CLEAN DEVELOPMENT MECHANISM
MONITORING REPORT

Santa Lúcia II Small Hydro Plant (SHP)

(CDM Registration Reference Number 0663)

Monitoring Report Version 2
Date: January 23th, 2009

Monitoring Period:
01/January/2008 to 31/December/2008

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Section A. General description of project activity

A.1. Title of project activity

Santa Lúcia II (SLII) Small Hydro Plant (SHP)
CDM, Small Scale Project
PDD Version 02; Date: May 2, 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 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 Goals[1].

Santa Lúcia II power plant is a run-of-river SHP (7.6 MW), and for this reason it has no dam or reservoir, therefore creating no environmental impact. It is also different from most Brazilian SHP's (Small Hydro Plants) either existing or planned, because it is located in an isolated system in the western part of Mato Grosso State that was originally supplied by a diesel fuelled thermal plant.

Maggi Energia S.A. is the only owner of Santa Lúcia II. This company has vast experience in energy generation using alternative power sources such as hydroelectric and biomass. Santa Lúcia II was designed in 2001, and buildings and installations have been implemented from January 2002 to April 2003. Commercial operation started in October, 2003. During the last two years it generated a total of almost 80 GWh.

The project is located in the county of Sapezal, distant approximately 480 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 the displacement of fossil fuels by renewable energy sources in the generation of power in isolated systems. Following the approach of the Plan for the Universalization of Electric Power (plan of the Federal Government intending to connect every home to the national grid), the local supplying utility, CEMAT (Centrais Elétricas Mato-Grossenses), has built and is operating Sapezal Thermal Plant since 1999. This plant has an installed capacity of 9.9 MW, and is composed of seven diesel generators that burn 8,000 m^3 of diesel per year, in average, emitting over 20,000 tCO_2e each year.

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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."

Santa Lúcia II improves power supply with clean renewable power, while contributing at the same time to the regional/local economic development. Small scale run-of-river hydro power plants provide local generation of electricity, in contrast with the "business as usual" of large hydro plants and natural gas thermal plants built along the last 5 years.

In the particular case of Santa Lucia II, this 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. SLII - Monitoring Report

Reduction in GHG emissions during the period 01/January/2008 through 31/December/2008 has been achieved through the generation of electricity dispatched by Santa Lúcia II SHP, which has replaced the combination of power generation in this part of the Brazilian National Interconnected Grid (South-Southeast-Midwest Grid).

The Monitoring Report is based on electricity delivered to the grid by Santa Lúcia II SHP. The amount of power delivered is monitored by the producer. Maggi, 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 after 2006 with the connection with the connected-grid. Before this the emission factor was **0.8** tCO2e/MWh, because it was considered an isolated system.

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

Time frame of the Monitoring Report: 01/January/2008 – 31/December /2008

Amount of monitored emission reductions: 31,469.531 tCO_2e

A.5. Date of completion of the monitoring report

The date of completion of the monitoring report was 5/January/2009.

A.6. Personnel in charge

Project Manager – MAGGI Energia S.A.
Monitoring Project – C-Trade Comercializadora de Carbono Ltda.

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 baseline 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 7.6 MW (below the limit of 15 MW for small scale CDM projects) that replaced diesel fuelled power generation provided by a thermal plant until January 2006, and after that date replaced thermal plants in the Brazilian integrated national grid. "This meets the requirements of Type I, Category I.D CDM methodology for Small Scale Projects."

B.3. Data to be monitored

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 is 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	tCO2/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	tCO2/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	tCO2/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 Modalities & Procedures, simplified to Small scale CDM Project Activity, monitoring consists in measuring electricity generated by the renewable technology. For project validation the calculation of CO_2 emission factor of the electric grid, as well as Operating and Build Margins of CO_2 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

Santa Lúcia II	
2008	
Month	Generation (MWh)
January	4.745,082
February	4.967,376
March	5.127,199
April	5.089,904
May	5.159,990
June	4.882,767
July	5.086,985
August	4.420,920
September	4.698,722
October	4.910,361
November	4.943,837
December	4.634,887
Total 2007	**58.668,030**

Table 1 – Generation of electricity delivered to the grid by SLII SHP

SSC Emission Factors for the Brazilian South-Southest-Midwest interconnected grid		
Small-scale baseline (without imports)	**OM (tCO2e/MWh)**	**Total Generation (MWh)**
2002	0.9394	276,731,024
2003	0.9680	295,666,969
2004	0.9431	301,422,617
	Average OM (2002-2004)	Total = 873,820,610
	tCO2e/MWh	**BM 2004 (tCO2e/MWh)**
	0.9472	0.1256
	OM*0.5+BM*0.5(tCO2e/MWh)	
	0.5364	

Table 2 – CO_2 emission factor of the grid/ Operating Margin of the electric grid's CO_2 emission factor / Build Margin of the electric grid's CO_2 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, CO_2 emission factor of the grid is 0.5364 tCO_2e/MWh after 2006, before this date the emission factor was 0.8 tCO2e/MWh, because it was an isolated system. 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 reduction by a project activity (ER_y) during a given period of year *y* is the product of baseline emissions (EF_y, in tCO_2e/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:

$$ER_y = EF_y \, . \, EG_y \qquad \textbf{Equation 1}$$

D.2 Tables informing values obtained when applying formulae above

	Eletricity Generation	Baseline Emission Factor	Emission Reduction
Year	MWh	tCO2e/MWh	tCO2e
2008	58,668.030	0.5364	31,469.531
01/Jan/2008 to 31/Dec/2008			
Total			31,469.531

Annexes

Annex 1 - Contact information on participants

(project developer)

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