



Voluntary Carbon Standard 2007.1 Validation Report

19 November 2007

Project-No: 5484 – 08/541

Validation Report:

Name of Validation company:	Date of the issue:
TÜV NORD CERT GmbH	March 2 nd , 2009
Report Title:	Approved by:
Final Validation 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 validate the project: "Cenol and Telha Forte Ceramics Switching Fuel Project" with regard to the relevant requirements of the VCS 2007.1 Standard. The project activity consists of switching non-renewable to renewable biomass fuel for end-user thermal energy generation. A risk-based approach has been followed to perform this validation. In the course of the draft validation 07 Corrective Action Requests (CARs) and 21 Clarification Requests (CRs) were raised and successfully closed. The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria. In detail the conclusions can be summarised as follows: - The project is in line with all relevant host country criteria (Brazil) and all relevant VCS 2007.1 Standard criteria. - The project additionality is sufficiently justified in the VCS PD. - The monitoring plan is transparent and adequate. - The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 577,290 t CO_{2e} is most likely to be achieved within the 10 years (renewable) crediting period. The conclusion of this report shows, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.	
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1 Introduction

1.1 Objective

The purpose of this validation is to have an independent third party assessment on the project design. In particular the project's baseline, the monitoring plan (MP), and the project's compliance with the requirements of:

- VCS 2007.1 Standard
- other relevant rules, including the host country (Brazil)
- legislation and sustainability criteria

are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of Voluntary Carbon Units (VCUs).

1.2 Scope and Criteria

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan (based on AMS-I.E: Switch from non-renewable biomass for thermal applications by the user - Version 01, February 1st 2008 onwards), which are included in the VCS PD and other relevant supporting documents.

The items covered in the validation are described below:

- Project Description
- Project Baseline
- Monitoring Plan
- Calculation of GHG Emissions
- Environmental Impacts
- Stakeholder Consultation

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 tonnes of native firewood per year producing 44,400,000 ceramics devices per year in its 8 “Paulistinha” kilns and 15 “Round” kilns. The kilns reach a temperature of 900°C for cycles of 60 hours.

The total replacement occurred in November 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.

Due to the project activity investments were necessary to maintain the facility productions, such as: new mechanical burners to feed the kilns, adjustments in the kilns entrance before adapted to the native firewood fuel, construction of a shed to store the renewable biomass and staff training regarding the new fuel adoption.

The project contributes to the sustainable development as due to its activity it will: diversify and improve sources of thermal energy generation, make possible new renewable biomass thermal energy generation technologies to be applied in the ceramic sector or other similar process, reuse biomass waste material, utilize renewable sources of biomass for thermal energy generation and contributes to the local biome preservation.

The estimated annual GHG emission reduction is 57,729 tCO₂e during the 10 years of the project activity.

1.4 Level of assurance

The validation report is based on VCS PD and documents provided by the project proponent, as well as information obtained from the on-site visit. The validation opinion is assured provided the credibility of all above.

2 Methodology

The validation of the project was carried out from November 2008 to January 2009.

Preparations: 2007-11-02 to 2007-11-04

On-site visit: 2007-11-06 and 2007-11-07

Draft Reporting: 2008-11-10

(Final) Reporting: 2009-02-26

The validation consists of the following three phases:

- a desk review of the project design and the baseline and monitoring methodology
- follow-up interviews
- the resolution of outstanding issues and the issuance of the final validation report and opinion.

According to the VCS 2007.1 policy validations shall be completed within two years of the project start date, or within 1 year of 19 November 2007, whichever is later. The Policy announcement from the VCS Association (10 September 2008) extends this validation deadline. There it is stated, that proof of contracting prior to 19 November 2008 shall be provided. The signed contract between the parts was checked and it is prior to the defined date^{/PRO/}.

2.1 Review of Document

VCS PD^{/VCS PD/} and proof of title submitted by Cenol and Telha Forte Ceramics, as well as the supporting documents were reviewed.

The draft VCS PD^{/VCS DPD/} submitted by Cenol and Telha Forte Ceramics and background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation by third parties like host party legislation, and technical data based on the project design provided by the company.

Afterwards, this report show the documents considered during the validation process and listed as follows:

- Documents provided by the project proponent (Table 5-1)
- Background investigations and assessment documents (Table 5-2)
- Websites consulted (Table 5-3)

2.2 Follow-up Interviews

Before and during the on-site visit on 2007-11-06, the verifier of TÜV NORD performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

Cenol and Telha Forte Ceramic's owners and Carbono Social Serviços Ambientais Ltda.'s consultants were interviewed. The main topics of the interviews are summarised in Table 5-4 and the participant's information is addressed in table 5-5.

2.3 Resolution of any material discrepancy

The report includes Corrective action and Clarification Requests (CAR and CR) identified in the course of this validation.

A Corrective Action Request is established if:

- mistakes have been made in assumptions or the project documentation which directly will influence the project results,
- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered by the UNFCCC or that emission reductions cannot be verified and certified.

A Clarification Request is issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

After resolution of these CARs and CRs by the project proponent the validator will issue the (final) validation report and opinion.

07 CARs and 21 CRs were found during pre-validation. Please refer to Section 3.

3 Validation Findings

3.1 Project Design

The project comprehends the use of renewable biomass instead of non-renewable sources of biomass to generate thermal energy to feed the kilns and producing ceramic devices. Prior to the project implementation the ceramic used native firewood from unsustainable production as fuel to feed their kilns that nowadays was switched to different types of renewable biomass. The ceramic will preferably apply sawdust and açai pits offered by the providers addressed in the VCS PD. In case of lack of providers other renewable biomasses sources such as rice husk and elephant grass may also be employed.

The identified project boundary is the limits of the ceramic facility, in accordance with the applied methodology. The GHGs considered within the project boundary is the CO₂ emission from the combustion of native firewood used to occur in the baseline scenario. No other sources of GHG emission, sinks or reservoirs were identified.

Key parameters of the project are as below:

Table 3-1: Key parameters of the proposed project activity

Parameter	Value
Number of 'Round' kilns operating on <i>Cenol Ceramic</i>	7
Number of 'Paulistinha' kilns operating on <i>Cenol Ceramic</i>	3
Number of 'Round' kilns operating on <i>Telha Forte Ceramic</i>	8
Number of 'Paulistinha' kilns operating on <i>Telha Forte Ceramic</i>	5
Firing temperature of the kilns	900 °C
Production capacity per month of <i>Cenol ceramic</i>	1,200,000 ceramic devices
Production capacity per month of <i>Telha Forte ceramic</i>	2,500,000 ceramic devices

Table 3-2: Project Location

Item	Project Scope
Host Country	Brazil
Region:	Pará state, North region, Brazil
Project location address:	CENOL and TELHA FORTE CERAMICS Rodovia BR 010 – km 1808 – Bairro Industrial São Miguel do Guamá, Pará, Brazil Postal Code 68660-000
Latitude:	01° 37' 09.22" S
Longitude:	47° 28' 33.68" W

Telephone:	+55 (91) 3446-2341
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This project does not participate in any other project emission trading program and was not rejected in other GHG programme.

In the initial phase of the project activity a validation and verification process under BRTÜV Q-27 Standard was carried out covering the crediting period from 2007/07/01 to 2008/01/31. Emissions reduction units coming from this Standard have been withdrawn^{/LoW/}. It could be checked that the crediting period considered for the VCS project activity is later than the withdrawal process for the credits issued under Q-27 Standard, thus there is no possibility of double-counting emission reductions occurs.

This project is eligible under the VCS methodology, so it fulfils all applicability criteria of the methodology used. The project consists of thermal appliances (ceramic kilns) that displace the use of native firewood by introducing renewable sources of biomass as fuel for end-user energy generation. As the energy generation necessary for the ceramic pieces production occur only in the ceramic facility, the validation team assumed that the plant is the end-user for the thermal energy generated. The native firewood utilized in the baseline scenario can be considered as non-renewable biomass as its extraction is illegal (but common practice) and no sustainable management plan is adopted. The renewable sources of biomass could be evidenced as follows:

- Açaí Pits – the origin of the açaí pits is from the local açaí production, where the state of Pará is the national most important producer^{/WEB7/}. The açaí pits, around 75% of the açaí, is a residue from the açaí production^{/WEB8/}. The açaí suppliers must maintain its cultivation area sustainable in order to keep its production. Therefore the validation team can assume that a sustainable management methodology is adopted in the açaí cultivation. This will be controlled by the verification team in the time of verification process. The project participant will deliver documents that justify the renewable origin of the biomass.
- Elephant grass – if adopted by the project activity its cultivations will follow sustainable management methodologies. The elephant grass will be exclusively cultivated for the purpose to supply fuel to the project activity. The ceramic owner will be responsible to maintain a sustainable management production. Until now the ceramic did not use elephant grass for their project. A detailed justification on sustainability will be provided, when it will be adopted first during a verification period.
- Rice husk – the rice cultivations and harvesting is necessary to maintain the production of rice in the region. Its cultivation can be assumed as sustainable because the rice producers' demands yearly incoming of rice, thus it is necessary to maintain the cultivation area. The rice husk is a waste from the rice production and therefore renewable according to the methodology.
- Sawdust – the sawdust used in the project activity is originated from sawmills industries which utilizes wood coming from sustainable forest management. All sawdust suppliers is listed in SEIMA – “Sistema Estadual de Informações Ambientais” (“Municipal System of Environmental Information”) website, indicating that its production process is in line with all pertinent laws and ensure the use of wood originated in sustainable forest managed areas^{/WEB6/}. As the sawdust is an industrial residue it falls therefore under the renewable biomass criteria of the applied methodology.

There are no similar CDM projects activities in the regions as could be evidenced in the UNFCCC website. Moreover the project participants could prove the use of non-renewable biomass since 31 December 1989 using survey methods. Firewood is a well known fuel used in Brazil^{/WEB2/} since the colonial period^{/WEB1/}. The use of native wood and its unsustainable management is the most common practice in the ceramic sector^{/WEB3/}.

The project reduces the greenhouse gases (GHG) by switching from non renewable firewood as fuel to renewable biomass. It will also contribute for the sustainable development of the region. The participation is voluntary.

The project duration is: 10 years, twice renewable.

Crediting period is 01/11/2007 – 31/10/2017.

Project start date is 01/03/2007

Cenol and Telha Forte and Carbono Social Serviços Ambientais Ltda. have ownership of the proposed project. Proof of title was submitted to the validators^{/PFT/}.

The emission reduction was not double counted.

During the validation 02 CARs and 07 CRs were raised and closed successfully:

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR 1 In Table 4 – Actual production parameter. According to footnote 11 the ceramics have increased its production. Why the same value given in sections 1.9 was used in this table indicating the actual production??	VCS PD Item 1.9	Information provided by footnote 11 was excluded because it was not consistent.		OK. The footnote was excluded from VCS PD.
CAR 2 It is necessary to inform in PDD section 1.9 the actual consumption	VCS PD Item 1.9	The actual consumption of renewable biomasses and ceramic devices production for		Ok. The amounts of biomass given in table 4 are inline with the data

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
of renewable biomasses and devices production for both ceramics. Moreover in PDD section 1.9 it is stated that around 50% of each renewable biomass will be applied, contradicting the information provided in pg 29 ($Q_{renbiomass}$ parameter).		both ceramic companies were addressed on the table 4 of the section 1.9. The percentage of each renewable biomass employed was rechecked, and approximately 80% of sawdust and 20% of açai pits are employed for both ceramic companies.		delivered during on-site visit.
CR 1 In table 4, “the products at baseline (devices per year) are “per month”. Please correct it.	VCS PD Item 1.9	It was rechecked.		OK. It was changed the word “year” into moth. Now the value and the unit are correct.
CR 2 The point: “closing of the ceramic” is not a risk that may affect the emission reductions, because if the ceramic fabric closes there won’t be emissions at all.	VCD PD Item 1.11	It was added the following sentence in VCS PD:” If the ceramic companies close, they may substantially affect the project’s GHG emission reductions, once other ceramic would probably supply the products consuming native wood		Ok, the information provided. The emission reduction risk is the supply of ceramics pieces demanded from the local market by other ceramics that does not uses renewable

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
		which is the common practice of the region.”		biomasses in its burning process.
CR 3 Second last paragraph: For the assumption: “The elephant grass is cultivated in pasture or degrades areas, in which there is no vegetation to be deforested,” must be substantiated with a reference.	VCS PD Item 2.2	It was rechecked. “In case of using elephant grass it will be cultivated in pasture or degraded areas, in which there is no vegetation to be deforested. Therefore, this practice will not generate competing use of biomass and it will not deforest a vegetated area”. References about its easy adaptation in almost all climate and soil Brazilian conditions have already been addressed in the VCS PD.		Ok, information has been provided. Until now the ceramic did not use elephant grass for their project. A detailed justification on sustainability will be provided, when it will be adopted first during a verification period.
CR 4 Please check the tables numbering. There is not table 6.	VCS PD Item 2.4	It was rechecked.		OK. It was checked in VCS PD and corrected accordingly.
CR 5 Footnote 25 – It is necessary to	VCS PD Item 2.4	It was rechecked. Only the name of the ceramic		OK. It was rechecked and now it changed to

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
provide detailed information concerning the ceramics comparison. They are located in the same region? The same wood suppliers were utilized? Suppliers' distances are similar? Etc...		company was wrong, therefore, it was modified.		footnote 24.
CR 6 A burning cycle of 60 hours has been indicated. In the excel sheet a total cycle of 168 hours (incl. 48 hours of burning) are stated. Please clarify.	VCS PD Item 2.5	It was rechecked in the VCS PD and spreadsheet. The burning not total burning cycle, comprises 60 hours.		Ok, correction applied accordingly. A 60 hour burning cycle can be verified by the validator as other ceramics applied the same value.
CR 7 In table 7 and 8 the "parameter monthly consumption of the fuel" shall be given per month. But for the renewable biomass it is given per year. Correction is also necessary in the financial spreadsheet.	VCS PD Item 2.5	It was rechecked.		Information revised accordingly. The parameters are now given for a monthly consumption. The values could be verified during on-site visit due to receipts from providers.

Minor Change:

- In section 1.14 It must say “This grouped project was **not** rejected under any formal GHG...”
- Under table 6 there is a half part of a sentence, which should be deleted.
- In section 1.9 first paragraph: “Before the project activity.....” This sentence is contradictory as it says that no modifications had to be done for the project.

Corrections of these minor changes have been done accordingly.

3.2 Baseline

The proposed project used CDM approved methodology Category AMS-I.E: Switch from non-renewable biomass for thermal applications by the user - Version 01, February 1st 2008 onwards; this methodology has been select by the project developer since contemplate the switching of non renewable biomass for renewable biomass.

The baseline scenario is the continuation of the common practice in the region, which is the use of native firewood from unsustainable management to feed the ceramic kilns contributing for the deforestation of the Amazonian biome. In the past, the two ceramics used approximately 3,700 t of native firewood in order to produce 3,700,000 ceramic pieces monthly according to ceramic owner experience^{/IM01/}, which could be evidenced during on-site visit. Such data make possible to calculate the efficiency factor of native wood consumption per pieces production (1 t of native firewood / 1000 ceramic pieces). Applying this efficiency factor, the identified native firewood consumption in the baseline scenario is 3,700 t for the ceramic facility per month.

The baseline identification was assessed considering the data made available to the validation team. The most possible baseline scenarios would be the use of wood, fuel oil, natural gas respectively and renewable biomass (without VCS project activity), as information checked in the Brazilian Energy Balance in the ceramic sector for the year 2007^{/WEB3/}. The fuel oil was discarded as a candidate because its high price when compared with the use of wood. Despite of the fact that the fuel oil presents a higher net calorific value when compared with wood its costs for the ceramic facility are higher because of its expensive price, as show in a reliable university study^{/WEB4/}. The natural gas was disconsidered as a possible baseline scenario due to the absence of its distribution in the project activity region^{/WEB9/}. Moreover the natural gas presents higher prices when compared with wood^{/WEB10/} and its supply lacks of availability^{/WEB11/}.

The use of renewable biomass in the baseline (not carried out as a VCS project) has also been addressed as one possible baseline candidate. Due to some barriers that will be explained in the next step of additionality assessment this baseline scenario can also be excluded from the list.

Due to information above, the most possible identified and only remaining baseline scenario to occur in the absence of the project activity would be the use of wood. Additionally it could be evidenced that the use of wood was the most important national energy source until the 70's decade, when the use of petroleum assumed the first position^{/WEB2/}. Although, when assessing exclusively the ceramic sector, the use of wood is still the most important fuel adopted^{/WEB3/} and its source is originated from unsustainable managed areas^{/WEB1/}. Thus, the use of non-sustainable firewood in the identified baseline scenario was properly assessed.

With the identified kiln efficiency utilizing native firewood the consumption of native firewood that would occur in the absence of the project activity, based on the actual

production of the ceramic, could be identified. Therefore the validation team concludes that the identified baseline scenario could be properly assessed and it was correctly identified.

The project attends satisfactorily all the requested tests according to the V-C-S program. It is not enforced by Brazilian legislation; the barriers met were real and verified and the use of native firewood is very common in the ceramic sector.

The additionality was assessed using the project test (1) of section 5.8 of the VCS 2007.1 Standard. The project activity is not mandatory by any enforced applicable federal, state and municipal law, thus passing through step 1. The implementations barriers identified were:

- 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 use in the process. The açai pits produces a lot ash and the kiln must be clear.

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

- 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^{/FAE/}. 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.

▪ Financial (investment costs)

- Kilns firing entrance adjustments – Although the price for the kilns adjustments are small it is also considered as a barrier^{/FAE/}.
- Staff training courses – it was necessary to provide resources for the staff training.
- Maintenance costs – costs related to the maintenance of the new mechanical burners acquired. It was evidenced during the On-site visit that this equipment frequently needs to be repaired^{/FAE/}.
- Mechanical burners acquired – the price paid for the new machinery used in the project activity could be evidenced through buying receipts^{/FAE/}.

The financial barrier due to investment cost has been validated to be true but found not to be significant for the additionality of the small-scale project activity as no financial analysis has been carried out.

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.

This barrier related to the price has been validated to be true but found not to be significant for the additionality of the small-scale project activity.

The validation team believe that the most impacting barrier for the proposed project activity are the new fuel used (technical barrier) including the production difficulties experienced due to the new fuel applied, renewable biomass purchase, mechanical biomass burners acquired and the uncertain of the renewable biomass supply due its possible upcoming demand in the future and the higher amount of variable costs (financial barrier). The presented technical and financial barrier is sufficient to properly address step 2 requests.

For the common practice analyse it was used the GHG Protocol criteria assessment. As show in VCS PD the most common practice in the region is the use of native firewood as fuel in the ceramics sector. The data available for the common practice analyse was the same presented for the baseline identification, thus the validation assessment was carried out in the same manner. The high levels of deforestation rates in the project region^{/WEB12/} and the practices in Brazil^{/WEB1//WEB2/} and specific in the ceramic sector^{/WEB1//WEB3/} supports this conclusion.

During the validation were raised 03CAR and 02 CRs and were successfully closed:

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR 3 Step 5: Identify a final list of baseline candidates: Also the use of renewable biomass is a baseline candidate in case it is not performed as a VCS project activity. So it must be included in the list of candidates.	VCS PD Section 2.5	The list of possible baseline scenarios was revised and the use of renewable biomass without performed as a VCS project was included.		Ok, sufficient information provided to close the CR. The use of renewable biomass without undertaken as a VCS project was included as a possible biomass.
CAR 4 The barrier due to the price is not valid as the biomass is coming from donation. This was not a barrier that could prevent the project	VCS PD Item 2.5	The price of biomass was considered zero because it is the lowest price that the ceramic companies have already paid, this cost was applied to be conservative. However, the barrier due to the price of biomass is valid because its price may increase as described in the VCS PD.		Ok, the validation team corrected their assumption regarding this CAR as the price for biomass can affect the project in the future.
CAR 5 The measurement method of the "Origin of	VCS PD Item 3.3	It was added to VCS PD		OK. It was added to the table in VCS PD.

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
renewable biomass” parameter must indicate the website consulted for the legal sawmills suppliers’ selection.				
CR 8 The identified ceramics efficiency of 1.5 m3 or 1 ton to produce 1,000 ceramics device does not consider that there are two different types of kiln operating (Round and Paulistinha kilns). Do they have the same ceramics device capacity? What about the burning cycle, do they reach the same temperature and operating burning time?	VCS PD	As described and referenced in the section 2.4, “paulista” and “round” kilns have the same efficiency or consumption of non-renewable biomass per thousand of ceramic devices. Furthermore, according to the ceramic owner, those kilns have the same producing capacity; both reach the same temperature and operating time.		OK. It was explained by the ceramic owner and described in item 2.4 The data could be evidenced during on-site visit. Moreover the provided study ^{TAP/} clearly indicates the similar kilns efficiency and the data could be cross-checked with other similar project activities.
CR 9 Section 2.5 states that the kiln temperature is 920°C, but in section 1.9 presents 900 °C.	VCS PD Item 1.9	It was rechecked. The kiln temperature is about 900°C.		OK. It was corrected and the project proponent said it is 900°C which could be verified

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
Please clarify.				with following literature ^{/TAP/}

Minor Change:

- In table 10, “Brazilian Legal Amazonian regarding the year of 2003 must consider the third decimal unit after the dot.

The minor change has been corrected accordingly.

3.3 Monitoring Plan

The proposed project used CDM approved methodology Category AMS-I.E: Switch from non-renewable biomass for thermal applications by the user - Version 01, February 1st 2008 onwards. The project satisfies all criteria for the applied methodology. The application of monitoring methodology was assessed as correct.

The monitoring plan provides detailed information related to the collection, archiving and monitoring of all relevant data needed to:

- Estimate or measure emissions occurring from GHG sources, sinks and reservoirs
- Determine the baseline emissions
- Estimate changes in emissions from the site

The parameters to be monitored it will be responsibility of Mr. Francisco Valdir, ceramics' owner. He will be responsible for registration, monitoring, measurement and reporting.

Parameters that will be monitored:

- Amount of renewable biomass employed (tonnes) - measured by the project developer, monthly. The parameter will be monitored through the weight indicated in the buying receipts of the renewable biomasses providers. These values will be crosschecked with internal records on biomass they received. The specific gravity of each renewable biomass can be used for unit conversion^{/WEB21/}.
- 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^{/WEB13/}. The value will be monitored yearly in each verification 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 will only buy renewable biomass from the list of its reliable supplier. Depending on the renewable biomass type different criteria must be applied as state in section 3.1 of this report. The sustainability of the biomass has been proved by the operating licence of the client. The licence will only be provided

by Brazilian government when a sustainable management of the resources can be justified^{/WEB22/}. If the ceramic obtain their biomass from other suppliers than listed now in the PD they will check the origin of the biomass and provide evidence to the verification team.

- Renewable biomass surplus – In order to estimate the leakage emission of the renewable biomass the project participant will monitor the renewable biomass surplus in the specific region of the project activity, yearly. The measurement will be based on national and internal sources. During validation 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^{/VCS PD/}.
- Leakage of non-renewable biomass – All three sources of leakage predicted in the applied methodology will be monitored, annually. It will be provided information regarding the non-renewable biomass availability in the specific project region by official statistic data and national surveys.

The QAQC procedures of the monitored parameters are clearly described and it was considered adequate. The amount of non-renewable biomass that would be used in the absence of the project activity will be calculated according option “b” of the applied methodology. The kiln efficiency (quantity of renewable biomass / thousands of pieces) before the project implementation multiplied by the monthly production will reach to the amount of non-renewable biomass that would be utilized.

The fixed parameters for the project activity are:

- NCV non-renewable biomass – an average value from a reliable article was applied. It was considered an average of the typical Amazonian biome trees, as can be checked in the calculation spreadsheet^{/LOR/WEB14/WEB15/}.
- Wood specific gravity – an average value from an article was applied. It was considered an average of the typical Amazonian biome trees, as can be checked in the calculation spreadsheet^{/LOR/WEB14/WEB15/}.
- EF projected fossil fuel – As show above, the most probable fossil fuel in the absence of wood it would be the heavy oil. IPCC 2006 value was applied.
- Tons of wood per thousand of devices – Value adopted from ceramic owner experience. This value could be cross-checked with other ceramics with the same fuel and kiln used.

Despite of that 1 CR was addressed.

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CR 10 As the renewable biomass is coming from donations,	VCS PD section 3.3	It was added information on the QA/QC procedure fro		Ok, parameter revised accordingly.

how the QA/QC procedure for the $Q_{renbiomass}$ can be done using receipts of purchase? Clarification is necessary regarding all renewable biomasses considered in the project activity.		this parameter regarding the biomass coming from donation.		The biomass provider will deliver receipts and with internal records that indicate the amount of biomass the data will be checked. Also from the device production the amount of biomass can be estimated.
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3.4 Calculation of GHG Emissions

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.

According to the applied methodology leakage emissions regarding the project activity are to be considered. The leakage emission was assessed according to the “General guidance on leakage in biomass project activities” of Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories. The methodology requests due to the identification of potentially significant sources of leakage emission were properly addressed in the VCS PD and its emission is considered to be zero. Using the same assumptions and considerations as for the baseline identification^{/WEB1//WEB2//WEB3//WEB9/}, it can be assumed that the most employed fuel used is the native firewood. Thus no leakage emissions due to the non-renewable biomass should be considered. Despite of that, if this source of leakage emission is assessed to be significant in the further crediting period, the baseline will be identified to neutralize the leakage emission identified. For the leakage consideration regarding the renewable source of biomass it was properly addressed in VCS PD that the biomasses supply is significantly bigger (more than 75%) than the quantity necessary for the project activity. All possible biomasses were considered in this assessment^{/BRI//WEB16//WEB17//WEB18//WEB19//WEB21/}.

In the course of validation 02 CARs and 09 CRs were raised and could be successfully closed.

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR 6 The calculation used for the identification of the value 0.0009% regarding the leakage emission for sawdust is incorrect. It is necessary to revise the calculation. Moreover in the leakage assessment the demand for all biomasses considered in the project activity has not been considered. This is essential to come to a result if there is sufficient biomass available or not. Additionally Paragraph four states that 31 ceramic industries exist in Pará state and almost all of them use native wood. What do the others use? Can you give a reference for this statement?	VCS PD Section 4.1	It calculation for the sawdust leakage assessment was rechecked. There are no data regarding the demand for the biomasses in the State of <i>Pará</i>. However, according to <i>Barbosa (2009) [1]</i>, it is a common practice in sawmills the generation of methane due to the decay of sawdust in their on site places. However, currently, there is a very low demand for sawdust in the State of <i>Pará</i>. Furthermore, according to <i>Townsend (2001) [2]</i>, on the locals where the açai is processed, there is a lot of açai pits left to decay once they have very low utility. Therefore, the demand for the renewable biomasses used by the ceramic		Ok, calculation was revised. And found to be correct. The leakage assessment was revised. The demand of biomass in the region is not necessary to demonstrate according to the methodology. Additionally the sentence regarding the 31 ceramics was deleted.

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
		companies is very low. Moreover, as included in the VCS PD, the amount of sawdust is much higher than the consumed by the ceramic industry. There is also a considerable potential of this residue for electricity generation as stated by CENBIO indicating biomass surplus. Therefore, we can conclude that the demand for the renewable biomasses used by the ceramic companies is very low when compared with the amount generated. [1]Barbosa D. - <i>Do Globo Amazônia, em São Paulo</i>. Available at: <http://portalamazonia.globo.com/noticias.php?idN=77689&idLingua=1%20-%2044k> [2]Townsend C.		

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
		R., Costa N. L., Pereira R. G. A., Senger C. C. D. Características químico- bromatológica do caroço de açai. Nº 193, ago./01, p.1-5 Available at: <a href="http://www.cpafr
o.embrapa.br/P
esquisa/public/2
001/outros/Cot
193.PDF">http://www.cpafr o.embrapa.br/P esquisa/public/2 001/outros/Cot 193.PDF . Moreover the statement regarding the 31 ceramics was deleted.		
CAR 7 Cell D20 comment mentions that there are 14 mechanical burners, instead of 13 for Telha Forte and 10 for Cenol ceramics stated in VCS PD. Correction is necessary.	Cenol and Telha Forte financial spreadsheet	The description of this calculation (Loss of revenues) was incorrect once it was described 14 kilns instead of 13. It was rechecked.		OK. It was corrected according to the number of kilns in both ceramics.
CR 11 Parameter “Renewable biomass surplus” for elephant grass there is no data available. This is not sufficient to substantiate the sustainability of the biomass. Please	VCS PD section 3.3	As describe in the VCS PD in case of employing this kind of biomass, the project developer will cultivate, by himself, elephant grass in pasture or		Ok, as the client has not been applied this kind of biomass, detailed data are not necessary yet. When elephant

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
provide more detailed information		degraded areas, in which there is no vegetation to be deforested (this affirmation also respond the CR2). Therefore, this practice will not generate competing use of biomass and it will not deforest a vegetated area, i.e. this leakage will not exist. For further information about renewable biomass surplus and competing uses for the biomass see <i>"General guidance on leakage in biomass project activities"</i> (attachment C of appendix B) available at: http://cdm.unfccc.int/EB/025/eb25_repan33.pdf.		grass will be applied in one of the verification period, necessary data will be provided.
CR 12 Clarification is necessary if the cell D23 is applicable or not	Cenol and Telha Forte financial spreadsheet	Waste of biomass in the testing period was not considered due to the low price paid for renewable		Ok, cell was deleted. It was presented a comment in this cell suggesting that it should be a value

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
		biomass.		applied. Although the comment was deleted and it was not applicable to the project activity.
CR 13 The price of renewable biomass was considered zero according to D8 and D9. Clarification is necessary as the PDD provide information on the ceramics cost for the use of the new fuel.	Cenol and Telha Forte financial spreadsheet	As described in the VCS PD, section 2.5 – Financial Barrier, although the ceramic companies used to receive renewable biomass as donation, the most important additional costs are related to biomass transportation, once the non-renewable biomass was delivered by lumberjacks and renewable biomass must be identified, loaded and transported by the ceramic, increasing the costs with truck		OK. It was clarified that the majority of biomass were from donation. And the part that they used to buy was insignificant.

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
		maintenance. Therefore, even with the price of renewable biomass considered zero, there are costs with the use of the new fuel as described in the VCS PD.		
CR 14 Why the parameters costs of biomass transportation and number of trucks (D/E9 and D/E 10) are equal zero?? Aren't they essential for the calculation of the renewable biomass transportation cost? Please clarify.	Cenol and Telha Forte financial spreadsheet	They are essential for the calculation and are included in the cell of the costs of transportation maintenance. It includes all trucks; therefore, it was not considered the number of trucks in the calculations. The name of the cell was modified for "Costs of transportation and its 'maintenance' (BRL per month)". Invoices will be sent to prove		OK. It was explained though a comment in the table and the title of the cell was changed. All receipts invoices due to the truck utilization (maintenance and fuel use) was sent to the validation team. The values applied in the excel spreadsheet formula could be properly evidenced. As the renewable biomass is mainly

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
		the costs.		being donated the costs with the biomass payment are not considered ^{/F AE/} .
CR 15 It is necessary to explain more detailed the costs of transportation maintenance (cell EF12). What are the values applied and where they come from?	Cenol and Telha Forte financial spreadsheet	The receipts will be sent to show where the values come from and what they are. Furthermore, there is a comment to indicate this value.		Ok. The receipts were sent to the auditors and it was added a comment to the cell. All receipts could be checked as the values provided in the excel spreadsheet formula, which include trucks maintenance trucks drivers payment and fuel used in the trucks ^{/FAE/} .
CR 16 Cell D13 was left blank, although there is a comment indicating that there was a value to be applied. Clarification is necessary.	Cenol and Telha Forte financial spreadsheet	This cell was excluded because there is no receipt of costs with automation maintenance.		OK. The cell was excluded.

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CR 17 It is necessary to explain more detailed the value indicate in cell D14.	Telha Forte financial spreadsheet	The value indicated in cell D14 corresponds to the salary paid to the employees which were necessary to be contracted due to the project activity. Invoices will be sent to show those values.		OK. Invoices were sent to the auditors and could be explained ^{/FAE/} .
CR 18 It is necessary to insert o comment in cells EF15 and EF 19 demonstrating how the information could be evidenced.	Cenol and Telha Forte financial spreadsheet	It was referenced and invoices will be sent to be evidenced.		OK. It was added a comment in the cell and the invoices were sent to the auditors ^{/FAE/} .
CR 19 In the “waste of biomass in test in the testing period”, the biomass was from donations? Why it is stated in the comment that it is not considered because of the low price of the biomass?	Investment table	The ceramics companies used to receive donations of renewable biomass, therefore, there was no investment due to the waste of biomass in the testing period.		OK. It was correctly explained.

Minor Change:

- In table 11 the parameter $f_{NRB,y}$ must be indicated as a monitored parameter as stated in the monitoring parameters.

Minor change has been done accordingly.

3.5 Environmental Impact

The project will use renewable biomass for its firing process. The origin of the biomass will be monitored regularly and is included in the monitoring plan. A table that shows possible negative impacts to the environment has been included to the PD. There are no additional negative environmental impacts due to the project activity expected. An EIA (*Estudo de Impacto Ambiental* – Environment Impact Assessment) is not required by the environment federal authority. All mandatory licences for the project activity were available at the time of validation^{/OL1//OL2//OL3/}. However 1 CR was raised.

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CR 20 Table 15: The impact on “economic-social” area, what is meant by “improvement of the competitiveness”?	VCS PD Section 5	It was excluded.		Ok, as this impact was positive and not important to the project the deletion can be accepted.

3.6 Comments by stakeholders

The considered stakeholders for this project activity were the ceramic sector syndicate and the ceramic company employees. Moreover a public consultation was realized inviting the environmental organs non governmental organizations, the syndicate of ceramic sector in the region, some ceramics from São Miguel do Guamá and Brazilian Service for Support of Micro and Small Companies. The comments were received during a period of seven days after the letters were sent. The consultants have promoted a public informal consultation. Comments were received concerning the project activity, which expresses the positive impact of the project activity. Nevertheless 1 CR was opened.

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CR 21	VCS PD Section 6	It was rechecked. The		Ok, PDD revised

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
In the last paragraph it says that after lecture the participants could give their opinions and doubts. Have there been any opinions or doubts regarding the project?		doubts were mainly about the Social Carbon methodology and its applicability. Furthermore, positive comments concerning the project were received.		accordingly.

4 Validation conclusion

Carbono Social Serviços Ambientais Ltda. has commissioned the TÜV NORD JI/CDM Certification Program to validate the project: “Cenol and Telha Forte Switching Non-renewable Biomass Project” with regard to the relevant requirements of the VCS 2007.1 Standard.

The project activity consists of switching from non-renewable to renewable biomass fuel for end-user thermal energy generation. A risk-based approach has been followed to perform this validation. In the course of the draft validation 07 Corrective Action Requests (CARs) and 21 Clarification Requests (CRs) were raised.

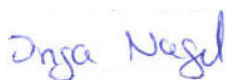
The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (Brazil) and all relevant VCS 2007.1 Standard criteria.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of **577,290 t CO_{2e}** is most likely to be achieved within the 10 years (renewable) crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

Hannover, 2009-03-02



Inga Nagel
TÜV NORD JI/CDM Assessor
Verification Team Leader

Essen, 2009-03-02



Eric Krupp
TÜV NORD JI/CDM Senior Assessor
Final approval

5 References

Table 5-1: Documents provided by the project proponent

Reference	Document
/BRI/	BRITO EO. Estimativa da produção de Resíduos na Indústria Brasileira de Serraria e Laminação de Madeira. Rev. da Madeira. v.4. n.26. 1995, pp. 34-39. – “Estimative waste production in the Brazilian industries”
/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.
/LOR/	LORENZI, H. Árvores Brasileiras: Manual de Identificação e Cultivo de Plantas Arbóreas Nativas do Brasil, vol.1. 4.ed. Nova Odessa, SP: Instituto Plantarum, 2002. – “Identification and cultivation manual for Brazilian native species”
/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
/LoW/	Letter of withdrawal of the Q-27 Standard crediting period issued by BRTÜV.
/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

Reference	Document
/PFT/	Contract signed between Carbono Social Serviços Ambientais Ltda. and Genol and Telha Forte ceramics stating their ownership of the project.
/PRO/	Signed BRTÜV proposal issued for the project activity. It is clear stated the date of contracting for the validation and verification process. Date 18/01/2008.
/TAP/	TAPIA, R. E. C. et al. Manual para a indústria de cerâmica vermelha. Rio de Janeiro: SEBRAE/RJ, 2000. – “Manual for red ceramics industries”
/VCS DPD/	VCS Draft Project design document Version 1 - submitted for validation on 2008/10/30.
/VCS PD/	Final VCS Project design document Version 5 – submitted for validation on 2008/02/20.
/WL/	Artesian well water use licence from January 02nd, 2007, for both ceramics
/WEB1/	Website consult on 2009/02/14: http://www.teses.usp.br/teses/disponiveis/86/86131/tde-14052008-113901/
/WEB2/	Website consult on 2009/02/14: http://www.scielo.br/scielo.php?pid=S0103-40142007000100015&script=sci_arttext&tlng=ES
/WEB3/	Website consult on 2009/02/14: https://ben.epe.gov.br/BEN2007_Capitulo3.aspx
/WEB4/	Website consult on 2009/02/14: http://www.abcm.org.br/xi_creem/resumos/TE/CRE04-TE01.pdf
/WEB5/	Website consult on 2009/02/14: http://www.abcm.org.br/xi_creem/resumos/TE/CRE04-TE01.pdf
/WEB6/	Website consult on 2009/02/19: http://www.sema.pa.gov.br/seiamlic/
/WEB7/	Website consult on 2009/02/19:

Reference	Document
	http://www.bancoamazonia.com.br/bancoamazonia2/revista/edicao_03/Analise_ret
/WEB8/	Website consult on 2009/02/19: http://www.cpatu.embrapa.br/sistemasdeproducao/acai/paginas/intro.htm
/WEB9/	Website consult on 2009/02/19: http://www.ctgas.com.br/template02.asp?parametro=2547
/WEB10/	Website consult on 2009/02/19: http://www.dep.fem.unicamp.br/boletim/BE31/artigo.htm
/WEB11/	Website consult on 2009/02/19: http://www.gasnet.com.br/novo_entrevistas.asp?cod=145
/WEB12/	Website consult on 2009/02/19: http://www.mct.gov.br/index.php/content/view/17341.html
/WEB13/	Website consult on 2009/02/19: http://faculty.jsd.claremont.edu/emorhardt/159/pdfs/2006/Klink.pdf
/WEB14/	Website consult on 2009/02/19: http://www.renabio.org.br/arquivos/p_poder_lignocelulosicos_11107.pdf
/WEB15/	Website consult on 2009/02/19: http://cdeam.ufam.edu.br/artigos/resumo%20expandido%20pioneiras_alterado1.pdf
/WEB16/	Website consult on 2009/02/19: http://www.ibge.gov.br/estadosat/temas.php?sigla=pa&tema=extracaovegetal2007
/WEB17/	Website consult on 2009/02/19: http://www.ibge.gov.br/estadosat/temas.php?sigla=pa&tema=pamclo2007
/WEB18/	Website consult on 2009/02/19: http://www.cetem.gov.br/publicacao/serie_anais_I_jpci_2007/Roberta_Gaidzinski.pdf
/WEB19/	Website consult on 2009/02/19:

Reference	Document
	http://www.feagri.unicamp.br/energia/agre2004/Fscommand/PDF/Agren er/Trabalho%2059.pdf
/WEB20/	Website consult on 2009/02/19: http://minhasfrutas.blogspot.com/2008/12/importancia-economica-do-aai.html
/WEB21/	Website consult on 2009/02/19: http://www.renabio.org.br/arquivos/p_avaliacao_energia_8340.pdf
/WEB22/	Website consult on 2009/02/19: http://www.belem.pa.gov.br/semma/paginas/Lei-5_887.htm
/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

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.

Reference	Document
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
/KP/	Kyoto Protocol (1997)
/CONAMA 279/	Resolution CONAMA 279 (2001) – Environmental National Board
/VCS/	Voluntary Carbon Standard Program Guideline 2007.

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
/DNPM/	http://www.dnpm.gov.br	National Department of Mineral Production

Table 5-4: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Mr. Francisco Valdir – <i>Cenol</i> and <i>Telha Forte</i> Ceramics' owner	▪ Desk review findings ▪ General aspects of the project ▪ Project design, Commissioning and implementation

Interviewed Persons / Entities	Interview topics
Ms. Flávia Takeuchi – Cantor CO2e Brasil Ms. Michele Bomback - Cantor CO2e Brasil	▪ 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 interviewed 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)

²⁾ Means of Interview: (Telephone, E-Mail, Visit)