

VERIFICATION REPORT

GOMES DE MATTOS CERAMIC FUEL SWITCHING PROJECT



Document Prepared By TÜV NORD CERT GmbH

Project Title	Gomes de Mattos Ceramic Fuel Switching Project
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Report Title	Verification Report – Gomes de Mattos Ceramic Fuel Switching Project
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Summary:

Sustainable Carbon – Projetos Ambientais Ltda. has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the project “Gomes de Mattos Ceramic Fuel Switching Project” with regard to the requirements of VCS Version 3.

The project activity involves fuel switching from native firewood from caatinga biome to wood from of sustainable forest management plan, algaroba wood and cashew tree wood. Thus, GHG emission reduction is achieved.

The project applies the CDM approved methodology AMS-I.E – Switch from Non-Renewable Biomass for Thermal Applications by the User – version 01.

In the course of the VCS Verification, 02 Correction Action Requests (CAR) and 01 Clarification Request (CL) were raised and successfully closed.

The VCS Verification was based on the draft monitoring report^{/MR/}, emission reduction calculation spreadsheet^{/XLS/}, the monitoring plan as set out in the validated PD^{/VCS-PD/} and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

Verification Period: from 2014-03-01 to 2016-04-30 (including both days)

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document;
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., AMS-I.E – version 01;
- the installed equipment essential for measuring parameters required for calculating emission reductions are properly maintained;
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

In addition, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **126,312 t CO₂e**

Abbreviations

BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CGM	Ceramic Gomes de Mattos
CO₂	Carbon dioxide
CO₂e	Carbon dioxide equivalent
CL	Clarification Request
DOF	Document of Forest Origin
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
MP	Monitoring Plan
MR	Monitoring Report
N/A	Not applicable
PA	Project Activity
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
SEMACE	Department of the Environment of the State of Ceará
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCS-PD	VCS – Project Description
VCU	Verified Carbon Unit
XLS	Emission Reduction Calculation Spread Sheet

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1 INTRODUCTION

Sustainable Carbon – Projetos Ambientais Ltda. has commissioned the TÜV NORD JI / CDM Certification Program to carry out the Verification of the project:

“Gomes de Mattos Ceramic Fuel Switching Project”

with regard to the relevant requirements of the Verified Carbon Standard Version 3^{/VCS/}. The verifier has reviewed the implementation of the monitoring plan in the VCS project for the monitoring period 2014-03-01 to 2016-04-30 (including both days).

The applied monitoring methodology is AMS-I.E – Switch from Non-Renewable Biomass for Thermal Applications by the User – version 01.

1.1 Objective

The purpose of this verification, by independent checking of objective evidence, is as follows:

- to verify that the project is implemented as described in the project design document;
- to assess the implementation of the monitoring plan content in the VCS-PD;
- to assess the project's compliance with other relevant rules, including the host country (Brazil) legislation;
- to confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions (VERs / VCUs) or ERs without any double counting; and
- to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification of this project is based on the validated project design document^{/VCS-PD/}, the monitoring report^{/MR/}, emission reduction calculation spread sheet^{/XLS/}, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore, publicly available information was considered as far as available and required.

The TÜV NORD JI/CDM CP has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

1.3 Level of Assurance

The verification has been planned and organized to achieve a

- ☒ reasonable level of assurance
- ☐ limited level of assurance

1.4 Summary Description of the Project

Located in Crato, state of Ceará – Brazil, the project comprises Gomes de Mattos Ceramic, which produces ceramic tiles and bricks. The project activity involves fuel switching from native firewood from caatinga biome to wood from of sustainable forest management plan, algaroba wood and cashew tree wood. Thus, GHG emission reduction is achieved.

Since before the project, Gomes de Mattos Ceramic has been using two *Hoffman* kilns and one *Câmara* kiln to produce ceramic devices for the local market. The fuel employed in the firing process

before the replacement of the biomass was fossil fuel, mainly heavy oil. Due to the reduction of fossil fuel availability and the increase of prices, the fuel was gradually substituted by native wood.

The project is listed at VCS and can be accessed by the following link:

http://vcsprojectdatabase.org/#/project_details/64

1.4.1 Project Characteristics

Essential data of the project is presented in the following tables:

Table 1.4.1: Project Characteristics

Item	Data
Project title	Gomes de Mattos Ceramic Fuel Switching Project
Project proponents	Cerâmica Gomes de Mattos Ltda - ME Sustainable Carbon – Projetos Ambientais Ltda.
Any specific project categories	☐ Large project (> 300,000 t CO ₂ e / y) ☒ Project (≤ 300,000 t CO ₂ e / y) ☐ AFOLU project ☐ Grouped project ☐ No specific project category
Applied Methodology	AMS-I.E – Switch from Non-Renewable Biomass for Thermal Applications by the User – version 01
Project starting date	2006-04-01
Crediting period	From 2006-05-01 to 2016-04-30 (including both days)
Type of crediting period	10 years – Renewable

1.4.2 Project Location

The details of the project location are given in Table 1.4.2:

Table 1.4.2: Project Location

No.	Project Location
Host Country	Brazil
Region	State of Ceará
Project location address	City of Crato
Latitude	7°10'36.50" S
Longitude	39°24'49.23" W

1.4.3 Technical Project Description

The key parameters of the project are given in Table 1.4.3:

Table 1.4.3: Technical data of the project activity

Parameter	Unit	Value
Kilns	-	03
Types	-	<i>Hoffman – 02</i> <i>Câmara – 01</i>

2 VERIFICATION PROCESS

At the time of this verification, the validation/verification body has also undertaken the SOCIALCARBON Standard verification – Point 5.

2.1 Method and Criteria

The verification of the project consisted of the following steps:

- contract review;
- appointment of team members and technical reviewers;
- desk review of the Monitoring Report^{MR/} submitted by the client and additional supporting documents;
- verification planning;
- on-site assessment;
- background investigation and follow-up interviews with personnel of the project developer and its contractors;
- draft verification reporting;
- resolution of corrective actions (if any);
- final verification reporting;
- technical review;
- final approval of the verification.

Verification is based on the criteria laid down by VCS.

The sequence of the verification is given in the table 2.1 below:

Table 2.1: Validation/Verification sequence

Topic	Date
Assignment of verification	2016-07-08
On-site visit	2016-08-02
Draft reporting finalized	2016-08-05
Final reporting finalized	2016-11-17

2.1.1 Appointment of team members and technical reviewer

Based on a competence analysis and individual availabilities, a verification team was appointed. Furthermore, also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 2.2 below.

Table 2.2: Involved Personnel

	Name	Company	Function ¹⁾	Qualification Status ²⁾	Scheme Competence ³⁾	Technical Competence ⁴⁾	Verification Competence ⁵⁾	Host country Competence	On-site visit
☒ Mr. ☐ Ms.	Sergio Cruz	BRTÜV	TL ^{A)}	SA	☒	1.2	☒	☒	☒
☒ Mr. ☐ Ms.	Marcelo Sebben	BRTÜV	TR ^{A)}	LA	☒	1.2	☒	☒	-
☒ Mr. ☐ Ms.	R. Winter	TÜV NORD, Germany	FA ^{B)}	SA	☒	1.2	☒	☐	-

¹⁾ TL: Team Leader; TM: Team Member^{A)}, TR: Technical review^{B)}; OT: Observer-Team^{B)}, OR: Observer-TR^{B)}; FA: Final approval^{B)}

^{A)} Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

^{B)} No team member: OT, TR, OR, FA

²⁾ GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

³⁾ GHG auditor status (at least Assessor)

⁴⁾ Technical Area / TR Subcategory as per S01-VA000-F02 or S01-VA070-F01 (such as 1.1, 1.2, ...)

⁵⁾ In case of verification projects

2.2 Document Review

The VCS-PD^{VCS-PD/} and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The references used in the course of this verification are summarized in Appendix I.

2.3 Interviews

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS.

Before and during the on-site visit, verification team performed interviews with the representative of project proponent to confirm selected information and to solve issues identified in the document review.

Representatives of Cerâmica Gomes de Mattos Ltda - ME and Sustainable Carbon – Projetos Ambientais Ltda., including the operational staff of the plant, have been interviewed. Details of the interviewed persons are included in Table 4 of Appendix I of this Report. The main topics of the interviews are summarized in Table 2.3.

Table 2.3: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project Owner & Operations Personnel Consultant	• General aspects of the project • Technical equipment and operation • Changes since implementation • Monitoring and measurement equipment • Calibration procedures • Remaining issues from validation • Quality management system • Involved personnel and responsibilities • Training and practice of the operational personnel • Implementation of the monitoring plan • Monitoring data management • Data uncertainty and residual risks • GHG calculation • Procedural aspects of the verification • Maintenance • Environmental aspects • Editorial issues of the Monitoring Report

2.4 Site Inspections

As most essential part of the verification exercise, it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore, the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include, but are not limited to:

- the on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- the operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- the monitoring processes, routines and documentations were audited to check their proper application.
- the monitoring data were checked completely.
- the data aggregation trails were checked via spot sample down to the level of the meter recordings.

Mr. Sergio Cruz, a CDM Senior Assessor and having technical expertise for scope 1, attended the site visit.

2.5 Resolution of Findings

Material discrepancies identified in the course of the verification are addressed either as CARs, CLs or FARs.

A **Corrective Action Request (CAR)** is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence on the project results,
- the requirements deemed relevant for verification of the project with certain characteristics have not been met, or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the next verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in Section 4 of this report.

2.5.1 Forward Action Requests

No FAR has been raised.

2.6 Eligibility for Validation Activities

TÜV NORD CERT GmbH holds accreditation for validation for the relevant sectoral scopes.

3 VALIDATION FINDINGS

No validation activities took place during the verification.

3.1 Participation under Other GHG Programs

The project activity is not part of any other GHG program.

3.2 Methodology Deviations

The project activity complies with the applied methodology AMS-I.E – Switch from Non-Renewable Biomass for Thermal Applications by the User – version 01.

No deviations have been observed.

3.3 Project Description Deviations

During the verification, a site visit was carried out. Based on this site visit and the reviewed project documentation, it can be confirmed that w.r.t. the realized technology, the project equipment, as well as the monitoring equipment, the project has been implemented and operated as described in the registered VCS-PD, with the corrections already implemented at the last monitoring period and accepted by VCS. They are:

- a. the registered VCS-PD sets that the project proponent (meaning the ceramic owner) would measure the amount of renewable biomasses used (parameter $Q_{\text{renbiomass}}$). However, the parameter is monitored through the receipts and invoices of biomass received by the ceramic company. This means that the amount of renewable biomass is measured by the supplier and controlled by the ceramic owner by the receipts and invoices. This approach considers that it is the responsibility of the provider to measure the amount of biomass, since this information

needs to be available in the sale invoice or receipt. As this information is used for commercial purposes, it is considered that data from the suppliers are a reliable source for this parameter.

- b. it was identified a mistake in the NCV value of native firewood validated in the in the VCS-PD. The equation used to calculate the NCV value was corrected according to the content of hydrogen. Therefore, the NCV value for native firewood with no forest management plan, as well as the NCV of native wood from forest management plan, were updated.
- c. the registered VCS-PD did not consider the conversion factor from stereo meter (m³ stereo) to cubic meter (m³) for the amount of renewable biomass that arrives in volume units (parameter $Q_{\text{renbiomass}}$). Therefore, the values presented in the table $Q_{\text{renbiomass}}$ were corrected in accordance to the conversion factors presented in the section 3.2 of the Monitoring Report – Table $Q_{\text{renbiomass}}$.

3.4 Grouped Project

Not applicable as the proposed project activity is not part of grouped projects.

4 VERIFICATION FINDINGS

In this section, the assessments and findings from the desk review of the VCS-PD, site visit, interviews and supporting documents as well as the final assessments are summarized. Table 4-1 includes an overview of all raised CARs, CLs and FARs.

Table 4-1: Overview of CARs, CLs and FARs issued

No.	Topic / Chapter	CAR	CL	FAR
4.1	Project Implementation Status	0	1	0
4.2	Accuracy of GHG Emission Reduction and Removal Calculations	2	0	0
4.3	Quality of Evidence to Determine GHG Emission Reductions and Removals	0	0	0
4.4	Non-Permanence Risk Analysis	0	0	0
SUM		2	1	0

4.1 Project Implementation Status

4.1.1 Implementation status of the project activity

Description

The project started the fuel switch on April/2003, which was completely achieved by April/2006.

Project activity was operational during the current monitoring period. Monitoring records were checked.

The project activity works with three kilns (two *Hoffmann* and one *Câmara*).

As per the on-site assessment, observations, interviews and collected evidences, it was possible to assess that the project activity has been implemented as described in the Project Design^{VCS-PD/} with the changes already accepted by VCS at the last verification and that are described above at Section 3.3 of this report.

The crediting period is from 2006-05-01 to 2016-04-30 (both days included) and renewable for two more periods of 10 years.

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed

Finding	1
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	At Section 2.2.2, not all deviations to the Project Description have been listed.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details. In case the MR is changed as part of the CA.</i>	The deviations were listed at the section 2.2.2, Project Description Deviations.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	All deviations already approved are now listed at Section 2.2.2 of the MR. <u>CL is closed</u>
Conclusion <i>Tick the appropriate checkbox</i>	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Final Assessment

The project is found to be implemented as described in validated PD^{VCS-PD/}.

- ☒ The implementation status of the project activity is in accordance with the registered VCS- PD.

4.1.2 Completeness of monitoring

Description

- The monitoring and reporting procedures reflect the requirements of the monitoring plan of the validated PD^{VCS-PD/} with the changes already accepted at the last monitoring period (refer to details at Section 3.3 above). The monitoring parameters are recorded as per the monitoring plan and methodology^{AMS/}.
- All parameters and their sources were verified during on-site visit.
- For the monitoring purpose, the monitoring equipment were verified.
- Data extracted from the reports were crosschecked against available evidences included in the emission reductions calculation spreadsheet.
- The submitted monitoring report^{MR/} which forms the basis of the verification was observed to be prepared by summarizing consolidated data over the whole monitoring period in accordance with the monitoring plan.
- All necessary monitoring devices are found to be in place. The devices are well known by personnel and according to the registered monitoring plan.
- The reporting procedures reflect the requirements of the monitoring report.
- Archiving is found to be appropriate during the whole monitoring period.
- The personnel involved have been found to be trained and demonstrated good skills in the operation and maintenance of the ceramic.

- The verification team has verified all records provided. They are recorded and maintained in line with monitoring plan of the validated PD^{/VCS-PD/} and the applied methodology. Thus, the DOE confirms the completeness of the monitoring in the key areas.
- During the verification site visit it was identified that the operational structure is implemented as stated in the monitoring plan of the registered PD^{/VCS-PD/} and the monitoring report^{/MR/}.
- Competent staff is employed to ensure the data quality.
- An operational structure is established with responsibilities identified.
- Data collection, measurement, recording and archiving was found to be carried out as per the monitoring plan as described in the validated PD^{/VCS-PD/}.
- The management and operational system is appropriate and operational.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed

Final Assessment

The monitoring and reporting procedures of the project activity reflect the requirements of the monitoring plan of the validated Project Design^{/VCS-PD/}.

- ☒ The final monitoring report^{/MR/} which forms the basis of the verification was observed to be in accordance with the monitoring plan and the VCS rules^{/VCS/}.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

Description

- The approved CDM methodology AMS-I.E – Switch from Non-Renewable Biomass for Thermal Applications by the User – version 01 is applied to the project activity. GHG emission reduction is calculated as baseline emissions.
- No project emissions are considered by the applied methodology.
- No leakage is considered for this kind of project as all three possible sources of leakage are demonstrated at the MR as:
 - o the amount of fire wood from management areas necessary to provide thermal energy for the project activity represents a non-representative quantity of this kind of biomass, which avoids the possibility of leakage;
 - o the project is expected to decrease the use of non-renewable biomass by similar users, especially due to the incentive of carbon credits;
 - o there is no transference of equipment.
- All formulas used in the calculations of emission reductions are in accordance to the approved methodology AMS-I.E^{/AMS/} and monitoring plan of the validated PD^{/VCS-PD/}.
- All records provided were found to be of adequate quality. The verification team has crosschecked the resulted value of units supplied by the project activity with the sources and it is found to be correct.
- The set of calculations for the actual emission reduction of the current verification period are transparently computed and presented in the spreadsheet of ER calculation^{/XLS/}.

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed

Finding	2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	At Section 3.2 – parameter $Q_{renbiomass}$, the quantities of native wood from forest management plan, sawdust and algaroba wood are not in accordance with presented evidences for the year of 2014.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details. In case the MR is changed as part of the CA.</i>	At section 3.2 the quantities of native wood from forest management plan, sawdust and algaroba wood was updated in order to present the corrected values.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The quantities of native wood from forest management plan, sawdust and algaroba wood were revised and they are now in accordance with presented evidences. CAR is closed		
Conclusion <i>Tick the appropriate checkbox</i>	☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Finding	3		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	At Section 3.2 – parameter PR_y , the amount of ceramic devices is not in accordance with presented evidences for the days 03, 16 and 20 of October/2015.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details. In case the MR is changed as part of the CA.</i>	At section 3.2, the amount of ceramic devices was updated in order to present the corrected values.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The amount of ceramic devices was revised and it is now in accordance with presented evidences. CAR is closed		
Conclusion <i>Tick the appropriate checkbox</i>	☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Final Assessment

The emission reduction spreadsheet is transparent and clearly referenced. The excel sheets were rigorously crosschecked with the archived monitored data and no discrepancies were found. All the formulae have been found to be correctly applied in the emission reduction calculations.

- ☒ The ER calculations are correct and accurate.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

Description

- Several documents were submitted by the project proponent as evidences to determine emission reductions.
- All records, sources, data and information provided were also found valid in the current verification period. These documents were verified through site visit, interviews and found to be authentic.
- When possible, records were checked directly from its source in order to cross check the information.
- Furthermore, competent employees are recruited, who are found knowledgeable about not only the ceramic operations but also ensuring the quality of the data, recording and maintaining.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed

Final Assessment

Documents used as evidences for input values of ER calculation were assessed and found to be reliable and authentic. The verification team concludes that the evidence and the data are of at acceptable level of quality.

- ☒ The verification team finds the quality to be of adequate level to assure confidence in the accurate quantification of the emission reductions.

4.4 Non-Permanence Risk Analysis

Not applicable.

5 VERIFICATION CONCLUSION

Sustainable Carbon – Projetos Ambientais Ltda. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the periodic verification of the project “Gomes de Mattos Ceramic Fuel Switching Project”, with regard to the relevant requirements of VCS Version 3.

The project activity involves fuel switching from native firewood from caatinga biome to wood from of sustainable forest management plan, algaroba wood and cashew tree wood. Thus, GHG emission reduction is achieved.

The verification is based on the draft monitoring report^{/MR/}, emission reduction calculation spreadsheet^{/XLS/}, the monitoring plan as set out in the validated PD^{/VCS-PD/} with changes accepted at the last verification^{/VER/} and supporting documents made available to the TÜV NORD JI/CDM CP by the project participants.

In detail, the conclusions can be summarized as follows:

- all operations of the project are implemented and installed as planned and described in the validated project description and project activity confirms with the verification criteria for project and their GHG emission reductions or removals set out in the VCS rules;
- the monitoring plan is in accordance with the applied approved methodology, i.e. AMS-I.E – version 01;
- the installed equipment essential for monitoring parameters required for calculating emission reductions are appropriate;
- the monitoring system is in place and functional. The project has generated verifiable GHG emission reductions.

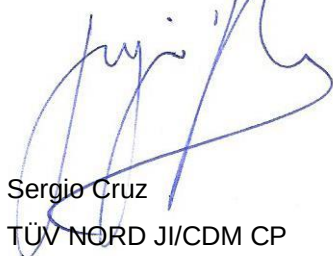
As the result of the verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions as presented below.

Verification period: from 2014-03-01 to 2016-04-30 (including both days).

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2014	47,067	0	0	47,067
2015	58,614	0	0	58,614
2016	20,631	0	0	20,631
Total	126,312	0	0	126,312

São Paulo, 2016-11-17

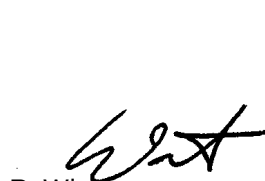


Sergio Cruz

TÜV NORD JI/CDM CP

Verification Team Leader

Essen, 2016-11-17



R. Winter

TÜV NORD JI/CDM CP

Final Approver

APPENDIX I: REFERENCES

Table 1: Documents provided by the project proponent

Reference	Document
/BIO/	<u>Biomass:</u> - Monthly Reports of Biomass - Records of purchase of sawdust, algarroba wood and residues from cashew trees - DOFs of native wood from forest management plan
/LIC/	- Operation License # 291/2013 – factory operation – SEMACE – 2013-06-26 – valid until 2017-06-17 - Operation License # 933/2012 – extraction of clay – SEMACE – 2012-09-19 – valid until 2016-09-18 - Operation License # 849/2013 – extraction of clay – SEMACE – 2013-12-20 – valid until 2017-12-19 - Authorization to exploit the management plan # 166/2015 – SEMACE – 2015-08-24 – valid until 2016-08-23 - Authorization to exploit the management plan # 19/2016 – SEMACE – 2016-05-27 – valid until 2017-05-27 - Municipal license # 24464/2016 – City Hall of Crato – 2016-04-19 – valid until 2016-12-31
/MR/	Monitoring Report “Gomes de Mattos Ceramic Fuel Switching Project” - version 01 – 2016-06-15 - version 02 – 2016-10-14
/PROD/	Report of daily production by type of ceramic devices
/VER/	Documents of previous verifications (Monitoring report, verification report, ER calculation sheet)
/XLS/	- Emission reduction calculation spread sheet - Annual monitoring spread sheets

Table 2: Background investigation and assessment documents

Reference	Document
/AMS/	AMS-I.E – Switch from Non-Renewable Biomass for Thermal Applications by the User – version 01

Reference	Document
/ICPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/IPCC/	1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/ISO 14064-1:2006/	Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals
/ISO 14064-2:2006/	Greenhouse gases – Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements.
/ISO 14064-3:2006/	Greenhouse gases - Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions
/ISO 14065:2007/	Greenhouse gases - Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition
/KPI/	Kyoto Protocol (1997)
/VAL/	Validation Report “Gomes de Mattos Ceramic Fuel Switching Project” – TÜV Nord – 2009-05-27
/VCS-PDI/	Project Description “Gomes de Mattos Ceramic Fuel Switching Project” – version 05 – 2009-05-27
/VER/	Documents of previous verifications (Monitoring report, verification report, ER calculation sheet)
VCS	Verified Carbon Standard Version 3.5

Table 3: **Websites used**

Reference	Link	Organization
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/unfccc/	http://cdm.unfccc.int	UNFCCC
/vcs/	http://v-c-s.org/	Verified Carbon Standard

Table 4: List of interviewed persons

Reference	Mol ¹		Name	Organization / Function
/IM01/	V	☒ Mr. ☐ Ms.	Stephenson Ramalho	CGM / Forest Engineer
/IM01/	V	☒ Mr. ☐ Ms.	Bruno de Almeida	CGM / Labor Health and Security Technician
/IM01/	V	☒ Mr. ☐ Ms.	Manoel J. da Silva	CGM / Forest Engineer
/IM02/	V	☒ Mr. ☐ Ms.	Dênis Gonçalves	Sustainable Carbon / Technical Analyst

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)