CLEAN DEVELOPMENT MECHANISM
MONITORING REPORT

Santa Edwiges II Small Hydroelectric Power Plant - Project Activity

(CDM Registration Reference Number 0831)

Monitored Period:
02 April 2007 to 30 September 2008

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Section A. General description of project activity

A.1. Title of the project activity

Project title: Rialma Companhia Energética S.A - Santa Edwiges II Small Hydroelectric Power Plant - Small Scale CDM Project Activity.

Document version number: 1

Document Date: 16/September/2008

Monitoring Report based on the PDD Version Number: 8, from 10/November/2006.

A.2. Description of the project activity

The project consists of a run-of-river small-hydro power plant (13 MW), that has a small reservoir (2.99 km²) with minor environmental impact. The project is located in the Midwest of Brazil, in the Buritis River, between Mambaí and Buritinópolis, state of Goiás, at the intersection of longitude 46º11'34,6'' W and latitude 14º21'20,4'' S, about 300 Km from Brasília (Federal District).

Project Participants have chosen the renewable crediting period and the total estimated emission reduction is 115,589 tCO_2e over the first 7-year crediting period (from 2007 to 2014). This monitoring report corresponds to the **first** verification of the project activity.

A.3. Monitoring Report

The GHG emissions reduction during the period from 2nd April 2007 to 30th September 2008 was achieved through the dispatched electricity generated by PCH Santa Edwiges II which displaced a mix of electricity generation in the Brazilian South-Southeast-Midwest interconnected grid.

The Monitoring Report is based on the electricity delivered to the grid by Santa Edwiges II Small hydro Plant. Until December 2007, the amount of energy delivered to the grid was monitored by the energy producer, Rialma Companhia Energética S.A, as well as by local concessionary CELG – *Centrais Elétricas de Goiás S.A*. From December 2007 on, the energy commercialization started to be done by CCEE – *Câmara Comercializadora de Energia Elétrica* – instead of CELG. CEEE is a private and state owned company that controls all electricity delivered to the grid and assures, for the buyer, that the electricity generated is delivered to the grid.

Calculation of the emissions reduction is based on validated and registered parameters fixed in the PDD and justified during the validation. The baseline emission factor for small-scale project activities for the Brazilian South-Southeast-Midwest grid is 0.2647 tCO2e/MWh.

A.4. Period of the monitoring report and amount of monitored emissions reductions

Period of the monitoring report: 2nd April 2007 to 30th September 2008
Amount of monitored emissions reductions: 20,593 tCO_2

A.5. Date of completing the monitoring report

The date of completing the monitoring report was 16/09/2008.

A.6. Personnel Responsible

Project Manager and Monitoring – Ricardo M. Ferreira (Rialma Companhia Energética S.A.)

Monitoring Report – A. Ricardo J. Esparta (Ecoinv Global Ltda.)

Section B. Monitoring methodology and plan

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

AMS I.D. - Grid connected renewable electricity generation (version 9)

Type I - Renewable Energy Projects

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

This Monitoring Plan has been chosen as it is suggested in the option (a) of Type I, Category D of CDM small-scale project activity categories contained in Appendix B of the simplified M&P for CDM small-scale project activity and applies to electricity capacity additions from small-scale run-of-river hydro power plants.

B.3. Data to be monitored:

ID number	Data type	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 of the Project delivered to grid	EG_y	MWh	M	15 minutes measurement and Monthly Recording	100%	Electronic	During the credit period and two years after	The electricity delivered to the grid is monitored both by the project owner (seller) and the energy buyer CELG – *Centrais Elétricas de Goiás* (the Local Distribution Company) controlled and monitored the electricity dispatched by the SHHP to the national interconnected grid until December, 2007. From this date on CCEE does the monitoring of energy dispatched to the grid. The amount of electricity delivered to the grid by the project activity is available in the invoices issued by CELG and in the Reports issued by CCEE.
2	CO_2 emission factor of the grid	EF_y	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 Operating Margin emission factor of the grid	$EF_{OM,y}$	tCO_2/MWh	C	At the validation	0%	Electronic	During the credit period and two years after	
4	CO_2 Build Margin emission factor of the grid	$Ef_{BM,y}$	tCO_2/MWh	C	At the validation	0%	Electronic	During the credit period and two years after	

Section C. Monitored data

According to option (a) of Type I, Category D of CDM small-scale project activity categories contained in Appendix B of the simplified M&P for CDM small-scale project activity, monitoring shall consist of metering the electricity generated by the renewable technology. At the project validation, the calculation of the CO2 emission factor of the grid as well as the CO2 Operating Margin and the CO2 Build Margin emission factors of the grid were also required. However, these data should be checked only once, at the validation.

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

According to the "Thresholds and criteria for the elegibility for the hydroelectric power plants with reservoirs as CDM project activity"[1], emissions from reservoirs, if there is any, shall be estimated considering the power density (W/m^2) of the plant. Considering that Santa Edwiges II has an installed capacity of 13 MW and a small reservoir of 2.99 km² of area, its power density will be 4.35 W/m^2. In this case an emission factor of 90 gCO_2eq/kWh has to be applied. The area of the reservoir did not change during the monitored period.

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

	2007	2008
Month	**Generation (MWh)**	**Generation (MWh)**
January	-	6,927
February	-	7,106
March	-	7,792
April[2]	6,265	7,002
May	6,844	6,501
June	6,309	5,956
July	6,641	6,501
August	6,025	6,308
September[3]	6,182	6,150
October	5,987	-
November	6,366	-
December	7,015	-
Total	**57,634**	**60,242**

[1] EB 23 Report, Annex 5
[2] Data considered from April 02th, 2007 (starting date of the crediting period).
[3] To be checked during the verification visit.

Table 1 – Electricity generation delivered to grid by Santa Edwiges II Small Hydro Plant
(Sources: CELG - Centrais Elétricas de Goiás, CCEE – Câmara de Comercialização de Energia Elétrica, Rialma Companhia Energética S.A)

Emission factors for the Brazilian South-Southeast-Midwest interconnected grid				
Baseline (including imports)	EF_{OM} [tCO2/MWh]	Load [MWh]	LCMR [GWh]	Imports [MWh]
2002	0.8548	275,402,896	258,720	1,607,395
2003	0.9421	288,493,929	274,649	459,586
2004	0.8763	297,879,874	284,748	1,468,275
	Total (2002-2004) =	861,776,699	818,118	3,535,256
	$EF_{OM,\ simple\text{-}adjusted}$ [tCO2/MWh]	$EF_{BM,2004}$	Lambda	
	0.4332	0.0962	λ_{2002}	
	Alternative weights	Default weights	0.5053	
	w_{OM} = 0.75	w_{OM} = 0.5	λ_{2003}	
	w_{BM} = 0.25	w_{BM} = 0.5	0.5312	
	Alternative EF_{CM} [tCO2/MWh]	Default EF_{OM} [tCO2/MWh]	λ_{2004}	
	0.3490	0.2647	0.5041	

Table 2 – CO_2 emission factor of the grid/ CO_2 Operating Margin emission factor of the grid/ CO_2 Build Margin emission factor of the grid

Section D. Calculation of GHG emission by 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, the CO2 emission factor of the grid is 0.2647 tCO2e/MWh

D.1 Describe the formulae used to calculate emissions reductions

The emission reductions by the project activity (*ERy*) during a given period of year y are the product of the baseline emissions factor (*EFy*, in tCO_2e/MWh) minus the emission from the reservoir (*PEy*, in tCO_2e/MWh) times the electricity supplied by the project to the grid at the same period of year y (*EGy*, in MWh), as follows:

$$ER_y = (EF_y - PE_y) \cdot EG_y \qquad \textbf{Equation 1}$$

D.2 Tables providing values obtained when applying formulae above

Baseline emission factor of the Brazilian grid (tCO2e/MWh)	0.2647
Emission factor of the project's reservoir (tCO2e/MWh)	0.09

2007				
Month	**Electricity Generation (MWh)**	**Emissions Reduction (tCO2e)**	**Project Emissions (tCO2e)**	**Total Emission Reductions (tCO2e)**
January	-	-	-	-
February	-	-	-	-
March	-	-	-	-
April*	6,265	1,658	564	1,095
May	6,844	1,812	616	1,196
June	6,309	1,670	568	1,102
July	6,641	1,758	598	1,160
August	6,025	1,595	542	1,053
September	6,182	1,636	556	1,080
October	5,987	1,585	539	1,046
November	6,366	1,685	573	1,112
December	7,015	1,857	631	1,226
Total	**57,634**	**15,256**	**5,187**	**10,069**

2008				
Month	**Electricity Generation (MWh)**	**Emissions Reduction (tCO2e)**	**Project Emissions (tCO2e)**	**Total Emission Reductions (tCO2e)**
January	6,927	1,834	623	1,210
February	7,106	1,881	640	1,241
March	7,792	2,063	701	1,361
April	7,002	1,854	630	1,223
May	6,501	1,721	585	1,136
June	5,956	1,577	536	1,040
July	6,501	1,721	585	1,136
August	6,308	1,670	568	1,102
September*	6,150	1,628	554	1,074
October	-	-	-	-
November	-	-	-	-
December	-	-	-	-
Total	**60,242**	**15,946**	**5,422**	**10,524**

*preliminary information to be checked during the verification visit

Total Emission Reductions (April/2007 - September/2008)	**20,593**

Annexes

Annex 1 - Contact information

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