

**GOLD STANDARD
VERIFICATION REPORT
SUSTAINABLE CARBON – PROJETOS
AMBIENTAIS LTDA**

**VERIFICATION OF
Balsas Renewable Energy Project**

1st Monitoring Period:
From 01/12/2011 - 30/09/2014 (days included)

**IBOPE Instituto Brasileiro de Opinião pública e
Estatística Ltda.**

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Gold Standard Verification Report 1st Version Date: 19/02/2015 Final Version Date: 27/07/2015	DOE: IBOPE Instituto Brasileiro de Opinião Pública e Estatística Ltda. Alameda Santos, 2101, Cerqueira César, São Paulo-SP ZIP Code: 01419-100 Brazil	☒ No distribution without permission from client or responsible organizational unit ☐ Limited distribution ☐ Unrestricted distribution
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Project Title: Balsas Renewable Energy Project	Methodology: AMS-I.E – version 05	Monitoring Period: From 01/12/2011 - 30/09/2014 (days included)
Project Participants: Sustainable Carbon - Projetos Ambientais Ltda Cerâmica Balsas Ltda		
Summary: IBOPE verified the 1 st monitoring period of the Balsas Renewable Energy Project, GS Registration Reference Number 1291, project of Sustainable Carbon – Projetos Ambientais Ltda located in Brazil. The project applies the methodology AMS-I.E version 05, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting, as well as GS requirements. In summary, IBOPE confirms that the project activity was correctly implemented according to selected monitoring methodology and monitoring plan. Monitoring equipment is installed being essential for generating emission reduction and runs reliably and it is calibrated appropriately. The monitoring system is in place and the project is already generating GHG emission reductions. The GHG emission reduction is calculated without material misstatements, and the emission reductions verified totalize 19,376 tCO ₂ e for the monitoring period. IBOPE, therefore, is pleased to issue a positive verification opinion.		
Verification Team Role Lead Verifier Verifier (in training)	Full Name Mr. Fernando Alarcon Nogueira Ms. Adriana de Oliveira Santos	
Technical Review Mr. Rafael Kupper Bonizio Oliva		
Current Revision Number: 03	Number of pages 32	

Abbreviations

CAR(s): Corrective Action Request(s)

CDM: Clean Development Mechanism

CL(s): Clarification Request(s)

CO₂: Carbon Dioxide

DOE: Designated Operational Entity

FAR(s): Forward Action Request(s)

GHG: Greenhouse Gas

GS: Gold Standard

MR: Monitoring Report

PDD: Project Design Document

PP(s): Project Participant(s)

tCO₂e: Tonne of Carbon Dioxide Equivalent

UNFCCC: United Nations Framework Convention on Climate Change

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1. INTRODUCTION

Sustainable Carbon – Projetos Ambientais Ltda has commissioned IBOPE to verify the emissions reductions of its Gold Standard project activity Balsas Renewable Energy Project (hereafter called “project” or “project activity”) in Brazil.

This report summarizes the findings of the verification of the project, performed based on UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. This report also considers GS requirements criteria of the Gold Standard Foundation. These criteria refer to GS requirements, version 2.2, GS Toolkit and supporting annexes.

1.1. Objective

In carrying out its verification work, the DOE shall ensure that the project activity complies with the following requirements:

- a) Ensure that the project activity has been implemented and operated as per the registered GS PDD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- b) Ensure that the monitoring report and other supporting documents provided are complete in accordance with GS and CDM requirements (when applicable);
- c) Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology;
- d) Evaluate the data recorded and stored as per the monitoring methodology.

The objective of this independent verification work was to verify and certify emission reductions and check the implementation of sustainable development indicators and mitigation measures monitoring, reported for Balsas Renewable Energy Project in the following period: From 01/12/2011 - 30/09/2014 (days included).

In particular, monitoring plan, monitoring report and the project’s compliance with relevant GS, UNFCCC and host Party criteria are verified in order to confirm that the project has been implemented in accordance with previously registered project design and conservative assumptions, as documented.

1.2. Scope

The scope of the verification comprises an independent and objective review of the project design document, the project’s baseline study and monitoring plan and other relevant documents

provided by PP. The information in these documents were reviewed against Kyoto Protocol requirements, UNFCCC rules, GS requirements and associated interpretations.

The verification considers both quantitative and qualitative information on emission reductions and sustainable development indicators. The verification is not meant to provide any consultancy towards the client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

2. DESCRIPTION OF GS PROJECT ACTIVITY

The project activity is the project of Balsas Ceramic, which is a red ceramic company located in Balsas municipality, state of Maranhão, northeast of Brazil. Balsas Ceramic produces structural ceramic bricks destined mainly for the regional market in the municipalities of Balsas, Mangabeira, Fortaleza dos Nogueira and Alto Parnaíba.

The ceramic factory used exclusively non-renewable woody biomass (wood without sustainable forest management, also referred as native firewood) as fuel. The use of this type of non-renewable biomass is a common practice in the ceramic industry. Although firewood has been used for many decades as a fuel in Brazil, it is impossible to define a start date on which this kind of non-renewable biomass began to be applied. Firewood used to be the most employed source of primary energy until 1970's, when the petroleum started to supply the majority of Brazilian's energy needs. Moreover, the Brazilian Energy and Mine Ministry has been monitoring every energy sector of Brazil since 1970, and firewood appears over the years monitored as a significant source of thermal energy for ceramic sector. On the other hand, the project activity focuses on the use of renewable biomass for thermal energy supply.

This project activity reduces the greenhouse gases (GHG) emissions through the substitution of non-renewable biomass for renewable biomasses to generate thermal energy. As renewable biomasses, the project activity utilizes mostly biomass residues (such as rice husks and wood residues), biomass from forests and biomass from cropland and/or grasslands) to feed the ceramic's kilns. The project also involves energy efficiency measures, such as improved fuel handling and kilns improvement to reduce the necessary energy per production output.

This project pointed out the possibility for switching from non-renewable biomass to renewable biomasses, which was unattractive due some barriers, including higher fuel costs, uncertainties associated to the fuel switch and the lack of knowledge to operate with renewable biomass. The ceramic owners have considered the income from the commercialization of the carbon credits to make the project activity viable.

The main goal of this project activity is to minimize the negative impacts of deforestation to obtain firewood, whose consumption also leads to GHG emissions that contribute to climate change. Moreover, in opposition to the identified baseline, the project activity generates thermal energy exclusively from renewable sources, by using abundant renewable biomasses in the region. All these measures contribute to sustainable development by promoting renewable energy, mitigating atmospheric pollution and improving the quality of employment for the ceramic workers.

The emission reductions due to the switching of non-renewable fuel (non-renewable wood) to renewable biomasses resulted in 19,376 tCO₂e during the monitoring period From 01/12/2011 - 30/09/2014 (days included).

3. METHODOLOGY

The overall verification was conducted using IBOPE internal procedures.

In order to ensure transparency, a verification protocol was customized for the project, according to CDM and GS requirements.

The protocol shows, in a transparent manner, criteria, means of verification and the results from verifying the identified criteria.

The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a GS project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The completed verification protocol is enclosed in Section 8 of this report.

3.1. Desk Review

The verification of the project documentation is based upon quantitative and qualitative information on emission reductions: quantitative information comprises the reported numbers in the monitoring report and qualitative information comprises information on internal management controls, calculation and transfer of data procedures, frequency of emissions reports, review and internal audit of calculations and other relevant information.

The verification has been performed based on the review of the following main documents:

- Registered GS PDD (including monitoring plan) v.12, dated from 21/01/2014.

- Monitoring Report v.05, dated from 19/06/2015 – Period from 01/12/2011 - 01/09/2014 (days included)
- GS MR Calculation Balsas_01 12 11_01 09 14_v05

A complete list of all documents reviewed is attached in section 6 of this report.

3.2. On-Site Visit

In order to confirm all physical features of the project activity are in place, as described in the registered GS PDD, and that the project participant has operated and correctly monitored all parameters of the registered GS project activity according to registered GS PDD, the verification team had carried out an on-site visit. The on-site visit objectives are, but are not limited to:

- Assess implementation and operation of project activity in comparison with the registered GS PDD and monitoring plan;
- Investigate whether all relevant equipment is installed and working;
- Check the monitoring processes, routines and documentations;
- Review how the monitored parameters are generated, aggregated and reported;
- Check the risks of inappropriate operation and data collection procedures;
- Identify quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameter;

Company 1. Cerâmica Balsas Ltda 2. Sustainable Carbon - Projetos Ambientais Ltda		Period of on-site visit From 20/11/2014 to 21/11/2014
Verification Team On-site Role Lead Verifier	Full Name Mr. Fernando Alarcon Nogueira	Date of on-site visit: From 20/11/2014 to 21/11/2014
People Interviewed Role Ceramic Owner	Full Name Mr. José Thyerson Ladeira da Paz	

Administrative Assistant	Ms. Soraia da Silva Silveira
Technical Analyst	Mr. Dênis Gonçalves dos Santos

IBOPE interviewed project participant and stakeholders to confirm data and information and also to resolve issues identified in the document review. The main topics of the interviews were:

Interviewed Organization	Interview Topics
Sustainable Carbon – Projetos Ambientais Ltda Cerâmica Balsa Ltda.	• Sustainable Development Indicators • Management and Operational Structure • Changes in Employment • Trainings • Emission Reduction Calculation • Training records • Cross-check procedures • Social security records of employees • Management of Project Activity • Sustainable Development Indicators

3.3. Resolution of CARs, CLs and FARs

The objective of this phase of the verification is to raise requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for IBOPE positive conclusion on the GHG emission reduction calculation.

Findings established during the initial verification can either be seen as a non-fulfilment of GS and CDM criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

A Corrective Action Request (CAR) is issued, where:

- a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- b) Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- c) Issues identified in a FAR during validation or previous verifications to be verified during verification have not been resolved by the project participants.

A Forward Action Request (FAR) is issued, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

A Clarification Request (CL) is issued if information is insufficient or not clear enough to determine whether the applicable requirements have been met.

The verification team identifies CARs, CLs and FARs which has to be adequately responded by PP. If so, the CARs and CLs will be closed by IBOPE.

To guarantee the transparency of the verification process, the concerns raised and response provided by PP are documented in the verification protocol in Section 8.

3.4. Internal Quality Control

Following the completion of the assessment process and a recommendation by the Verification Team, all documentation is forwarded to a Technical Reviewer.

The technical review is an independent process performed to examine thoroughly that the process of verification has been carried out in conformance with the requirements of the verification scheme.

The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified before presenting the Verification report to PP.

The Technical Reviewer will either accept or reject the recommendation made by the verification team.

4. VERIFICATION FINDINGS

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit, such as Clarification, Corrective and Forward Action Requests are further documented in the Verification Protocol in Section 8.

The verification of the Project resulted in 06 Corrective Action Requests.

The CARs, CLs and FARs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure.

4.1. Remaining issues from previous validation/verification

All CARs and CLs raised were successfully closed during the validation/verification stage of the project activity, and no remaining issues were left.

There was a remaining issue from previous validation, 01 FAR from the Validation Report of TÜV Rheinland (China) Ltd, Report No. 01 997 9105075655-GS, Version 05, 2014-01-21. The issue was closed on this report. The issues was documented in the Verification Protocol in Section 8

4.2. Compliance of the project implementation with the registered GS PDD

The implementation status of the project is in in accordance with the project description contained in the registered GS PDD V.12 –dated 21/01/2014 and it is fully operational, as confirmed by verification team through visual inspection in the on-site visit. The project is operating in normal condition during the reported monitoring period (From 01/12/2011 - 30/09/2014 (days included)). The facilities have not been modified and presented proper operating conditions.

4.3. Compliance of the monitoring plan with the monitoring methodology

The monitoring plan and the monitoring system implemented are in accordance with the approved methodology applied: AMS-I.E: "Switch from non-renewable biomass for thermal applications by the user" – Version 05.

Verification Team confirms that the monitoring plan in the GS PDD complies with the applied methodology.

4.4. Compliance of monitoring activities with the registered monitoring plan

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

All parameters stated in the validated monitoring plan are monitored and reported appropriately. The Verification Team has verified the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the values in the monitoring reports are described below:

Parameter	PR_y
Description	Amount of products produced in year y
Data unit	Thousands of ceramic pieces
Source of data used	Controlled by the ceramic owners.
Means of verification	Verification team verified PR_y through desk review, and checked on-site visit that the amount of products produced by the project used in the calculation and reported in the MR are correct and traceable to the data. Evidences were taken from manual control of devices burned in the kiln for the ceramic factory were verified and accepted by the verification team.

Parameter	Qrenbiomass
Description	Amount of renewable biomass used during year y of the crediting period.
Data unit	Tonnes
Source of data used	It was monitored through purchase invoice, delivery notes or other documents concerning the acquisition of renewable biomasses.
Means of verification	During the onsite visit and desk review, verification team verified that the amount of renewable biomass used during the monitoring period by the project used in the calculation and reported in the MR are correct and traceable Evidences and records of purchase invoices and delivery notes of renewable biomass for the ceramic were verified and accepted by the verification team.

Parameter	$f_{NRB,y}$
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Description	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable using survey methods.
Data unit	Fraction or percentage
Source of data used	Survey methods
Means of verification	Verification team checked the survey methods and accepted it accordingly.

Parameter	Origin of Renewable Biomass
Description	Renewable origin of the biomass
Data unit	Not applicable
Source of data used	Controlled by the ceramic owners
Means of verification	During the on-site visit and desk review, verification team verified the origin of renewable biomass. Evidences and records of the purchase invoices and delivery notes of renewable biomass for each ceramic company were verified and accepted by the verification team.

Parameter	Leakage due to competing uses of biomass
Description	This source of leakage was relevant for biomass residues and biomass from existing forests, according to the general guidance on leakage in biomass project activities. The quantity of renewable biomass available was assessed annually to determine the occurrence of leakage.
Data unit	tCO ₂ e
Source of data used	Monitored by surveys and publications
Means of verification	Verification team checked the survey methods and publications, and accepted it accordingly.

Parameter	Leakage of non-renewable woody biomass
Description	Leakage relating to non-renewable woody biomass
Data unit	tCO ₂ e
Source of data used	Monitored
Means of verification	During the on-site visit and desk review, verification team checked the renewable origin of the biomass. Evidences and records of purchase invoices and delivery notes of renewable

	biomass for each ceramic factory were verified and accepted by the verification team.
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Parameter	Specific fuel consumption
Description	Specific fuel consumption of the Ceramic factory
Data unit	TJ/thousands of ceramic units produced
Source of data used	Determined by the energy produced in TJ due to the amount of renewable biomass acquired (Qrenbiomass) and the amount of ceramic units produced (PRy) by the Ceramic factory.
Means of verification	During the desk review, the verification team checked the calculations and accepted it accordingly.

With respect to GS requirements, the project has to monitor the sustainability indicators, as defined in the GS Sustainability Monitoring Plan in the GS Passport.

The verification of the parameters required by the monitoring plan is provided as follows:

Number	01
Indicator	Air quality
Chosen Parameter	Emissions to the atmosphere
Way of Monitoring	Evaluations by applying Ringelmann smoke charts as recommended by SEMA (Environment Department and Natural Resources of Maranhão State), the environmental authority. Results shall be stored to assess the intensity of atmospheric emissions
Means of verification	Verification Team conducted interviews with responsible person of air quality evaluations and checked the monitoring spreadsheets utilized in the Ceramic Factor during onsite visit. During this monitoring period, ceramic owners applied the Ringelmann smoke chart and the results were compiled in proper files

Number	02
Indicator	Soil condition
Chosen Parameter	Procedures related to the control and disposal of ashes
Way of Monitoring	Ashes shall be quantified by using the number of wheelbarrows transported until the storage site and the number of buckets that is added to the clay mass by the trucks. Employees on the ceramic shall use spreadsheets to record the number of carts

	each time ashes are collected and transported to the storage site and the number of buckets added into the clay mass. Photographs shall be used as evidencing to its final destination. Interviews and meetings with stakeholders and ceramic personnel on Balsas ceramic shall also be applied to identify the relevant score under the Social Carbon indicator.
Means of verification	Verification Team conducted interviews with production employees concerning to ashes generation and checked the monitoring spreadsheets utilized in the Ceramic Factors during onsite visit. During this monitoring period, ceramic owners have provided a proper destination to ashes resulted from biomass combustion. Ashes quantification and destination method are documented on proper files.

Number	03
Indicator	Access to affordable and clean energy services
Chosen Parameter	Total energy produced from renewable sources
Way of Monitoring	The amount of renewable biomass used by Balsas ceramic was monitored during the crediting period (through purchase invoice, delivery notes or other documents concerning the acquisition of biomass). By using default values of energy content, the project proponents were able to determine the amount of renewable energy produced during each year of the crediting period.
Means of verification	Verification team checked this indicator by purchase invoices and delivery notes during the onsite visit.

Number	04
Indicator	Quantitative employment and income generation
Chosen Parameter	Voluntary emission reductions issued
Way of Monitoring	The issuance of voluntary emission reductions (or similar assets from the carbon market) will be monitored.
Means of verification	Verification Team checked this indicator by the analyses of GS MR.

Number	05
Indicator	Quantitative employment and income generation
Chosen Parameter	Additional revenues for biomass suppliers

Way of Monitoring	Total revenues will be monitored by storing purchase invoices, receipts of sale and other documents concerning biomass acquisition. Total revenues shall be compared to the baseline fuel cost for the ceramics which were destined to native firewood suppliers. This parameter is defined ex-ante using data from 2009 (the most recent year prior to the project start date). A conservative correction factor of 15% will be applied annually, to account for general price increase due to inflation.
Means of verification	Verification team checked this indicator by purchase invoices and delivery notes during the onsite visit, and by analysing the document GS MR Calculation Balsas_01 12 11_01 09 14_v03

Number	06
Indicator	Origin of renewable biomass
Chosen Parameter	Origin of renewable biomass
Way of Monitoring	The origin of the renewable biomass will be assessed storing documents (receipts, invoices) from the biomasses providers, thus allowing determining its origin. The biomasses shall be considered renewable as fulfilling definitions of renewable biomass approved by the CDM Executive Board.
Means of verification	Verification team checked this indicator by purchase invoices and delivery notes during the onsite visit.

Number	07
Indicator	Competing uses of biomass
Chosen Parameter	Biomass surplus
Way of Monitoring	According to the Gold Standard Passport, Sustainable Carbon will assess the biomass surplus by using published literature, official reports or surveys. In case this information proves to be unavailable, Sustainable Carbon will hire third party experts on biomass to determine the existence of biomass surplus for each biomass type used by Balsas Ceramic in the project region. Such assessment will be made ex ante. During the monitoring period, Sustainable Carbon shall annually determine if the quantity of available biomass in the region (as determined ex ante), is at least 25% larger than the quantity of biomass that is utilized including the project activity.
Means of verification	Verification team checked the analysis and calculation of the competing uses of biomass

4.5. MR Deviation and Revision

According to of the MSPPDD Balsas: "Values used during the project monitoring might be taken either from sales reports or from production control documents". Although this information is correct, the values used for the calculations were taken from manual control of devices burned in the kiln. Measurements were done by counting the total amount of wagon that enters in the kiln. Each wagon has the same capacity of ceramic pieces, and the burning cycle depends on the temperature of kiln (the kiln temperature is inversely proportional to the burn time). All data of production were consolidated in an internal control sheet monitored by employees.

The start date of the crediting period for this project was 20/11/2011, however project participants decided to request credits only from 01/12/2011. Therefore, in order to avoid confusion and save the generated credits by the project activity during the total crediting period, Gold Standard Secretariat suggested that the start date of crediting period should be 01/12/2011 instead of 20/11/2011. The end date was also updated accordingly, totalizing 10 years of project activity.

Verification team checked the production consolidated in an internal control sheet and the calculations.

4.6. Management System and Quality Assurance

The responsible for registration, monitoring, measurement and reporting the monitored data for *Cerâmica Balsa Ltda.* is the ceramic owner Mr. José Thyerson Ladeira da Paz and the administrative assistant Ms. Soraia da Silva Silveira.

The responsible for applying the monitoring methodology and elaborating the MR is Sustainable Carbon – Projetos Ambientais Ltda.

- Thiago de Avila Othero - Technical Coordinator
- Marcelo Hector Sabbagh Haddad - Technical Coordinator
- Ms. Mariana Broso Fieri - Technical Coordinator
- Dênis Gonçalves dos Santos - Technical Analyst
- Larissa Tega da Fonseca - Technical Analyst
- Beatriz Dal Rovere - Technical Analyst
- Victor de Oliveira Moller: - Technical Analyst

Therefore, the verification team concludes that the monitoring plan and relevant procedures reflect a good and appropriate monitoring practice to the project according to interviews made during the on-site visit. The verification team confirms that the PP was able to implement the monitoring plan as per the requirements of the applied monitoring methodology, GS and CDM requirements.

4.7. Compliance with the calibration frequency requirements for measuring instruments

No monitoring equipment was used to determine any parameter.

4.8. Assessment of data and calculation of emission reductions

IBOPE confirms that appropriate methods and formula for calculating baseline emissions, project emissions and leakage have been followed, and the assumptions, emission factors and default values that are applied in the calculation have been justified.

During the on-site visit, the verification team checked the implemented process and the actual monitoring plan (monitored parameters, source of data, and frequency of measurements).

Through desk review the verification team confirms the implementation of the project activity and the monitoring plan is in accordance with the registered PDD and the MR.

4.9. Baseline Emissions

According to the registered PDD and the approved methodology, the formula used to calculate the baseline emissions is:

$$ER_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\ fossil\ fuel}$$

Where:

ER_y: Emission reductions during the year y in tCO₂e

B_y: Quantity of woody biomass that was substituted or displaced in tonnes

f_{NRB,y}: Fraction of woody biomass used in the absence of the project activity in year y that was established as non-renewable biomass using survey methods

NCV_{biomass}: Net calorific value of non-renewable woody biomass that was substituted, in TJ/ton

EF_{projected fossil fuel}: Emission factor for substitution of non-renewable woody biomass by similar consumers, in tCO₂e/TJ.

B_y was calculated according to option (a) of the selected methodology, as follows:

(a) **B_y** was calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of woody biomass per appliance (tonnes/year);

The consumption of woody biomass in the kilns was calculated as the amount of products (ceramic pieces) produced and the consumption of woody biomass per thousand of ceramic pieces fired in year y, as follows:

$$B_y = PR_y \times BF_y$$

Where:

PR_y: Amount of products produced in year y, in thousands of ceramic pieces

BF_y: Quantity of woody biomass per thousand of ceramic units fired in year y.

The quantity of woody biomass that was substituted (**B_y**) is calculated by multiplying the amount of products produced (**PR_y**) with the quantity of woody biomass fired (**BF_y**). The counting of the total production was monitored by employees on each ceramic. Data was aggregated on a monthly basis from manual control of devices burned in the kiln, measured by monthly reports. During the on-site visit and desk review the verification team checked the amount of products produced (**PR_y**) through records of manual control of devices burned in the kiln.

The value of (**BF_y**) was determined with the use of the historical records from the ceramics included in the project, by dividing monthly average consumption in the baseline by monthly average baseline production.

The values are inputted in an electronic spreadsheet by the ceramic responsible and Sustainable Carbon has access to the information and then applied to the baseline emission calculations. The verification team confirms the correctly application of the values on the MR Calculation spreadsheet.

The fraction of woody biomass used in the absence of the project activity ($f_{NRB,y}$) applied in the calculation was rechecked by the verification team. The values for $f_{NRB,y}$ were applied by the PP accordingly.

Leakage Emissions

Leakage is estimated at 0 (zero) tCO₂e during the current monitoring period.

The sources of leakage relevant to the present project activity are the competing use of biomass for biomass from existing forests and for biomass residues or waste, in which follows the general guidance on leakage in biomass project activities.

Through desk review the verification team accessed the Studies and all documents related to the studies of leakage emissions and verified that the analysis and the calculations were performed in a conservative manner.

The applied methodology does not include any source of project emissions, then the emission reductions for the project activity is equal to the baseline emissions.

Balsas Renewable Energy Project	December 2011	January to	January to	January to September 2014	Total monitoring period
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		December 2012	December 2013		
Baseline emissions (tCO ₂ e)	433	6,704	7,010	5,229	19,376
Project emissions (tCO ₂ e)	0	0	0	0	0
Emissions reductions for the project activity (tCO₂e)	433	6,704	7,010	5,229	19,376

The baseline calculations, leakage and emission reduction calculations are carried out electronically with a spreadsheet; therefore the calculations are transparent, traceable and of high quality.

4.10. Comparison with the estimated emission reduction in the registered PDD

The emission reductions declared during the 1st monitoring period is 19,376 tCO₂e for 34 months, compared with the estimated and stated in the registered GS PDD 16,116 tCO₂e, for 34 months, it was verified that value is 20,22% higher than the estimation.

This is explained due to the production increase in the ceramic company, which is justified by the market demand and economic scenario, as can be verified through articles and economic information.

Hence, based on these evidences and onsite interviews, the Verification Team deemed that the difference between the estimated and the verified amount of emission reductions are feasible and real.

5. VERIFICATION OPINION

IBOPE has performed the 1st periodic verification of the Balsas Renewable Energy Project in Brazil, which applies the methodology AMS.I-E version 05. The verification was performed based on GS and CDM requirements.

The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of Sustainable Carbon – Projetos Ambientais Ltda is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring Plan indicated in the registered GS PDD. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

IBOPE verified the Project Monitoring Report version 05 (from 19/06/2015) for the reporting period as indicated above. IBOPE confirms that the project is implemented as described in validated and registered GS PDD. Installed equipment being essential for generating emission reduction runs reliably. The monitoring system is in place and the project is generating GHG emission reductions

IBOPE can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, IBOPE confirms the following statement:

Reporting period: From 01/12/2011 - 30/09/2014 (days included)

Baseline emissions	:	19,376 tCO ₂ e
Project emissions	:	0 tCO ₂ e
Leakage emissions	:	0 tCO ₂ e
Emission Reductions	:	19,376 tCO ₂ e



19/02/2014
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Technical Reviewer

6. REFERENCES

Documents provided by Sustainable Carbon – Projetos Ambientais Ltda that relate directly to the GHG components of the project and documents related to the design and/or methodologies employed in the design and/or other reference documents.

Ref. Documents

1. GS PDD – V.12 – 21/01/2014
2. Validation Report – V.5 – Dated: 21/01/2014
3. 1st Period Monitoring Report – V.1 – 01/10/2014
4. 1st Period Monitoring Report – V.2 – 27/01/2015
5. 1st Period Monitoring Report – V.3 – 04/02/2015
6. 1st Period Monitoring Report – V.4 – 02/04/2015
7. 1st Period Monitoring Report – V.5 – 19/06/2015
8. GS MR Calculation Balsas_01 12 11_01 09 14_v01
9. GS MR Calculation Balsas_01 12 11_01 09 14_v02
10. GS MR Calculation Balsas_01 12 11_01 09 14_v03
11. GS MR Calculation Balsas_01 12 11_01 09 14_v04
12. GS MR Calculation Balsas_01 12 11_01 09 14_v05
13. Records of Manual control of devices burned in the kiln
14. Records of purchase invoices and delivery notes of renewable biomass
15. Monitoring spreadsheets - air quality
16. Monitoring spreadsheets – soil condition
17. The Gold Standard requirements, version 2.2
18. The Gold Standard Toolkit version 2.2
19. UNFCCC Approved Small Scale Methodologies - AMS-I.E: "Switch from non-renewable biomass for thermal applications by the user" – Version 05.
20. General guidance on leakage in biomass project activities (Attachment C of Appendix B)

21. VVS version 05.0

f_{NRB} Calculation

Extent of planted forests in the Cerrado biome's region in Brazil: Brazilian Association of
1 the Planted Forest Procuers (ABRAF). Annual statistics 2013 (year 2012)

<http://www.bibliotecaflorestal.ufv.br/handle/123456789/3910>

Extent of natural forests in the Cerrado biome: Brazilian Environmental Agency.
2 Vegetation area in 2010. Available at:

http://www.mma.gov.br/estruturas/sbf_chm_rbbio/arquivos/relatoriofinal_cerrado_2010_final_72_1.pdf

Annual growth rate of biomass in natural forests of Cerrado biome: Second National
3 Inventory of Greenhouse Gas Emissions. Document available at:

http://www.mct.gov.br/upd_blob/0215/215037.pdf

Annual growth rate of biomass in planted forests Brazilian Association of the Planted
4 Forest Procuers (ABRAF). Annual statistics 2013 (year 2012). Available at:

<http://www.bibliotecaflorestal.ufv.br/handle/123456789/3910>

Protected area forest extent Brazilian Forestry Service - Year 2014. Protected areas in
5 the Cerrado biome, data from the National System of Protected Areas (SNUC). Document
available at:

http://www.florestal.gov.br/snif/recursos-florestais/index.php?option=com_k2&view=item&layout=item&catid=14&id=161

Cerrado deforestation rate. The deforestation annual rate was calculated based on the
6 FAO Global Forest Resources Assessment 2010: Brazil. Table "Result of forest area
estimation data for 1990, 2000, 2005, and 2010", Pag 17. Available at:

<http://www.fao.org/docrep/013/al464E/al464E.pdf>

Deforestation rate in the Cerrado Biome was obtained from Brazilian Environmental
7 Agency. Available at:

http://www.mma.gov.br/estruturas/sbf_chm_rbbio/arquivos/relatoriofinal_cerrado_2010_final_72_1.pdf

Total above ground biomass in Cerrado biome - Year 2010. Brazilian Forestry Service -
8 Year 2010. Available at:

http://www.florestal.gov.br/snif/recursos-florestais/index.php?option=com_k2&view=item&layout=item&catid=14&id=218

7. CURRICULA VITAE OF VERIFICATION TEAM AND TECHNICAL REVIEWER

Rafael Kupper Bonizio Oliva

Environmental engineer and post-graduated in project management. Certification and Sustainability Coordinator at DOE IBOPE E-0057: responsible for overseeing the Certification Department; responsible for Accreditations at UNFCCC, VCS, GS and INMETRO. Lead auditor for CDM, VCS, GS, GHG verifier, and sustainability reporting audits. Mr. Oliva has more than 20 validations/verifications under the CDM, VCS and GS Standards. Mr. Oliva has also more than 20 climate change projects registered as project developer.

Fernando Alarcon Nogueira

Environmental engineer and post graduated in renewable energies, energy efficiency and distributed generation. Mr. Nogueira has developed studies and carbon footprint certification of goods and services, environmental risk analysis studies and elaboration of greenhouse gas emission inventories. Mr. Nogueira has also experience with elaboration of project design document of CDM projects. Mr. Nogueira is an auditor with experience in CDM and VCS projects.

8. VERIFICATION PROTOCOL

Table 1 The Gold Standard Toolkit 2.2, The Gold Standard Requirements 2.2 and related annexes

Checklist Question	Document Reference	Validation team comments	Draft Concl.	Final Concl.
General requirements				
1. Has the PP (or DOE, when applicable) uploaded the carbon and sustainability reports together with supporting documents into the Gold Standard Registry?	The Gold Standard Toolkit 2.2 – 4.5	The PP has uploaded the carbon and sustainability reports together with supporting documents into the Gold Standard Registry	Ok	Ok
2. If the project activity is a CDM or JI project, is the Gold Standard verification process conducted at the same time and period under the regular CDM and JI project cycle?	The Gold Standard Toolkit 2.2 – 4.6	Not applicable.	Ok	Ok
3. Has the DOE selected samples of the monitoring plan? If so, has the DOE justified the selected samples?	The Gold Standard Toolkit 2.2 – 4.6	Not Applicable.	Ok	Ok
4. Has the PP made changes since validation/last verification that impact on the claimed emission reductions?	The Gold Standard Toolkit 2.2 – 4.6	The PP has not made any changes that impact on the claimed emissions reductions.	Ok	Ok
5. Has the project activity suffered any changes that might impact the Gold Standard qualification of the project?	The Gold Standard Toolkit 2.2 – 4.6	The project activity has not suffered any changes that might impact the Gold Standard qualification of the project.	Ok	Ok
Site visit				
1. In case of a large scale project, has the DOE conducted a site visit?	The Gold Standard Toolkit 2.2 – 4.7	Not applicable.	Ok	Ok
2. In case of small scale project, has the DOE conducted a site visit?	The Gold Standard Toolkit 2.2 – 4.7	Yes. The site visit took place on 20/11/2014 to 21/11/2014.	Ok	Ok

2.1. If not, a site visit was required according to Gold Standard requirements?	The Gold Standard Toolkit 2.2 – 4.7	Not applicable.	Ok	Ok
2.1.1. If so, has the PP demonstrated with appropriate justification and requested less frequent visits?	The Gold Standard Toolkit 2.2 – 4.7	Not applicable.	Ok	Ok
2.1.1.1. If so, has the previous DOE provided a positive opinion and it was approved by Gold Standard?	The Gold Standard Toolkit 2.2 – 4.7	Not applicable.	Ok	Ok
Monitoring GHG reductions and Sustainable Development				
3. Has the PP included in the monitoring report:	The Gold Standard Toolkit 2.2 – 4.1			
3.1. A monitoring table from the PDD and Passport? (Gap analysis report when applicable)	The Gold Standard Toolkit 2.2 – 4.1	Yes. The PP included monitoring table from the PDD and Passport onf the GS MR	Ok	Ok
3.2. Data entry sheets of self-monitored parameters?	The Gold Standard Toolkit 2.2 – 4.1	Yes, data included in Section D of the GS MR. CAR 02, CAR 03 and CAR 04.	CAR 02 CAR 03 CAR 04	Ok
3.3. Remarks on the monitoring process used?	The Gold Standard Toolkit 2.2 – 4.1	Yes, remarks were included in Section D of the GS MR.	Ok	Ok
3.4. Current or expected status and future status of the parameters in the table? In addition, has the PP described how it/they is/are monitoring these parameters?	The Gold Standard Toolkit 2.2 – 4.1	Yes, information were included in Section D of the GS MR.	Ok	Ok
3.5. Other data sources to substantiate PPs' claims?	The Gold Standard Toolkit 2.2 – 4.1	Not applicable.	Ok	Ok
4. Has the PP monitored the sustainability impact of the project activity according to the sustainability monitoring report?	The Gold Standard Toolkit 2.2 – 2.4.3	Yes, it was monitored on Annex 01.	Ok	Ok

Forward Action Requests (FARs) raised by Gold Standard				
1. Has the Gold Standard raised any FAR in the previous desk review? If so, has the PP considered it/them in the current monitoring?		No, not applicable.	Ok	Ok
Forward Action Requests (FARs) raised by previous verification				
1. Has the previous DOE raised any FAR to be considered in the current monitoring? If so, has the PP considered it/them in the current monitoring?		Yes. There was a remaining issue from previous validation, 01 FAR from the Validation Report of TÜV Rheinland (China) Ltd, Report No. 01 997 9105075655-GS, Version 05, 2014-01-21. The PP considered it in the current monitoring. The issue was closed on this report.	Ok	Ok

Table 2 Resolution of Remaining issues from previous validation/verification

ITEM 1	FAR 1
REFERENCE	Validation Report of TÜV Rheinland (China) Ltd, Report No. 01 997 9105075655-GS, Version 05, 2014-01-21. Table 3: List of forward action requests (FARs)
FAR	Refer to ANNEX-AQ, Environmental issues, 'Soil Condition': PP should have in place the procedure to manage and dispose ashes during verification stage.
CONCLUSION	The PP had in place the procedure to manage and dispose ashes. This was checked during the desk review and assured during on site visit.

Table 3 Resolution of Corrective Action /Clarification / Forward Action Requests

ITEM 1	CAR 1.
REFERENCE	Section B.1 Implementation status of the project activity
ROUND	1 st
CAR/CL	The first paragraph states the following: "...and this present monitoring report is being verified by the Designated Operational Entity IBOPE Ambiental." Please correct the name of the Designated Operational Entity to IBOPE, <i>Instituto Brasileiro de Opinião Pública e Estatística Ltda.</i>
CLIENT ANSWER	The name of the verification team was changed to Instituto Brasileiro de Opinião Pública e Estatística Ltda.
REVISED SECTION	Section B.1
CONCLUSION	The name of the Designated Operational was corrected accordingly. CAR Closed.

ITEM 2	CAR 2.
REFERENCE	Parameter: PR _y
ROUND	1 st
CAR/CL	According to the site visit, the method to measure and control the PR _y for the Tunnel Kiln is calculated utilizing its temperature and the time spent in it. Please revise this parameter and explain the measurement correctly. Please consider to revise section B.2.Revision of the monitoring plan, if applicable.
CLIENT ANSWER	The measurements were done by counting the total amount of wagon that enters in the kiln. Each wagon has the same capacity of ceramic pieces, and the burning cycle depends on the temperature of kiln (the kiln temperature is inversely proportional to the burn time). All data of production were consolidated in an internal control sheet monitored by employees. This was explained in parameter Pry (Measured /Calculated /Default:) The section B.2 refers to the monitoring of the sustainability indicators, thus Pry does not affect this section.
REVISED SECTION	Section D.2 Pry
ROUND	2 nd
CAR/CL	As there was a change in the measurement of the Parameter PR _y when comparing with the PDD, please revise

	Section B.2 Revision of the monitoring plan,
CLIENT ANSWER	The monitoring plan was reviewed in order to explain the changes in the measurement of the parameter PRy
REVISED SECTION	Section B.2
CONCLUSION	OK, it was corrected accordingly. CAR Closed.

ITEM 3	CAR 3.
REFERENCE ROUND	Parameter: Specific fuel consumption 1 st
CAR/CL	According to this parameter, the “Measuring/ Reading/ Recording frequency” is monthly. However, the value presented was not on a monthly basis.
CLIENT ANSWER	The measuring is presented on a monthly basis. The amount of biomass acquired by the ceramic is registered daily, according to how many times that the truck travels to get the biomass. An evidence regarding the biomass registration was made available to Verification Team.
REVISED SECTION	-
ROUND	2 nd
CAR/CL	The parameter ‘Specific fuel consumption’ still not being presented on a monthly basis. Please correct it accordingly.
CLIENT ANSWER	The parameter Specific fuel consumption was corrected in order to present data in a monthly basis
REVISED SECTION	Section D.2 Specific fuel consumption.
CONCLUSION	OK, it was corrected accordingly. CAR Closed.

ITEM 4	CAR 4.
REFERENCE ROUND	Parameter: Leakage due to competing uses of biomass E.3. Leakage calculation; Rice Husk 1 st
CAR/CL	According to the GS MR and GS PD, the parameter ‘Leakage due to competing uses of biomass’ shall be monitored. However, the last data for the Rice Husk is dated from harvesting 2010/2011. Please consider to utilize the most possible recent data available.

CLIENT ANSWER	According to GS PD the Leakage due to competing uses of biomass is considered using the general guidance on leakage in biomass project activities (attachment C of Appendix B) which is available at http://cdm.unfccc.int/methodologies/SSCmethodologies/AppB_SSC_AttachmentC.pdf and states that 'The project participant shall evaluate ex ante if there is a surplus of the biomass in the region of the project activity, which is not utilized.' The evaluation Ex ante was made at VCS PD using data from 2010 e 2011, therefore there is no need to update the values presented in Section E.3 Leakage Calculation.
REVISED SECTION	-
ROUND	2 nd
CAR/CL	The 'Measuring/ Reading/ Recording frequency' of the parameter 'Leakage due to competing uses of biomass' is described as 'Annually'. However, only one value of this parameter was presented. Please correct it accordingly.
CLIENT ANSWER	The parameter Leakage due to competing uses of biomass was corrected in order to present data from all the years monitored.
REVISED SECTION	Section D2 Leakage due to competing uses of biomass.
CONCLUSION	OK, it was corrected accordingly. CAR Closed.

ITEM 5	CAR 5.
REFERENCE	Parameter PR _y
ROUND	1 st
CAR/CL	In the PR _y monitoring sheets, several times it contains production notes stating "Kiln warm". According to on site interviews, there is no production during these events. Thus, it shall not be accounted as PR _y Please revise the PR _y accordingly.
CLIENT ANSWER	The person responsible for monitoring the production does not take into account the information regarding the kiln warming, thus the value of PR _y is correct
REVISED SECTION	-
CONCLUSION	Ok. The Car was clarified accordingly. CAR closed.

ITEM 6	CAR 6.
REFERENCE	Section A.3.Location of the project activity:
ROUND	1 st

CAR/CL	The first paragraph states "The ceramics are located in Brazil, in the state of Ceará in the northeast region of the country." According to GS PD and site visit, this information is not corrected. Please correct it.
CLIENT ANSWER	The first paragraph was corrected, the ceramic is located in Maranhão.
REVISED SECTION	Section A.3
CONCLUSION	It was correct accordingly. CAR closed.