

**CLEAN DEVELOPMENT MECHANISM
MONITORING REPORT**

**Braço Norte III
Small Hydroelectric Plant (SHP)**

(CDM Registration Reference Number 0667)

**Monitoring Period:
03 October 2003 to 30 November 2006**

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Section A. General description of project activity**A.1. Title of project activity**

Braço Norte III (BNIII) SHP (Small Hydroelectric Plant)
CDM, Small Scale Project
PDD Version 3; Date: July 20, 2006
Monitoring Report Version 1
Date: December 6, 2006

A.2. Description of the project activity

The main objective of the SLII Project is to help meet Brazil's increasing demand for energy – which results from its economic growth – by improving power supply, and at the same time to contribute to environmental, social and economic sustainability by increasing the share of renewable energy in the Brazilian (and Latin American, and Caribbean) total consumption of electricity.

Countries in Latin America and the Caribbean region have expressed their commitment to make renewable power reach 10% of the total power use in the region. Through the initiative of Ministers of the Environment (UNEP-LAC, 2002), a preliminary meeting of the World Summit for Sustainable Development (WSSD) was held in Johannesburg in 2002. In the WSSD's final Plan for Implementation no specific targets or timeframes have been stated, but their importance has been recognized for achieving sustainability in accordance with the Millennium Development Goals¹.

¹ WSSD, Plan for Implementation, Paragraph 19 (e): "Diversify energy supply by developing advanced, clean, more efficient, available and cost-effective technologies, including fossil fuel technologies and renewable energy technologies, hydro included, and their transference to developing countries in concession conditions that are mutually agreed upon.

With a sense of urgency, the global share of renewable energy sources should increase substantially, with the objective of increasing their contribution to add up energy supply, recognizing national roles and voluntary regional objectives, as well as initiatives where they might exist, and ensuring that energy policies be supportive to developing countries' efforts to eradicate poverty, and regularly evaluating available data to review progress to this end."

Braço Norte III power plant is a small run-of-river SHP (14.16MW) with a reservoir that causes almost no environmental impact. It is located in a remote region in the northern part of Mato Grosso State.

Guarantã Energética Ltda. is the only owner of Braço Norte III. This company has vast experience in energy generation using alternative power sources such as hydroelectric and biomass. Braço Norte III was designed in 2001, and buildings and installations have been implemented from May 2001 until September. Commercial operation started in October 3, 2003. During the year 2004 it has generated almost 75 GWh.

The project is located in the county of Guarantã, distant approximately 700 km from Cuiabá, capital city of the Mato Grosso State. The main economic activities in the region are agriculture (soybean and rice crops), timber industry, and cattle raising. This is one of the fastest-growing regions in the country, thanks mainly to export activities based on agroindustry, which has an impact on power consumption with the result that this market is expected to grow 5% per year.

The most important aspect of this project is reducing losses in transmission and consequently improving system stability. This region has joined the National Electricity Grid in 2003, and losses occur due to the long distances between the system's center of gravity and cities in the region. With the addition of local sources of energy to the grid, transmission losses shall be reduced..

Braço Norte III improves power supply with clean renewable energy from hydroelectric source, while contributing at the same time to local economic development. Run-of-river SHPs provide local generation of electricity, in contrast with large hydro plants and natural gas thermal plants built along the last 5 years.

In the particular case of this project, it occurs in a region that is developing at a very high rate when compared to the national average, and where the demand for power supply is also growing at a faster pace than average. In order to be sustained, such a pace requires new sources of power supply, even after the region has been integrated in the national grid.

This inherent, cleaner power source offers a relevant contribution to environmental sustainability, because it reduces emissions of greenhouse gas (GHG) by avoiding electricity generation by fossil fuel sources and its CO₂ emissions, which would be emitted in the absence of the project.

A.3. BNIII - Monitoring Report

Reduction in GHG emissions during the period October 2003 through November 2006 has been achieved through the generation of electricity dispatched by Braço Norte III SHP, which has replaced the combination of power generation in this part of the Brazilian National Integrated Grid (South-Southeast-Midwest Grid).

The Monitoring Report is based on electricity delivered to the grid by Braço Norte III SHP. The amount of power delivered is monitored by the producer. Guarantã, the power producer, is the seller as well as CCEE - Câmara de Comercialização de Energia Elétrica (Chamber for Power Commercialization), the entity in control of all electricity delivered to the grid who guarantees to the buyer that electricity generated shall be delivered to the grid.

Calculation of emission reduction is based on approved and registered parameters that are defined in the PDD and justified during validation. The baseline emissions factor for small scale project activities in the South-Southeast-Midwest Brazilian grid is **0.5364 tCO₂e/MWh**.

A.4. Period of monitoring and amount of monitored emission reductions

Time frame of the Monitoring Report: 03/October/2003 – 30/November/2006

Amount of monitored emission reductions: **135,304.14 tCO₂**

A.5. Date of completion of the monitoring report

The date of completion of the monitoring report was 06/December/2006.

A.6. Personnel in charge

Project Manager – Garantã Energética

Monitoring Project – C-Trade Comercializadora de Carbono

Monitoring Report – C-Trade Comercializadora de Carbono

Section B. Methodology and plan of monitoring

B.1. Name and reference of the approved monitoring methodology applied to the project activity

Calculations of the linebase are defined according to Appendix B, which presents simplified modalities and procedures for small scale CDM project activities (Type I– Renewable Energy Project I.D ‘Renewable electricity generation for a grid’):
Monitoring consists in measuring electricity generated by the power plant.

B.2. Justification of the choice of methodology and why it is applicable to the project activity

The project is a run-of-river SHP with a installed capacity of 14.16 MW (below the limit of 15 MW for small scale CDM projects), that fits as **AMS** Type I Category I.D renewable energy project – grid-connected renewable energy generation that dislocates fossil fuel from the grid’s build and operating margins.

B.3. Datos a serem monitorados:

ID Number	Type of data	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of monitored data	How will the data be archived? (electronic/ paper)	For how long are archived data to be kept?	Comment
1	Electricity generation	Electricity generation of the Project delivered to grid	MWh	M	15 minutes measuring and Monthly Recording	100%	Electronic and paper	During the credit period and two years after	Electricity delivered to the grid is monitored both by the project owner (seller) and by the energy buyer. Grid-connected energy meter, and sales receipt.
2	CO ₂ emission factor	CO ₂ emission factor of the grid	tCO ₂ /MWh	C	At the validation	0%	Electronic	During the credit period and two years after	Data will be archived according to internal procedures.
3	CO ₂ emission factor	Operating Margin of the grid's CO ₂ emission factor	tCO ₂ /MWh	C	At the validation	0%	Electronic	During the credit period and two years after	Data will be archived according to internal procedures.
4	CO ₂ emission factor	Build Margin of the grid's CO ₂ emission factor	tCO ₂ /MWh	C	At the validation	0%	Electronic	During the credit period and two years after	Data will be archived according to internal procedures.

Section C. Monitored data

According to option (a) of Type I, Category D among Categories of the small scale CDM project activities as contained in Appendix B of M&P, simplified to Small scale CDM Project Activity, monitoring consists in measuring electricity generated by the renewable technology. For project validation the calculation of CO₂ emission factor of the electric grid, as well as Operating and Build Margins of CO₂ emission factor of the electric grid have both been necessary. But these data must be verified only once, during validation.

C.1. Data collected in order to monitor project emissions

GHG emissions by the project activity are zero.

C.2. Data collected in order to monitor baseline emissions

BRAÇO NORTE III				
	Year			
	2003	2004	2005	2006
Month	Generation (MWh)	Generation (MWh)	Generation (MWh)	Generation (MWh)
January	-	7,892.07	10,239.86	9,978.01
February	-	9,513.95	9,430.53	7,815.56
March	-	10,478.27	10,499.54	6,731.00
April	-	9,954.10	4,657.45	9,676.00
May	-	8,171.79	4,600.80	9,239.00
June	-	5,183.74	1,718.54	5,782.00
July	-	5,132.87	4,997.79	4,855.00
August	-	4,642.73	4,566.24	5,184.00
September	-	4,490.39	4,406.55	4,306.00
October	5,055.48	5,506.71	5,147.01	5,277.00
November	5,239.85	5,655.38	4,916.32	9,383.00
December	6,477.50	7,835.50	7,607.32	-
Total	16,772.83	84,457.49	72,787.97	78,226.56

Table 1 – Generation of electricity delivered to the grid by Braço Norte III SHP

Fatores de emissão PPE para as interconexões a rede elétrica brasileiras Sul-Sudeste-Meio Oeste		
Cenário base de pequena escala (sem importações)	OM (tCO ₂ e/MWh)	Geração total (MWh)
	2002 0,9394	276.731.024
	2003 0,9698	295.555.969
	2004 0,9431	301.422.617
	Média OM (2002-2004)	Total 873.820.610
	tCO ₂ e/MWh	BM 2004 (tCO₂e/MWh)
	0,9472	0,1256
	OM*0,5+BM*0,5(tCO₂e/MWh)	
	0,5364	

Table 2 – CO₂ emission factor of the grid/ Operating Margin of the electric grid's CO₂ emission factor / Build Margin of the electric grid's CO₂ emission factor

Section D. Calculation of GHG emission from sources

The Monitoring Report applies the *ex ante* validated emission factor for small scale project activities for the Brazilian South-Southeast-Midwest interconnected grid. As shown in the table above, CO₂ emission factor of the grid is 0.5364 tCO₂e/MWh. Details of calculation such as formulae and conditions are presented in PDD, and the finished review of all revised data is available with project proponents..

D.1 Describe formulae used to calculate emission reductions

Emission reductions by a project activity (ER_y) during a given period of year y are the product of baseline emissions (EF_y , in tCO₂e/MWh) multiplied by the project's delivery of electricity to the grid during the same period of year y (EG_y , in MWh), as follows:

$$ER_y = EF_y \cdot EG_y \quad \text{Equation 1}$$

D.2 Tables informing values obtained when applying formulae above

BRAÇO NORTE III			
Ano	Electricity Generation (MWh)	Baseline emission factor (tCO ₂ e/MWh)	Emission Reduction (tCO ₂ e)
2003 (03/Oct/2003 to 30/Dec/2003)	16,772.83	0.5364	8,996.95
2004 (01/Jan/2004 to 30/Dec/2004)	84,457.49	0.5364	45,303.00
2005 (01/Jan/2005 to 30/Dec/2005)	72,787.97	0.5364	39,043.46
2006 (01/Jan/2006 to 30/Nov/2006)	78,226.56	0.5364	41,960.73

Total (tCO₂e)	135,304.14
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Annexes

Annex 1 - Contact information on participants
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(project developer)

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