



EcoSecurities International Ltd.

CDM Monitoring Report

## *Saldanha Small Hydroelectric Project*

Project CDM ID: 1526

Project registration date: 16 March 2009

Monitoring period: 16/03/2009 to 30/04/2010

Date monitoring report and version: 02/06/2010 Version 01

## 1. Project background

“Saldanha Small Hydroelectric Project” has been registered as CDM project by the UNFCCC on March 16<sup>th</sup>, 2009 under reference number 1526.

Further background on this project can be found in the PDD and associated documents, which are available on the UNFCCC website:

<http://cdm.unfccc.int/Projects/DB/DNV-CUK1200486228.81/view>

Parties involved are Brazil (Host Country) and The Netherlands (Annex 1 Parties). The Project Participants are Hidroluz Centrais Elétricas Ltda. (Project Developer and Operator) and EcoSecurities Group PLC.

## 2. Project implementation in relation to registered PDD

The project is implemented and been operated as per registered PDD.

### 2.1. Implementation status

The Plant consists of the installation of a small hydroelectric plant with an installed capacity of 5MW, located in Saldanha River, in the municipality of Alta Floresta d'Oeste, Rondônia State. The plant will bring renewable electricity to develop this remote area both socially and economically, which has always been a difficult issue. This project will increase the supply of electricity to the grid, offsetting thermal generation with a renewable source of energy.

### 2.2. Operation of the project

The project was operational per August 2005. The project has been operating since this date. “Operational” in this context includes downtime due to maintenance or technical issues.

### 2.3. Forecasted emission reductions versus actual emission reductions

The forecasted emission reduction in the PDD is 28,059 tCO<sub>2</sub>e/year. The actual emission reduction over this monitoring period (410 days) was 40,226 tCO<sub>2</sub>e<sup>1</sup>.

This volume seems to be above the volume expected in the PDD, however:

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<sup>1</sup> A discount has been applied to comply with the “Guidelines for Assessing Compliance with the Calibration Frequency Requirements”. The total emission reduction without the discount would be 40,307 tCO<sub>2</sub> over the monitoring period.

1. The calculations in the PDD are based on electricity generation stated in the Project PPA. The current monitoring period presented a higher level of water available on the river, implying a higher electricity generation if compared to the amount stated in the PPA.
2. The monitoring period covers more than a full calendar year and includes mainly the wet season that in the region goes from January to May. The months included in the monitored period covers two wet seasons. Therefore the observed power output is not unusual for this period.

### 3. Compliance of the monitoring plan with the monitoring methodology

This project has been registered under the methodology AMS I.D (version 13 in effect as of December 14<sup>th</sup>, 2007.) The project has not sought revision or deviation to the monitoring plan. The validated monitoring plan is therefore in accordance with the approved methodology applied to the CDM project activity.

### 4. Compliance of monitoring with the monitoring plan

Monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD.

#### 4.1. Monitoring period

This is the first monitoring period of the Project. It covers 16/03/2009 to 30/04/2010. The starting date of the monitoring period is the registration date on 16/03/2009. The ending date of the current monitoring period is before the end of the crediting period, on 15/03/2019.

#### 4.2. Monitoring parameters

Data/parameter:	EG <sub>y</sub>
Data unit:	MWh
Description:	Net electricity supplied to the grid
Source of data used:	Project developer and Grid Company (CERON) monitoring system
Value for this monitoring period:	42,699 <sup>2</sup>
Description of measurement methods and	Data collected is continuously measured by the meter and read on a monthly basis. Hourly readings are also

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<sup>2</sup> This value is related to the discounted generation, the monitored generation is 42,784MWh.

procedures applied:	taken in line with the PDD. The utility monthly reading is used for issuing the electricity sale invoices (this document shows the amount of electricity supplied to the grid).
QA/QC procedures applied:	Collected data has low uncertainty levels and to guarantee its accuracy it will be cross checked with the electricity sales receipts obtained from the grid operator.
Comments:	A discount of 0.2% was applied to this value in order to calculate the emission reduction in accordance with the "Guidelines for Assessing Compliance with the Calibration Frequency Requirements"

#### 4.3. Management and operational system

The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in section B.7.2 of the PDD.

#### 4.4. Quality assurance and quality control

The accuracy of the monitoring results are in conformity with calibration requirements, recording frequency and quality assurance and quality control procedures stated in the monitoring plan.

##### 4.4.1. Calibration of monitoring equipment

The site uses power meter for the measurement of net electricity exported to the grid. The meter used for the calculation of emission reduction is a two way meter that is used to measure the amount of electricity actually dispatched to the grid, the auxiliary consumption is already discounted by the meter.

As per the manufacturer of the meter, a calibration is not required. Following the "Guidelines for Assessing Compliance with the Calibration Frequency Requirements", version 1, the requirement applicable in this case is the General guidance to SSC CDM methodologies<sup>3</sup>, version 12.1, which states a calibration should be carried out at least once every 3 years. Since a calibration was not done a discount has been applied to the emission reduction volume. The maximum permissible error of the meter is 0.2%.

Meter	Nr	Error
Revenue Meter	4999304	0.2%

##### 4.4.2. Monitoring frequency

The parameters to be monitored were read with the frequency indicated in section 4.2 of this document. This corresponds with the requirements from methodology AMS I-D, version 13 and the registered monitoring plan.

<sup>3</sup> "Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories"  
[http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC\\_guid06.pdf](http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06.pdf)

#### *4.4.3. Monitoring system*

##### **a) Monitoring organisation**

A monitoring organization has been set up. This involved setting up an organization and the development of procedures for all the staff involved in the CDM Project.

CDM staff training has taken place and presentations are available on site. Procedures for data collection, archiving and data quality assurance and quality control were detailed during the CDM trainings and are described in the presentation available on site.

##### **b) Monitoring equipment and installation**

The meter is installed by qualified technicians. During the monitoring period no failure of meters occurred. Failure is proven when zero readings occur when project activities take place or when cross checks show deviations from expected values. Meter failures and replacements are registered in the plant log book.

##### **c) Data records and management**

Data records are filed electronically each month and kept for 2 years after the end of the crediting period. The procedures for data management are described in the monitoring manual.

##### **d) Internal audits**

The implementation of the monitoring manual is checked regularly by EcoSecurities during field visits and/or the consistency and plausibility of the data which are processed each month.

#### *4.4.4. Forward Action Requests*

This is the first verification and no open issues remain from the validation.

## **5. Calculation of emission reductions**

Calculation of emission reductions took place on the basis of a complete set of cross checked data, applying the approved methodology. No assumptions, IPCC default data or other reference values were required for this calculation. Calculations are summarized in Annex I.

### **5.1. Data completeness**

All data were monitored according to the frequency indicated in the validated monitoring plan. A complete set of data was used in the calculation of emission reductions. There was therefore no reason to apply a conservative scenario in view of partial data availability.

### **5.2. Cross checks of monitoring data**

The data is checked by the Project Developer and by the Grid Company (CERON), the electricity buyer. Both Parties sign off a report containing the measured electricity generation. Cross checks between the amount of electricity measured and signed off by the parties and the amount of electricity stated in the sales invoices applied during this

period showed that the electricity generation stated in the sales invoices are a reliable source and therefore the data used in the calculation of emission reductions are reliable.

### 5.3. Calculation of emission reductions

Emission reductions have been calculated on the basis of the formulas provided by the validated PDD and the approved methodology. The calculations are shown in Annex I of this document and the formulae provided in the Annex II

### 5.4. Assumptions in emission calculations

No assumptions were required when calculating the emission reductions over the monitoring period.

### 5.5. Application of emission factors, IPCC default values and other reference values

The emission factor used in the calculation of the emission reductions is the combined margin grid emission factor. This has been calculated in the PDD, in the ex ante option, which was validated and registered. The value is shown in Annex I and it is valid throughout the crediting period. No IPCC default values or other reference values were required in the calculation of emission reductions in the current monitoring period.

## 6. Summary

The CDM project activity Saldanha Small Hydroelectric Project, CDM reference 1526 has reduced 40,226 tCO<sub>2</sub>e in the period 16/03/2009 to 30/04/2010. The emission reduction has been calculated as set out in the validated PDD and the approved methodology. The validated monitoring plan is in accordance with the approved methodology. Monitoring has been carried out as per validated monitoring plan.

## Annex I – Emission Reduction calculation summary

**Table 1 - Emission Reduction Calculation in 2009**

<i>Variable</i>	<i>Units</i>	Mar/2009	Apr/2009	May/2009	Jun/2009	Jul/2009	Aug/2009	Sep/2009	Oct/2009	Nov/2009	Dec/2009	<i>Total 2009</i>
Net Electricity generated	MWh	2,123	4,007	4,129	3,292	2,272	2,100	1,735	1,701	3,214	2,511	27,084
Meter error (Calibration discount)	%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Discounted Net Electricity generated	MWh	2,118	3,999	4,121	3,285	2,268	2,096	1,731	1,698	3,208	2,506	27,030
Grid Emission Factor	tCO <sub>2</sub> e/MWh	0.9421	0.9421	0.9421	0.9421	0.9421	0.9421	0.9421	0.9421	0.9421	0.9421	0.9421
Baseline Emission	tCO <sub>2</sub> e	1,996	3,767	3,882	3,095	2,136	1,975	1,631	1,600	3,022	2,360	25,465
Emission reduction	tCO <sub>2</sub> e	1,996	3,767	3,882	3,095	2,136	1,975	1,631	1,600	3,022	2,360	25,465

**Table 2 - Emission Reduction Calculation in 2010**

<i>Variable</i>	<i>Units</i>	Jan/2010	Feb/2010	Mar/2010	Apr/2010	<i>Total2010</i>
Net Electricity generated	MWh	3,896	3,735	4,101	3,968	15,700
Meter error (Calibration discount)	%	0.2%	0.2%	0.2%	0.2%	0.2%
Discounted Net Electricity generated	MWh	3,888	3,728	4,093	3,960	15,669
Grid Emission Factor	tCO <sub>2</sub> e/MWh	0.9421	0.9421	0.9421	0.9421	0.9421
Baseline Emission	tCO <sub>2</sub> e	3,663	3,512	3,856	3,731	14,762
Emission reduction	tCO <sub>2</sub> e	3,663	3,512	3,856	3,731	14,762

**Table 3 – Total emission reduction in the monitoring period**

<i>Variable</i>	<i>Units</i>	<i>Total</i>
Net Electricity generated	MWh	42,784
Meter error (Calibration discount)	%	0.20%
Discounted Net Electricity generated	MWh	42,699
Grid Emission Factor	tCO <sub>2</sub> e/MWh	0.9421
Baseline Emission	tCO <sub>2</sub> e	40,226
Total Emission reduction	tCO <sub>2</sub> e	40,226

**Table 4 - *Ex-ante* parameters**

<i>Parameter description</i>	<i>Parameter</i>	<i>Units</i>	Value
Grid Build Margin	$EF_{grid,BM,y}$	tCO <sub>2</sub> e/MWh	1.0160
Grid Operating Margin	$EF_{grid,OM,y}$	tCO <sub>2</sub> e/MWh	0.8682
Grid Emission Factor	$EF_{grid,CMy}$	tCO <sub>2</sub> e/MWh	0.9421



## Annex II – Formulae used to calculate Emission Reduction

### Emission reductions due to displacement of electricity:

$$ER_{electricity,y} = EG_y \cdot EF_{grid,CM,y} \quad (1)$$

$ER_{electricity,y}$	Emission reductions due to displacement of electricity during the year y (tCO <sub>2</sub> /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)
$EF_{grid,CM,y}$	CO <sub>2</sub> emission factor for the electricity displaced due to the project activity during the year y (tCO <sub>2</sub> /MWh). The ex-ante option was chosen, therefore the parameter is defined as per the registered PDD.