the efficiency in the Bagasse cogeneration facility at Monte Rosa, a Nicaraguan sugar Mill and thereby reducing GHG emissions by displacing the fossil fuel consumption for electricity generation.
2. The equipment installed at MRBCP, prior and after the start of the project activity, are presented in table 1, below:

Table 1 - Equipment installed in the cogeneration plant prior and after the start of the Monte Rosa bagasse cogeneration project activity

Chronogram	**Active / In Operation**			**Deactivated**	Stand-By
Before the Expansion Plan	One 3 MW Backpressure **turbo generator 2** (TG)	One 2.5 MW backpressure turbo generator (TG)	One 1.5 MW backpressure turbo generator (TG)		
	One 13.78 bar **boiler 1** (36 t/h)	One 13.78 bar **boiler 2** (22.67 t/h)	One 13.78 bar boiler (11.33 t/h)		
Phase 1 2001-2002	One 15 MW backpressure extraction turbo generator (TG) May - Dec 2001	One 3 MW Backpressure **turbo generator 2** (TG)		One 2.5 MW backpressure turbo generator (TG) May – Jun 2002	Two 4 MW backpressure turbo generator (1,6) (TG) Jun – Dec 2002
	One 62 bar **boiler 3** (120 t/h) Jan - Dec 2001			One 1.5 MW backpressure turbo generator (TG) May – Jun 2002	
	One 13.78 bar **boiler 1** (36 t/h)	One 13.78 bar **boiler 2** (22.67 t/h)	One 13.78 bar boiler (11.33 t/h)		
Phase 2 2004	One 16.5 MW condensing **turbo generator 4**. Jun-Dec 2004	One 20 MW extraction **turbo generator 3** TG (backpressure). Jun-Nov 2004	One 20 MW extraction **turbo generator 5** TG (backpressure) Jun-Nov 2005	One 15 MW backpressure extraction turbo generator (TG) May - 2005	Two 4 MW backpressure **turbo generator (1,6)** (TG)
	One 62 **boiler 3** (120 t/h)	One 62 **boiler 4** (150 t/h) Oct 2003 - Nov 2004		One 13.78 bar boiler (11.33 t/h)	One 3 MW Backpressure **turbo generator 2** (TG)
					One 13.78 bar **boiler 1** (36 t/h)
					One 13.78 bar **boiler 2** (22.67 t/h)

Phase 3 (validation Period)	One 16.5 MW condensing **turbo generator 4**.	One 20 MW extraction **turbo generator 3** TG (backpressure).	One 20 MW extraction **turbo generator 5** TG (backpressure).	One 15 MW backpressure extraction turbo generator (TG) May - 2005	Two 4 MW backpressure **turbo generator (1,6)** (TG)
	One 62 bar **boiler 3** (120 t/h)	One 62 bar **boiler 4** (150 t/h)		One 13.78 bar boiler (11.33 t/h)	One 3 MW Backpressure **turbo generator 2** (TG)
					One 13.78 bar **boiler 1** (36 t/h)
					One 13.78 bar **boiler 2** (22.67 t/h)

1. The project has the following relevant dates for just active equipment:

Table 2 - Equipment list with commissioning and operation start data

Equipment	Capacity	Commissioning	Operation Start	Operational**(*)** during the monitoring period
Boiler 1	13.78 bar – 36 t/h	-	-	**YES**
Boiler 2	13.78 bar – 22.67 t/h	-	-	NO
Boiler 3	62 Bar - 120 t/h	11/2001	12/2001	YES
Boiler 4	62 bar - 150 t/h	11/2004	12/2004	YES
Turbo generator 1	4 MW	09/2002	11/2002	NO
Turbo generator 2	3 MW	09/1999	11/1999	**YES**
Turbo generator 3	20 MW	06/2004	11/2004	YES
Turbo generator 4	16.5 MW	06/2004	12/2004	YES
Turbo generator 5	20 MW	06/2005	11/2005	YES
Turbo generator 6	4 MW	09/2002	11/2002	NO

(*)During the season 2012/2013 the project activity, the Boiler 1 and Turbo-generator 2 were operational, since these equipment were available to be used, as per explained in the registered PDD, and they could be operational or not depending of project participant decision. It is important to mention that the operational license allows up to 60 MW of installed capacity and the project activity do not exceeded that threshold value (the combination of all turbo-generators achieve 59.5 MW at most). The Turbo-generator 2 started to provide electricity to the system since 28/11/2012.

Total emission reductions achieved in this monitoring period is **216,782 tCO_2.**

A.2. Location of project activity

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El Viejo City is located in the northwest of the country. The MRBCP is located in the site of the Monte Rosa Sugar mill, five km away from El Viejo City.

Geographical coordinates: (Latitude 12.700003°, Longitude -87.233336°) [1]

Figure 1 - Monte Rosa Sugar Mill site overview Geographical position of the city of El Viejo

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)**
Nicaragua (host)	Monte Rosa S.A. (Private entity)	No
Brazil	Econergy Brasil Ltda. (Private entity)	No

A.4. Reference of applied methodology

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- ACM0006 ("Consolidated methodology electricity generation from biomass residues") version 09; (http://cdm.unfccc.int/UserManagement/FileStorage/Z6BPV3VIRQ78TCDIO62YT2DU9JYDAQ);
  - ACM0002 ("Consolidated baseline methodology for grid-connected electricity generation from renewable sources") version 10;

    (http://cdm.unfccc.int/UserManagement/FileStorage/NF9EDAOV5K382HW0JR14GS7XYQUMCP);

[1] Geographical coordinates were changed from degrees, minutes and seconds (as was indicated in the PDD) to decimal degrees. (12º 42' 00"; -87º 14' 00")

- "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 04;

  (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-04-v4.pdf);

- "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 02;

  (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf);

- "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" version 01;

  (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf);

- "Combined tool to identify the baseline scenario and demonstrate additionality" version 02.2;

  (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v2.2.pdf);
- "Tool for the demonstration and assessment of additionality" version 05.2

  (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.pdf);
- "Tool to calculate the emission factor for an electricity system" version 02;

  (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf);

A.5. Crediting period of project activity

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The crediting period chosen was seven years, renewable for one more 7 years periods.

The crediting period of MRBCP started on 01/03/2002. The first crediting period finished on 28/02/2009. The crediting period was renewed for more 7 years, and the currently (second) crediting period started 01/03/2009 and will finish 29/02/2016.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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The project uses the steam-Rankine cycle, a world-wide spread technology for generating megawatt (MW) levels of electricity from biomass. The cycle consists of direct combustion of biomass in a boiler to generate steam, which is then expanded through a turbine. Most steam cycle plants are located at industrial sites, where the waste heat from the steam turbine is recovered and used for meeting industrial process heat needs. Such combined heat and power (CHP), or cogeneration systems provide greater levels of energy services per unit of biomass consumed than systems that generate electric power only.

The steam-Rankine cycle involves heating pressurized water; with the resulting steam expanding to drive a turbine-generator and then condensing back to water for partial or full recycling to the boiler. A heat exchanger is used in some cases to recover heat from flue gases to preheat combustion air and a de-aerator must be used to remove dissolved oxygen from water before it enters the boiler.

Steam turbines are designed as either "backpressure" or "condensing" turbines. CHP applications

typically employ backpressure turbines, wherein steam expands to a pressure that is still substantially above ambient pressure. It leaves the turbine still as a moist steam and is sent to satisfy industrial heating needs, where it condenses back to water. It is then partially or fully returned to the boiler. Alternatively, if process steam demands can be met using only a portion of the available steam, a condensing-extraction steam turbine (CEST) might be used. This design includes the capability for some steam to be extracted at one or more points along the expansion path for meeting process needs. Steam that is not extracted continues to expand to sub-atmospheric pressures, thereby increasing the amount of electricity generated per unit of steam compared to the backpressure turbine. The non-extracted steam is converted back to liquid water in a condenser that utilizes ambient air and/or a cold water source as the coolant.

The steam-Rankine cycle uses different boiler designs, depending on the scale of the facility and the type of the fuel being used. The initial pressure and temperature of the steam, together with the pressure to which it is expanded, determine the amount of electricity that can be generated per kilogram of steam. In general, the higher the peak pressure and temperature of the steam, the more efficient, sophisticated, and costly the cycle is.

Table 3 – Operational boilers' list

Quantity	Boiler Details	Steam Generation Capacity	Manufacturer	Model / Serial	Commissioning	Operation start
1	13.78 bar	36 t/h	Without visible plate	Without visible plate	-	Before the expansion of the plant
1	62 bar	120 t/h	CALDEMA	AUP-405GI-PSE / 077	11/2001	12/2001
1	62 bar	150 t/h	SERMATEC	VS-500 / VS-5150/2	11/2004	12/2004

Table 4 – Operational turbines' list

Quantity	Nominal Capacity	Manufacturer	Model / Serial	Commissioning	Operation start
1	3 MW	WESTINGHOUSE	Not available / 5A4250-1	Before the expansion of the plant	Before the expansion of the plant
1	20 MW - backpressure	TGM	TME 25000A / Not available	06/2004	11/2004
1	20 MW - backpressure	TGM	TME 25000A / Not available	06/2005	11/2005
1	16.5 MW - condensing	TGM	TMC 25000A / Not available	06/2004	12/2004

Table 5 – Operational generators' list

Quantity	Generator Details	Manufacturer	Model / Serial	Commissioning	Operation start
1	3.750 MVA / P.F: 80% (≈3 MW)	WESTINGHOUSE	NP 25891-D / IS31P597	Before the expansion of the plant	Before the expansion of the plant
1	20 MW	WEG	SSW1120 / 127365	06/2004	11/200
	16.5 MW	WEG	SSW1000 / 120673	06/2004	12/2004
1	20 MW	GEVISA	271R560G1 / W H227001433	06/2005	11/2005

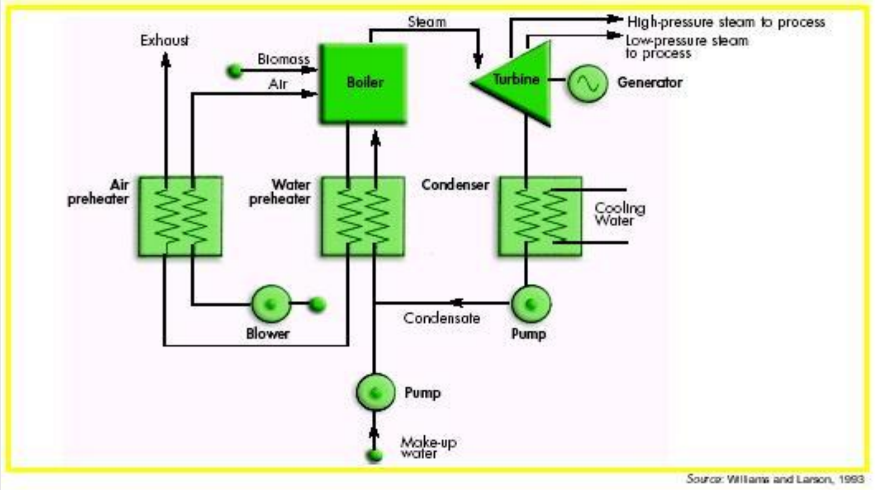

Figure 2 - Schematic diagram of a biomass-fired steam-Rankine cycle for cogeneration using a condensing-extraction steam turbine

Figure 3 - MRBCP panoramic photo

Figure 4 - MRBCP Cogeneration sector

The project has not significant shutdowns during the monitoring period, but among them, project participant presented the more relevant events ordered by data of occurrence. These reasons led to the stop of the complete power plant.

The plant has generated energy for 237 days since 21/11/2011 to 14/07/2012 and 284 days since 12/11/2012 to 22/08/2013, and some downtimes were observed during this time interval as presented in Table 6, Table 7 and Table 8 below. Besides these events, during 30/05/2011 to 20/11/2011 and 15/07/2012 to 11/11/2012 the power plant was not operational due the fact that all bagasse is finished; this period is used for performing the periodical maintenance.

Table 6 - Events during monitoring period in 2011

2011 Downtimes			
Data	**Event**	**Reason**	**Duration (HH:MM)**
22/11/2011	Stop of Turbogenerator # 4	Out of synchrony (Test)	08:13
22/11/2011	Stop of Turbogenerator # 4	Out of synchrony (Test)	13:21
23/11/2011	Stop of Turbogenerator # 4	Out of synchrony (Test)	15:12
26/11/2011	Stop of Turbogenerator # 4	Stop because no sugar cane in process	12:05
13/12/2011	Stop of Turbogenerator # 5	Programmed Maintenance	10:13
13/12/2011	Stop of Turbogenerator # 4	Repairments in a leakage on Boiler 6	16:19
14/12/2011	Stop of Turbogenerator # 4	Repairments in a leakage on Boiler 6	17:22
26/12/2011	Stop of Turbogenerator # 4	Repairments in a leakage on Boiler 6	23:26
27/12/2011	Stop of Turbogenerator # 4	Repairments in a leakage on Boiler 6	24 hours
28/12/2011	Stop of Turbogenerator # 4	Repairments in a leakage on Boiler 6	20:23

Table 7 - Events during monitoring period in 2012

2012 Downtimes			
Data	**Event**	**Reason**	**Duration (HH:MM)**
18/01/2012	Stop of Turbogenerator # 4	Low temperature in Boiler 7.	23:19
21/02/2012	Stop of Turbogenerator # 4	Boiler 6 out of service, due to repairs on forced stream ventilator appurtenances	24 Hrs
16/03/2012	Stop of Turbogenerator # 4	Dangerous vibrations on Boiler 6 ventilation system	91 Hrs 15 min
18/04/2012	Stop of Turbogenerator # 3	Boiler 6 out of service	6:34
17/05/2012	Stop of Turbogenerator # 5	Boiler 6 out of service	122 Hrs.
18/05/2012	Stop of Turbogenerator # 4	Maintenance on main bagasse feed conveyor	10:23
23/05/2012	Stop of Turbogenerator # 5	Low consumption of extraction steam	202 Hrs 27 min
15/06/2012	Stop of Turbogenerator # 4	Low pressure on Boiler 7.	17:49
19/06/2012	Stop of Turbogenerator # 4	Grilled floor maintenance of Boiler 7.	14:11
18/11/2012	Stop of Turbogenerator # 4	Electrical system dispatch restrictions	8:46
30/11/2012	Stop of Turbogenerator # 2	Boiler 5 out of service, due to repairs on forced stream ventilator appurtenances	15:52
09/12/2012	Stop of Turbogenerator # 2	Boiler 5 maintenance	22:37
10/12/2012	Stop of Turbogenerator # 2	Boiler 5 maintenance	24 Hrs
11/12/2012	Stop of Turbogenerator # 2	Boiler 5 maintenance	21:12

Table 8 - Events during monitoring period in 2013

2013 Downtimes			
Data	**Event**	**Reason**	**Duration (HH:MM)**
26/02/2013	Stop of Turbogenerator # 2	Programmed maintenance, Boiler 5 out of service.	11:34
04/03/2013	Stop of turbogenerator # 4	Repairments in a leakage on Boiler 6	16:21
05/03/2013	Stop of turbogenerator # 4	Repairments in a leakage on Boiler 6	14:15
18/04/2013	Stop of turbogenerator # 4	Repairments in a leakage on Boiler 6	14:46
19/04/2013	Stop of turbogenerator # 4	Repairments in a leakage on Boiler 6	21:19
02/05/2013	Stop of turbogenerator # 4	Repairments on Boiler 6	15:21
03/05/2013	Stop of turbogenerator # 4	Repairments on Boiler 6	16:39
07/05/2013	Stop of turbogenerator # 4	Boiler 6 out of service. Problems in electrical system	12:00
19/05/2013	Stop of turbogenerator # 5	Boiler 6 out of service	24 Hrs
20/05/13 to 26/05/13	Stop of turbogenerator # 5	Boiler 6 out of service	168 hrs
27/05/13 to 31/05/13	Stop of turbogenerator # 5	Boiler 6 out of service	120 Hrs
01/06/13 to 02/06/13	Stop of turbogenerator # 5	Boiler 6 out of service	48 Hrs
03/06/2013	Stop of turbogenerator # 5	Boiler 6 out of service	14:40
01/08/2013	Stop of turbogenerator # 4	Cleaning of Boiler 6	18:39
17/08/2013	Stop of turbogenerator # 4	Cleaning of Boiler 6	16:04

Bagasse obtained in the milling process is used to feed the boilers and the excess is stored in the yard to take advantage according to the requirements of energy production. This dynamic operation has been maintained throughout the life of the project activity up to December 10th, 2010, since this moment the storage of the 7.99% of produced bagasse is made in the form of bales, as this allows a better use storage space. In Figure 5 and Figure 6 show diagrams of operation of this practice, this is done during the crop season and between crop seasons.

Harvest Handling Bagasse

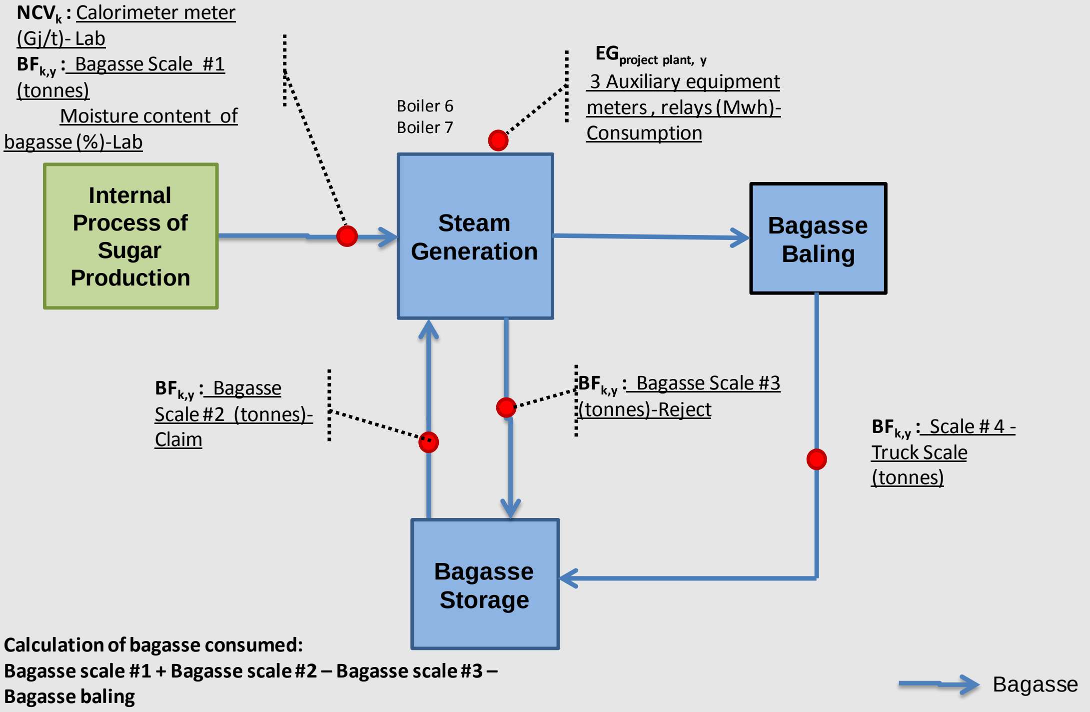

Figure 5 - Diagram of the management of bagasse during the crop season

After the crop season all the bagasse consumed is weighted with the scales installed in the bagasse belts, as described in figure 6. Regarding to the flow from Steam Generation to Bagasse Baling to Bagasse Storage, this flow represent the flow of residual bagasse not used by the heat generators during the crops season, this residual bagasse is delivered to bagasse baling and after is weighted an delivered to the bagasse storage section to be used during the non-crop season period. Note that this flow disappears after de crop season because no residual bagasse is generated during this period (Figure 6).

Non Harvest Handling Bagasse

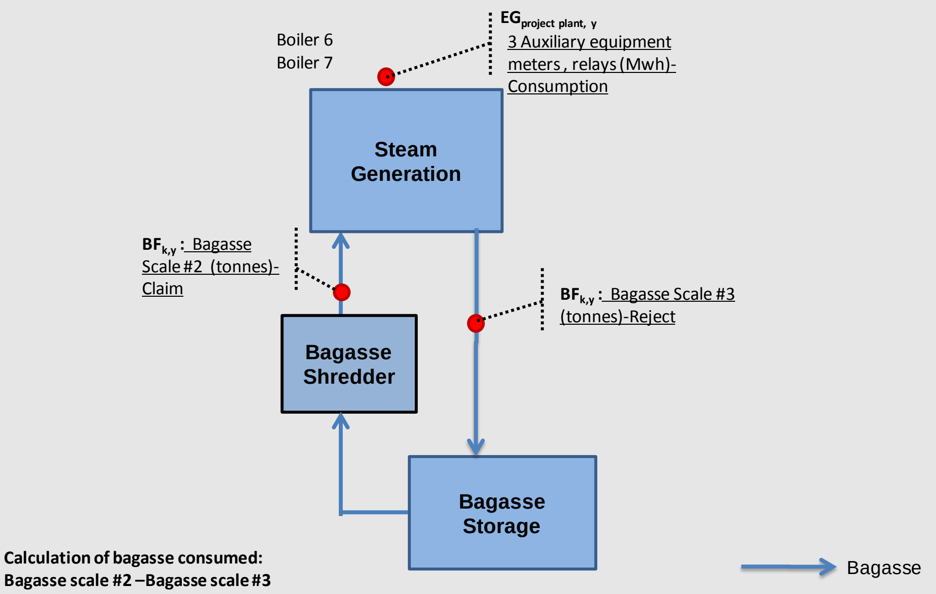

Figure 6 - Diagram of the management of bagasse after the crop season

The baling system was implemented mainly due to the fact that there is not enough free space in the courtyard to store the produced bagasse that has been growing yearly as Monte Rosa mill is increasing the sugar cane processing and baling is the cheaper process to fix this without causing any change in the bagasse quality. This fact is described in the technical literature. One paragraph from a well reputed publication is presented in the text below:

"Because loose bagasse has such a low bulk density, numerous investigations have been made into baling bagasse to reduce the volume of stored bagasse. Baling has generally been proven to be better than pelletizing, which requires costly equipment that is expensive to maintain"[2]

The baling process embraces two sub-processes. The first of them is the own baling process and the second one is the fraying of bagasse bales before its combustion. Both systems require electricity consumption. This electricity consumption has been discounted from the energy generation, because PP includes it inside the auxiliary consumption as conservative approach. The baling machine and fraying machine are included in Boiler 3 and Boiler 4 electrical circuits as was presented to DOE during the onsite visit through single line planes. The bagasse that is converted into bales must be 100% weighted through the scale#4.

During all the current monitoring period, all the bales were weighted in scales#4.

Finally, the events or situations that occurred during the monitoring period and were presented in table above have no impact on the applicability of the methodology.

B.2. Post registration changes

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

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No temporary deviations were considered

B.2.2. Corrections

>>

No corrections were considered

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

>>

No permanent changes have occurred

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

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It was included a new information in the Section A.3 of the registered PDD. This information is regarding to the implantation of a new packaging and storage bagasse system in bales which was storage in outdoor piles in the time of the register of the PDD. This new baling system aims optimize the area of bagasse storage considering the growth of bagasse volume due to increase of installed capacity of plant.

This change does not bring on impacts in the registered CDM project activity as explained in the Section A.3 of the PDD.

B.2.5. Changes to start date of crediting period

[2] Rein Peter, Cane Sugar Engineering. Berlin, Verlag Dr. Albert Bartens KG, 2007, page 606.

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No changes to start date of crediting period have occurred.

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

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Not applicable

SECTION C. Description of monitoring system

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Monitoring processes must be implemented according to the monitoring plan in order to ensure that the real, measurable and long-term greenhouse gas (GHG) emission reduction for the proposed project is monitored and reported. Project participants provides a line diagram (graphical scheme) showing all relevant monitoring points in Figure 7.

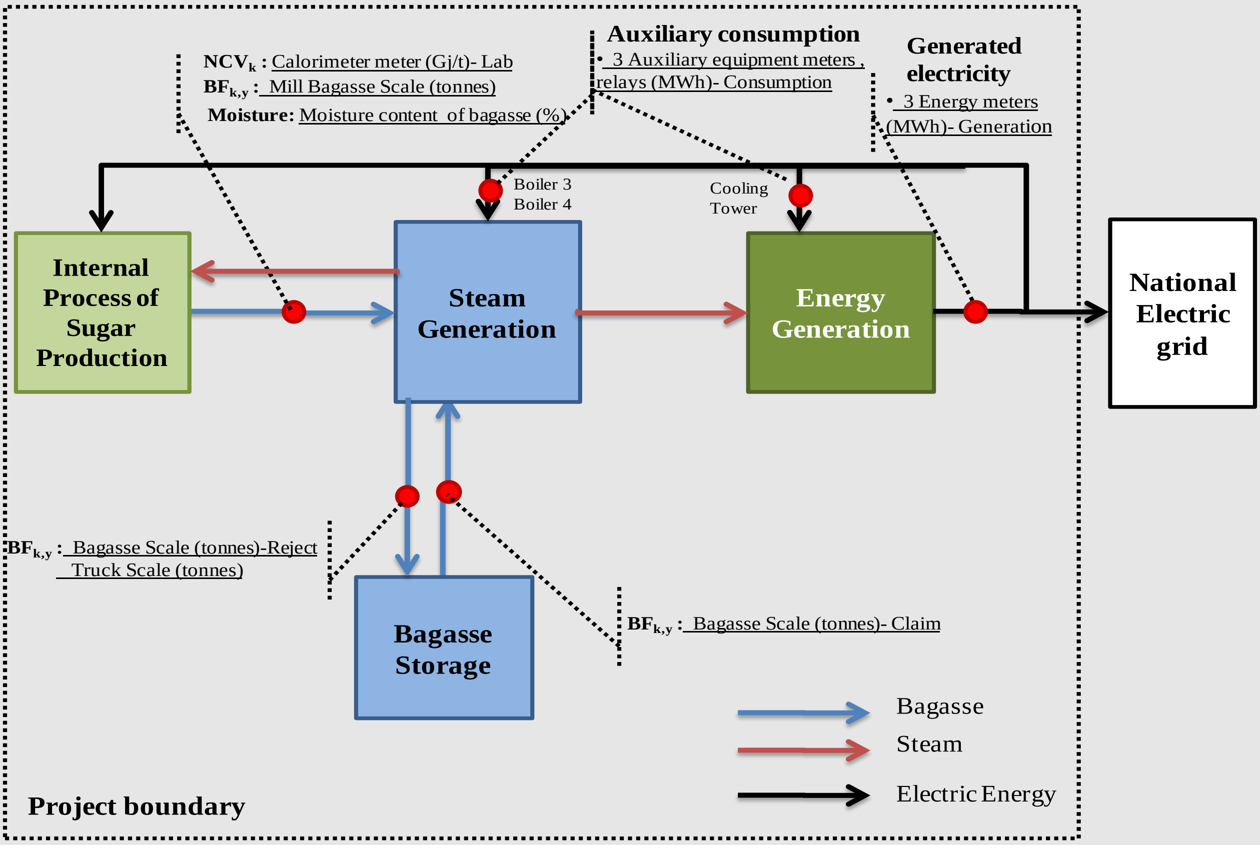

Figure 7 - Line diagram of the monitoring system

Where:

$EG_{project\ plant,y}$ = Generated electricity – Auxiliary consumption;
$BF_{k,y}$ = Quantity of biomass residue type k combusted in the project plant during the year y;
NCV_k = Net calorific value of biomass residue type k;
% Moisture = Moisture content in the bagasse.

- **Data Collection**:

The net quantity of electricity generated in the project plant was calculated by means of the subtraction of the energy consumed by auxiliary equipment to the monitored energy in the generators. The energy meters installed at the generators and the software that controls the operation of the power plant.
The entrance and exit of surplus bagasse in the boilers are monitored using weigh meters. During this monitoring period there was no use of straw, but the possibility is still available for future monitoring periods.

The bagasse produced in the mill can also be determined using the formula below (in order to cross-check the bagasse weighed):

$$\%bagasseinsugarcane = \frac{\%fiberinsugarcane}{(100 - \left(moistureofbagasse + \left(\frac{sacaroseinbagasse}{purityoftheresidualjuice}\right)*100\right))*100}$$ [3]

$$bagasse_{moistmass} = sugarcaneprocessed * \%bagasseinsugarcane$$

$$bagasse_{drymass} = bagasse_{moistmass} * (1 - moisturecontent_{bagasse})$$

The moisture content of biomass residue (%) was continuously monitored by Monte Rosa laboratory and used to determine the quantity of dry biomass.

The Net Calorific Value (NCV) of biomass residues was monitored by Monte Rosa laboratory, at least every six months, taking at least three samples for each measurement. Actually this parameter is monitored more frequently and presented in the harvest bulletins.

Monte Rosa has an environmental license N° 06-2005.

- **Equipment Calibration:**

The metering equipment is periodically calibrated according to the manufacturer specification and/or sector regulation. All records were documented and archived in soft and hard copies, as is showed in table 7.
Nicaragua does not have any national regulation or law regarding the frequency of calibration of the weight scales of bagasse, but in case of the of energy meter's calibration, there are electrical sector regulations which establish that this calibration must be performed every two years.

Bascules calibration
The Bascule calibration is been made for Monte Rosa every 15 days through weight patterns. These weight patterns are calibrated annually by LANAMET, which is a qualified laboratory in metrology. Regarding the scales used for weighing bales, the calibration is carried out annually by the provider or sales representative of manufacturer.

Energy meters calibration
All energy meters are calibrated each two years owing to sector regulations of the public entity ENATREL.

Moisture meter calibration
The moisture meter calibration (scales) is requested for Monte Rosa annually. This calibration was made by IPROCEM, theirweight patterns are calibrated annually by LANAMET.

[3] Source: Manual de azúcar de caña: para fabricantes de azúcar de caña y químicos especializados; James C. P. Chen; Editorial Limusa, S.A. de C.V; 1999.

Monte Rosa has evidence of all equipments calibrations, which are available for whom concern.

- **Data Recording:**

Data collected was recorded into an electronic spreadsheet administered by the manager of Monte Rosa CDM project and stored at Monte Rosa server.

- **Data Archives:**

Data reports were archived and kept at least for two years after the end of the crediting period or the last issuance of CERs for this proposed project activity, whatever occurs later. There are two types of reports in Monte Rosa. One of them is made for the laboratory head and other one for the Power Plant Head as seem in the Figure 8 the structure. These reports are made for each crop day.

In order to guaranty quality assurance, the monitoring staff assessed the appropriateness of the monitoring processes, including:

- Data collection procedures;
- Quality of metering / calibration method;
- General quality and accuracy of the collected data.

All people that participate in the monitoring process is suitably qualified and trained in the operation and maintenance of the plant, due to the fact that MRBCP has ISO9001 accreditation. They also received instructions of the monitoring plan of MRBCP.

Organizational structure

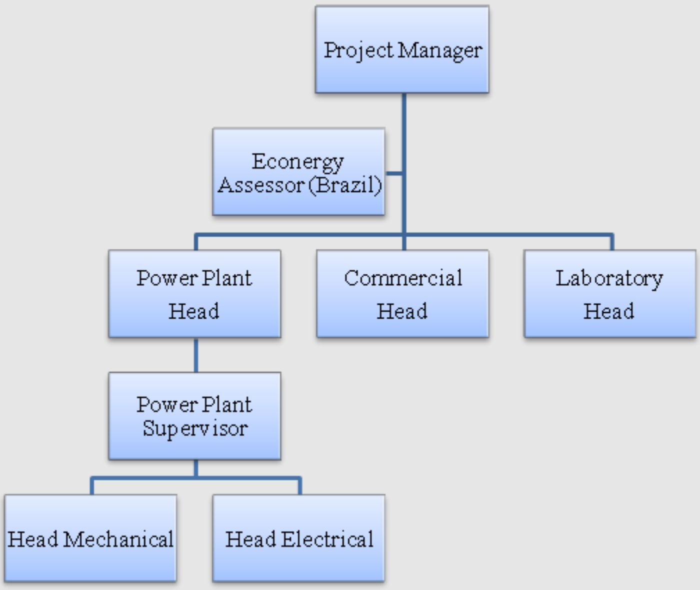

Figure 8 - Organizational structure of CDM projects in MRBCP

Roles and Responsibilities

Table 9 - Roles and professionals

Designation	Responsibility
Project Manager	Overall responsibility of CDM Project. 1. Ensure the adequate resources for the operation of the project. 2. Take decision of hiring an external consultancy to assist MRBCP during the project. 3. Communicate to everyone involved with the project the goals, objectives and results of the project operation. 4. Establish process necessary objectives of the project to achieve planned results. 5. Review results of conducted internal and external audits. 6. Continuous assessment of process efficiency and correct functioning. 7. Taking decisions to ensure the correct decisions in order to improve the project efficiency.
Econergy Consultancy	Support in elaboration of CDM projects (Project design document, monitoring report and CERs calculation) and verification process. • Facilitator for the efforts of the CDM Project. • Monte Rosa adviser on methodology updates for meet UNFCCC requirements. • Keeping Monte Rosa informed on CDM developments.
Power Plant Head	Monitoring of various operations at the power plant and keeping all generation records. 1. Responsible for electric energy generations to satisfy the domestic demand during crop season and sell of the energy surplus to the market energy agents. 2. Elaborate and execute maintenance plants during no crop season and guaranteed the correct functioning of the generation power plant. 3. Planning system records (evidence) needed to demonstrate the results of the operation of the process. 4. Ensure that they are recovering and archiving all the reading of the power meters.
Commercial Head	Monitoring of CERs obtained within monitoring period
Laboratory Head	Monitoring of various chemical properties readings of sugar cane and bagasse and keeping all laboratory records. Responsible to check the validity of calibrating certificates for laboratory equipments.
Power Plant Supervisor	Taking readings of Power generations. Responsible to check the validity of calibrating certificates for electrical and mechanical measure equipment.
Head-Electrical	Monitoring of various instruments used in

	measurements of electrical variables.
Head-Mechanical	Monitoring of various instruments used in measurements of energy variables.

Emergency procedures

The plant maintains the laboratory reports in both hard and soft copy formats at Monte Rosa´s server as presented in Table 10. The reports could be generated again whether they are required from the laboratory system. The Monte Rosa server receives a daily revision for avoid malfunctions or information losses.

Table 10 - Back up of information

Process	Variable	Documentation	Type of registry	Disponibility of the information	Notes
Laboratory	Sugar cane fiber	1LA-R026	Hard copy	Hard and Soft copies	Three times per day
	Bagasse moisture	7LA-R047	Hard copy	Hard and Soft copies	
	Bagasse Pol	7LA-R006	Hard copy	Hard and Soft copies	
	Residual juice POL	1LA-R011	Hard copy	Hard and Soft copies	
	% brix Residual juice	1LA-R011	Hard copy	Hard and Soft copies	
	Residual juice purity	1LA-R011	Hard copy	Hard and Soft copies	
	NCV	1LA-R027	Hard copy	Hard and Soft copies	The NCV is determined in laboratory with the simple taken at mill 5 output
	GCV	1LA-R027	Hard copy	Hard and Soft copies	
	Weight measurement for bagasse at mill 5 output (A)	1LA-R054	Hard copy	Hard and Soft copies	
	Weight measurement for claimed bagasse (B)	1LA-R054	Hard copy	Hard and Soft copies	
	Weight measurement for refused bagasse (C)	1LA-R054	Hard copy	Hard and Soft copies	
	% Bagasse obtained from sugar cane vs Weight measurement for bagasse at mill 5 output		Excel Spreadsheet	Soft copy	The daily values reported by automation area are compared with the values determined by the laboratory
Energy	Meter calibration	Calibrated and certificated by ENATREL	Hard copy	Hard copy	Each two years
	Electric generation for each turbine	6EN-R004	Hard Copy	Hard and Soft copies	These values are avaliable in the daily energy report
Automation	Bagasse weight control	Excel spreadsheets	Soft copy	Soft copy	All information is reported to the laboratory each day at 6 am, indicating the bagasse weight for different conditions (Generated, claimed, refused and fired)
	Calibration of bagasse scales	Register 6AU-R025	Hard Copy	Hard Copy	Calibrations are performed every 15 days, through the plant stops
	Calibration of patterns for scale calibration	Calibrated and certified by LANAMET (National Laboratory of Metrology)	Hard copy	Hard and Soft copies	The pattern ́s calibration take place annually

Additionally Monte Rosa has emergency procedures for some abnormal problems:

- **Action in event of electricity meter failure:** The operator of the electrical plant records every hour all the power generation information, as was shown during at the site visit. If the operator finds a deviation of measurement, i.e., abnormal measurement, the operator shall verify that the energy meter is ok. If the evaluation shows that the meter calibration is really working improperly, Monte Rosa replaces the power meter immediately. In order to perform this corrective action, Monte Rosa has 2 calibrated energy meters in its warehouse, allowing a quick response to the corrective action. Monte Rose presented the invoice of the referred energy meters to the DOE. So far these energy meters were not used.

- **Action in event of weighbridge failure:** The bagasse quantity should be determined, in case of weight scales failure, by estimation using the equation mentioned in page.33 from the registered CDM-PDD.

- **Action in event of NCV and % of moisture meters failure:** The PP must contract a reputed laboratory in order to measure these values.

SECTION D. Data and parameters

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

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

Data / Parameter:	$EF_{grid,2005-2007}$
Unit:	tCO_2 / MWh
Description:	CO_2 emission factor for the Nicaraguan grid electricity
Source of data:	Calculated
Value(s) applied):	0.7124
Purpose of data:	Baseline emissions
Additional comment:	-

Data / Parameter:	$\varepsilon_{el,reference\ retrofit\ plant}$
U it:	%
Description:	Average net energy efficiency of electricity generation in the reference power plant after the retrofit that would take place in the absence of the project activity.
Source of data:	Calculated
Value(s) applied):	4.1%
Purpose of data:	Baseline emissions
Additional comment:	Applicable to scenario 19

D.2. Data and parameters monitored

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

Data / Parameter:	$EG_{project\ plant,y}$
Unit:	MWh/yr
Description:	Net quantity of electricity generated in the project plant during the year y

<table>
<tr><td>Measured/ Calculated / Default:</td><td>Measured and Calculated</td></tr>
<tr><td>Source of data:</td><td>On-site measurements</td></tr>
<tr><td>Value(s) of monitored parameter:</td><td>Values in MWh
<table>
<tr><th>2011</th><th>2012</th><th>2013</th></tr>
<tr><td>37,770.79</td><td>210,982.88</td><td>180,026.31</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment:</td><td>Type: Energy meter, Calibration frequency: once in 2 years
<table>
<tr><th>Manufacturer</th><th>Model</th><th>Circuit name</th><th>Serial No.</th><th>Accuracy Class</th><th>Calibration date (*)</th><th>Valid until</th></tr>
<tr><td rowspan="4">Schneider Electric</td><td>ION-8300</td><td>Turbo generator 4</td><td>PS-0407A141-01</td><td>0.2%</td><td>07/10/2011</td><td>06/10/2013</td></tr>
<tr><td>ION-8500</td><td>Turbo generator 3</td><td>PQ-0406A208-03</td><td>0.2%</td><td>07/10/2011</td><td>06/10/2013</td></tr>
<tr><td>ION-8500</td><td>Turbo generator 5</td><td>PQ-0409A042-03</td><td>0.2%</td><td>07/10/2011</td><td>06/10/2013</td></tr>
<tr><td>ION-8600</td><td>Turbo generator 2 (*)</td><td>PT-1112A347-01</td><td>0.2%</td><td>21/12/2011</td><td>20/12/2013</td></tr>
</table>
(*): This is a brand new electrical meter and was installed before the start of 2012/2013 crop season. This electricity meter was calibrated by the manufacturer and the certificate was presented along the validation process.

Auxiliary equipment meters (Relays):
<u>First Calibration:</u>
<table>
<tr><th>Serial No.</th><th>Circuit name</th><th>Accuracy Class</th><th>Calibration date (*)</th><th>Valid until</th></tr>
<tr><td>A2712443</td><td>Boiler 3</td><td>2%</td><td>18/06/2011</td><td>18/06/2013</td></tr>
<tr><td>A2741386</td><td>Cooling tower</td><td>2%</td><td>18/06/2011</td><td>18/06/2013</td></tr>
<tr><td>B2773072</td><td>Boiler 4</td><td>2%</td><td>18/06/2011</td><td>18/06/2013</td></tr>
<tr><td>A2721893</td><td>Boiler 5</td><td>2%</td><td>18/06/2011</td><td>18/06/2013</td></tr>
</table>
<u>Second Calibration:</u>
<table>
<tr><th>Serial No.</th><th>Circuit name</th><th>Accuracy Class</th><th>Calibration date (*)</th><th>Valid until</th></tr>
<tr><td>A2712443</td><td>Boiler 3</td><td>2%</td><td>18/06/2013</td><td>18/06/2015</td></tr>
<tr><td>A2741386</td><td>Cooling tower</td><td>2%</td><td>18/06/2013</td><td>18/06/2015</td></tr>
<tr><td>B2773072</td><td>Boiler 4</td><td>2%</td><td>18/06/2013</td><td>18/06/2015</td></tr>
<tr><td>A2721893</td><td>Boiler 5</td><td>2%</td><td>18/06/2013</td><td>18/06/2015</td></tr>
</table>
</td></tr>
<tr><td>Measuring/ Reading/ Recording frequency:</td><td>The total of generated energy and auxiliary consumption are recorded by the energy meters and the total values were presented in every daily crop bulletin.</td></tr>
<tr><td>Calculation method (if applicable):</td><td>Net quantity of electricity generated in the project plant is the subtraction of the auxiliary consumption energy to the total generated energy.</td></tr>
<tr><td>QA/QC procedures:</td><td>This is crosschecked with the period energy balance based on the NCV and quantity of biomass utilized in the project activity.</td></tr>
<tr><td>Purpose of data:</td><td>Baseline emissions</td></tr>
<tr><td>Additional comment:</td><td>-</td></tr>
</table>

Data / Parameter:	$BF_{k,y}$
Unit:	tonnes of dry matter
Description:	Quantity of biomass residue type k combusted in the project plant during the year *y*
Measured/ Calculated / Default:	Measured and calculated
Source of data:	On-site measurements
Value(s) of monitored parameter:	Various: Bagasse: Dry tonnes

2011	**2012**	**2013**
61,437.00	298,315.80	241,148.89

Straw: Along the conducted monitoring period there was not straw combustion

Monitoring equipment:	Type: Bascule, Verification frequency with calibrated weight standards: 15 days.

Manufacturer	Serial No.	Accuracy Class	Internal verification
Schenk	131246-01A-BEMPII H/D	0.5%	15 days
	131106-01B-BXO	0.25%	15 days
	131106-01A-BXO	0.25%	15 days

Specifications of the truck scale used for weighing bales of bagasse (frequency: Annual)

Manufacturer	Serial No.	Accuracy Class/Verification Division (e)*	1st Calibration date	2nd Calibration date
Revuelta (Scale of income)	67815C.14 08LE	Medium III e = 20 kg	21/11/2011	21/11/2012
Revuelta (Scale of tare)	67816C.14 08	Medium III e = 10 kg	21/11/2011	21/11/2012

(*): The classification is according to National Metrology Center of Mexico that follows the standards established by the International Organization of Legal Metrology (OIML).

Measuring/ Reading/ Recording frequency:	Continuously along the production process. The day accumulated is recorded in the crop bulletin.
Calculation method (if applicable):	The quantity of biomass residue consumed was directly measured in moist base, using weigh meters. The moisture content is used to determine the quantity of water contained in this bagasse, and subtracted in order to calculate the dry bagasse weight.
QA/QC procedures:	Crosschecked with the quantity of processed sugar cane.
Purpose of data:	Baseline emissions
Additional comment:	-

Data / Parameter:	NCV_k
Unit:	GJ/tonnes of dry matter
Description:	Net calorific value of biomass residue type k
Measured/ Calculated / Default:	Measured
Source of data:	On-site measurements
Value(s) of monitored parameter:	Bagasse NCV:

Year	NCV (GJ/ton)
2011	17.61
2012	17.95
2013	18.60

Monitoring equipment:	The NCV is determined by means of two calibrated equipment; a very sensible weight scale that is used to determine the weight of the sample and a calorimetric bomb to determine the value. The calibration frequency for both is Annual.

The table below presents the equipment used for the monitoring of this parameter:

Item	Equipment	Brand	Model / Serial number	Accuracy class
1	Weight scale	Sartorius	TE214S / 23951004	0.1mg
2	Calorimetric bomb	LECO	AC500 / 3602	By procedure (*)

(*) Refer to calibration procedure in LECO AC500 section, see information below.

Calibrations:

1. **Sartorius TE214S**

Calibration Number	Date of Calibration	Limit of validation
1	05/10/2011	04/10/2012
2	26/09/2012	25/09/2013

	First verification	Second verification	Third verification	Forth verification
Internal periodical verification using weight standards(**)	31/12/2011	25/04/2012	18/12/2012	12/04/2013

(**) This is an internal procedure

Weight standard for verification	Serial number	Date of calibration	Limit of validation
Troemner	27803	11/08/2011	10/08/2012
		30/08/2012	29/08/2013

2. **LECO AC500 (*)**

The calibrations were carried out by "Inbox Technology and Services S.A.", Which is the official representative of LECO Corporation in Central America and for Monte Rosa Laboratory.

This calibration was performed using the ASTM D 5865 - 7a norm. From the combustion of a certain amount of benzoic acid standard, making 10 runs of measurements, determine the heat capacity of the system, the latter is calculated as the arithmetic mean of the 10 measurements. Then calculate the standard deviation, and this is divided by the arithmetic mean to obtain the% deviation, if this% is greater than 0.17%, the data set are discarded and the procedure must be performed again to obtain acceptable values.

Calibration number	Date of Calibration	Limit of validation
1	11/12/2010	10/12/2011
2(**)	09/12/2011	08/12/2012
3	28/03/2012	28/09/2013
4	12/12/2012	11/12/2013

(**) This calibration was pursued internally by using the recommended benzoic acid (presented below).

The Standard benzoic acid used for calibration:

Manufacturer	Lot number	Crop	Calorific value of the standard	Limit of validation
Leco	PARR Lot # 102303 Benzoic acid CAS # 65-85-0	11-12	11,373 Btu/lb	The certificate indicates "indefinite expiration date"
Leco	LECO 774-208-150 Lot 1026 Benzoic acid CAS 65-85-0	12-13	11,374 ±17 Btu/lb	The certificate indicates "indefinite expiration date"

Measuring/ Reading/ Recording frequency:	The Net Calorific Value (NCV) of biomass residues was monitored by Monte Rosa laboratory, at least every six months, taking at least three samples for each measurement. Actually this parameter is monitored more frequently and presented in the harvest bulletins.
Calculation method (if applicable):	-
QA/QC procedures:	Check the consistency of the measurements by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory).
Purpose of data:	Baseline emissions
Additional comment:	-

Data / Parameter:	Moisture content of the biomass residues
Unit:	% water content
Description:	Moisture content in the bagasse
Measured/ Calculated / Default:	Measured
Source of data:	On-site measurements
Value(s) of monitored parameter:	Bagasse:

Year	Moisture (%)
2011	51.44
2012	51.17
2013	51.32

Monitoring equipment:	The % moisture is determined by means of two calibrated equipment; a sensible weight scale that is used to determine the weight of the sample in most and dry base; and an electric stove to dehumidify the bagasse. The calibration frequency for both is Annual. The table below presents the equipment used for the monitoring of this parameter: (see tables below)

Item	Manufacturer	Model	Serial No	Accuracy class
1	Sartorius	TE3102S	19250259	0.01 g
2	Spencer Stove	TE-060	11110814	2°C(*)

(*) This accuracy is referred to the thermometer that is inside the stove, because is the only instrument that is required to be calibrated.

Calibrations:

1. **Sartorius TE3102S**

Calibration number	Date of Calibration	Data of next Calibration
1	05/10/2011	04/10/2012
2	26/09/2012	25/09/2013

	First verification	Second verification	Third verification	Forth verification
Internal periodical verification using weight standards(*)	31/12/2011	24/04/2012	18/12/2012	12/04/2013

(*) This is an internal procedure

Weight standard for verification	Serial number	Date of calibration	Data of next Calibration
Troemner	64451	15/08/2011	14/08/2012
		04/09/2012	03/09/2013

2. **Spencer Stove TE-060**

Calibration number	Date of Calibration	Limit of validation
1	04/10/2011	03/10/2012
2 (**)	10/10/2012	09/10/2013

(**) This calibration was pursued internally by using calibrated temperature standards. The mentioned standards were calibrated and the information is presented in table below.

Temperature standard for verification	Serial number	Date of calibration	Data of next Calibration
Fisher	OP-2319-12-09	31/08/2012	30/08/2013

Measuring/ Reading/ Recording frequency:	Monte Rosa performs 1 moisture analysis using 4 samplings, which were taken in constant intervals of an hour. The sampling process continues during the entire day (6 analyses per day), so totalizing 24 samplings per day. Hence, Monte Rosa is following international recommendations and this could be considered as continuous monitoring.
Calculation method (if applicable):	
QA/QC procedures:	Check the consistency of the measurements by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature).
Purpose of data:	Baseline emissions

Additional comment:	-

Data / Parameter:	$\varepsilon_{el,project\ plant,y}$
Unit:	%
Description:	Average net efficiency of electricity generation in the project plant in year y
Measured/ Calculated / Default:	Calculated
Source of data:	On-site measurements
Value(s) of monitored parameter:	This value was calculated for the monitoring period: Year / $\varepsilon_{el,project\ plant,y}$ (%) 2011 / 12.60% 2012 / 14.17% 2013 / 14.44%
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	-
Calculation method (if applicable):	This value is calculated using measured information ($EG_{project\ plant,y}$, NCV_k, $BF_{k,y}$), by means the following equation: $\varepsilon_{el,project\ plant,y} = \frac{EG_{project\ plant,y}}{\sum_k NCV_k \cdot BF_{k,y}}$
QA/QC procedures:	Check consistency with the previous monitoring reports.
Purpose of data:	Baseline emissions
Additional comment:	-

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 project activity mainly reduces CO_2 emissions through substitution of power generation with fossil fuels by energy generation with biomass residues. A general formula of the emission reduction calculation is shown below:

$$ER_y = ER_{heat,y} + ER_{electricity,y} + BE_{biomass,y} - PE_y - L_y$$

Where:

ER_y = Emissions reductions of the project activity during the year *y* (tCO_2/yr);

$ER_{electricity,y}$ = Emission reductions due to displacement of electricity during the year *y* (tCO_2/yr);

$ER_{heat,y}$	= Emission reductions due to displacement of heat during the year *y* (tCO_2/yr);
$BE_{biomass,y}$	= Baseline emissions due to natural decay or burning of anthropogenic sources of biomass residues during the year *y* (tCO_2e/yr);
PE_y	= Project emissions during the year *y* (tCO_2/yr);
L_y	= Leakage emissions during the year *y* (tCO_2/yr).

The emission reductions due to displacement of heat is assumed as zero ($ER_{heat,y}$=0) because the thermal efficiency of the project plant is similar compared with the thermal efficiency of the reference plant considered in baseline scenario.

As $ER_{heat,y}$ can be estimated as zero, according with ACM0006 version 09, the variables $Q_{project\ plant,\ y}$ (net quantity of heat generated from firing biomass in the project plant), ε_{boiler} (Average net energy efficiency of heat generation in the boiler that is operated next to the project plant) do not need to be monitored on the project activity.

The baseline emissions due to uncontrolled burning or decay of the biomass residues are zero ($BE_{Biomass,y}$ = 0), since in this case the biomass residues would not decay or be burnt in the absence of the project activity.

Emission reductions due to the displacement of electricity are calculated by multiplying the net quantity of increased electricity generated with biomass residues as a result of the project activity (EG_y) with the CO_2 baseline emission factor for the electricity displaced due to the project ($EF_{electricity,y}$), as follows:

$$ER_{electricity,y} = EG_y \cdot EF_{electricity,y}$$

Where:

$ER_{electricity,y}$	= Emission reductions due to displacement of electricity during the year *y* (tCO_2/yr);
EG_y	= Net quantity of increased electricity generation as a result of the project activity (incremental to baseline generation) during the year *y* (MWh);
$EF_{electricity,y}$	= CO_2 emission factor for the electricity displaced due to the project activity during the year *y* (tCO_2/MWh).

The emission factor for the displacement of electricity should correspond to the grid emission factor ($EF_{electricity,y} = EF_{grid,y}$) and $EF_{grid,y}$ is determined in section B.6.3.

According to scenario 19, EG_y is determined based on the average efficiency of electricity generation in the reference plant (after retrofit) with a lower efficiency of electricity generation than with the retrofit in the project activity ($\varepsilon_{el,baseline\ plant} = \varepsilon_{el,reference\ retrofit\ plant}$) and the average net efficiency of electricity generation in the project plant after project implementation $\varepsilon_{el,project\ plant,y}$, as follows:

$$EG_y = EG_{project\ plant,y} \cdot \left(1 - \frac{\varepsilon_{el,baseline plant}}{\varepsilon_{el,project\ plant,y}}\right)$$

Where:

EG_y	= Net quantity of increased electricity generation as a result of the project activity (incremental to baseline generation) during the year *y* (MWh);
$EG_{project\ plant,y}$	= Net quantity of electricity generated in the project plant during the year *y* (MWh);
$\varepsilon_{el,\ baseline\ plant}$	= Average efficiency of electricity generation in the baseline plant ($MWh_{el}/MWh_{biomass}$);
$\varepsilon_{el,project\ plant,y}$	= Average efficiency of electricity generation in the project plant ($MWh_{el}/MWh_{biomass}$).

The average net efficiency of electricity generation in the project plant ($\varepsilon_{el,project\ plant,y}$) should be calculated by dividing the electricity generation during the year *y* by the sum of biomass residue, expressed in energy units, as follows:

$$\varepsilon_{el,project\ plant,y} = \frac{EG_{project\ plant,y}}{\sum_k NCV_k \cdot BF_{k,y}}$$

Where:

$\varepsilon_{el,project\ plant,y}$	=	Average net energy efficiency of electricity generation in the project plant;
$EG_{project\ plant,y}$	=	Net quantity of electricity generated in the project plant during the year *y* (MWh);
$BF_{k,y}$	=	Quantity of biomass residue combusted in the project plant during the year *y* (tons of dry matter or liter);
NCV_k	=	Net calorific value of the biomass residue (MWh/ton of dry matter or GJ/liter).

CER ́s calculation				
Monitoring Report Period	30/05/2011 - 22/08/2013			
Parameters	Values for 2011	Values for 2012	Values for 2013	Units
Period Energy Generation	40,500.08	227,734.16	194,169.03	MWh
Process Equipments consumption	2,729.29	16,751.28	14,142.72	MWh
Net Quantity of Electricity	37,770.79	210,982.88	180,026.31	MWh
Quantity of processed sugar cane	511,286.26	2,459,271.98	1,925,834.23	tons
Quantity of produced bagasse (moist base)	126,620.32	604,860.64	495,811.74	tons
Quantity of produced bagasse (dry base)	61,437.00	298,315.80	241,148.89	tons
Net Calorific Value (NCV)	17.61	17.95	18.60	GJ/ton
∑NCV x BFky	299,854.42	1,489,168.28	1,247,112.27	MWh
Average net energy efficiency of electricity generation in the project plant (εel, projectplant)	12.60%	14.17%	14.44%	%
Average net energy efficiency of electricity generation in the baseline plant (εel, baselineplant)	4.10%	4.10%	4.10%	%
EF2005-2007	0.7124	0.7124	0.7124	tCO_2/MWh
$EG_{project\ plant,y}$	25,476.76	149,926.98	128,894.70	MWh
EReletricity	18,149.64	106,807.98	91,824.59	tCO_2/period
PEy	0.00	0.00	0.00	tCO_2/period
$ER_y = EReletricity - PE_y - L_y$	18,149.64	106,807.98	91,824.59	tCO_2/Period
		Emissions Reductions	216,782	tCO_2/yr
L_y	Not need to be addressed			

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

>>

Project emissions were not considered, because there was no transportation of biomass residues to the project site ($PET_y=0$), no on-site consumption of fossil fuels due to the project activity ($PEFF_y=0$), no consumption of electricity ($PE_{EC,y}=0$) and no CH_4 emissions from the combustion of biomass residues ($PE_{Biomass,CH4,y}=0$). Thus, $PE_y=0$.

E.3. Calculation of leakage

>>

The diversion of biomass residues to the project activity is already considered in the calculation of baseline reductions. Then, leakage effects do not need to be addressed (L_y. = 0).

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	216,782	0	0	216,782

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)	**240,217 tCO_2[4]**	**216,782 tCO_2**

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

>>

Not applicable since there is no increase in the actual emission reductions achieved during the current monitoring period compared to the estimated value in the PDD.

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)	**124,958 tCO_2**	**91,824 tCO_2**

[4] The number of the days for each year was calculated considering the crediting period from 21/11/2011 to 22/08/2013. Thus, in 2011 the number of the days was 41 (from 21/11/2011 to 31/12/2011), in 2012 was the complete year and in 2013 was 234 days (from 01/01/2013 to 22/08/2013). The amount of Emission Reductions (ER) for each year was 18,050 tCO_2 in 2011, 122,286 tCO_2 in 2012 and 99,881 tCO_2 in 2013, totalizing for the whole monitoring period 240,217 tCO_2.

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Document information

Version	*Date*	*Description*
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 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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