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# VERIFICATION AND CERTIFICATION REPORT

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**C-Trade Comercializadora de Carbono  
Ltda**

**Santa Lúcia II Small Hydro Plant**

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**SGS Climate Change Programme**

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<b>Date of Issue:</b>		<b>Project Number:</b>	
27-01-2009		CDM.VER0154	
<b>Project Title:</b>			
Santa Lúcia II Small Hydro Plant			
<b>Organisation:</b>		<b>Client:</b>	
SGS United Kingdom Limited		C-Trade Comercializadora de Carbono Ltda	
<b>Publication of Monitoring Report:</b>			
<b>Monitoring Period:</b>		01/01/2008 – 31/12/2008	
First Monitoring Version and Date:		Version 1, 05/01/2009	
Final Monitoring Version and Date:		Version 2, 23/01/2009	
<b>Summary:</b>			
<p>SGS United Kingdom Ltd has performed the third periodic verification of the CDM project Santa Lúcia II Small Hydro Plant, UNFCCC reference number 0663. The verification includes confirming the implementation of the monitoring plan of the registered PDD and the application of the monitoring methodology as per methodology AMS IC, version 8. A site visit was conducted to verify the data submitted in the monitoring report.</p> <p>The Santa Lúcia II Plant is a small run of river hydro plant (7.6 MW), therefore without any reservoir, that generates no adverse environmental impact.</p> <p>Santa Lúcia II uses water from the Juruena River to generate electricity with 7.6 MW installed capacity. It is located right next to its sister plant, Santa Lúcia I, to tap all the flow of the river. This run-of-river project does not have any dam or water storage, and therefore makes complete use of the water flow. Santa Lúcia II has five sets of turbine-generators. As there is almost no head, Francis Vertical Open Flume turbines, being the most adequate technology as of today, were employed.</p> <p>SGS confirms that the project is implemented in accordance with the validated and registered Project Design Document. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in <b>31,469 tCO<sub>2</sub>e</b> during period 01/01/2008 up to 31/12/2008.</p>			
<b>Subject:</b>			
CDM Verification			
<b>Verification Team:</b>			
Fabian Gonçalves – Lead Assessor		<input checked="" type="checkbox"/> No Distribution (without permission from the Client or responsible organisational unit)	
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## Abbreviations

AM	Approved Methodology
CAR	Corrective Action Request
CER	Certified Emission Reduction
DNA	Designated National Authority
MP	Monitoring Plan
NIR	New Information Request
PDD	Project Design Document
SGS	Société Générale de Surveillance
EF	Emission Factor
GHG	Greenhouse Gas(es)
UNFCCC	United Nation Framework Convention on Climate Change
SL II	Santa Lúcia II
ONS	Operador Nacional do Sistema (National system operator)
CDM	Clean Development Mechanism

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## 1. Introduction

### 1.1 Objective

SGS United Kingdom Ltd has been contracted by C-Trade Comercializadora de Carbono Ltda to perform an independent verification of its CDM project Santa Lúcia II Small Hydro Plant. CDM projects must undergo periodic audits and verification of emission reductions as the basis for issuance of Certified Emission Reductions (CERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The emissions report conforms with the requirements of the monitoring plan in the registered PDD and the approved methodology; and
- The data reported are complete and transparent.

### 1.2 Scope

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on the validated and registered project design document and the monitoring report. The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

SGS has, based on the recommendations in the Validation and Verification Manual, employed a risk-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

### 1.3 Project Activity and Period Covered

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity:	Santa Lúcia II Small Hydro Plant
UNFCCC Registration Number:	0663
Monitoring Period Covered in this Report	01/01/2008 – 31/12/2008
Project Participants	Maggi Energia S.A. C-Trade Comercializadora de Carbono Ltda. Lumina Engenharia e Consultoria Ltda.
Location of the Project Activity:	Sapezal/MT - Brazil

The Santa Lúcia II Plant is a small run of river hydro plant (7.6 MW), therefore without any reservoir, that generates no adverse environmental impact.

Maggi Energia S.A. is the sole owner of Santa Lúcia II and has been generating electricity using alternative energy sources such as hydropower and biomass. Santa Lúcia II project started during 2001, all construction and installations from January 2002 until January 2003. Commercial operation started in October, 2003.

The project is located more than 480 km from Cuiabá, the capital of the State of Mato Grosso, in the city of Sapezal. The most important aspect of this project is the displacement of fossil fuels by renewable energy sources in the generation of electricity in isolated systems.

## 2. Methodology

### 2.1 General Approach

SGS's approach to the verification is a two-stage process.

In the first stage, SGS completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

At the end of this stage, SGS produced a Periodic Verification Checklist which, based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

Using the Periodic Verification checklist, SGS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

### 2.2 Verification Team for this Assessment

Name	Role	SGS Office
Fabian Gonçalves	Lead Assessor	SGS Brazil

### 2.3 Means of Verification

#### 2.3.1 Review of Documentation

The validated PDD, the monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached in section 8 of this report.

### 2.3.2 Site Visits

As part of the verification, the following on-site inspections have been performed:

<b>Location:</b> Rondonópolis/MT – Brazil	
<b>Date:</b> 12/01/2009	
<b>Coverage:</b>	<b>Source of Information / Persons Interviewed</b>
Confirmation of data reported in monitoring report. Sampling of internal system. Procedures. Electricity generation records. Equipments installed; operation. Sampling of internal system data.	Rosmari Cavasan – Maggi Energia (Administrative coordinator) Leo Scabeni – Maggi Energia (Manager)
Monitoring report	Clóvis Badaró Galvão – Lumina Energia (Director)

### 2.4 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the team shall raise a New Information Request (NIR) specifying what additional information is required.

Where a non-conformance arises the team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

- I. the verification is not able to obtain sufficient evidence for the reported emission reductions or part of the reported emission reductions. In this case these emission reductions shall not be verified and certified;
- II. the verification has identified misstatements in the reported emission reductions. Emission reductions with misstatements shall be discounted based on the verifiers ex-post determination of the achieved emission reductions

The verification process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a NIR may result in a CAR. Information or clarifications provided as a result of an NIR may also lead to a CAR.

Observations may be raised which are for the benefit of future projects and future verification actors. These have no impact upon the completion of the verification activity.

Corrective Action Requests and New Information Requests are detailed in Periodic Verification Checklist. The Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

### 2.5 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment Team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

### 3. Verification Findings

#### 3.1 Project Documentation and Compliance with the Registered PDD

Monitoring report is consistent with registered PDD. All parameters mentioned in the monitoring plan are discussed in the monitoring report.

No mistakes or changes related to the second monitoring period date were verified: Monitoring Period: 01/01/2008 – 31/12/2008.

No changes observed in the monitoring plan against methodology AMS ID version 8. Project is still following the registered monitoring plan and methodology.

No additional source attributable to the project needs to be included in the monitoring plan.

#### 3.2 Monitoring Results

Electricity generation (delivered to the grid)	MWh	<p>Data is generated automatically. The meter collects data continuously. Monthly the concessionary (Cemat) collect this data and send the information by email to project (Maggi – SLII). The energy data controlled by the concessionary (energy buyer) represents the net energy delivered to the grid and the value to be invoiced.</p> <p>The energy data received from Cemat and internal data measured are compared before invoicing.</p> <p>100% of monitored data were verified (monthly data, invoices) and an error was detected in the months of November and December 2008. See table below (reported value/verified value). CAR 1 was raised to correct the monitoring report in the months of November and December 2008. Consequently the total CER required was affected. The monthly data from concessionary and invoices were verified and are correct. The monitoring report version was also checked and reflects the correct values for the net energy delivered to the grid in November and December 2008. CAR 1 was closed out.</p>
CO2 emission factor of the Grid	tCO2/MWh	<p>This value was calculated using data information from ONS, the Brazilian electricity system manager.</p> <p>Fixed value determined ex-ante according registered PDD.</p>

#### 3.3 Remaining Issues, CAR's, FAR's from Previous Validation or Verification

Not applicable.

#### 3.4 Project Implementation

Generators and turbines are still the same verified in the previous verification. The energy meters are still the same from previous verification: meters ION 8600, serial numbers PT-0702A381-01 (principal), PT0707A106-01 (backup).

Verified calibration certificate: ION 8600, PT-0702A381-01 (principal) issued on 21/02/2007. ION 8600, PT0707A106-01 (backup) issued on 09/07/2007. Meters are calibrated according Brazilian regulations (Following ONS procedure: ONS – Sub module 12.3 - Maintenance of the measurement system for billing).

Managers and operators were interviewed and observed performing their activities (monitoring, recording and inputting data). It was verified that personnel is adequately trained for its tasks.



### **3.5 Completeness of Monitoring**

The reporting procedures reflect the content of the monitoring plan. The monitoring mechanism is effective and reliable.

### **3.6 Accuracy of Emission Reduction Calculations**

During site visit all invoices issued for the monitored period were compared to the data report of the energy meter (memória de massa) and monitoring report.

A difference in the total energy generated was detected:

- Monitoring report = 59,634.015 MWh
- Verified during site visit = 58,669.030 MWh

CAR 1 was raised. This difference is a typo in monitoring report version 1.

The difference detected is not significant and was detected by checking all energy invoices for this monitoring period. To avoid this error in future verification a worksheet with following information will be presented before each verification: to inform the monitored months, clients (consumers), energy data and a summary of all exception occurred during period. The typo has been corrected in monitoring report version 2.

CAR 1 was closed out.

The details of the reported and the verified values for all parameters are listed in section 4.

### **3.7 Quality of Evidence to Determine Emission Reductions**

Critical parameters used for the determination of the Emission Reductions are discussed above in section 3.2 above. All the data recorded is in compliance with the monitoring report.

### **3.8 Management System and Quality Assurance**

The companies involved in the project have operational and maintenance procedures therefore we can affirm that the management system the CDM project is in place; with the responsibilities properly identified and in place.

In order to verify data quality, the Companies involves in the project works in accordance with a quality assurance procedure, which establishes the operational and management structure implemented.

### **3.9 Data from External Sources**

Emission Factor of the S-SE-CO Brazilian Grid (EF) = 0.5364 tCO<sub>2</sub>e/MWh;

Fixed value determined ex-ante according registered PDD. No calculation is applicable.

#### 4. Calculation of Emission Reductions

Parameter	Reported Value	Verified Value
Electricity generation (delivered to the grid) - MWh	59,634.015 MWh	58,668.030 MWh
CO2 emission factor of the Grid (tCO2/MWh)	0.5364 tCO2e/MWh	0.5364 tCO2e/MWh

Net electricity delivered to the grid = 58,668.030 MWh

ER = 58,668.030 MWh \* 0.5364 tCO2/MWh = 31,469 tCO2e

ER is correctly applied in the monitoring report version 2 and CER spreadsheet.

## **5. Recommendations for Changes in the Monitoring Plan**

Not applicable.

## 6. Overview of Results

### Assessment Against the Provisions of Decision 17/CP.7:

Is the project documentation in accordance with the requirements of the registered PDD and relevant provision of decision 17/CP.7, EB decisions and guidance and the COP/MOP?

*Yes. The results of the compliance assessment are recorded in the verification checklist which is used as an internal report only.*

Have on-site inspections been performed that may comprise, inter alia, a review of performance records, interviews with project participants and local stakeholders, collection of measurements, observations of established practices and testing of the accuracy of monitoring equipment?

*Yes. Fabian Gonçalves as lead assessor visited the sites and undertook interviews, collected data, audited the implementation of procedures, checked calibration certificates and checked data, inter alia.*

*The results of the site visits are recorded in the verification checklist which is used as an internal report only.*

*The evidences have been checked and collected. The revised monitoring report is attached with this verification report.*

Has data from additional sources been used? If yes, please detail the source and significance.

*Emission Factor of the S-SE-CO Brazilian Grid (EF) = 0.5364 tCO<sub>2</sub>e/MWh was used. This is fixed value determined ex-ante according registered PDD.*

Please review the monitoring results and verify that the monitoring methodologies for the estimation of reductions in anthropogenic emissions by sources have been applied correctly and their documentation is complete and transparent.

*Yes. The monitoring methodology has been correctly applied and the monitoring report and supporting references are complete and transparent.*

Have any recommendations for changes to the monitoring methodology for any future crediting period been issued to the project participant?

*No.*

Determine the reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CDM project activity, based on the data and information using calculation procedures consistent with those contained in the registered project design document and the monitoring plan.

*The data used in anthropogenic emission reduction calculation is consistent with those contained in the registered PDD and monitoring plan. The emission reduction was 19,975 tCO<sub>2</sub> for the period 01/01/2008 to 31/12/2008 as per the estimation made in the registered PDD. The actual emission reduction has been verified as 31,469 tCO<sub>2</sub> for the same period. The emission reduction is higher than estimated in the registered PDD because the energy generated in the period was higher than expected. Besides the higher electricity generation, it is still inside the installed capacity. With a 7.6MW installed capacity the project can generate 66,576MWh/year. The verified electricity generation in the monitored period (year 2008) was 58,668.030MWh.*

Identify and inform the project participants of any concerns related to the conformity of the actual project activity and its operation with the registered project design document. Project participants shall address the concerns and supply relevant additional information.

*No such non conformity of the actual project activity and its operation with the registered project design document has been observed.*

Post monitoring report on UNFCCC website

*Yes, the monitoring report is available at ref. UNFCCC Project Reference Number 0663 on UNFCCC website.*

## 7. Verification and Certification Statement

SGS United Kingdom Ltd has been contracted by C-Trade Comercializadora de Carbono Ltda to perform the verification of the emission reductions reported for the CDM project Santa Lúcia II Small Hydro Plant, UNFCCC reference number 0663 in the period 01/01/2008 – 31/12/2008.

The verification is based on the validated and registered project design document and the monitoring report for this project. Verification is performed in accordance with section I of Decision 3/CMP.1, and relevant decisions of the CDM EB and CoP/MoP. The scope of this engagement covers the verification and certification of greenhouse gas emission reductions generated by the above project during the above mentioned period, as reported in Santa Lúcia II Small Hydro Plant monitoring report, version 2, 23/01/2009.

The management of the C-Trade Comercializadora de Carbono Ltda, Maggi Energia S.A., Lumina Engenharia e Consultoria Ltda (project participants) is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project monitoring report version 2, 23/01/2009. Calculation and determination of GHG emission reductions from the project is the responsibility of the management of the Santa Lúcia II Small Hydro Plant. The development and maintenance of records and reporting procedures are in accordance with the monitoring report.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 01/01/2008 – 31/12/2008 based on the reported emission reductions in the monitoring report version 2 dated 23/01/2009 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, SGS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

SGS confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have seen and evaluated, we confirm the following:

Project Title:	Santa Lúcia II Small Hydro Plant
UNFCCC Reference Number:	0663
Registered PDD and Approved Used for Verification:	Santa Lúcia II Small Hydro Plant, version 2, 02/05/2006.
Methodology Used for Verification:	Methodology AMS ID, version 8.
Applicable Period:	01/01/2008 – 31/12/2008
Total GHG Emission Reductions Verified:	31,469tCO <sub>2</sub> e

**Signed on behalf of the Verification Body by Authorized Signatory**



Signature:

Name: Siddharth Yadav

Date: 19<sup>th</sup> March 2009

## 8. Document References

ID	Document
1	PDD: Santa Lúcia II small hydro plant, version 2, 02/05/2006
2	Methodology: AMS ID version 8
3	Monitoring report: version 1, 05/01/2009; version 2, 23/01/2009
4	CER spreadsheet version 2, 23/01/2009
5	Environmental license: LO 2134/2007, 02/03/2007 issued by Feam
6	Calibration certificate: ION 8600, PT-0702A381-01 (principal) issued on 21/02/2007. ION 8600, PT0707A106-01 (backup) issued on 09/07/2007.
7	Procedures: Archiving procedure Maggi Energia, 30/01/2008
8	Photos
9	Invoices (energy delivered to the grid) for the months Jan-Dec 2008
10	CEMAT report and mass memory of the energy meter for the months Jan-Dec 2008

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