

# **MONITORING REPORT**

## **CRUZ ALTA BAGASSE COGENERATION PROJECT (CABCP)**

**(CDM Registration Reference Number 0216)**

### **Monitoring Periods:**

**10 May, 2003 to 30 June, 2006**

**Prepared by Econergy Brasil Ltda**

**Version 2**

**19 July, 2006**

# 1. Introduction

This document reports the Emission Reductions (ERs) generated by the Cruz Alta Bagasse Cogeneration Project (hereinafter CABCP), CDM Registration Reference Number 0216, from 10/05/2003 to 30/06/2006.

This project activity consists of increasing efficiency in the bagasse (a renewable fuel source, residue from sugarcane processing) cogeneration facility at Cruz Alta sugar mill (Cruz Alta), one of the two sugar mills owned by **Açúcar Guarani S.A.** (Guarani). With the implementation of this project, the mill is able to sell electricity to the national grid, avoiding the dispatch of same amount of energy produced by fossil-fuelled thermal plants to that grid. By that, the initiative avoids CO<sub>2</sub> emissions, also contributing to the regional and national sustainable development.

Using steam-Rankine cycle as the basic technology of its cogeneration system, for achieving an increasing amount of surplus electricity to be generated, Cruz Alta began its efforts in two phases, which are:

**Phase 0 (until 2002):** Until 2002, Cruz Alta did not use to commercialize electricity. It had two 4 MW and one 2,4 MW backpressure turbo-generators installed and active, totalling 10,4 MW installed capacity. To supply steam, three 22 bar boilers were used.

**Phase 1 (2003):** In Phase 1, Guarani installed a 21,8 MW backpressure turbo-generator and a 63 bar boiler in Cruz Alta, while deactivating one 2,4 MW backpressure turbo-generator and putting a 22 bar boiler on stand-by, with total capacity in this phase reaching 29,8 MW.

The CABCP operation has been monitored in accordance with the requirements of the applicable Monitoring Methodology AM0015: “Bagasse-based cogeneration connected to an electricity grid” as described in its Project Design Document. Quality assurance and Quality control mechanisms stipulated in the Monitoring Methodology have been applied.

## 2. Emission Reductions Calculation Formula

ERs generated by the CABCP are calculated as follows:

Net generation from project during the monitoring period times baseline emission factor =  
 (MWh) \* (tCO<sub>2</sub>e /MWh) = Net CO<sub>2</sub> emissions avoided at grid (tCO<sub>2</sub>e)

Where the ex-ante baseline emission factor is 0.2677 tCO<sub>2</sub>e/MWh, for years 2002, 2003 and 2004, according to the Cruz Alta PDD registered.

The project activity follows the steps provided by the methodology taking into account the (b) Simple Adjusted OM calculation for the STEP 1, since there would be no available data for applying to the preferred option – (c) *Dispatch Data Analysis OM*. For STEP 2, the option 1 was chosen. The following table presents the key information and data used to determine the baseline scenario.

Variable	Data type	Value	Unit	Data Source
EG <sub>y</sub>	Electricity supplied to the grid by the Project.	Obtained throughout project activity lifetime.	MWh	Cruz Alta
EF <sub>y</sub>	CO <sub>2</sub> emission factor of the Grid.	0.2677	tCO <sub>2</sub> e/MWh	Calculated
EF <sub>OM,y</sub>	CO <sub>2</sub> Operating Margin emission factor of the grid.	0.4310	tCO <sub>2</sub> e/MWh	This value was calculated using data from ONS (National System Operator).
EF <sub>BM,y</sub>	CO <sub>2</sub> Build Margin emission factor of the grid.	0.1045	tCO <sub>2</sub> e/MWh	This value was calculated using data from ONS
λ <sub>y</sub>	Fraction of time during which low-cost/ must-run sources are on the margin.	λ <sub>2002</sub> = 0.5053 λ <sub>2003</sub> = 0.5312 λ <sub>2004</sub> = 0.5041	-	This value was calculated using data from ONS.

### 3. Dispatched energy to the grid in the Monitoring Periods

Date (DD/MM/AA)		Amount of energy sold to the grid (MWh)	Invoice number	Invoice date
From	To			
10/05/03	31/05/03	0.00	-	-
01/06/03	30/06/03	6 015.39	224326	08/07/03
01/07/03	31/07/03	6 438.32	229092	11/08/03
01/08/03	31/08/03	3 582.43	233381	10/09/03
01/09/03	30/09/03	4 090.40	238250	13/10/03
01/10/03	31/10/03	468.87	242691	13/11/03
01/11/03	30/11/03	905.44	245811	08/12/03
01/12/03	31/12/03	0.00	-	-
01/01/04	31/01/04	0.00	-	-
01/02/04	28/02/04	0.00	-	-
01/03/04	31/03/04	0.00	-	-
01/04/04	30/04/04	0.00	-	-
01/05/04	31/05/04	1 726.07	264248	09/06/04
01/06/04	30/06/04	729.95	267290	08/07/04
01/07/04	31/07/04	6 355.18	271919	12/08/04
01/08/04	31/08/04	6 688.10	275723	10/09/04
01/09/04	30/09/04	6 840.08	279683	07/10/04
01/10/04	31/10/04	5 905.93	284348	11/11/04
01/11/04	30/11/04	4 818.75	287124	07/12/04
01/12/04	31/12/04	2 530.89	290179	10/01/05
01/01/05	31/01/05	0.00	-	-
01/02/05	28/02/05	0.00	-	-
01/03/05	31/03/05	0.00	-	-
01/04/05	30/04/05	1 716.10	302059	09/05/05
01/05/05	31/05/05	2 952.52	306152	10/06/05
01/06/05	30/06/05	4 229.04	309261	07/07/05
01/07/05	31/07/05	5 366.12	312998	06/08/05
01/08/05	31/08/05	5 887.87	317472	09/09/05
01/09/05	30/09/05	5 512.91	320938	07/10/05
01/10/05	31/10/05	6 135.23	324625	08/11/05

01/11/05	30/11/05	5 958.14	328316	08/12/05
01/12/05	31/12/05	2 802.76	331707	10/01/06
01/01/05	31/01/05	0.00	-	-
01/02/05	28/02/05	0.00	-	-
01/03/05	31/03/05	0.00	-	-
01/04/05	30/04/05	2 617.06	345145	11/05/06
01/05/05	31/05/05	7 440.00	349048	09/06/06
01/05/05	31/05/05	429.06	349049	09/06/06
01/06/05	30/06/05	7 200.00	353414	10/07/06
01/06/05	30/06/05	1 314.39	353415	10/07/06

Invoices are available with the project participants.

#### 4. ERs Generated in the Monitoring Periods

Calculation of Emission Reductions (ERs)			
Period	Metered Electricity Supply (MWh)	Baseline Emission Factor (tCO <sub>2</sub> e/MWh)	ERs (tCO <sub>2</sub> e)
From 10/05/03 to 31/12/03	21 500.85	0.2677	5 755.77
From 01/01/04 to 31/12/04	35 594.95	0.2677	9 528.76
From 01/01/05 to 31/12/05	40 560.69	0.2677	10 858.10
From 01/01/06 to 30/06/06	19 000.51	0.2677	5 086.43
<b>Total</b>	<b>116 657.00</b>	<b>0.2677</b>	<b>31 229.08</b>

In accordance with the formula in section 2, the CABCP has in the monitoring periods generated: 116 657.00 MWh \* 0.2677 tCO<sub>2</sub>e/MWh = **31 229 (thirty one thousand, two hundred and twenty nine) tCO<sub>2</sub>e.**