



Voluntary Carbon Standard Version 2007.1 Verification Report

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Verification Report:

Name of Verification company:	Date of the issue:
TÜV NORD CERT GmbH	March 02 nd , 2009
Report Title:	Approved by:
Final Verification Report CENOL AND TELHA FORTE CERAMICS	Mr. Eric Krupp
Client:	Project Title:
Carbono Social Serviços Ambientais Ltda.	"CENOL AND TELHA FORTE CERAMICS SWITCHING FUEL PROJECT"

Summary:

Carbono Social Serviços Ambientais Ltda. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1st periodic verification of the project: "CENOL AND TELHA FORTE CERAMICS SWITCHING FUEL PROJECT", with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to switching non-renewable to renewable biomass fuel for end-user thermal energy generation. This verification covers the period from 2007-11-01 to 2008-09-30 (including both days).

In the course of the verification 2 Corrective Action Requests (CAR) and 2 Clarification Request (CR) were raised and successfully closed. Furthermore 0 FARs are raised to improve the monitoring system in the future. The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the VCS PD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

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, AMS-IE: Switch from non-renewable biomass for thermal applications by the user - Version 01, February 1st 2008 onwards
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 1st periodic 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 in the above mentioned reporting period as follows:

Emission reductions:	CO ₂ [t CO ₂]	CH ₄ [t CH ₄]	N ₂ O [t N ₂ O]	HFCs [t HFC]	PFCs [t PFC]	SF ₆ [t SF ₆]	Sum [t CO ₂ e]
2007	8,923	-	-	-	-	-	8,923
2008	38,585	-	-	-	-	-	38,585
TOTAL:							47,508

Work carried out by:	Number of pages:
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1 Introduction

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 confirm that the monitoring system is implemented and fully functional to generate voluntary carbon units (VCUs) 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 VCS project is based on the VCS project description^{/VCS PD/}, the monitoring report^{/MR/}, 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 VCS project Description

Located in São Miguel do Guamá, Pará state, this grouped project comprises two enterprises, *Cenol* and *Telha Forte* ceramics, which produce structural ceramic devices like bricks. The project activity involves fuel switching from native firewood to *açaí* pits and sawdust originated from sustainable managed firewood areas used to feed the ceramic kilns; thus GHG emission reduction is achieved.

Before the switching of the fuel, the *ceramics* consumed 44,400 tones of native firewood per year producing 44,400,000 ceramics devices per year in its 8 "Paulistinha" kilns and fifteen "Round" kilns. The kilns reach a temperature of 900 °C for burning cycles of 60 hours^{/XCS1//IM01/}.

The total replacement occurred in October 2007, and now, to produce the same level of ceramics devices, *both* Ceramics are consuming 4,500 tonnes of *açaí* pits and 21,500 tonnes of sawdust per month.

The GHG emission reduction for the considered crediting period is 47,508 tCO₂e^{/XCS3/}.

1.4 Level of assurance

The verification report is based on VCS PD, monitoring report, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. The verification opinion is assured provided the credibility of all above.

2 Methodology

The verification of the project was carried out from November 2008 to February 2009.

Preparations: 2007/11/02 to 2007/11/04

On-site validation: 2007/11/06 and 2007/11/07

(Draft) Reporting: 2008/11/10

(Final) Reporting: 2009/03/01

The verification consisted of the following steps:

- A desk review of the VCS PD^{/VCS PD/} and supporting documents with the use of the relevant sections of a customised protocol according to the VCS 2007.1;
- A desk review of the Monitoring Report^{/MR/} and additional supporting documents which the client submitted. The relevant sections of the above-mentioned customised protocol according to the VCS 2007.1 were used.
- Verification audit planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer,
- Verification reporting (Draft Verification Report and Final Verification Report).

The criteria of this verification include the relevant rules and steps as set out in the VCS.

3 Verification Findings

3.1 Remaining issues, including any material discrepancy, from previous validation

There are no pending issues raised during the validation process. This is the first period of verification, thus there is any pending issued from previous verification.

3.2 Project Implementation

The project consists of the fuel switching in the ceramic facility, with the substitution of unsustainable native firewood to sawdust and acai pits. For the project implementation the ceramic owner had to deal with different kind of difficulties and barriers, such as:

- Technological
 - Kilns adjustment – As the kilns are now fed with mechanical burners, adjustments in the kilns entrances were necessary to the correct fit of the machinery. Without the adjustments a significant lost of thermal energy would occur. The adjustments could be evidenced during the On-site visit as well as invoices and sales receipts^{/FAE/}.
 - Use of the new mechanical burners – The ceramic had to learn how to manage the new machinery to get the most efficient activity. It could be

evidenced during the On-site visit that the ceramist experiences some difficulties with the equipments as maintenance and bad working when applying bigger pieces of renewable biomass. Moreover it was necessary to train the staff responsible for the kiln feeding^{/IM01//ECT/}.

- Use of the new fuel – During the fuel switching the ceramic facility had to deal with the difficulty of establishing the total amount of new fuel necessary to get the proper kiln temperature. Due to this reason the ceramic pieces get cracked or altered its final colour. It was evidenced that the ceramic production decays significantly during the initial fuel switching period^{/IM01/}.
- Storage of the renewable biomass – It was evidenced during on-site visit that the use of the new fuel had to be done with the proper humidity and therefore a new storage logistic was necessary^{/FAE/}. The renewable biomass has to be left drying for a certain period before it could be used in the process. The açai pits produces a lot ash and the kiln must be clear.
- Financial (variable costs)
 - Renewable biomass purchase – As it is clear indicated in the VCS PD and the financial spreadsheet that the variable cost with the renewable biomass is higher when compared with native firewood. The new fuel implicates in higher costs due to its transportation, storage and trucks maintenance. The native firewood price was evidenced during the On-site visit according to experience data of the ceramic owner^{/IM01/}. The transportation costs are higher when using the new fuel due to the fact that when using firewood lumberjacks used to deliver the fuel practicing lower prices, as evidenced during on-site visit^{/IM01/}. All values used for the calculations could be evidenced and properly assessed^{/FAE/}. It is considered for the calculation: bought of pieces for the trucks maintenance used in the transportation, trucks maintenance services and bought of the fuel utilized by the trucks during the transportations. Please refer to the financial spreadsheet.
 - Electrical consumptions cost due to the new mechanical burners – before the project activity the costs with electricity consumption was smaller compared with the baseline scenario. It was evidenced through electricity consumption receipts^{/ECR/}.

The financial barrier due to variable costs has been validated and found to be significant for the additionality of the small-scale project activity.

Another barrier has been addressed that might be faced in the future:

- Increase in the renewable biomass price due the upcoming demand – As the use of renewable biomasses in the ceramic sector is an innovation the future demand of these fuels is difficult to foresee. Although there is currently a great amount of these biomasses available, there is a possibility that the prices will increase. Also the price does not affect the project participant so far as the biomass is a donation; this may change in the future.

During the verification a site visit was carried out. On the basis of this site visit and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipments, as well as the monitoring and metering equipment, the project has been implemented and operated as described in the VCS PD and is inline with the VCS 2007.1 Standard.

3.3 Completeness of Monitoring

Cenol and Telha Forte Ceramics will be responsible for monitoring the pertinent parameters as described in VCS PD. The roles and responsibilities are clearly defined. Mr. Francisco Valdir, ceramics' owner, he is responsible for monitoring the pertinent data for the project activity. The monitored parameter could be evidenced as follows:

- Amount of renewable biomass employed (tonnes) - measured by the project developer, monthly. The parameter was monitored through the weight indicated in the donation receipts of the renewable biomasses providers. These values were crosschecked with internal records on biomass they received. The specific gravity of each renewable biomass was used for unit conversion^{/WEB1/}.
- Fraction of native wood used in the absence of the project activity has been identified by 92.3%. The source could be verified with to be reliable^{/WEB2/}. The value was monitored to this specific crediting period.
- Production of ceramic devices (units per month) - controlled by the project developer, monthly – The ceramic maintain an internal spreadsheet for the production controlling that is fed daily. The QAQC procedure consists of a rigorous register of the daily production. The ceramic must have an internal control of the production for the internal financial balance^{/IM01/}.
- Renewable origin of the biomass - controlled by the project developer, annually. The project participant only buys renewable biomass from the list of its reliable supplier. Depending on the renewable biomass type different criteria was applied as state in section 3.1 of the validation report. The sustainability of the sawdust has been proved by the operating licence of the sawmill offering the biomass. The licence will only be provided by Brazilian government when a sustainable management of the resources can be justified^{/WEB3/}. The açai pits could be assumed as sustainable because it is an industrial waste of the açai production. As the açai cultivation is necessary to maintain its production, the validation team assumed that the carbon stock was kept unaltered in the cultivation area.
- Renewable biomass surplus – In order to estimate the leakage emission of the renewable biomass the project participant monitor the renewable biomass surplus in the specific region of the project activity, yearly. The measurement was based on national and internal sources. During this verification period, leakage could not be identified so far. According to the general guidance on leakage EB 28 a possible source of leakage is the competing use of biomass. This is the case when the project uses more than 25% of the biomass available in the region. With proper references the PP could show, that there is more than 75% of each biomass available on the market not used for the project activity^{/MR/}.
- Leakage of non-renewable biomass – All three sources of leakage predicted in the applied methodology was monitored, annually. It was provided information regarding the non-renewable biomass availability in the specific project region by official statistic data and national surveys.

The monitoring equipments are perfectly equilibrated based on the INMETRO Standard (Brazilian institute for metrology and calibration). An internal audit will be performed twice a year to ensure that the monitoring plan is being followed according the proposed in the VCS PD.

Nevertheless, 2CARs and 2 CRs have been opened and were successfully closed:

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR 1 Please correct all parameters monitored and fixed according to the newest version of the VCS PD.	Section B.3 of VCS PD	It was rechecked.		The parameters $EF_{\text{projected fossil fuel}}$, NCV_{biomass} , ρ_{biomass} , $f_{\text{NRB},y}$, $Q_{\text{renbiomass}}$, Origin of renewable biomass were revised accordingly to VCS PD.
CAR 2 Please correct leakage results for forest residues according to the newest version of the PD.	Section B.6 of VCS PD	It was rechecked.		Ok, leakage section was revised and the information was included.
CR 1 In the parameter $Q_{\text{renbiomass}}$ please add one line with the total quantity.	Monitoring Report	It was rechecked		The total quantity has been included in the table accordingly.
CR 2 Clarify why in September and August the values are 0.	Monitoring Report	It was rechecked once some invoices were not considered in the version 3 of the monitoring report.		OK. It was completed according to the documents and is now consistent.

3.4 Accuracy of Emission Reduction Calculations

The approved CDM baseline and monitoring methodology Category AMS-I.E: Switch from non-renewable biomass for thermal applications by the user - Version 01, February 1st 2008 onwards, is applied to the project activity.

GHG emission reduction is calculated as baseline emissions minus project emissions minus leakage emissions. As no project and leakage emissions are identified according to the applied methodology, baseline emissions are equal to the amount of emission reduction. Emission reduction is calculated through the estimate value of native wood

that would be consumed in the absence of the project activity in year y (according option "b" of applied methodology as state in section 3.3 of this report) multiplied by the fraction of non-renewable biomass (wood) used in the absence of the project activity in year y multiplied by Net calorific value of non-renewable biomass multiplied by the EF of the projected fossil fuel adopted. The approach used for the emission reduction calculation was considered to be in accordance with the applied methodology.

It was verified in the course of this verification that the above-mentioned methodology has been correctly and accurately applied in calculating the total emission reductions and the emission reduction calculation is accurate and conservative.

Minor Change:

- NCV_{biomass} : last visit of website should be corrected the date

Minor change corrected accordingly.

3.5 Quality of Evidence to Determine Emission Reductions

The project proponent as evidence to determine emission reductions submitted several documents. Refer to Table 5-1.

The evidences were assessed as of sufficient quantity and appropriate quality.

3.6 Management and Operational System

The management and operational system of the project is suitable. An operational structure was established with responsibilities identified. Staff training plan was clear; training records were available^{/ECT/}. The quality management and erroneous procedures were clearly defined^{/VCS PD/}.

4 Verification Conclusion

Carbono Social Serviços Ambientais Ltda. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1st periodic verification of the project: "Cenol and Telha Forte Ceramics Switching Non-Renewable Biomass Project", with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to switching non-renewable to renewable biomass fuel for end-user thermal energy generation. This verification covers the period from 2007-11-01 to 2008-09-30 (including both days).

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Emission reductions:	CO ₂ [t CO ₂]	CH ₄ [t CH ₄]	N ₂ O [t N ₂ O]	HFCs [t HFC]	PFCs [t PFC]	SF ₆ [t SF ₆]	Sum [t CO ₂ e]
2007	8,923	-	-	-	-	-	8,923
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TOTAL:							47,508

Essen, 2009-03-02



Rainer Winter
TÜV NORD JI/CDM CP
Verification Team Leader

Essen, 2009-03-02



Eric Krupp
TÜV NORD JI/CDM CP
Final approval

5 References

Table 5-1: Documents provided by the project proponent

Reference	Document
/ECR/	Electric consumptions receipts checked during on-site visit. It could be evidenced that the electric consumption and costs are higher than before of the project activity.
/ECT/	Employee's certificates for training realized regarding process for the project activity.
/FAE/	Financial assessment evidences. Please refer to invoice receipts for the assessment of the pertinent financial data used in the financial spreadsheet calculation.
/ML1/	Municipal licence to <i>Telha Forte</i> Ceramic - economic register inscription (inscrição no cadastro econômico) # 000140. Emission date 2007/01/04 and expire in 2007/12/31.
/ML2/	Municipal licence to <i>Cenol</i> Ceramic - economic register inscription (inscrição no cadastro econômico) # 000134. Emission date 2007/01/04 and expire in 2007/12/31
/MR/	Final Monitoring Report Version 5 – submitted for verification on 2008/02/26.
/OL1/	Operation Licence, <i>Telha Forte</i> Ceramic – Nº 288/2007, on August 16th, 2007 for ceramic material manufacture. Expire in August 15th, 2008
/OL2/	Operation Licence, <i>Cenol</i> Ceramic – Nº 287/2007, on August 21st, 2007 for ceramic material manufacture. Expire in August 20th, 2008
/OL3/	Operation Licence, <i>Cenol</i> Ceramic – Nº 285/2007, at August 21st, 2007 for clay extraction. Expire in August 20th, 2008.
/VCS PD/	Final VCS Project design document Version 5 – submitted for validation on 2008/02/20.
/WEB1/	Website consult on 2009/02/19: http://www.renabio.org.br/arquivos/p_avaliacao_energia_8340.pdf
/WEB2/	Website consult on 2009/02/19: http://faculty.jsd.claremont.edu/emorhardt/159/pdfs/2006/Klink.pdf
/WEB3/	Website consult on 2009/02/19:

Reference	Document
	http://www.belem.pa.gov.br/semma/paginas/Lei-5_887.htm
/WL/	Artesian well water use licence from January 02nd, 2007, for both ceramics.
/XCS1/	Calculation spreadsheet of baseline study and emission reduction in "estimativas" - Version 05 – February 20 th , 2009
/XCS2/	"Adicionalidade financeira Cenol and Telha Forte" (Financial costs) – Version 05 – February 20 th , 2009
/XCS3/	"VCS Calculation MR - Cenol_Telha Forte - for MR version 5" (Emission Reduction Calculation) – Version 05 – February 26 th , 2009

Table 5-2: Background investigation and assessment documents

Reference	Document
/AMS-I.E./	AMS-I.E: Switch from non-renewable biomass for thermal applications by the user - Version 01, February 1 st 2008 onwards.
/GHG Protocol/	GHG Protocol for Project Accounting 2005.
/IPCC-GP/	IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000
/IPCC/	2006 IPCC Guidelines for National Greenhouse Gas Inventories: General Guidance and Reporting
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

Reference	Document
/KP/	Kyoto Protocol (1997)
/CONAMA 279/	Resolution CONAMA 279 (2001) – Environmental National Board
/VCS/	Voluntary Carbon Standard Program Guideline 2007.1.

Table 5-3: Websites used

Reference	Link	Organization
/CETESB/	http://www.cetesb.sp.gov.br	Companhia de Tecnologia de Saneamento Ambiental
/MCT/	http://www.mct.gov.br	Ministério da Ciência e Tecnologia – Technology and Science Department
/UNFCCC/	http://unfccc.int	United Nations Framework Convention on Climate Change
/VCS/	http://www.v-c-s.org	Voluntary Carbon Standard

Table 5-4: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Francisco Valdir – <i>Cenol</i> and <i>Telha Forte Ceramics</i>' owner Ms. Flávia Takeuchi – Cantor CO2e Brasil Ms. Michele Bomback - Cantor CO2e Brasil	▪ Desk review findings ▪ General aspects of the project ▪ Project design, Commissioning and implementation ▪ Technical equipment and operation of the project ▪ Performance of the project ▪ Involved personnel and responsibilities ▪ Training and practice of the operational personnel ▪ Implementation of the monitoring plan ▪ Monitoring and measurement equipment ▪ QA/QC Testing and calibration procedures ▪ Monitored data management ▪ Data quality, archiving and reporting procedures ▪ Data uncertainty and residual risks ▪ GHG calculation ▪ Procedural aspects of the verification

Table 5-5: List of interview people

Reference	Mol ¹		Name	Organization / Function
/IM01/	V	☒ Mr. ☐ Ms.	Francisco Valdir	<i>Cenol and Telha Forte</i> Ceramics' owner
/IM01/	E, V	☐ Mr. ☒ Ms.	Flávia Yumi Takeuchi	CantorCO2e Brasil - Technical Coordinator
/IM01/	V	☐ Mr. ☒ Ms.	Michele Bomback	CantorCO2e Brasil - Technical Analyst

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

CERTIFICATION REPORT

CARBONO SOCIAL SERVICOS
AMBIENTAIS LTDA

CENOL AND TELHA FORTE CERAMICS
SWITCHING FUEL PROJECT

47,508 TON CO_{2E}

MONITORING PERIOD 2007-11-01 – 2008-09-30

Report No: 8000368467-08/541-C01.1

Date: 2009-March-02

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www.global-warming.de

CERTIFICATION STATEMENT

Project Title: Cenol and Telha Forte Ceramics Switching Fuel Project
 Project Participant(s): Carbono Social Servicos Ambientais Ltda
 Applied Standard: Voluntary Carbon Standard (version 2007.1)
 Monitoring period: 2007-11-01 to 2008-09-30
 Type of Verification: ☐ Combined (no separate validation) ☒ Based on validated VCS PD
 VCS PD: Final version dt. 2009-02-20
 Monitoring report: Final version dt. 2009-02-26
 Methodological approach: ☒ Approved CDM Meth; ☐ Combined appr. Meths; ☐ Project specific Meth
 Applied methodology(s): AMS-I.E.: "Switch from non-renewable biomass for thermal application by the user" (Vers. 1)
 Verification Opinion: The scope of this verification covers the determination of voluntary greenhouse gas emission reductions generated by the above mentioned project. The verification is based on the VCS PD (VCS 2007.1), monitoring report and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

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

- The project activity is in line with all applicable criteria of the VCS version 2007.1.
- All operations of the project are implemented and installed as planned and described in the project design document. The monitoring system is in place and functional. The installed equipment essential for generating emission reductions runs reliable and is calibrated appropriately.
- 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 indicated in the table below.

Emission reductions:	CO ₂ [t CO ₂]	CH ₄ [t CH ₄]	N ₂ O [t N ₂ O]	HFCs [t HFC]	PFCs [t PFC]	SF ₆ [t SF ₆]	Sum [t CO ₂ e]
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