Voluntary Carbon Standard 2007

Validation Report Template

19 November 2007

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Validation Report for Bom Jesus Ceramic Fuel Switching Project	Marco Prauchner – Internal Technical Reviewer
Client:	**Project Title:**
Carbono Social Serviços Ambientais LTDA	Bom Jesus Ceramic Fuel Switching Project, BRAZIL

Summary:

BUREAU VERITAS Certification has made the validation of the Bom Jesus Ceramic Fuel Switching Project, which is a red ceramic industry localized in Paudalho municipality, in the state of Pernambuco, northeast of Brazil. The ceramic industry produces bricks and flagstones, destined mainly for the regional market in Pernambuco.

A brief description of the validation project is that the project activity consists in utilizing sugar cane briquette , Algaroba wood , Eucalyptus wood , native wood with sustainable management plan and wood residues from construction and industries to feed the ceramic's kilns, replacing the use of wood from areas with non sustainable forest management, which did not have any kind of contribution to the level of biodiversity enrichment.

As renewable biomasses, the project activity consists in utilizing sugar cane briquette , Algaroba wood , Eucalyptus wood , native wood with sustainable management plan and wood residues from construction and industries to feed the ceramic's kilns, replacing the use of wood from areas with non sustainable forest management, which did not have any kind of contribution to the level of biodiversity enrichment.

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan (June 2009); ii) follow-up interviews and on site visit (September 2009); iii) resolution of outstanding issues and the issuance of the final validation report and opinion (October, 2009).

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using BUREAU VERITAS Certification internal procedures. The first output of the validation process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in the Validation Report, version 01. Taking into account this output, the project proponent revised its project design document, originating the PD version 04, of September 11th 2009. In summary, it is BUREAU VERITAS Certification's opinion that the project correctly applies the baseline and monitoring methodology AMS-I.E (Switch from Non – Renewable Biomass for Thermal Application by the User) Version 01 from February 01st of 2008 onwards and meets the relevant VCS requirements, and local legislation.

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1. Introduction

This report summarizes the findings of the validation of the project, performed on the basis of VCS criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The validation serves as project design verification and is a requirement of all projects. The validation is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant VCS criteria which 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 a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Voluntary Carbon Units (VCUs).

1.2 Scope and Criteria

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, VCS rules and associated interpretations. The validation is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 VCS project Description

The project activity is the project of Bom Jesus Ceramic, which is a red ceramic industry localized in Paudalho municipality, in the state of Pernambuco, northeast of Brazil. The ceramic industry produces bricks and flagstones, destined mainly for the regional market in Pernambuco.

The fuel utilized in the baseline scenario to cook the ceramic devices was native wood from the Caatinga biome, which is a pioneer practice in the region. This type of wood is considered a non-renewable biomass, once it is not originated in areas with reforestation activities or sustainable management activities.

The Caatinga is an exclusively Brazilian biome and occupies around 844,453 Km², equivalent to around 10% of the territory of the country . Although being rich in natural resources, the Caatinga is one of the most threatened ecosystems on the planet. Its high calorific value causes a major cause of its decline. In a region where the shortage of rivers leads to less access to electric energy, native firewood and charcoal account for thirty percent of the total energy utilized in the industries of the region, which has intensified the local deforestation .

The Caatinga is a biome with a strong propensity to desertification and its deforestation consequently brings forward an increase in this possibility. With the loss of natural vegetation, the exposed soil becomes more susceptible to erosion and salinization. These processes are responsible for changing the system of rivers, which makes the water supply of local communities and family farming scarce.

This fuel switching project activity will reduce the greenhouse gases (GHG) emissions through the substitution of native wood from deforestation activity for renewable biomasses to generate thermal energy.

As renewable biomasses, the project activity consists in utilizing sugar cane briquette , Algaroba wood , Eucalyptus wood , native wood with sustainable management plan and wood residues from construction and industries to feed the ceramic's kilns, replacing the use of wood from areas with non sustainable forest management, which did not have any kind of contribution to the level of biodiversity enrichment.

This project pointed out the possibility to switch non-renewable biomass for renewable biomasses, which was unattractive due to high investments on the adaptation of machineries to work with the new biomasses and other barriers. The ceramic owner considered the income from the commercialization of the carbon credits to become the project activity viable.

The main goal of this project activity is to minimize the negative impacts of the deforestation of the Caatinga biome by discouraging the exploitation of the area through limiting the interested party in acquiring the proper legal documents for the commercialization of the native firewood. Moreover, in opposition to the identified baseline, the project activity will generate thermal energy without stimulating deforestation by using an abundant renewable biomass in the region.

1.4 Level of assurance

The implementation of the project activity will save energy due to the following modifications:

• Use of biomasses with less surface area than wood;

• Insertion of air with the new fuels, increasing the oxygenation;

• Reduction of thermal energy loss since the entrances will be kept closed or connected to the equipments;

• Injection of biomasses controlled by equipments, avoiding surplus of fuel often occurred when using wood.

All of these changes were made taking account the approval of this project in VCS, in order to the ceramic to become able to receive the renewable biomass to be used.

With basis in the assessment of this project, a validation statement expressing a reasonable level of assurance is expressed as follows:

— is materially correct and is a fair representation of the GHG data and,

— was prepared in accordance with the related International Standard on GHG quantification, monitoring and reporting, and to relevant national standards.

2. Methodology

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

Preparations: 2009-09-01 to 2009-09-09

On-site visit: 2009-09-01

Draft Reporting: 2009-10-29

Validation Reporting: 2009-11-05

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 policy validations shall be completed within two years of the project start date, or within 1 year of 19 November 2008, 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, according with contract informed in the last sentence from section 3.1. The signed contract between the parts is prior to the defined date on September 30th 2008.

2.1 Review of Documents

The Project Description of the Bom Jesus Ceramic Fuel Switching Project was assessed against the following criteria, documents and references:

- Approved consolidated baseline and monitoring methodology AMS-I.E (Switch from Non – Renewable Biomass for Thermal Application by the User) Version 01 from February 01st of 2008 onwards;

- Attachment C to Appendix B - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories, version 02;

- Voluntary Carbon Standard 2007.1, November 18th 2008;

- Voluntary Carbon Standard Program Guidelines, November 18th 2008;

- ISO 14064-2, June 2006;

- VCS - Project Description Template, November 19th 2007;

- GHG Project Protocol;

- Clean Development Mechanism – Validation and Verification Manual, EB 44, Annex 3;

We assessed all biomass sources that were being used in the project activity and were considered as follows with respect to the conditions of acceptability of the methodology AMS IE, version 1. The Section 7 of the methodology states that "Biomass is "renewable"1 if any one of the following five conditions is satisfied:

I. The biomass is originating from land areas that are forests where:

(a) The land area remains a forest; and

(b) Sustainable management practices are undertaken on these land areas to ensure, in particular, that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and

(c) Any national or regional forestry and nature conservation regulations are complied with.

II. The biomass is woody biomass and originates from croplands and/or grasslands where:

(a) The land area remains cropland and/or grasslands or is reverted to forest; and

(b) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and

(c) Any national or regional forestry, agriculture and nature conservation regulations are complied with.

III. The biomass is non-woody biomass and originates from croplands and/or grasslands where:

(a) The land area remains cropland and/or grasslands or is reverted to forest; and

(b) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and

(c) Any national or regional forestry, agriculture and nature conservation regulations are complied with.

IV. The biomass is a biomass residue and the use of that biomass residue in the project activity

does not involve a decrease of carbon pools, in particular dead wood, litter or soil organic carbon, on the land areas where the biomass residues are originating from.

V. The biomass is the non-fossil fraction of an industrial or municipal waste.

The demonstration that the project meets at least one of them, and the rationale is given below:

Condition I: The native wood with sustainable forest management plan and Eucalyptus wood;

Rationale: The native wood with sustainable forest management plan fits all the three options above since the area remains a forest due to sustainable management practices that are undertaken with.

The sustainable forest management plan can be organized into three stages: firstly, the division of the property in exploitable areas and areas of permanent preservation that are inaccessible to exploitation. The second stage is the planning of roads that connect the area with the primary roads. In the third stage, the allocated area is divided for exploration in blocks in order to sustain forest exploitation annually.

Condition II: The cashew tree pruning;

Rationale: Residues from cashew trees also fits all the three options above since just residues from the croplands area would be utilized, i.e. the area remains a cropland with the use of the biomass. Moreover, the areas where the cashew trees fallows sustainable management practices, according to is cultivation and harvest techniques, where the pruning of cashew trees is necessary in order to allow an appropriate formation of the tree and maintaining favorable conditions for the next harvest period . This way, in cashew cultivation must be cut undesirable branches of the cashew trees.

Condition III: The elephant grass (but not include into VCU calculus and financial barrier);

Rationale: Currently, elephant grass has been acquiring national importance as biomass to generate thermal energy due to its high productiveness and easy adaptation in almost all climate and soil Brazilian conditions. The elephant grass is 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.

Condition IV: The Algaroba wood

Rationale: The utilization of Prosopis Juliflora is in according with option IV since it is considered a biomass residue due its competitive characteristics. A research made by EMBRAPA , which encompass the States of Pernambuco and Bahia, affirmed that Algaroba is characterized as an invasive exotic plant due to its fast expansion, which causes many environmental impacts . This source stated that there were several centers of Algaroba operation highlighting the San Francisco Basin, which is comprised for many municipalities from the states of Bahia and Pernambuco, including this project region.

Condition V: Sugar cane briquette, sawdust, wood residues from industries and constructions, coconut husk, and glycerin are industries residues coming from large scale reforestation or agro industrial projects.

Rationale: Sugar cane bagasse is generated by industries to produce sugar and alcohol, and is compacted into briquettes in order to generate thermal energy. The wood residues are resulted from construction and industries residues. Eventually, the coconut husk is widely generated due to the utilization of the coconut fruit for several finalities. The glycerin is a waste generated during a stage production of biodiesel.

The most probably scenario in the absence of native wood from deforestation areas would be the use of fuel oil, which is not viable considering its higher prices when compared with other non-renewable biomass. Even though, fuel oil presents a higher Net Calorific Value when compared with non-renewable firewood; the costs with fuel oil are higher because of its expensive prices. Fuel oil presents an average price of 0.895 BRL/kg and the firewood without sustainable forest management used to present an average price of 0.02346 BRL/kg in the baseline scenario. These values lead us to conclude that the price of fuel oil is around 0.000090587 BRL/Kcal as long as the price of this kind of wood is around 0.00000608757 BRL/Kcal according to CAETANO et al (2004) that utilized the Net Calorific Value and the specific gravity of both fuels. The value of price per kcal is acquired through dividing the price per weight (BRL/kg) by the NCV per kg (kcal/kg).

Therefore, the cost with the utilization of fuel oil is higher than the utilization of firewood without sustainable forest management. Besides, the fuel oil requires more technology to be inserted. The conclusion is that the use of fuel oil is not attractive, at all.

Another plausible baseline scenario would be the use of Natural Gas. Although there is distribution/gas pipe in the region , the inconstant distribution of natural gas made the project proponents not to trust in this fuel, as 40% of the natural gas consumed in Brazil proceeds from Bolivia , therefore excluding this possibility.

Therefore, the identified baseline for this project activity is the use of native wood without sustainable forest management, which was used by the ceramic for a long time and has a consolidated delivery system and long term supply assurance. The overall characteristics of the ceramic production are used to obtain the real amount of non-renewable biomass utilized in the baseline scenario.

The monthly consumption of native wood from deforestation activities by the ceramic was around 873.7 m³. According to historical experience of the ceramic, around 61.5% was consumed in the "Tunnel" kiln and 38.5% consumed in the "Hoffman" kiln. Therefore, of a total of 873.7 m³ of native wood utilized at the baseline scenario, 537.3 m³ (or 433.7 tons) would be utilized at the "Tunnel" kiln, and 336.3 m³ (or 271.5 tons) would be utilized at the "Hoffman" kiln.

Before the project activity, the Ceramic's monthly production was about 2,026,627 ceramic devices per month. Each kiln was responsible for producing 50% of Bom Jesus Ceramic production. Thus, 1,013,313 ceramic pieces are produced at the "Tunnel" kiln, and 1,013,313 ceramic pieces are produced at the "Hoffman" kiln.

Eventually, these values lead to an efficiency of 0.4279 tons of native wood to produce a thousand of ceramic pieces at the "Tunnel" kiln, and 0.2679 tons of native wood to produce a thousand of ceramic pieces at the "Hoffman" kiln.

The efficiencies of Bom Jesus' kilns are more efficient than average efficiency for "Hoffman" and "Tunnel" kilns . These values were not expected due to the lack of technology in the region and the indiscriminate use of the native wood without sustainable forest management. Furthermore, the "Tunnel" kiln is connected with the driers, thus the heat generated in the kiln is reused by forwarding to the dryers, leading to a lower efficiency.

If afterwards, the production in the ceramic industry rises, it will be reported in the monitoring report.

The efficiency of the kilns are less efficient than average for the “Hoffman” and “Tunnel” kilns. These values are discrepant because of the lack of technology in the region, and the indiscriminate use of the native wood without sustainable forest management.

The ceramic is located in the Municipality of PAUDALHO in the state of Pernambuco which is indicated in Figure 1. The project site has the following postal address and geographical coordinates:

Engenho Belém, without number.

PAUDALHO – Pernambuco, Brasil

Zip Code: 55.825-000

Ceramic’s Boundaries Coordinates (measured through GPS):

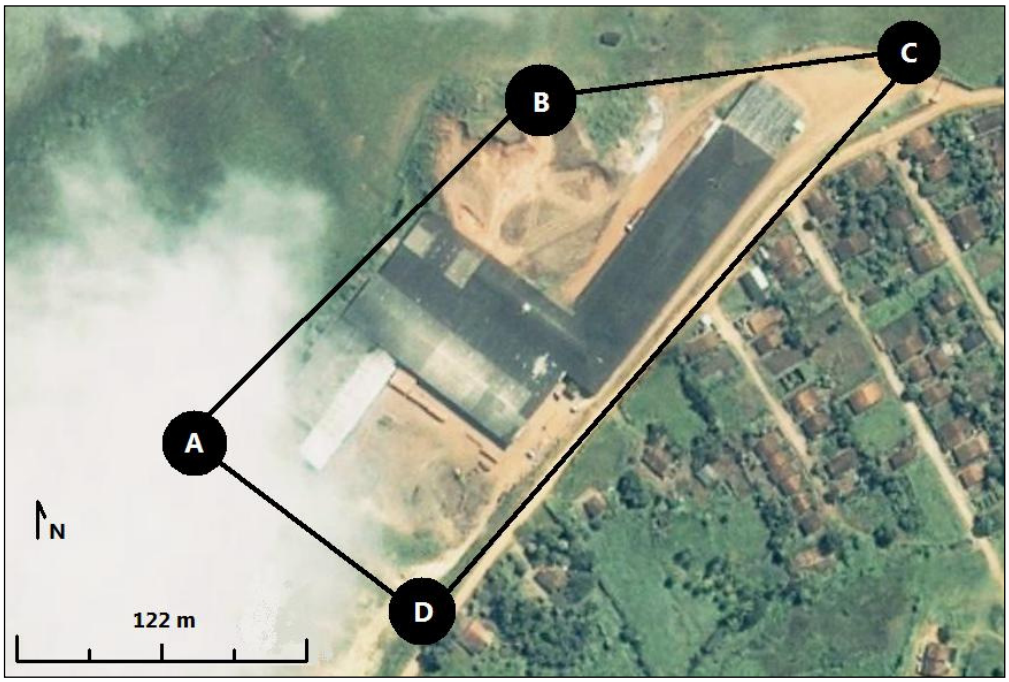
A: 7º53’35” S, 35º11’24” W;

B: 7º53’35” S; 35°11’21” W;

C: 7º53’32” S; 35º11’22” W;

D: 7º53’30” S; 35º11’17” W.

Figure 1. Bom Jesus Ceramic’s boundaries:



Furthermore, the project activity will annually generate less than 45 MWthermal.

It was conduced a document desk review and a site visit, regarding the assessment of relevant points of the project activity, as:

- The project details as per VCS PD template;

- Appropriateness of methodology applied;

- Compliance with relevant laws and regulations;

- Correctness of application of baseline and monitoring methodology;

- Demonstration of additionality;

- Monitoring plan;

- Stakeholder comments;

- Other information related to the project activity, as IPCC emission factor and NCVs where applicable;

The background documents are provided by the project participants, and the complete list of them is available in Section 5. References Validation Report.

2.2 Follow-up Interviews

On September 10st, 2009, Bureau Veritas Certification performed interviews with persons of Bom Jesus Ceramics Industries and Social Carbon Ltda, related to project specific questions and emission factor.

Interviewed persons were:

From Bom Jesus Ceramics: Mário Henrique de Mattos e Silva and from Social Carbon: Gabriel Fernandes de Toledo Piza, Marcelo Hector Sabbagh Haddad (Project Design Document writers).

Interviewed persons and interview topics:

Bom Jesus Ceramic's owners and Social Carbon's consultants were interviewed as reported above. The main topics of the interviews are summarized below.

- □ 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

2.3 Resolution of any material discrepancy

During the Validation, no material discrepancies were identified.

3. Validation Findings

3.1 Project design

- Technology used

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 its kilns that nowadays was switched to sugar cane briquette , Algaroba wood , Eucalyptus wood , native wood with sustainable management plan and wood residues from construction and industries. The ceramic will preferably apply the biomasses offered by the provider addressed in the VCS PD, but, in case of lack of providers, it may also employ other renewable biomasses sources as municipal garden's residues and elephant grass, but will be evaluated by the official documents of the VCS on the permission for change or development of a new PD.

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:

Technical Parameters	"Tunnel" Kiln	"Hoffman" Kiln
Features	Continuous with rectangular shape and furnaces in the lateral part of the kiln (7 burning lines with two fuel entrances each).	Continuous with rectangular shape and 78 lines (each line has three fuel entrances). The furnaces are in the upper part of the kiln.
Maximum Temperature	800°	900°
Time of loading	5 minutes	15 minutes
Burning Cycle	21 hours	1 hour and 10 minutes
Time of unloading	5 minutes	15 minutes
Average production per burning cycle	720	2,000
Number of burning cycles per month	1,735	625

- Project duration, crediting time and project start date

According to the Policy Announcement from the VCS Association in 10 September 2008, the VCS definition for project start date is the date the project activity began reducing or removing GHG emissions.

Project Start Date: November 1st, 2006.

The VCS PD version 04 has defined as the crediting period start date: January 1st, 2007.

VCS project crediting period: 10 years, twice renewable.

The event which determined the start date in this project is the changing in the biomass. This was assessed by the DOE, and the receipts of the purchase of renewable biomass at the starting date were available.

- Ownership

    - Proof of title:

    The proof of title is verified by the DOE, by assessing the concession contract and its following Additional Terms, signed between Carbono Social Serviços Ambientais Ltda and Bom Jesus Ceramics.

The Additional Terms from the above concession contract constitute proof of the Bom Jesus Ceramics and Carbono Social Serviços Ambientais Ltda. the right of the revenues of the VCUs.

- Double counting and whether the project participated in another emission trading programme;

The Validation team verified that this project is not creating any other form of environmental credit under any specific programme.

Bom Jesus Ceramic and Carbono Social Serviços Ambientais Ltda. have ownership of the proposed project. Proof of title was submitted to the validation team.

The emission reduction was not double counted.

- Project applicability to the VCS for projects rejected under other GHG programme

The project being submitted has not been rejected under other GHG Programme.

- Whether the project is eligible under the VCS

Bom Jesus Ceramic Fuel Switching Project will be registered as a Voluntary Carbon Standard (VCS) project and facilitate the project implementation with carbon revenue coming from the carbon credits sale. Due to its significant contribution in diminishing carbon emissions and protecting the climate, this project is anticipated to fulfill VCS and qualify for carbon finance.

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 occurs only in the ceramic facility, the validation team assumed that the plant is the end-user for the thermal energy generated.

3.2 Baseline

According to the applied methodology, the project boundary is the physical, geographical areas of the use of biomass or the renewable energy.

In the baseline scenario, there is use of non-renewable biomass to burn ceramic devices in the ceramic's kilns. This practice is responsible to discharge in the atmosphere the carbon that was stored inside of the wood (well-known by a carbon sink).

The common fuels employed and therefore, the baseline candidates are: natural gas, charcoal, wood, other recuperations, diesel oil, fuel oil, liquefied petroleum gas, others from petroleum, piped gas, electricity and others non-specified.

The most probably scenario in the absence of native wood from deforestation areas would be the use of fuel oil, which is not viable considering its higher prices when compared with other non-renewable biomass. Even though, fuel oil presents a higher Net Calorific Value when compared with non-

renewable firewood; the costs with fuel oil are higher because of its expensive prices. Fuel oil presents an average price of 0.895 BRL/kg and the firewood without sustainable forest management used to present an average price of 0.02346 BRL/kg in the baseline scenario. These values lead us to conclude that the price of fuel oil is around 0.000090587 BRL/Kcal as long as the price of this kind of wood is around 0.00000608757 BRL/Kcal according to CAETANO et al (2004) that utilized the Net Calorific Value and the specific gravity of both fuels. The value of price per kcal is acquired through dividing the price per weight (BRL/kg) by the NCV per Kg(kcal/kg) .

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If afterwards, the production in the ceramic industry rises, it will be reported in the monitoring report.

The DOE assessed the project activity, through desk review of the PD, a site visit and analysis of the applicable methodology and related documents.

Due this, the DOE can conclude that:

- The baseline methodology is approved,

- The selected baseline methodology is correct applied,

- The appropriate settings of baseline scenario where adopted,

- Assessment and demonstration of additionality

The methodology applied is Category AMS-I.E.: Switch from Non–Renewable Biomass for Thermal Application by the User – Version 01 from February 01 of 2008 onwards, which is applicable for project activities that avoid greenhouse gas emissions by using renewable biomass in order to generate thermal energy.

Furthermore, the project activity will annually generate less than 45 MWthermal.

The production during the baseline scenario could increase, since there is no lack of non-renewable wood offer. The high devastation rate of Caatinga Biome makes available large amounts of wood.

According to ASPAN, the major industries, mainly the steel, plasterer and ceramic industries are primarily responsible for the use of native firewood as fuel in their productions. Of a total of 844,453 km², it is currently remaining 50% of the local biome, even with 365,000 hectares of annual loss of all the biome.

Therefore, assuming that the deforestation rate maintains constant, the native wood would be enough to ensure the increase in Ceramic Company production for at least the next 30 years, which is over the project activity life-time.

Project additionality is explained according to section 5.8 of the Voluntary Carbon Standard - Specification for the project-level quantification, monitoring and reporting as well as validation and verification of greenhouse gas emission reductions or removals. To demonstrate that the project is additional, the PD used the test 1:

- Test 1 – The project test

    - Step 1: Regulatory Surplus

The project is not mandated by any enforced law, statute or other regulatory framework in Federal, State and Municipal levels in the survey performed.

Legal requirements, as stated by the Constitution of the Federal Republic of Brazil as well as Federal and State Regulations, do not require entrepreneurs, which use raw forest materials as an energy source, to switch from non-renewable biomasses to renewable biomasses. Therefore, the project activity is not a legal obligation, and in accordance with Article 5 of the Constitution of the Federative

Republic of Brazil; moreover, nobody can be forced to follow a course of action if it is not addressed by law.

There are legal requirements constraints regarding the use of non-renewable biomass as exposed in Decree N.5,975 of November 30th,2006. However, it is not enforced namely due to the lack of control.

The consumption of non-renewable biomass by the ceramic industry was related by several authors (NERI, 2003; ALBUQUERQUE et al, 2006; BRASIL, 2001 ; VIANA, 2006 ; CARDOSO, 2008).

Probably, the fuel switch would not be to renewable biomass, once the common practice at the ceramic sector is the use of non-renewable fuel.

- Step 2: Implementation Barriers

The project shall face at least one distinct barrier compared with barriers faced by alternative projects.

- Technological Barrier

As affirmed before, the use of wood from areas without sustainable forest management is a traditional and well-known process, and as a result of the sudden change, a lot of effort from each employee in the ceramic was necessary. The main technological barriers were the non-availability of human knowledge to operate and maintain the new technology, the internal and external logistic modification and the employee's resistance to the new technology.

Before the project activity, the process was noticeably different: non-renewable native wood was delivered in the plant; it was inserted in the kilns by the employees and it was not necessary any machine experience or logistic modification in order to attend the project's needs, e.g. the new biomass must be stored in covered sites and needs to be dried in order to achieve a better burning efficiency.

This ceramic had to acquire a wood shredder and a circular axe in order to cut the bigger pieces of wood and permit their entrance into the kilns. Furthermore, it was acquired nine mechanic burners in order to automatically inject biomasses and air into the kilns.

The operators did not have knowledge of the ideal amount of renewable biomass that was necessary to achieve the correct temperature in the kilns in order to cook the ceramic devices, therefore, acquiring the final product with same quality and maintaining the optimal process as they did when using native wood. As a consequence of this barrier, there were variations in the color of the final ceramic devices, affecting the quality of the products; cracks on the ceramic devices; the explosion of some of them and cracks along the kilns; adding a significant amount of insecurity in production process. A pyrometric system (thermocouples) was installed at the "Tunnel" kiln in order to get a better control of the burning due to the lack of experience with the new fuel.

The employees must be careful not to fill the devices with large amounts of biomass, which can clog the mechanic burner and consequently, cause disorder in the burning process, which was one of the causes of the production losses throughout the adaptation period. Thus, the mechanic burner's feeding has to be gradually done, demanding even more time and labor from the employees.

As a result of the fuel switch, some training courses were required for the staffs in order to clarify new measures linked to the machinery, sustaining the quality of the final product.

Furthermore, there was a lack of infrastructure to utilize the new technology. The northeast region of Brazil is well known for not being updated with new technologies in the Ceramic sector and very resistant to changes or improvements to its work process and general practices. This way, a set of adaptations were necessary, such as adjustments in the kilns' entrances to embed mechanic burners and the logistic with the biomasses, which must be stored in covered sites in order to keep them dry, consequently improving their burning efficiency.

Moreover, the use of new biomasses represented a high risk to the ceramic owner as although there is currently a great amount of these types of biomasses available locally, it is possible the unavailability of the biomasses. It may happen because thermal energy generation through the combustion of renewable biomasses is an innovation in ceramic industry and their future demand (e.g. by other consumers) is not easy to foresee.

This means that Bom Jesus Ceramic had to find the best procedure to handle with the new technology, i.e. the new biomasses, logistic and machines.

All these changes were made counting on this project approval in order to the ceramic become able to receive the biomass to be used. Bom Jesus Ceramic, with this project activity, intends to develop its burning process and its machineries in order to reduce losses.

The ceramic sector is very resistant to changes and improvements in its work process. The modifications required for the fuel switch are an innovation in the region and represent a first step in the sector to revert this situation. This way, it will also stimulate regional development.

- Financial barrier

With the project implementation, the ceramic company had to withstand higher costs rather than if it had continued utilizing non-renewable native wood as fuel. The most important additional costs are related to biomass transportation, once the non-renewable biomass was delivered by lumberjacks and renewable biomass must be acquired from farther distances, increasing the costs with freight.

Furthermore, there are spending with electrical energy and with the equipment maintenance, so the mechanic burners can operate. Besides, due to the implementation of the project activity, the ceramic had to purchase six mechanic burners to automatically inject the biomass with air inside the kilns. The project proponent also acquired thermocouples.

Due to all the above mentioned, the ceramic industry had to deal with higher production costs.

With the project activity's implementation, together with the investments cost, the total spending has increased, as can be verified at the table above. The income from the commercialization of the carbon credits is essential to maintain the fuel switch, as this change needs more resources than previously to maintain operations. This disparity obviously puts the ceramic in a less competitive situation, which would make the fuel switching and the continued use of the needed machinery unfeasible without the existence of the carbon markets.

- Institutional barriers

  - Risks of the project

Since the use of native wood without sustainable management is an established and well-known process, the project activity implementation presents a risk to the project proponent because the use of a new biomass and its machines add a significant amount of insecurity to the production process. This change translates into an extensive period of fiscal vulnerability for the ceramic, since during the reconstruction of the kilns, the production of the ceramic was low. In addition, there was the transition period where the ceramic had lost production due to the adaptation to the use of biomass and to the new machineries.

Furthermore, the ceramic can go through a period in which there is a possibility that there is lack of biomass, representing another risk period.

Since there is no direct subsidy or support from the government for this project, without the income from the commercialization of the carbon credits, the fuel switch at the Bom Jesus ceramic would not be feasible or attractive to the project proponent.

  - Barrier due to the price of the biomass

The thermal energy generation through the combustion of sugar cane briquette, Algaroba wood, Eucalyptus wood, native wood with sustainable forest management plan, wood residues from constructions and industries, and sawdust is an innovation in the ceramic industry. The future demand of these alternative fuels e.g. by other consumers is not easy to foresee. Although there is currently a great amount of these types of biomasses available locally, there is a possibility that the prices would increase as well, especially between harvests periods, when the problem with biomass disposal is mitigated. If the price of the biomass increases, the ceramic company could not repass it, once the company would not have competitive prices in relation to others which did not made the fuel switch.

- Step 3: Common Practice

According to the GHG Protocol for Project Accounting, common practice analysis shall be carried out following:

a. Define the product or service provided by the project activity.

The types of ceramic pieces produced by Bom Jesus Ceramic are: 9x19x19 (8 holes), 9x14x19 (6 holes), 8x19x38 (Economical block), 7x19x19 (4 holes), 12x19x19 (8 holes 12), and 8x19x28 (structural block).

b. Identify possible types of baseline candidates.

The common fuels employed and therefore, the baseline candidates are: natural gas, charcoal, wood, other recuperations, diesel oil, fuel oil, liquefied petroleum gas, others from petroleum, piped gas, electricity, renewable biomass and others non-specified.

c. Define and justify the geographic area and the temporal range used to identify baseline candidates.

Brazil was identified as the geographic area of the baseline candidates because Energy Research Company from Mines and Energy Ministry of Brazil is the most representative and reliable source of information about the ceramic sector and its fuel employed. Furthermore, there was no local data regarding to the ceramic sector and its energy source in the State of Pernambuco. Therefore, data from table above were provided by a reliable source and it was considered 3 years of its historical data, including the most recent available data and the period when Bom Jesus Ceramic did its fuel switch.

d. Define and justify any other criteria used to identify baseline candidates.

The other types of criteria used to identify baseline candidates were the common practice, the costs of fuel and the local availability of technology and fuel.

The criterion common practice was used to identify baseline candidates because if a kind of fuel has already been employed with success in the ceramic sector it is an obvious baseline candidate.

Besides, the fuel cost was criterion once if a kind of fuel has high costs it will discourage the scenario of investing in this type of fuel, for example.

Equally important, the local availability of technology and fuel were pieces of criterion because the lack of technology and fuel in the region excludes them as baseline candidates. An example may be the lack of natural gas distribution in some regions.

There are legal requirements constraints regarding the use of non-renewable biomass as exposed in Decree N.5,975 of November 30th,2006. However, it is not enforced namely due to the lack of control. The consumption of non-renewable biomass by ceramic industry was related by several authors (NERI, 2003; ALBUQUERQUE et al, 2006 ; BRASIL, 2001 ; VIANA, 2006 ; CARDOSO, 2008). This is also observed in other industries as in the production of steel (BRASIL, 2005), which has a much better structure and internal organization when compared with ceramic industries that are generally small and familiar enterprises. BRASIL (2001) suggests that it is important to stimulate the miner sector, especially who are respecting the environment. The incomes from carbon credits can be this incentive which would contribute to avoid the consumption of non-renewable biomass illegally. Therefore laws and regulations will not be considered as criteria to excluded baseline candidates and to constraint the geographical area and temporal range of the final list of the baseline candidates.

The project activity implementation without the carbon credits incomes is a criterion once there was biomass availability.

e. Identify a final list of baseline candidates.

Baseline candidates are the use of:

i. **Wood:** The fuel most employed, which would be the scenario of highest GHG emissions, once its emission factor is the highest according to IPCC 2006 .

ii. **Natural gas:** The Brazilian Energy Balance results showed significant percentage of natural gas consumption especially due to the production of ceramic tiles (used to finish floor or wall). Furthermore, in the case of structural ceramic, the use of natural gas is restricted by the absence of pipes, and its high costs . The risk of lack of offering and higher costs when compared with other fuels discourages the scenario of investing in this type of fuel even in local with piped gas. The distribution of gas is preferentially performed to thermal power plants, increasing the risk of blackout of natural gas.

iii. **Fuel oil:** This fuel is more expensive than wood, however it can be a more probable of substitute of wood than natural gas. The risks involving natural gas distribution are so considerable that PETROBRÁS was offering subsidy to the consumption of fuel oil in spite of natural gas in the State of São Paulo. However, in the baseline scenario, the use of fuel oil is not feasible due to the high costs associated to atomization system required to its burn, which demands frequent maintenance. Moreover, the lack of natural gas at northeast is very common.

iv. **Renewable biomass:** despite the high biomass availability, the main problems concerning the use of renewable biomass are related to the high investments, technological and institutional barrier, mainly the risk of changing for a biomass not consolidated as fuel for ceramic industries.

f. Identify baseline candidates that are representative of common practice (for the project-specific baseline procedure).

In Brazil, the red ceramic devices are produced through an inefficient and traditional process using wood without forest management plan to generate thermal energy technologies . In this industry segment, the use of wood represents about 98% of the total fuel employed, therefore stimulating the increase in Brazilian deforestation and desertification rates. It happens because wood without forest management is offered with lower prices than wood from areas with forest management plan . Furthermore, using non-renewable wood is a simple procedure and well known by the kilns operators.

The native forest without any kind of sustainable forest management plan has always been a source of firewood in the ceramic sector , which seemed inexhaustible, due to the amount generated in the expansion of the agriculture frontier bringing forward environmental impacts, with regard to the degradation of soil, change in the regime of rainfall and consequent desertification.

The ceramic industry sector has practically not evolved compared to the past, mainly due to the simplified techniques of manufacture. Moreover, the major equipments (chiefly kilns) of the production process were not improved significantly. Most of these companies still use non-renewable

wood in their kilns and the drying process occurs naturally, without the utilization of energy. On the other hand, the influence of the market by improvements in this sector is very insignificant .

Thus, the common practice is the use of wood and its non-renewable fraction, which is the fuel most utilized and with less risk associated.

The acquiring of new equipments and the overall costs of the fuel switch represented a risk to the ceramic owner since the baseline practice was already established and well-known by the laborers. The operators did not have the knowledge of the ideal amount of renewable biomass that is necessary to use in order to achieve the correct temperature to cook its ceramic pieces, to acquire the final product with the same quality and to maintain the optimal process as they did when using the non-renewable wood. As a result of the fuel switch, an extensive training course was required for the staff in order to clarify new measures linked to the machinery in order to sustain the quality of the final product.

Therefore, the project activity is not a common practice.

g. Impact of projects approval

Presently, the ceramic industrial segment of the state of Pernambuco is comprised mostly by small industrial units that still use varying technological models. The grand majority of ceramic industries in the region of this project activity use native wood without sustainable forest management as fuel, mainly from Caatinga biome. These industries have some technological restrictions such as the energy exploitation and the efficiency of the machinery.

Brazil is the third major contributor to the carbon dioxide emissions in the year of 2003, though contemporary studies generally place Brazil fourth in the ranking of the countries that emit the most GHGs.

The First Brazilian Inventory of Anthropogenic Greenhouse Gas Emissions – Background Reports indicates that the major source of GHG emissions in Brazil is due to deforestation, mainly occurred in Amazonian (59% of the deforestation) and Cerrado biomes (26%) .

The Caatinga is an exclusively Brazilian biome and occupies 844,453 Km², equivalent to around 10% of the territory of the country . Although being rich in natural resources, the Caatinga is one of the most threatened ecosystems on the planet. Its high calorific value causes a major cause of its decline. In a region where the shortage of rivers leads to less access to electric energy, native firewood and charcoal account for thirty percent of the total energy utilized in the industries of the region, which has intensified the local deforestation . The forecast for 2010 is that it will remain less than 30% of the original area of Caatinga. Currently it is remaining 50% of its original structure .

According to ASPAN , the major industries, mainly the steel, plasterer and ceramic industries are primarily responsible for the use of native firewood as fuel in their productions .

The Caatinga is a biome with a strong propensity to desertification and its deforestation consequently brings forward an increase in this possibility. With the loss of natural vegetation, the exposed soil becomes more susceptible to erosion and salinization. These processes are responsible for changing the system of rivers, which makes the water supply of local communities and family farming scarce.

The Caatinga biome is the fourth largest Brazilian biome. It is located in the northeast portion of Brazil and can be observed in table 11. The flora and fauna of this biome is rich once it shares frontiers with the main Brazilian biomes to its west with Amazonian, to the southwest with Cerrado, and to the southeast with Mata Atlântica. In spite of the size and importance of this biome, the Caatinga is an endangered habitat.

Another relevant issue is how fast deforestation occurs in the Caatinga biome, representing 365,000 ha/year .

Therefore it can be concluded that measures should be taken to preserve this biome and the project activity represents an example that can be followed by other activities.

The party will also implement the Social Carbon Methodology, which was developed by Instituto Ecológica, and focuses on a sustainable development and better social conditions for the communities where it is implemented.

Brazil occupies a top position between the emitters of carbon dioxide, therefore any kind of efforts to change this scenario and take Brazil out of this uncomfortable top position, is willingly received. In addition, the project activity will contribute to the sustainable development of the host country.

Due this explanation, the DOE concluded that the project is additional and the project meets all relevant applicability conditions, as shown in the comments above.

3.3 Monitoring Plan

The party responsible for implementing the monitoring plan will be the owner of Bom Jesus Ceramic. The ceramic owner will also be responsible for developing the forms and registration formats for data collection and further classification. Data monitored will be kept during the crediting period and 2 years after. For this purpose, the authority for the registration, monitoring, measurement and reporting will be Mr. Mário Henrique de Mattos e Silva by Bom Jesus Ceramic. All the monitored parameter will be checked annually as requested in the methodology AMS-I.E. - Switch from Non-Renewable Biomass for Thermal Applications by the User – Version 01 from February 01 of 2008 onwards.

The management structure will rely on the local technicians with a periodical operation schedule during the project. The technical team will manage the monitoring, the quality control and quality assessment procedures.

With the carbon credits income, in order to complement the monitoring of the production of ceramic devices, equipments from Alutal will monitor each burning cycle of the 2 kilns through graphics of the temperature reached in each kiln versus time.

Social Carbon Company will also implement the sustainability report following the Social Carbon methodology, which was developed by Instituto Ecológica and focus in implementing the environmental and social activities within the fuel switching project. Social Carbon follows the Social Carbon Guidelines available at: <http://www.socialcarbon.org/Guidelines/>.

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 DOE concludes that the monitoring methodology is correct applied in this project.

In addition, the Social Carbon Reports will be available at: TZ1/Social Carbon Registry (http://www.tz1market.com/socialpublic.php) once the project is registered.

Data reported in monitoring estimation

Parameters	Description	Units	Origin	Frequency
Qrenbiomass	Amount of renewable biomass	Tonnes	Measured by the ceramic owner	Monthly
Origin of Renewable Biomass	Renewable origin of the biomass	Not applicable	Controlled by the ceramic owner	Annually
PRy	Production of ceramic pieces	Units	Controlled by the ceramic owner	Monthly
Renewable Biomass Surplus	Amount of renewable biomass available	Tonnes or m³	Monitored by articles and database.	Annually
Leakage of Non-Renewable Biomass	Leakage resulted from the non-renewable biomasses	tCO2e	Monitored by articles and database.	Annually
EFprojected fossil fuel	CO2 Emission factor of residual fuel oil	tCO2/TJ	IPCC 2006 Guidelines for National Greenhouse Gas Inventories. Source: <http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf>. Page 2.18. Table 2.3.	Not monitored
NCVbiomass	Net Calorific Value of non-renewable biomass	TJ/tonne of Wood	Bibliography	Not monitored
ρbiomass	Specific gravity of non-renewable biomass	Tonne/m3	Bibliography	Not monitored
***f*NRB,y**	Fraction of biomass (wood) used in the absence of the project activity in year y can be established as non-renewable biomass using survey methods	Percentage	Bibliography	Annually
BFy	Consumption of non-renewable biomass per thousand of ceramic devices produced	tonnes/ thousand of ceramic devices	Data from ceramic owner	Function of PRy

Monitored Parameters

Data / Parameter:	**$Q_{renbiomass}$**
Data unit:	tons per month
Description:	Amount of renewable biomass employed
Source of data to be	Measured by the ceramic owner

<table>
<tr><td>used:</td><td></td></tr>
<tr><td>Value of Data applied for the purpose of calculating expected emission reductions:</td><td>The ceramic owner will preferentially utilize sugar cane briquette, Algaroba wood, Eucalyptus wood, native wood with sustainable forest management plan, and wood residues from constructions and industries in its burning process, as can be verified in the table below.
<table>
<tr><th>Biomass</th><th>Sugar cane briquette</th><th>Algaroba wood</th><th>Eucalyptus wood</th><th>Native wood with sustainable management plan</th><th>Wood resides from construction and industries</th><th>Sawdust</th></tr>
<tr><td>$Q_{renbiomass}$</td><td>54.01</td><td>18.63</td><td>40.19</td><td>341.71</td><td>0.76</td><td>0.19</td></tr>
</table></td></tr>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>The amount of renewable biomass will be monitored in accordance to the weight described in the receipts or invoices from the providers.

It will be utilized the Specific Gravity in order to convert from m³ to ton. The data to be applied are:
<table>
<tr><th>Biomass</th><th>Algaroba wood</th><th>Eucalyptus wood</th><th>Native wood with sustainable management plan</th><th>Wood resides from construction and industries</th></tr>
<tr><td>Specific gravity (tonnes/m³)</td><td>0.76</td><td>0.51</td><td>0.8072</td><td>0.35</td></tr>
</table>
The sources of these data are:

- Native wood with sustainable forest management plan

NASCIMENTO, W. S. A. Avaliação dos Impactos Ambientais Gerados Por Uma Indústria Cerâmica Típica da Região do Seridó/RN; Dissertação (Mestrado em Engenharia Mecânica), Universidade Federal do Rio Grande do Norte, Natal, 2007. Available at: <http://bdtd.bczm.ufrn.br/tedesimplificado//tde_busca/arquivo.php?codArquivo=1239>. Last visit on: July 04th, 2009.

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.

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.

Associação de Plantas do Nordeste. Projeto Madeira. Available at: <http://www.plantasdonordeste.org/madeiras.pdf>.

- Algaroba wood

PEREIRA, J. C. D.; LIMA, P. C. F. Comparação da Qualidade da Madeira de seis Espécies de Algarobeira para a Produção de Energia. Colombo: Embrapa Florestas, 2002. p. 99-107. Available at: <http://www.cnpf.embrapa.br/publica/boletim/boletarqv/bolet45/pag-99_106.pdf>. Last visit on April 28th, 2009.

It was considered the average value of the specific gravities of the</td></tr>
</table>

	species of *Algaroba*. - Sugar cane briquette and sawdust The amount of sugar cane briquette described at the invoices is in tons. - *Eucalyptus* wood IPCC: Intergovernmental Pannel on Climate Change. Orientación del IPCC sobre las buenas prácticas para UTCUTS. Capítulo 3: Orientación sobre las buenas prácticas en el sector de CUTS. Cuadro 3A.1.9-2: Densidade de maderas básicas (D) de troncos (toneladas de materia seca/m³ de volumen recién talado) para especies arbóreas tropicales. Page: 184. It was utilized the specific gravity of *Eucalyptus robusta* at the *América Tropical* column. - Wood residues from constructions and industries SIMIONI, F. J. **Análise diagnóstica e prospectiva da cadeia produtiva de energia de biomassa de origem florestal no planalto sul de Santa Catarina** - Curitiba: UFPR, 2007. 132p.: il. - Available at: <http://dspace.c3sl.ufpr.br/dspace/handle/1884/10294>. Last visit on: May 5th, 2009. It was utilized the average value of the specific gravity for wood chips.
QA/QC procedures to be applied:	It will be rechecked according to the receipts of purchase.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter:	**PRy**
Data unit:	Unity of ceramic devices per month
Description:	Production of ceramic devices
Source of data to be used:	Controlled by the ceramic owner
Value of Data applied for the purpose of calculating expected emission reductions:	2,026,627
Description of measurement methods and procedures to be applied:	The amount was acquired by counting the average production of one year before the project start date (from November, 2005 to October, 2006). The production was calculated through the financial transactions of the ceramic.
QA/QC procedures to be applied:	The ceramic has an internal control of the quantity of pieces produced. It will be rechecked according to the biomass employed and the kiln consumption of renewable biomass.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter:	**Origin of Renewable Biomass**
Data unit:	Not applicable
Description:	Renewable origin of the biomass
Source of data to be used:	Controlled by the ceramic owner
Value of Data applied for the purpose of calculating expected emission reductions:	Renewable biomass

Description of measurement methods and procedures to be applied:	This information will be given by the biomasses providers. The guarantee of acquiring renewable biomass will be achieved by invoices from the providers. As stated in the section 2.2, the biomasses (sugar cane briquette, *Algaroba* wood, *Eucalyptus* wood, native wood with sustainable forest management plan, constructions residues, and sawdust) are considered renewable as fulfilling the options described in the methodology applied.
QA/QC procedures to be applied :	The biomass will be considered as renewable if it is according to the definition given by the methodology applied. Furthermore, documents proving the origin of renewable biomass from forested resources will be provided.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter:	**Leakage of non-renewable biomass**
Data unit:	tCO2e
Description:	Leakage resulted from the non-renewable biomass
Source of data to be used:	Monitored
Value of Data applied for the purpose of calculating expected emission reductions:	0
Description of measurement methods and procedures to be applied:	The three sources of leakages predicted in methodology applied will be monitored. Scientific articles, official statistical data, regional and national surveys will be provided in order to ensure that there is no leakage from non-renewable biomass (or to estimate the leakage).
QA/QC procedures to be applied :	Data available regarding the ceramic industry fuel consumption will be employed to monitor the leakage.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter:	**Renewable biomass surplus**
Data unit:	ton or m³
Description:	Amount of renewable biomass available
Source of data to be used:	Monitored

Value of Data applied for the purpose of calculating expected emission reductions:

Biomass surplus	Surplus	Year
Cashew tree pruning in tonnes	82,875	2007
Wood residues from construction and industries in tonnes	749,839	2006
Coconut husk in tonnes	6,700,000	2006
Sugar cane bagasse in tonnes	2,209,479	2007
Native wood with sustainable forest management plan in m³	519,558	2007
Algaroba wood in m³	2,500,000	2007
Eucalyptus wood in m³	13,259,341	2007
Sawdust in m³	2,917,055	2007

	<table><tr><td>Glycerin in m³</td><td>129,370</td><td>2008</td></tr><tr><td>Elephant Grass</td><td>Not measured</td><td>-</td></tr></table> Detailed information in section 4.1 – LEAKAGE
Description of measurement methods and procedures to be applied:	It will be used to calculate the leakage of renewable biomass. The sources of leakages predicted in methodology applied will be monitored. The measurement of the leakage will be based in national and international articles and databases every monitoring period. These sources will provide information about the biomass availability in the project activity's region.
QA/QC procedures to be applied :	Data available regarding the ceramic industry fuel consumption will be employed to monitor the leakage.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter:	$f_{NRB,y}$
Data unit:	Fraction of biomass or (percentage).
Description:	Fraction of biomass (wood) used in the absence of the project activity in year y established as non-renewable biomass using survey methods. It was also discounted the amount of wood saved by similar projects in the same biome.
Source of data used:	Survey methods
Value of Data applied for the purpose of calculating expected emission reductions:	0.996 or 99.6%
Description of measurement methods and procedures actually applied :	Before the project activity, wood from areas without forest management was offered with low prices and high viability to the ceramics owner. Thus, the totality of fuel employed in the baseline scenario is from non-renewable origin. However, according to Klink (2005), the *Caatinga* Biome has only 0.11% of its total area with sustainable use. According to a research made by Brazilian Environmental Ministry, there are around 20m³ of wood per hectare in *Caatinga* biome. Thus, the amount of non-renewable wood available at *Caatinga* biome is around 1,471,979m³. It was made two sheets in order to calculate the amount of wood consumed. The first one encompasses the amount of wood consumed by the ceramics located at the *Caatinga* biome. The other sheet calculates the amount of wood consumed regarding only *Bom Jesus* Ceramic. Dividing these values by the total of wood available, it was achieved the amount of renewable biomass that has been saved by all the project activities or only by *Bom Jesus Ceramic Fuel Switching Project*, respectively. Afterwards, summing each value with the Sustainable use areas defined by Klink (2005), it was acquired two fraction of renewable biomass. Finally, each value was subtracted from 100% to achieve the *f*NRB,y. Therefore, it was taken the smaller value in order to be more conservative. These sheets are available at the VCU Estimative spreadsheet.
QA/QC procedures to be applied :	The monitoring of this parameter will be based in national and international articles and database. The source provided information about the sustainable use of *Caatinga* biome. Wood saved from projects with same biome and applied methodology developed by *Carbono Social Serviços Ambientais LTDA* was

	considered in this fraction. CDM or VCS registered projects will also be included in this fraction if placed in the same region and methodology.
Any comment:	It will be employed in order to estimate the amount of non-renewable biomass. Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Fixed Parameters

Data / Parameter:	**$EF_{projected\ fossil\ fuel}$**
Data unit:	tCO_2/TJ
Description:	CO2 Emission factor of residual fuel oil
Source of data used:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories. Source: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf. Page 2.18. Table 2.3. Visited on March 27th, 2009.
Value of Data applied for the purpose of calculating expected emission reductions:	77.4
Description of measurement methods and procedures actually applied	In the baseline scenario, the probable fossil fuel that would be consumed in the absence of native wood without sustainable forest management would be the heavy oil. This fuel is more expensive than wood, however it can be a more plausible of substitute of wood than natural gas due to risks involving natural gas distribution.
QA/QC procedures to be applied :	The fossil fuel likely to be used by similar consumers is taken the IPCC default value of residual fossil fuel.
Any comment:	Applicable for stationary combustion in the manufacturing industries and construction.

Data / Parameter:	**$NCV_{biomass}$**
Data unit:	TJ/Ton of wood
Description:	Net Calorific Value
Source of data used:	Brazilian study carried out with *Caatinga* wood utilized at the ceramic sector: NASCIMENTO, W. S. A. Avaliação dos Impactos Ambientais Gerados Por Uma Indústria Cerâmica Típica da Região do Seridó/RN; Dissertação (Mestrado em Engenharia Mecânica), Universidade Federal do Rio Grande do Norte, Natal, 2007. Available at: <http://bdtd.bczm.ufrn.br/tedesimplificado//tde_busca/arquivo.php?codArquivo=1239>. Last visit on: July 04th, 2009.
Value of Data applied for the purpose of calculating expected emission reductions:	0.0159
Description of measurement methods and procedures actually applied	This value will provide the energy generated by the amount of wood that would be used in the absence of the project. The species used to calculate the average value are typical trees of *Caatinga* Biome that are usually employed as fuel in the ceramic industries of the region. Some sources of data used provide the Gross Calorific Values (GCV) of the *Caatinga* species. In order to transform the GCV to NCV, it was utilized the equation which is available at the VCU Estimative spreadsheet. IPCC default values shall be used only when country or project specific data are not available or difficult to obtain, according to "Guidance on IPCC default values" (Extract of the report of the twenty-fifth meeting

	of the Executive Board, paragraph 59).
QA/QC procedures to be applied :	It was included species that are usually employed as fuel from *Caatinga* Biome in the ceramic sector according to "NASCIMENTO, W. S. A." These species present such good characteristics in order to be applied as fuel in the ceramic kilns.
Any comment:	

Data / Parameter:	$\rho_{biomass}$
Data unit:	tonne/ m³
Description:	Specific gravity of non-renewable wood
Source of data used:	Brazilian study carried out with *Caatinga* wood utilized at the ceramic sector: NASCIMENTO, W. S. A. **Avaliação dos Impactos Ambientais Gerados Por Uma Indústria Cerâmica Típica da Região do Seridó/RN**; Dissertação (Mestrado em Engenharia Mecânica), Universidade Federal do Rio Grande do Norte, Natal, 2007. Available at: <http://bdtd.bczm.ufrn.br/tedesimplificado//tde_busca/arquivo.php?codArquivo=1239>. Last visit on: July 04th, 2009. 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. 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. Associação de Plantas do Nordeste. Projeto Madeira. Available at: <http://www.plantasdonordeste.org/madeiras.pdf>.
Value of Data applied for the purpose of calculating expected emission reductions:	0.8072
Description of measurement methods and procedures actually applied	The amount of wood used in the baseline was measured by volume units, so this data is used to the unity conversion. The species used to calculate the average value are typical trees of *Caatinga* Biome that are usually employed as fuel in the ceramic industries of the region.
QA/QC procedures to be applied :	It was included species that are usually employed as fuel from *Caatinga* Biome in the ceramic sector according to "NASCIMENTO, W. S. A." These species present such good characteristics in order to be applied as fuel in the ceramic kilns.
Any comment:	

Data / Parameter:	**BFy**		
Data unit:	Tonnes of wood per thousand of devices		
Description:	Consumption of non renewable biomass per thousand of ceramic devices produced in year y		
Source of data used:	Historical data from ceramic owner		
Value of Data applied for the purpose of calculating expected emission reductions:	**BFy**	**"Tunnel" kiln**	**"Hoffman" kiln**
	(tons/thousand of pieces)	0.4279	0.2679
Justification of the	The value was acquired through the average consumption and		

choice of data or description of measurement methods and procedures actually applied	production of ceramic devices during the years when the ceramic used to consume non-sustainable wood. This value is in accordance with the data acquired in other ceramics that utilize the same types of kiln in the region. If nowadays *Bom Jesus* ceramic still used native firewood, its ceramic consumption would be around 705.2 tons of native firewood (or 873.7 m³) per month to produce 2,026,627 ceramic pieces. The value is utilized to calculate the real amount of wood displaced to maintain the ceramic production in the baseline scenario.
QA/QC procedures to be applied :	Of a total of 705.2 tons of native wood utilized at the baseline scenario, 61.5% (or 433.7 tons) would be utilized at the "Tunnel" kiln, and 38.5% (or 271.5 tons) would be utilized at the "Hoffman" kiln. Moreover, of a total of 2,026,627 ceramic pieces produced per month, 50% are produced at the "Tunnel" kiln, and 50% are produced at the "Hoffman" kiln. Thus, the production at each kiln reaches 1,013,313 pieces per month. Eventually, these values lead to an efficiency of 0.4279 tons of native wood to produce a thousand of ceramic pieces at the "Tunnel" kiln, and 0.2679 tons of native wood to produce a thousand of ceramic pieces at the "Hoffman" kiln. *Bom Jesus* Ceramic's kilns are more efficient than average for a "Hoffman" and "Tunnel" kiln.. These values were not expected because of the lack of technology in the region, the indiscriminate use of the wood causing it surplus.
Any comment:	

3.4 Calculation of GHG Emissions

This category comprises small thermal appliances that displace the use of non-renewable biomass by introducing new renewable energy end-user technologies. The project's emissions from the combustion of native wood are accounted in the same way as fossil fuel combustion, once it is not renewable and emits CO2.

Baseline

According the methodology AMS IE, Version 1, the baseline is calculated according the formula:

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

Where:

ER_y: Emission reductions during the year y in tCO2e

B_y: Quantity of biomass that is substituted or displaced in tons

$fNRB_{,y}$: Fraction of non-renewable biomass (wood) used in the absence of the project activity in year y

$NCV_{biomass}$: Net calorific value of non-renewable biomass in TJ/ton

$EF_{projected\ fossil\ fuel}$: Emission factor for the projected fossil fuel consumption in the baseline in tCO_2e/TJ .

B_y is determined using the following option: calculated through the product of the number of appliances multiplied by the estimate of average annual consumption of biomass per appliance.

$$B_y = PR_y \times BF_y$$

Where:

PR_y = Number of ceramic pieces produced per month;

BF_y = Tons of wood per thousand of pieces produced.

The exactly production (PR_y) will be monitored by the financial transactions of the ceramic.

The value of BF_y was determined through historical consumption of non-renewable biomass by the ceramic. It was calculated by dividing the monthly consumption at the baseline from the monthly production at the baseline, in thousands.

The Appropriateness of the source was considered satisfactory and validated by validation team. The option "a" was used to identify the Calculation as the product of the number of appliances multiplied by the estimate of average annual consumption of biomass per appliance (tonnes / year). This was derived from historical data or estimated using survey methods.

All sources and calculations have shown themselves conservative, according to the license to operate the environmental agency and validated by validation team. All assumptions data and documents have been reflected in the planned results VCP PD.

The table below shows the estimated Emission reductions during the crediting period. Monitoring period from 2007 to 2016, ie 10 years of the crediting period. The annual average of estimated emissions reductions for the 10 years of crediting period is 10.370 tCO2

Emission reductions estimate during the crediting period

Year	Emission Reductions (tCO_2e)
2007	10,370
2008	10,370
2009	10,370
2010	10,370
2011	10,370
2012	10,370
2013	10,370
2014	10,370
2015	10,370
2016	10,370
Total Emission Reductions (tCO_2e)	**103,700**
Number of years of the crediting period	10
Annual average of estimated emissions reductions for the 10 years of crediting period (tCO_2e)	10,370

The DOE concludes that the formulas and factors used are correct and transparent and the assumptions made for estimating GHG emission reductions are correct.

3.5 Environmental Impact

As can be observed in table 17 from VCS PD item 05, the only negative impact identified is that the project activity will generate ashes due to the burning of the biomass, but this impact will be mitigated by incorporating the ashes into the clay mixture used as thermal insulator in the kilns entrance. In addition, they also use the ashes as fertilizer in the crops next to the Ceramic.

The burning of the new biomasses also emits particulate material and CO2, as well as when using wood. However, the emission reductions of GHG will improve since they are renewable biomasses.

If utilized by the ceramic industry, the combustion of glycerin would need to have special precautions. Beyond the storage tank and pipelines must be correctly built in order to prevent leakages, the glycerin would be only injected into the kilns once the temperature would reach 280ºC. It happens because when glycerine is burned, the reaction has a product named acrolein, which is toxic. However, acrolein is unstable and flammable at higher temperatures. Thus, burning glycerine at temperatures higher than 280°C avoids the emission of acrolein.

This way the project does not cause any additional negative impacts as all generated energy is a result of the best and unique exploitation of the natural resources available. On the other hand, the project activity will improve the local environmental conditions by establishing proper treatment for the renewable biomasses and also by contributing to the reduction of the deforestation rate.The operating permit and its conditions were aware

The Validation team had access to the Operational License, them conditionings, and the data related of its emissions, and validity.

Operation License (LO) # 03211/2008

• Signed on: September 12th , 2009

• Valid until: September 12th , 2010

The other consideration are that the negative impact identified is that the project activity will generate ashes due to the burning of the biomass, but this impact will be mitigated by incorporating the ashes into the clay mixture used as thermal insulator in the kilns entrance.

The burning of the new biomasses also emits particulate material and CO2, as well as when using wood. However, the emission reductions of GHG will improve since they are renewable biomasses.

This way the project does not cause any additional significant negative impact, because all the generated energy results from the best and unique exploitation of the natural resources available. On the other hand, the project activity will improve the local environmental conditions by establishing proper treatment for the renewable biomasses and also by contributing to the reduction of the deforestation rate.

3.6 Comments by stakeholders

The main stakeholders considered in this project are the ceramic industry labour union (SINDICER) and the ceramic company employees. A letter was sent to the stakeholders informing about the project. In the ceramic's facilities, the letter was posted on the employees' board which is a visible place with high circulation of employees. The letter was available during 7 days and the comments were expected for a period of 7 days after the letter has been posted.

In addition, having the ceramic sector association being aware of the project, other local stakeholders were consulted about the proposed project activities, because the ceramic sector association has great visibility trough different parts of the community, public entities on different levels, like Municipality, State and Federal organizations. This consultation process was by sending a registered letter with a receipt advice.

The ceramic sector association keeps relationships to local developing agencies, like SEBRAE (Brazilian Service to support Micro and Small size companies), SENAI (Brazilian Service to support technically Manufacturing Companies), among others so it will help in the diffusion of project results and practices.

Stakeholders of the project have been described above, however but until the end of VCS PD, no comments were received.

4. Validation conclusion

Bureau Veritas Certification has performed the Validation of "Bom Jesus Ceramic Switching Fuel Project", which is a red ceramic industry localized in Paudalho municipality, in the state of Pernambuco, northeast of Brazil. The ceramic industry produces bricks and flagstones, destined mainly for the regional market in Pernambuco.

The validation was performed on the basis of VCS criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases:

i. A desk review of the project design and the baseline and monitoring plan (September 2009);

ii. Follow-up interviews and on site visit (October 2009);

iii. The resolution of outstanding issues and the issuance of the final validation report and opinion (October 2009).

Project participants used the latest requirement from VCS. In line with this tool, the PD provides analysis of investment and prevailing barriers to determine that the project activity itself is not the baseline scenario.

By generating energy using renewable biomass, the project is likely to result in reductions of GHG emissions partially displacing the energy that would have been generated using fossil fuels. An analysis

of the investment barrier demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions. The review of the Project Description (Version 01 dated August 17th, 2009) and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. The Project Description was subsequently revised as Version 04 dated September 11th 2009 to solve the issues that rise during the interviews and subsequent interactions.

In our opinion, the project correctly applies and meets the relevant VCS requirements. The validation is based on the information made available to us and the engagement conditions detailed in this report.

São Paulo, November 11th 2009

Eduardo J. L. Galvão
Validation Team Leader

Marco Prauchner
Internal Technical Reviewer

5. References

Documents provided by the company that relate directly to the GHG components of the project.

i. PD Bom Jesus Ceramic Fuel Switching Project, version 01, of August 17th, 2009.

ii. PD Bom Jesus Ceramic Fuel Switching Project, version 02, of September 10th, 2009.

iii. PD Bom Jesus Ceramic Fuel Switching Project, version 03, of October 21th, 2009.

iv. PD Bom Jesus Ceramic Fuel Switching Project, version 04, of November 11th, 2009.

v. - Approved consolidated baseline and monitoring methodology AMS-I.E (Switch from Non – Renewable Biomass for Thermal Application by the User) Version 01 from February 01st of 2008 onwards;

vi. VCS PD Template – November 19th,2007;

vii. VCS Validation Report Template – November 19th,2007;

viii. Calculation Excel Spreadsheets;

ix. Attachment C to Appendix B - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories, version 02;

x. Voluntary Carbon Standard 2007.1, November 18th 2008;

xi. Voluntary Carbon Standard Program Guidelines, November 18th 2008;

xii. ISO 14064-2, June 2006;

xiii. GHG Project Protocol;

xiv. Clean Development Mechanism – Validation and Verification Manual, EB 44, Annex 3;

xv. Operation License (LO) # 03211/2008, Renewed on: September 12th, 2010;

xvi. Financial Demonstrations and Calculations and Invoices.

xvii. Annex 18, EB 23 from UNFCCC;

xviii. Receipts of renewable biomass purchases since project start date and receipts of equipments purchases to the project activities;

xix. The concession contract and its following Additional Terms, signed between Carbono Social Serviços Ambientais Ltda and Bom Jesus Ceramics

6. Verifiers' CV's

Bureau Veritas Certification Leader GHG Verifier and GHG Verifier

Eduardo J. L. Galvão – Is graduated in Mechanical engineer production with experience in Quality and Environmental management in mechanical, plastic and chemical industries. He is ISO 9001:2008 and ISO 14001:2004 Lead Auditor and has also experience in the implementation of Environmental Management Systems. Eduardo is qualified as Verifier GHG – Green House Gases.

Antonio Daraya – is graduated in Chemical Engineering with a very large experience in Industrial and Environmental management in several industrial fields. He is ISO 9001:2008, ISO 14001:2004 and OHSAS 18001 Lead Auditor and has also experience in the implementation of Quality and Environmental Management Systems. Antonio is qualified as Lead Verifier GHG – Green House Gases.Bureau Veritas Certification GHG Verifier

Ricardo Fontenele – Is graduated in Mechanical engineer with in Quality, Environmental and Health and Safety management in mechanical, plastic and chemical industries. He is ISO 9001:2008, ISO 14001:2004 and OHSAS 18001 Lead Auditor and has also experience in the implementation of Quality and Environmental Management Systems. Ricardo is qualified as Verifier GHG – Green House Gases.

Bureau Veritas Certification, Finance Specialist

Bernardo Aleksandravicius - Bernardo Aleksandravicius is graduated in Business Administration with a very expressive experience in valuation of new projects in the electrical and technology sectors; Equity analyst with focus on the consumer staples, consumer discretionary, technology and telecommunications sectors for many companies in Brazil.

Bureau Veritas Certification, Internal Technical Reviewer

Marco F. Prauchner – is graduated in Mechanical Engineering with experience in Quality and Environmental management in mechanical, plastic and chemical industries. He is ISO 9001:2008 and ISO 14001:2004 Lead Auditor and has also experience in the implementation of Environmental Management Systems. Marco is qualified as Lead Verifier and Internal technical reviewer to the GHG – Green House Gases.

7. VCS Validation Protocol

TABLE 1 VALIDATION REQUIREMENTS BASED ON THE VOLUNTARY CARBON STANDARD 2007.1

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
1. VCS Program specific issues					
a. Have the project(s) created another form of environmental credit (for example renewable energy certificates)?	VCS	3.1	This project is not creating any other form of environmental credit under any specific program, Social Carbon Methodology is being applied only as a Sustainability tool in association with VCS 2007.1 Standard, in accordance with 1.13 - VCS PD Ceramic Bom Jesus.	OK	Ok
b. If yes, have the project participants provided a letter from the program operator that the credit has not been used and has been cancelled from the relevant programthe?	VCS	3.1	NA	OK	OK
c. Are he VCS PD, monitoring reports, and other documents required under the VCS Program in English?	VCS	3.2	Yes, all the documents are in English.	OK	OK
2. Project level requirements					
a. General requirements					
a. Have the project proponent applied an approved VCS Program methodology or a methodology from an approved GHG Program based on the list of current VCS Program approved GHG Programs and methodologies as set out on www.v-c-s.org?	VCS	5.2	Yes, the methodologies used were: Category AMS-I.E: Switch from Non–Renewable Biomass for Thermal Application by the User – Version 01 from February 1st 2008 onwards.	OK	OK
b. Is the Project Start Date before 1 January 2002? (If yes, a CAR shall be raised as the Project Start Date for non-AFOLU projects for the VCS 2007.1 shall not be before 1 January 2002)	VCS	5.2.1	No, the Project start Date is August 1st 2007 to Bom Jesus Ceramic Fuel Switching Project activities **CL15 -** Clarify the event that defined the start date (to the Project Start Date for non-AFOLU projects for the VCS 2007.1 shall not be before 1 January 2002)	CL15	OK
c. Will this validation be completed within two years of the Project Start Date? If not, was this validation	VCS	5.2.1	Yes, as defined at VCS 2007.1, item 5.2.1 " For non-AFOLU projects, VCS 2007.1 validation shall be	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
contracted before 19 November 2008? (If yes validation shall be completed by 19 November 2009 and proof of contracting prior to 19 November 2008 shall be provided)			completed within two years of the Project Start Date, or shall be completed or contracted before 19 November 2008. In the case of this project, the contract for validation was firstly signed with another DOE, before the above deadline. This situation was considered approved by VCS according to a Social Carbon clarification requested issued by e-mail to VCS and answered on 06th May , 2009		
d. Is the earliest Project Crediting Period Start Date under the VCS 2007.1 28 March 2006 for non-AFOLU projects and 1 January 2002 for AFOLU projects ?	VCS	5.2.1	Yes, the crediting period start date is January 1st, 2007.	OK	OK
e. Does the project reduce GHG emissions from activities that are included in an emissions trading program; or take place in a jurisdiction or sector in which binding limits are established on GHG emissions?	VCS	5.2.1	NA	OK	OK
f. If yes, have the project proponents provided evidence that the reductions or removals generated by the project have or will not be used in the emissions trading program or for the purpose of demonstrating compliance with the binding limits that are in place in that jurisdiction or sector? Such evidence could include: a letter from the program operator or designated national authority that emissions allowances (or other GHG credits used in the program) equivalent to the reductions or removals generated by the project have been cancelled from the program; or national cap as applicable or; purchase	VCS	5.2.1	No.	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
and cancellation of GHG allowances equivalent to the GHG emissions reductions or removals generated by the project related to the program or national cap]					
g. Have project proponents claimed GHG credits from one project under more than one GHG Program? (If yes, a CAR shall be raised, as Project proponents shall not claim GHG credits from one project under more than one GHG Program)	VCS	5.2.1	No.	OK	OK
h. Was this project rejected by other GHG Programs?	VCS	5.2.2	No. Informed that the project was not rejected under any formal GHG reduction or removal program. It is cross-checked the UNFCCC website, list of rejected project activities available on September 9th 2009	OK	OK
i. If yes, have project proponents:	VCS	5.2.2			
i. clearly stated in its VCS PD all GHG Programs for which the project has applied for credits and why the project was rejected? (Such information shall not be deemed commercially sensitive information	VCS	5.2.2	NA	OK	OK
ii. provided the VCS Program validator and verifier, VCS Program project database and VCS Program Registry with the actual rejection document(s) including any additional explanations?	VCS	5.2.2	NA	OK	OK
j. Is this a renewal of the Project Crediting Period?	VCS	5.2.3	No	OK	OK
k. If yes have a VCS Program approved validator determined that the original project baseline scenario(s) and additionality is still valid or has been updated taking account of new data and changed VCS Program requirements where applicable?	VCS	5.2.3	NA	OK	OK
b. Standards and factors					

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
d. Do standards and factors used to derive GHG emission data as well as any supporting data for additionality and baseline scenario(s) meet the following requirements:	VCS	5.5			
i. be publicly available from a reputable and recognised source (e.g. IPCC, publishedGovernment data etc)?	VCS	5.5	No, We confirmed several sources and factors used, but there are still pending as indicated in the CAR10, which should follow the same methodology as used. Refer to **CAR10**	CAR10	OK
ii. be reviewed as part of its publication by a recognised competent organization?			No, Refer to **CAR10**	CAR10	OK
c. Project grouping					
a. Is this a grouped project?	VCS	5.6	No.	OK	OK
b. If yes , was this grouped project described in one VCS PD?	VCS	5.6	NA	OK	OK
c. Does this PD include a description of the central GHG information system and controls associated with the project and its monitoring?	VCS	5.6	NA	OK	OK
i**.** Does the grouped project have one central GHG information system and controls associated with the project and its monitoring?	VCS Guidelines	5.2	NA	OK	OK
ii. Does the organization or project's GHG information system and its controls for sources of potential errors, omissions and misrepresentations, is taking the following into consideration? a) selection and management of the GHG data and information; b) processes for collecting, processing, consolidating and reporting GHG data and information;	ISO 14064.3	4.5	NA	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
c) systems and processes that ensure the accuracy of the GHG data and information; d) design and maintenance of the GHG information system; e) systems and processes that support the GHG information system; f) results of previous assessments, if available and appropriate.					

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
d. What is the sampling carried out by the VCS verifier?	VCS	5.6	NA	OK	OK
e. Have the sampling of a grouped project taken account of any sub groups and associated activities within each sub group?	VCS	5.6	NA	OK	OK
f. Do this project, which intends to apply for the VCS Program VCUs as part of a grouped project also comply with the VCS Program requirements for grouped projects, detailed in the most recent version of the Program Guidelines 2007.1 on www.v-c-s.org?	VCS	5.6	NA	OK	OK
d. Content of the VCS PD					
a. Is the PDD used as a basis for validation prepared in accordance with the latest template and guidance from the VCS?	VCS	5.7	Yes, Voluntary Carbon Standard - Project Description Template based on template from November 19th 2007.	OK	OK
b. Is there a project title?	PD temp	1.1.	Yes, The title is "Bom Jesus Ceramic Fuel Switching Project"	OK	OK
c. Type/Category of the project	PD temp	1.2	Yes, Category AMS-I.E: Switch from Non – Renewable Biomass for Thermal Application by the User – Version 01 from February 01st 2008 onwards.	OK	OK
i. Is it defined whether the project category is part of a GHG program that has been approved by the VCS Board?	PD temp	1.2	Yes. It is cross-checked the UNFCCC website, approved SSC methodologies project activities available on September 9th 2009.	OK	OK
ii. Is it specified if the project is a Grouped project?	PD temp	1.2	Yes, This project is not a grouped projects.	OK	OK
d. Is the amount of emission reductions over the crediting period estimated, including project size? (Micro project: Less than 5,000 tonnes CO2 equivalent emissions reductions per year; Mega Project: More than 1,000,000 tonnes CO2 equivalent emissions reductions per year)	PD temp	1.3	The amount of emission reductions is greater than 5,000 tonnes of CO2 equivalent and less than 1,000,000 tonnes of CO2 equivalent, thus classifying this project under the VCS 2007 size project (micro project, project, mega project). The total estimated Emission Reductions (tones of CO2e) is **203,590** tonnes/10 years.	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
e. Is a brief description of the project provided?	PD temp	1.4	Yes, The project activity is the project of Bom Jesus Ceramic, which is a red ceramic industry localized in Paudalho municipality, in the state of Pernambuco, northeast of Brazil. The ceramic industry produces bricks and flagstones, destined mainly for the regional market in Pernambuco. The fuel utilized in the baseline scenario to cook the ceramic devices was native wood from the Caatinga biome, which is a pioneer practice in the region. This type of wood is considered a non- renewable biomass, once it is not originated in areas with reforestation activities or sustainable management activities. The Caatinga is an exclusively Brazilian biome and occupies around 844,453 Km², equivalent to around 10% of the territory of the country. Although being rich in natural resources, the Caatinga is one of the most threatened ecosystems on the planet. Its high calorific value causes a major cause of its decline. In a region where the shortage of rivers leads to less access to electric energy, native firewood and charcoal account for thirty percent of the total energy utilized in the industries of the region, which has intensified the local deforestation2. The Caatinga is a biome with a strong propensity to desertification and its deforestation consequently brings forward an increase in this possibility. With the loss of natural vegetation, the exposed soil becomes more susceptible to erosion and salinization. These processes are responsible for changing the system of rivers, which makes the water supply of local communities and family	CAR11	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			farming scarce. This fuel switching project activity will reduce the greenhouse gases (GHG) emissions through the substitution of native wood from deforestation activity for renewable biomasses to generate thermal energy. As renewable biomasses, the project activity consists in utilizing sugar cane briquette, Algaroba wood, Eucalyptus wood, native wood with sustainable management plan and wood residues from construction and industries to feed the ceramic's kilns, replacing the use of wood from areas with non sustainable forest management, which did not have any kind of contribution to the level of biodiversity enrichment. This project pointed out the possibility to switch non-renewable biomass for renewable biomasses, which was unattractive due to high investments on the adaptation of machineries to work with the new biomasses and other barriers. The ceramic owner considered the income from the commercialization of the carbon credits to become the project activity viable. The main goal of this project activity is to minimize the negative impacts of the deforestation of the Caatinga biome by discouraging the exploitation of the area through limiting the interested party in acquiring the proper legal documents for the commercialization of the native firewood. Moreover, in opposition to the identified baseline, the project activity will generate thermal energy without stimulating deforestation by using an abundant renewable biomass in the region. **CAR11** - It was not identified the use of sawdust as a		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			renewable biomass in the project, but it was seen during the site visit of ceramic Bom Jesus, using this biomass. For example, in the item 1.9 from VCS PD this biomass was indicated as "…possible renewable biomasses that are available in the region and could be utilized in the future…."		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
f. Is the project location, including geographic and physical information allowing the unique identification and delineation of the specific extent of the project, and including GPS project boundaries, provided?	PD temp	1.5	The ceramic is located in the Municipality of Paudalho in the state of Pernambuco which is indicated in Figure 1 from VCS PD. The project site has the following postal address and geographical coordinates: Engenho Belém, without number. Paudalho – Pernambuco, Brasil Zip Code: 55.825-000 Bom Jesus Ceramic's boundaries: A: 7°53'37" S, 35°11'26" W; B: 7°53'31" S, 35°11'21" W; C: 7°53'31" S, 35°11'16" W; D: 7°53'38" S, 35°11"23" W. Geographic location of the city of the project activity that has the following coordinates in Pernambuco State: Paudalho: 07º53'48" S and 35º10'47" W. **CAR14 –** Not confirmed the coordinates of the Ceramics Unit. GPS was not used, but only approximation in Google earth and does not include the "GPS project boundaries " too. It was cross-checked the following references sources: (all checked on September 09th 2009) 1.OK http://www.ibge.gov.br/home/presidencia/noticias/noticia_visualiza.php?id_noticia=169&id_pagina=1 2.OK http://www.faunabrasil.com.br/sistema/modules/wfsection/article.php?articleid=47 3.OK http://www.bndes.gov.br/conhecimento/seminario/a	CAR14	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			lcool_discussao.pdf 4. http://www.embrapa.gov.br/imprensa/noticias/2002/agosto/bn.2004-11-25.4648301041/ 5. OK http://www.sbs.org.br/atualidades.php 6.OK		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
g. Duration of the project activity/crediting period	PD temp	1.6			
i. Is the project start date, i.e., the date on which the project begun reducing or removing GHG emissions ?	PD temp	1.6	Yes, see below the dates: - Project start date: August,1st 2007; - Date of initiating the project activity: January 1st, 2008; - Date of terminating the project activity: December 31st, 2017; **CL01 –** Please provide evidences about the Project start date and Date of initiating the project activity. It was cross-checked the following references sources: (all checked on September 09th 2009) 7.OK 8.OK 9.OK	CL01	OK
ii. Is the crediting period start date, i.e., the date the first monitoring period commenced, provided? (VCS project crediting period: A maximum of ten years which may be renewed at most two times)	PD temp	1.6	Yes, VCS project crediting period: 10 years twice renewable.	OK	OK
h. Are the conditions prior to project initiation provided?	PD temp	1.7	No. It's necessary to clarify some points: **CL02 -** As described in the project "the use of wood represents about 98% of the total fuel employed.",	CL02 CAR09 CAR10	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			please source of such data. **CAR09 -** Please present proof of consumed amount of wood per year, in accordance with VCU Estimatives file in the *f*NRB,y calculations sheet (informed that Bom Jesus ceramics is 20,580 m3/year) It was cross-checked the following references sources: (all checked on September 09th 2009) It's necessary to check all PD regarding this subject. 8.OK http://www.mme.gov.br/download.do?attachmentId=16555&download 9. **CAR10 -** It's necessary that the project proponent made available to the validation, all supporting information and data needed do evidence statements and data in the VCS PD, for examples: - SEYE, O. Análise de ciclo de vida aplicada ao processo produtivo de cerâmica estrutural tendo como insumo energético capim elefante (Pennisetum Purpureum Schaum). 10.OK http://www.scielo.br/scielo.php?pid=S0103-40142007000100015&script=sci_arttext&tlng=ES 11.OK http://www.mme.gov.br/download.do?attachmentId=16555&download		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			12.Refer to **CAR10.**		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
i. Is a description of how the project will achieve GHG emission reductions and/or removal enhancements provided?	PD temp	1.8	Yes, The emission reductions will be achieved by displacing the use of wood from areas with no sustainable forest management to provide thermal energy in the ceramic company. Therefore, the emissions launched during the combustion of native wood from deforestation activities were not offset by the replanting, which is a carbon absorbance method. An opposite scenario occurs with the renewable biomasses utilized in this project activity, which have carbon neutral cycle.	OK	OK
j. Are project technologies, products, services and the expected level of activity described?	PD temp	1.9	No, it's necessary to answer the following: Bom Jesus Ceramic produces bricks and flagstones. The production process at Bom Jesus Ceramic encompasses one "Hoffman" kiln and one "Tunnel" kiln in order to cook the ceramic devices. The ceramic also has two dryers, in order to dry part of the devices that will be burnt at the "Tunnel" kiln. The heat generated in the "Tunnel" kiln is reused by forwarding to both dryers. The ceramic devices that will be cooked at the "Hoffman" kiln are dried naturally, using ventilators and crystal roof in order to accelerate the drying process. The "Hoffman" kiln has 78 lines, but cooks 23 lines per day, reaching about 1,000,000 pieces monthly. The "Tunnel" kiln cooks 65 cars per day, totalizing about 1,000,000 devices monthly. Each kart has capacity for 720 pieces. Bom Jesus ceramic had to acquire a wood shredder and a circular axe in order to cut the bigger pieces of wood and permit their entrance into the kilns. Furthermore, it	CAR01 CL03 CAR05	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			was acquired six mechanic burners in order to automatically inject biomasses and air into the both kilns. Currently, the fraction of each renewable biomasses utilized are around: sugar cane briquette (11%), Algaroba wood (4%), Eucalyptus wood (9%), native wood with sustainable forest management plan (75%), and wood residues from constructions and industries (1%). In the future, the proportion of these renewable biomasses may change. Probably, the proportion utilized of native wood with sustainable management plan will decrease, comparing with other renewable biomasses. Other possible renewable biomasses that are available in the region and could be utilized in the future by Bom Jesus ceramic are: cashew tree pruning, coconut husk, sawdust, and elephant grass. It was cross-checked the following references sources: (all checked on September 09th 2009) 13. OK 14. OK 15. OK 16. OK 17. OK		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			18. OK **CAR01 -** There are differences between the values of table 03 from VCS PD and validated values in the site visit. A correction is necessary. **CL03 -** The suppliers of biomass are different (checked in the site visit) and not just those listed in the PD, is necessary to clarify this situation in PD, including selection criteria for identifying them, ahead of the requirements process and requirements of applicable legislation **CAR05 -** The fraction indicates in the VCS PD of each renewable biomasses utilized are around: sugar cane briquette (11%), Algaroba wood (4%), Eucalyptus wood (9%), native wood with sustainable forest management plan (75%), and wood residues from constructions and industries (1%) are differents values validated during site visit.		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
k. Does the VCS PD include identification of relevant local laws and regulations related to the project and demonstration of compliance with them?	PD temp	1.10	No, It has been observed the following laws: CONAMA 237, Law 6938, the IBAMA Normative Instruction Nº 112 from August 21st, 2006, the Normative Instruction N° 8, from August 24th, 2004, Article 5 and Article 20 of the constitution, but did not find the compliance to these laws. It's necessary answer the following. **CAR02 -** Applicable laws have not been identified to the biomass used, and have not been described what are the evidences of compliance the law of renewable biomass. **CAR15** – the CPRH state register is not available on the site visit. A proof of this register must to send to the validation team to approval. It was cross-checked the following references sources: (all checked on September 09th 2009) 19. OK http://www.mma.gov.br/port/conama/estr.cfm 20. OK http://www.cprh.pe.gov.br/ 21. OK http://www.cetesb.sp.gov.br/licenciamentoo/legislacao/federal/inst_normativa/2006_Instr_Norm_IBAMA_112.pdf 22. OK http://servicos.ibama.gov.br/ctf/sistema.php?modulo=apl	CAR02 CAR15	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			icacao/modulo&moduloId=392 23. OK http://www.mda.gov.br/saf/arquivos/IN8-2004-MMA.doc 24. OK http://www.dnpm.gov.br/enportal/conteudo.asp?IDSecao=168&IDPagina=222>		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
l. Are risks that may substantially affect the project's GHG emission reductions or removal enhancements idendified?	PD temp	1.11	Yes, there are: - Availability and price of the renewable biomasses; - Availability of the renewable biomasses - Closing of the ceramic business - Difficulty related to the common practice;	OK	OK
m. Is confirmation that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction demonstred?	PD temp	1.12	Yes, The historical of Bom Jesus's activities using non-renewable native wood as fuel clearly confirms that the project was not implemented to create GHG emissions for the purpose of its subsequent removal or destruction. Bom Jesus Ceramic used to feed the kilns with native wood from deforestation activities to generate thermal energy in order to cook ceramic devices. According to historical data from Bom Jesus, the ceramic facilities used to utilize non-renewable native wood from areas without any kind of management since 1986.	OK	OK
n. Has the project created another form of environmental credit (for example renewable energy certificates)?	PD temp	1.13	Informed this project is not creating any other form of environmental credit under any specific program	OK	OK
o. If yes, has the proponent provided a letter from the program operator that the credit has not been used and has been cancelled from the relevant program?	PD temp	1.13	NA	OK	OK
p. Was the project rejected under other GHG programs (if applicable)	PD temp	1.14	Yes, Informed that the project was not rejected under any formal GHG reduction or removal program. It is cross-checked the UNFCCC website, list of rejected project activities available on September 9th 2009	OK	OK
q. If yes, does the project:	PD temp	1.14			
i. clearly state in its VCS PD all GHG programs for which the project has applied for credits and why the project was rejected? (Such information shall not be deemed commercially sensitive information)	PD temp	1.14	NA	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
ii. provide the VCS verifier and Registry with the actual rejection document(s) including explanation?	PD temp	1.14	NA	OK	OK
r. Are project proponents roles and responsibilities, including contact information of the project proponent, other project participants provided?	PD temp	1.15	Yes, some people were evidenced like Project Proponent and other Project Developer.	OK	OK
s. Is any information relevant for the eligibility of the project and quantification of emission reductions or removal enhancements, including legislative, technical, economic, sectoral, social, environmental, geographic, site-specific and temporal information provided?	PD temp	1.16	No, it's necessary to answer **CAR02.** The project is eligible according to: Legislative, Technical, Economic, Sectoral, Social, Environmental, Geographic /site specific and Temporal information. However there is no information relevant for its eligibility which is not already described in this VCS PD.	CAR02	OK
t. Is there any commercially sensitive information that has been excluded from the public version of the VCS PD that will be displayed on the VCS Project Database?	PD temp	1.17	No, none of the information disclosed to the validator was withheld from the public version of the report.	OK	OK
u. If yes, was it listed?	PD temp	1.17	NA	OK	OK
v. Are title and reference of the VCS methodology applied to the project activity and explanation of methodology choices provided?	PD temp	2.1	Yes, the methodologies used were: Category AMS-I.E: Switch from Non–Renewable Biomass for Thermal Application by the User – Version 01 from February 1st 2008 onwards. The amount of non-renewable biomass (By) will be determined according to the option "a" of the applied methodology. The project´s emissions from the combustion of native wood from deforestation areas are accounted in the same way as fossil fuel combustion, once it is not renewable and emits CO_2.	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
w. Does the project use one of the VCS program approved project methodologies and provide information relevant to methodology deviations or methodology revisions?	PD temp	2.1	Yes, refer item v)	OK	OK
x. Are the choice of the methodology and its applicability to the project activity justified?	PD temp	2.2	Yes, but it's necessary clarify **CAR11.** This category comprises small thermal appliances that displace the use of non-renewable biomass by introducing new renewable energy end-user technologies. The end-user technology in the case of this project can be established as the project proponent, who utilizes the thermal energy generated by the new renewable energy technology. There are no similar registered small-scale CDM project activities in the region of Paudalho once Social Carbon Company made a research and did not find any registered small–scale CDM Project activity in the region. The sources of registered small-scale CDM project activity consulted were the United Nations Framework Convention on Climate Change (UNFCCC) and Brazilian's Technology and Science Ministry . Therefore, the proposed project activity is not saving the non-renewable biomass accounted by the other registered project activities. The utilization of firewood from area without any kind of management cannot be considered a renewable source of biomass, since it involves a decrease of carbon pools and increases the carbon emissions to the atmosphere, turning green house effect even worse. Moreover, the native wood provided from areas without a reforestation management plan does not fit any of the options of	CAR11 CL04 CAR10 CL21 CAR04	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			UNFCCC definition of renewable biomass in Annex 18, EB 23. According to historical data from Bom Jesus ceramic industry, the ceramic facilities used to employ non-renewable native wood from areas without any kind of management since 1986. This way, it can be concluded that non-renewable biomass has been used since before 31st December, 1989. Thus, the project activity is in agreement under the methodology applicability requirements, but refer to **CAR04.** The biomasses utilized in the project, sugar cane briquette, Algaroba wood, Eucalyptus wood, native wood with sustainable management plan, constructions residues, and sawdust are common in the region generated. Refer to **CAR11** Biomass is "renewable" if any one of the following five conditions is satisfied but we find various compliance conditions, for example: Condition I: The native wood with sustainable forest management plan and the Eucalyptus wood; Condition II: cashew tree pruning; Condition III: The elephant grass; Condition IV: The Algaroba wood Condition V: Sugar cane briquette, sawdust, coconut husk and wood residues from construction and industries are all industries residues coming from large scale reforestation or agro industrial projects **CL04 -** Please clarify why in the project of Bom Jesus		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			the Eucalyptus wood was considered option I and now, in this project, as option II. It was cross-checked the following references sources: (all checked on September 09th 2009) 25. OK http://cdm.unfccc.int/Projects/registered.html 26. OK http://www.mct.gov.br/index.php/content/view/47952.html 27. OK http://www.manejoflorestal.org/guia/pdf/guia_cap1.pdf 28.Refer to **CAR10.** 29. OK http://www.planalto.gov.br/ccivil_03/LEIS/L4771.htm 30. OK http://www.sbs.org.br/atualidades.php. 31. **CL21 -** This web site from reference 31, are not available.http://www.celso-foelkel.com.br/artigos/Palestras/Silvicultura%20&%20Meio%20Ambiente.%20Vers%E3o%20final.pdf. 32. OK		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			http://www.ipef.br/mct/MCT_03.htm 33. OK http://www.abraflor.org.br/estrutura.asp 34. OK http://www.cepel.br/~per/download/rer/rt-789-00.pdf 35. OK http://www.nordesterural.com.br/nordesterural/matLerdest.asp?newsId=2219 36. OK http://www.mwglobal.org/ipsbrasil.net/nota.php?idnews=3292 37.OK - Embrapa 38.Refer **CAR10.**		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
y. Are GHG sources, sinks and reservoirs identified for the baseline scenario and for the project?	PD temp	2.3	Yes, According to the applied methodology, the project boundary is the physical, geographical area of the use of biomass or the renewable energy. In the baseline scenario, there is use of non-renewable biomass to burn ceramic devices in the ceramic's kilns. This practice is responsible to discharge in the atmosphere the carbon that was stored inside of the wood (well-known by a carbon sink).	OK	OK
z. Is it described how the baseline scenario is identified and discription of the identified baseline scenario?	PD temp	2.4	No, It's necessary answer de following: Identified in the table 6 from item 2.4 the Distribution of fuel employed at the ceramic sector in Brazil in percentage It was cross-checked the following references sources: (all checked on September 09th 2009) **Tab05** - OK http://www.mme.gov.br/download.do?attachmentId=16555&download 39.OK http://www.abcm.org.br/xi_creem/resumos/TE/CRE04-TE01.pdf 40.OK 41.OK http://www.abcm.org.br/xi_creem/resumos/TE/CRE04-TE01.pdf	CAR10	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			42.Refer to **CAR10** 43.OK http://www.ctgas.com.br/template02.asp?parametro=2547 44.OK http://ecen.com/eee51/eee51p/gn_bolivia.htm 45.Refer to **CAR10**		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
aa. Has the project proponent selected the most reasonable baseline scenario for the project?	PD temp	2.4	No. the identified baseline for this project activity is the use of native wood without sustainable forest management, which was used by the ceramic for a long time and has a consolidated delivery system and long term supply assurance. The overall characteristics of the ceramic production are used to obtain the real amount of non-renewable biomass utilized in the baseline scenario. **CAR08 –** the values in the text," of a total of 1,384.3 tons of native wood utilized at the baseline scenario, 61.5% or 851.3 tons would be utilized at the "Tunnel" kiln, and 38.5% or 533 tons would be utilized at the "Hoffman" kiln. Moreover, of a total of 2,011,145 ceramic pieces produced per month, each kiln produces 50% of Bom Jesus Ceramic production", are not validated yet.	CAR08	OK
bb. Does it reflect what most likely would have occurred in the absence of the project?	PD temp	2.4	Yes.	OK	OK
cc. Is it described how the emissions of GHG by source in baseline scenario are reduced below those that would have occurred in the absence of the project activity (assessment and demonstration of additionality)?	PD temp	2.5	No. it's necessary answer the following. It was used the project test. The project activity will annually generate less than 45 MWthermal. The production during the baseline scenario could increase, since there is no lack of non-renewable wood offer. To demonstrate that the project is additional it was be used the test 1. - The project test. It was cross-checked the following references sources: (all checked on September 09th 2009)	CAR10 CAR21	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			46. OK http://www.aspan.org.br/ 47. OK http://www.faunabrasil.com.br/sistema/modules/wfsection/article.php?articleid=47 48. OK http://www.planalto.gov.br/ccivil_03/constituicao/constitui%C3%A7ao.htm 49. OK http://www.grandecpa.com.br/?p=noticia&id_noticia=129 50. Refer to **CAR10** 51. Refer to **CAR10** 52. OK http://www.cgee.org.br/prospeccao/doc_arq/prod/registro/pdf/regdoc710.pdf 53. OK http://www.pep.ufrn.br/publicacoes.php?enviou=1 54. Refer to **CAR10** 55. Refer to **CAR10**		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			56. OK http://www.grandecpa.com.br/?p=noticia&id_noticia=129> 57.Refer to **CAR10** 58. Refer to **CAR10** 59. OK http://www.cgee.org.br/prospeccao/doc_arq/prod/registro/pdf/regdoc710.pdf 60. OK http://www.pep.ufrn.br/publicacoes.php?enviou=1 61. Refer to **CAR10** 62. Refer to **CAR10** 63. OK http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf 64. OK http://www.dep.fem.unicamp.br/boletim/BE31/artigo.htm 65. OK		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			http://www.gasbrasiliano.com.br/institucional/concessao_sp.asp 66. OK http://www2.petrobras.com.br/ingles/ads/ads_Petrobras.html 67. OK http://www.ctgas.com.br/template04.asp?parametro=155 68. Refer to **CAR10** (Brazilian Energy Balance???) 69. OK http://www.nuca.ie.ufrj.br/bgn/bv/abreu2.htm 70. Refer to **CAR10** 71. OK http://www.teses.usp.br/teses/disponiveis/86/86131/tde-14052008-113901/ 72. OK http://biblioteca.universia.net/html_bura/ficha/params/id/597230.html 73. OK http://www.scielo.br/pdf/ea/v19n55/14.pdf 74. OK http://www.mct.gov.br/index.php/content/view/17341.ht		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			ml 75. OK http://www.mct.gov.br/index.php/content/view/21455.html 76. OK http://www.ibge.gov.br/home/presidencia/noticias/noticia_visualiza.php?id_noticia=169&id_pagina=1 77. OK http://www.faunabrasil.com.br/sistema/modules/wfsection/article.php?articleid=47 78. This web site are not available, refer to **CAR21.** http://www.reape.pe.gov.br/not-01-2007.shtml 79. OK http://www.aspan.org.br/ 80. OK http://www.ambienteemfoco.com.br/?p=457 81. OK http://www.ibge.gov.br/home/presidencia/noticias/noticia_visualiza.php?id_noticia=169&id_pagina=1 82. OK http://www.reporterbrasil.org.br/exibe.php?id=553		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
dd. Has the project proponent demonstated, in the VCS PD, in addition to describing how the project meets the VCS methodology, that the project is additional based on one of the tests, the project test, the performance test, and technology test?	PD temp	2.5	Yes, based on test 01 (project test)	OK	OK
ee. Are title and reference of the VCS methodology (which includes the monitoring requirements) applied to the project activity and explanation of methodology choices provided?	PD temp	3.1	Yes, Category AMS-I.E: Switch from Non – Renewable Biomass for Thermal Applications by the User – Version 01 from February 01st 2008 onwards.	OK	OK
ff. Is monitoring, including estimation, modelling, measurement or calculation approaches desbride including:	PD temp	3.2			
i. Purpose of monitoring?	PD temp	3.2	Yes	OK	OK
ii. Types of data and information to be reported, including units of measurement?	PD temp	3.2	Yes, in accordance with table 12 accept ,	OK	OK
iii. Origin of the data?	PD temp	3.2	**CAR12** – It was not described the origin of Datas in the table 12 for the following: - Articles and database from renewable biomass and Leakege; - Bibliography from NCVbiomass, ρbiomass, *f*NRB,y This informations should be included in the VCS PD.	CAR12	OK
iv. Monitoring, including estimation, modelling, measurement or calculation approaches?	PD temp	3.2	Yes, see MR Calculations.	OK	OK
v. Monitoring times and periods, considering the needs of intended users?	PD temp	3.2	Yes.	OK	OK
vi. Monitoring roles and responsibilities ?	PD temp	3.2	Yes. The responsible to monitor data provided in table 12 will be Mrs. Elisângela Maria Carneiro. Internal audit will guarantee data quality. It will be realized by Mr. Joaquim Beltrão Correia de Oliveira, Director of Bom	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			Jesus Ceramic.		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
vii. Managing data quality?	PD temp	3.2	No. The responsibly persons was identified, however the internal audit report of the monitoring period was not verified. **CL06** – Please send a internal audit report of the monitoring was not verified. Please send a copy to the validation time.	CL06	OK
gg. Are data and parameters monitored/selecting relevant GHG sources, sinks and reservoirs for monitoring or estimating GHG emissions and removals described in the tabular form including:	PD temp	3.3			
i. Data unit?	PD temp	3.3	Yes.	OK	OK
ii. Description?	PD temp	3.3	Yes.	OK	OK
iii. Source of data to be used?	PD temp	3.3	Yes.	OK	OK
iv. Value of data applied for the purpose of calculating expected emissions reductions?	PD temp	3.3	Yes, the values were identified in the Monitored Parameters table. It was cross-checked the following references sources: (all checked on September 09th 2009) **$Q_{renbiomass}$** 01 – OK Native wood with sustainable forest management plan - http://bdtd.bczm.ufrn.br/tedesimplificado//tde_busca/arquivo.php?codArquivo=1239 http://www.plantasdonordeste.org/madeiras.pdf 02 - Algaroba Wood - OK	CAR10	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			http://www.cnpf.embrapa.br/publica/boletim/boletarqv/bolet45/pag-99_106.pdf 03 - Sugar cane briquette and sawdust - OK The quantity of sugar cane briquette described at the invoices is in tons. 04 - Eucalyptus wood - **NOK** Refer to **CAR10** 05 - Wood residues from constructions and industries - OK http://dspace.c3sl.ufpr.br/dspace/handle/1884/10294 It was utilized the average value of the specific gravity for wood chips. **Origin of Renewable Biomass** 01 – OK http://www.cnip.org.br/planos_manejo.html **$EF_{projected\ fossil\ fuel}$** 01 - OK http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf $\rho_{biomass}$ 01 - OK http://bdtd.bczm.ufrn.br/tedesimplificado//tde_busca/arquivo.php?codArquivo=1239		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			02 – OK http://www.plantasdonordeste.org/madeiras.pdf It was cross-checked the following references sources: (all checked on September 09th 2009) – references. 83 – OK http://faculty.jsd.claremont.edu/emorhardt/159/pdfs/2006/Klink.pdf 84 - OK 85 - OK		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
v. Description of measurement methods and procedures to be applied?	PD temp	3.3	Yes.	OK	OK
vi. QA/QC procedures to be applied?	PD temp	3.3	Yes, in the Monitored and Fixed Parameters.	OK	OK
vii. Any comment?	PD temp	3.3	Yes.	OK	OK
hh. Is the monitoring plan described?	PD temp	3.4	Yes. It was cross-checked the following references sources: (all checked on September 09th 2009) 86 - OK	OK	OK
ii. Are methodological choices explained?	PD temp	4.1	No. It's necessary answer as following: **CAR03 -** Calculation of Amount of native firewood needed to produce a certain amount of product in tonnes / thousand of ceramic devices (efficiency of the furnaces at baseline - BFy), the production of parts and consumption of non-renewable biomass before the start of the project (baseline), however these values were not validated because the evidence of discrepancies found in the values on site visits. **CAR06 -** Data Production of ceramic devices and Consumption of non renewable biomass per appliance and By, used in the calculation of emission reductions, described in the spreadsheet for monitoring were not validated because the evidence of discrepancies found in the values on site visits. **CAR13 -** Data Amount of renewable biomasses	CAR13 CAR06 CAR03	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			employed in the monitoring period, used in PRy Double check with biomass as described in the spreadsheet monitoring were not validated because the evidence of discrepancies found in the value on site visits. It was cross-checked the following references sources: (all checked on September 09th 2009) 87.OK 88.OK http://www.manejoflorestal.org/guia/pdf/guia_cap1.pdf 89.OK http://www.planalto.gov.br/ccivil_03/LEIS/L4771.htm 90. OK < http://www.cnip.org.br/planos_manejo.html> 91.Refer to **CAR10** 92. Refer to **CAR10** 93. Refer to **CAR10** 94. OK http://www.triangulomineiro.com/noticia.aspx?catNot=59&id=3097&nomeCatNot=Ci%C3%AAncia 95. OK		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			www.cgee.org.br/arquivos/estudo003_02.pdf 96. Refer to **CAR10** 97. Refer to **CAR10** 98.OK 99. OK http://www.embrapa.gov.br/imprensa/noticias/2002/agosto/bn.2004-11-25.4648301041/> 100.OK 101. Refer to **CAR10** 102. OK http://www.embrapa.gov.br/imprensa/noticias/2002/agosto/bn.2004-11-25.4648301041/ 103.OK 104. OK www.ibama.gov.br 105. OK http://www.cpatsa.embrapa.br/public_eletronica/downloads/COT51.pdf 106. OK		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			http://www.sbs.org.br/atualidades.php 107. OK http://www.ipef.br/mct/MCT_03.htm 108. OK http://www.bndes.gov.br/conhecimento/bnset/set1601.pdf 109. OK http://www.ibge.gov.br/estadosat/temas.php?sigla=ba&tema=extracaovegetal2007 110. OK http://sistemasdeproducao.cnptia.embrapa.br/FontesHTML/Caju/CultivodoCajueiro/index.htm 111. OK http://www.nordesterural.com.br/nordesterural/matLerdest.asp?newsId=2219 112. OK http://sistemasdeproducao.cnptia.embrapa.br/FontesHTML/Caju/CultivodoCajueiro/tratosculturais.htm 113. This web site are not available. http://sbrtv1.ibict.br/upload/sbrt4555.pdf?PHPSESSID=76a9111889defa6787039ca56b380c58 114. OK		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			http://www.cepel.br/~per/download/rer/rt-789-00.pdf 115. OK 116. OK http://www.saneamento.poli.ufrj.br/documentos/24CBES/III-024.pdf 117. OK http://folio.mp.pr.gov.br/downloads/Meio_Ambiente/ri_iriap.pdf 118. OK www.sbpcnet.org.br/livro/60ra/textos/SI-GoreteMacedo.pdf 119.OK 120.Refer to **CAR10** 121. OK http://www.ibge.gov.br/estadosat/temas.php?sigla=ba&tema=extracaovegetal2007 122. Refer to **CAR10** 123. Refer to **CAR10** 124. Refer to **CAR10**		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			125. OK www.mwglobal.org/ipsbrasil.net/nota.php?idnews=3292 126. OK www.cnpgl.embrapa.br/nova/informacoes/pastprod/textos/17Instrucao.pdf 127. - OK 128. OK http://www.faunabrasil.com.br/sistema/modules/wfsection/article.php?articleid=47		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
jj. Are GHG emissions and/or removals for the baseline scenario quantified?	PD temp	4.2	No, it's necessary answer **CAR06 and 38**. In accordance with Table 15 – Emissions reductions without considering the leakage, but the data were not validated yet.	CAR06 CAR03	OK
kk. Are GHG emissions and/or removals for the project quantified?	PD temp	4.3	Yes, The applied methodology does not predict project emissions and leakage was considered to be zero	OK	OK
ll. Are GHG emission reductions and removal enhancements for the GHG project quantified?	PD temp	4.4	Yes, how the leakage was assessed as zero emissions reduction is equal to the line of baseline emissions. In accordance with table 16.	OK	OK
mm. Was a summary of environmental impact assessment, when such an assessment is required by applicable legislation or regulation, provided? ISO14064-2, 5.2.k	PD temp	5	Yes, in accordance with table 17 from CVS PD. the only negative impact identified is that the project activity will generate ashes due to the burning of the biomass, but this impact will be mitigated by incorporating the ashes into the clay mixture used as thermal insulator in the kilns entrance. In addition, they also use the ashes as fertilizer in the crops next to the Ceramic. The burning of the new biomasses also emits particulate material and CO2, as well as when using wood. However, the emission reductions of GHG will improve since they are renewable biomasses. This way the project does not cause any additional negative impacts as all generated energy is a result of the best and unique exploitation of the natural resources available. On the other hand, the project activity will improve the local environmental conditions by establishing proper treatment for the renewable biomasses and also by contributing to the reduction of the deforestation rate.	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
nn. Were relevant outcomes from stakeholder consultations and mechanisms for on-going communication provided?	PD temp	6	No, **CL14 –** Please send a copy of the letter you sent to the Stakeholders and it's acknowledgement receipt **CL10** - In accordance reference 130 from item 6.0 "Stakeholders comments" to the VCS PD, a letter " SINDICER sent a letter stating their support to the present project activity to the DOE". Please send a copy to evidence this letter. It was cross-checked the following references sources: (all checked on September 09th 2009) 129.OK 130.Refer to **CL10**	CL14 CL10	OK
oo. Where chronological plan for the date of initiating project activities, date of terminating the project, frequency of monitoring and reporting and the project period, including relevant project activities in each step of the GHG project cycle provided?	PD temp	7	No, it's necessary clarify **CL15.** •Project start date: Date on which the project began reducing or removing GHG emissions, i.e. when the project proponents began employing renewable biomass: November, 2006. •Crediting period start date: 01/01/2007; •Validation Report predicted to: September, 2009; •First Verification Report predicted to September, 2009; •VCS project crediting period: 10 years, twice renewable; •Monitoring and reporting frequency: preferentially from 6 to 12 months, since the beginning of the crediting	CL15	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			period; •Date of terminating the project: 31/12/2016. After the project start date, the ceramic owner made adaptations due to the use of new biomasses and its technology, encompassing for example, tests using the new biomasses, the ideal mix of renewable biomasses (different percentages of each biomass) and technological adaptations.		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
pp. Was evidence of proof of title provided through one of the following:	PD temp	8.1			
i. a legislative right?	PD temp	8.1	Yes.	OK	OK
ii. a right under local common law?	PD temp	8.1	Yes.	OK	OK
iii. ownership of the plant, equipment and/or process generating the reductions/removals?	PD temp	8.1	Yes.	OK	OK
iv. a contractual arrangement with the owner of the plant, equipment or process that grants all reductions/removals to the proponent?	PD temp	8.1	Yes, there is a contracted between Social Carbon and Ceramic Bom Jesus and was validated by DOE in the site visit.	OK	OK
qq. Does the project reduce GHG emissions from activities that participate in an emissions trading program, or take place in a jurisdiction or sector in which binding limits are established on GHG emissions?	PD temp	8.2	NA	OK	OK
rr. If yes, have project proponents provided evidence that the reductions or removals generated by the project have or will not be used in the Program or jurisdiction for the purpose of demonstrating compliance, such as:	PD temp	8.2	NA	OK	OK
i. a letter from the Program operator or designated national authority that emissions allowances (or other GHG credits used in the Program) equivalent to the reductions/removals generated by the project have been cancelled from the Program; or national cap as applicable?	PD temp	8.2	NA	OK	OK
ii. purchase and cancellation of GHG allowances equivalent to the reductions/removals generated by the project related to the Program or national cap?	PD temp	8.2	NA	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
e. Additionality					
a. Has the project proponent demonstrated that the project is additional using one of the following tests: Test 1 - The project test; Test 2 – Performance test; Test 3 – Technology test?	VCS	5.8	Yes, to demonstrate that the project is additional it was used the test 1.	OK	OK
b. If the project proponent used Test 1:	VCS	5.8			
iii. Step 1 – Regulatory Surplus - Is the project be mandated by any enforced law, statute or other regulatory framework? (If yes a CAR shall be issued and the project shall be deemed non additional).	VCS	5.8	The project is not mandated by any enforced law, statute or other regulatory framework in Federal, State and Municipal levels in the survey performed. **CL18 –** Please provide de source of information and the survey performed to guarantee that is not project be mandated by any enforced law, statute or other regulatory framework	CL18	OK
iv. Step 2 – Implementation Barriers – Does the project face one (or more) distinct barrier(s) compared with barriers faced by alternative projects?	VCS	5.8	NA	OK	OK
i. Investment Barrier – Does the project face capital or investment return constraints that can be overcome by the additional revenues associated with the generation of VCUs?	VCS	5.8	Yes, the investment analysis show that operational costs will increase from R$ 46,197.40 to R$ 50,059.08 on a monthly basis, so the additional revenues associated with the generation of VCUs are essencial for this project. **CARBQA01** – the project proponent didn't justified with references the following investment analysis assumptions: - Scenario: Non-renewable wood Monthly consumption of the fuel, fuel price, electrical energy consumption and energy costs. -Scenario: Renewable biomass	CARBQA01	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			Monthly consumption of the fuel and fuel price of each one of renewable biomass, electrical energy consumption and energy costs.		

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
ii. Technological Barriers – Does the project face technology-related barriers to its implementation?	VCS	5.8	Yes. The operators did not have knowledge of the ideal amount of renewable biomass that was necessary to achieve the temperature of about 850ºC for its ceramic devices cooking, to acquire the final product with same quality and to maintain the optimal process as they did when using native wood. As a consequence of this barrier, there were variations in the color of the final ceramic devices, affecting the quality of the products; cracks on the ceramic devices; the explosion of some of them and cracks along the kilns; adding a significant amount of insecurity in production process. A pyrometric system (thermocouples) was installed in order to control the burning due to the lack of experience with the new fuel.	OK	OK
iii. Institutional barriers – Does the project face financial, organizational, cultural or social barriers that the VCU revenue stream can help overcome?	VCS	5.8	Yes, in accordance with: • Risks of the project; • Barrier due to the price of the biomass;	OK	OK
v. Step 3 – Common Practice	VCS	5.8			
i. Is project type common practice in sector/region, compared with projects that have received no carbon finance?	VCS	5.8	Yes, According to the GHG Protocol for Project Accounting, common practice analysis shall be carried out following: 1. Define the product or service provided by the project activity. 2. Identify possible types of baseline candidates 3. Define and justify the geographic area and the temporal range used to identify baseline candidates. 4. Define and justify any other criteria used to	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
			identify baseline candidates 5. Identify a final list of baseline candidates 6. Identify baseline candidates that are representative of common practice (for the project-specific baseline procedure). 7. Impact of projects approval Therefore, the project activity is not a common practice.		
ii. if it is common practice, have the project proponents identified barriers faced compared with existing projects?	VCS	5.8	NA	OK	OK
iii. Is the demonstration that the project is not common practice based on guidance in the GHG Protocol for Project Accounting, Chapter 7?	VCS	5.8	Yes.	OK	OK
iv. Was it collected data on all baseline candidates within the geographic area and calculating a relative percentage for each different technology or practice? Common practice refers to the predominant technologies or practices in a given market, as determined by the degree to which those technologies or practices have penetrated the market (defined by a specified geographic area). This percentage could be based on the number of plants or sites using each technology or practice, or could be Weighted by the proportion of the total output for the market that is attributed to each technology or practice.	GHG PROTOCOL	7.4.2 AND 7.6	Yes, in accordance with Distribution of fuel employed on the ceramic sector in Brazil in Percentage table, page 31.	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
c. If the project proponent used Test 2:	VCS	5.8	NA	OK	OK
vi. Step 1 – Regulatory Surplus - Is the project be mandated by any enforced law, statute or other regulatory framework? (If yes a CAR shall be issued and the project shall be deemed non additional).	VCS	5.8	NA	OK	OK
vii. Step 2: Performance Standard	VCS	5.8	NA	OK	OK
i. Are the emissions generated per unit output by the project below the level that has been approved by the VCS Program for the product, service, sector or industry, as the level defined to ensure that the project is not business-as-usual?	VCS	5.8	NA	OK	OK
ii. Are performance standard based additionality tests approved through the double approval process and by the VCS Board? (The list of approved performance standards is on www.v-c-s.org)	VCS	5.8	NA	OK	OK
d. If the project proponent used Test 3:	VCS	5.8	NA	OK	OK
viii. Step 1: Regulatory Surplus - Is the project be mandated by any enforced law, statute or other regulatory framework? (If yes a CAR shall be issued and the project shall be deemed non additional).	VCS	5.8	NA	OK	OK
ix. Step 2: Technology Additionality – Are the project and its location contained in the list of project types and applicable areas approved as being additional by the VCS Program? (The	VCS	5.8	NA	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
approved list is available on www.v-c-s.org)					
f. Identifying GHG sources, sinks and reservoirs relevant to the project					
a. Refer to table 2 under Methodologies.	VCS	5.9	Refer to Clause 2, under Methodologies.	OK	OK
g. Determining the baseline scenario					
a. Has the project proponent selected the most conservative baseline scenario for the project, based on the requirements in the applicable VCS methodology?	VCS	5.10	Refer to Table 2 (Methodology)	OK	OK
b. Does the baseline scenario set out the geographic scope as applicable to the project?	VCS	5.10	Yes, According to the applied methodology, the project boundary is the physical, geographical area of the use of biomass or the renewable energy.	OK	OK
c. Has the project participant demonstrated that the project has met the requirements in ISO 14064-2:006 clause 5.4:	VCS	5.10			
i. Does the project proponent select or establish criteria and procedures for identifying and assessing potential baseline scenarios considering the following ? a) the project description, including identified GHG sources, sinks and reservoirs (see 5.3); b) existing and alternative project types, activities and technologies providing equivalent type and level of activity of products or services to the project; c) data availability, reliability and limitations; d) other relevant information concerning present or future conditions, such as legislative, technical, economic,sociocultural, environmental, geographic, site-specific and temporal assumptions or projections.	ISO 1406 4.2	5.4	Yes, Observing table 07, the common fuels employed and therefore, the baseline candidates are: natural gas, charcoal, wood, other recuperations, diesel oil, fuel oil, liquefied petroleum gas, others from petroleum, piped gas, electricity and others non-specified. Therefore, the identified baseline for this project activity is the use of native wood without sustainable forest management, which was used by the ceramic for a long time and has a consolidated delivery system and long term supply assurance. The overall characteristics of the ceramic production are used to obtain the real amount of non-renewable biomass used in the baseline scenario.	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
ii. Does the project proponent demonstrate equivalence in type and level of activity of products or services provided between the project and the baseline scenario and shall explain, as appropriate, any significant differences between the project and the baseline scenario ?	ISO 1406 4.2	5.4	No. It's necessary to clarify **CL19** first. **CL19 -** Please clarify to the table 6, item 2.4 does not demonstrate equivalence in type and level of activity of products or services provided between the project and the baseline scenario, neither any significant differences between the project and the baseline scenario.	CL19	OK
iii. Does the project proponent select or establish, explain and apply criteria and procedures for identifying and justifying the baseline scenario ?	ISO 1406 4.2	5.4	Yes, in accordance with table 5 – Gases included in the project boundary and brief explanation	OK	OK
iv. In developing the baseline scenario, does the project proponent select the assumptions, values and procedures that help ensure that GHG emissions reductions or removal enhancements are not over-estimated ?	ISO 1406 4.2	5.4	No, refer **CAR10**	CAR10	OK
v. Does the project proponent select or establish, justify and apply criteria and procedures for demonstrating that the project results in GHG emissions reductions or removal enhancements that are additional to what would occur in the baseline scenario ?	ISO 1406 4.2	5.4	Yes. In accordance test 1 performed by the project proponent type I.	OK	OK
d. Has the project participant demonstrated that the project has met all relevant regulations, legislation and project approvals (e.g. environmental permits)?	VCS	5.10	No. Refer to **CAR02**	CAR02	OK
h. Monitoring the GHG project					
a. Has the project proponent shall established and maintained criteria and procedures for obtaining, recording, compiling and analysing data and information important for quantifying and reporting GHG emissions and/or removals relevant for the	VCS	5.11	Yes, in accordance with item 3.0 Monitoring, from VCD PD.	OK	OK

CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
project and baseline scenario (i.e. GHG information system)?					
b. Do the monitoring procedures include?	VCS	5.11	Yes.	OK	OK
i. purpose of monitoring?	VCS	5.11	Yes.	OK	OK
ii. types of data and information to be reported, including units of measurement?	VCS	5.11	Yes.	OK	OK
iii. origin of the data?	VCS	5.11	No, refer to CAR12	CAR12	
iv. monitoring methodologies, including estimation, modelling, measurement or calculation approaches?	VCS	5.11	Yes.	OK	OK
v. monitoring times and periods, considering the needs of intended users?	VCS	5.11	Yes.	OK	OK
vi. monitoring roles and responsibilities?	VCS	5.11	Yes.	OK	OK
vii. GHG information management systems, including the location and retention of stored data?	VCS	5.11	**CL05 -** Please clarify how was establish the control of documents and data.	CL05	OK
c. Where measurement and monitoring equipment is used, does the project proponent ensure the equipment is calibrated according to current good practice?	VCS	5.11	**CL16 –** Please send the calibration report of all instruments that were used to measurement and monitoring the parameters from table 12., item 3.3, or identified in the VCS PD how you guarantee that parameters used are reliable.	CL16	OK
d. Does the project proponent apply GHG monitoring criteria and procedures on a regular basis during project implementation?	VCS	5.11	Yes, Refer item h) clause b-5).	OK	OK
i. Monitoring reports for the GHG project					
a. Do monitoring reports include all the monitoring data, calculations, estimations, conversion factors and others standard factors as defined in the monitoring clause of the applied VCS Program methodology and	VCS	5.12	No, refer to **CL17 –** Please provide all sources for all conversions factors adopted and assumptions, in the file VCU Estimates and VCS PD.	CL17	OK

	CHECKLIST QUESTION	Ref.	item	COMMENTS	Draft Concl	Final Concl
	set out in the VCS PD? (A list of VCS approved methodologies is available on www.v-c-s.org)					
	j. Records relating to the project					
a.	Has the project proponent kept all documents and records in a secure and retrievable manner for at least two years after the end of the project crediting period.?	VCS	5.13	N.A, the process is the beginning.	OK	OK
	k. Information to validator and verifier					
a.	Has the project proponent made available to the validator the VCS PD, proof of title and any requested supporting information and data needed to evidence statements and data in the VCS PD and proof of title?	VCS	5.14	No, refer to **CAR07 –** It's necessary that the project proponent made available to the validator, all supporting information and data needed do evidence statements and data in the VCS PD, for examples: - parameters NVC biomass to Quirino W. F., Vale A. T.; Andrade A. P. A., Abreu,V.L. S.; Azevedo A. C. S. Calorific Value of Wood and Wood Residues It's necessary to check all PD regarding this subject.	CAR07	OK
b.	Has the project proponent made the VCS PD and validation report available to the verifiers as well as a monitoring report applicable to the period of monitoring and any requested supporting information and data needed to evidence statements and data in the monitoring report?	VCS	5.14	Yes, the project proponent made de VCS PD and MR, except by **CAR07** that must by provided**..**	CAR07	OK

TABLE 2 METHODOLOGY AMS I.E_V.1

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
a. Is the selected baseline and monitoring methodology, previously approved by the CDM Executive Board, applicable to the project activity?	VVM	68	Yes, the methodologies used were: Category AMS-I.E: Switch from Non–Renewable Biomass for Thermal Application by the User – Version 01 from February 1st 2008 onwards.	OK	OK
b. Is this category comprises small thermal appliances that displace the use of non-renewable biomass by introducing new renewable energy end-user technologies ? Examples of these end user technologies include biogas stoves and solar cookers.	AMS I.E V.1	1	Yes.	OK	OK
c. Is there any similar registered small-scale CDM project activities exist in the same region as the proposed project activity ? If yes , then it must be ensured that the proposed project activity is not saving the nonrenewable biomass accounted for by the other registered project activities.	AMS I.E V.1	2	No. **CL11 -** Please clarify how this is been compliance the item 2 from methodology: "If any similar registered small-scale CDM project activities exist in the same region as the proposed project activity then it must be ensured that the proposed project activity is not saving the nonrenewable biomass accounted for registered by the other project activities" Refer to **CL19**	CL11	OK
d. Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods ?	AMS I.E V.1	3	No. refer to CAR04. **CAR04 –** The ceramics needs to proof that non-renewable biomass has been used since 31 December 1989. Send a proof to the validation time.	CAR04	OK
e. Does the PDD correctly describe the project boundary, including the physical delineation of the proposed CDM project activity included within the project boundary for the purpose of calculating project and baseline emissions for the proposed CDM project activity?	VVM	77	No. Refer to **CAR14.**	CAR14	OK

i. Is the project boundary the physical, geographical area of the use of biomass or the renewable energy ?	AMS I.E V.1	4	No. Refer to **CAR14**	CAR14	OK
ii. Table 1 of Attachment C to Appendix B identifies different emission sources based on type of biomass being considered. Was included at the project boundary for biomass from forests and biomass from croplands or grasslands the area where the biomass is extracted or produced ?	Att. C App. B	2	Yes, it was identified in the table 13.	OK	OK
f. Has any procedure contained in the methodology to identify the most reasonable baseline scenario, been correctly applied?	VVM	81	Yes.	OK	OK
i. Is it assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs ?	AMS I.E V.1	5	Yes.	OK	OK
g. Have the equations and parameters in the PDD been correctly applied with respect those in the select approved methodology?	AMS I.E V.1	6	No. **CL12 -** Please clarify the calculation of the parameter of NCV kcal / kg and how you obtain the lower calorific value. Please clarify, which methodology was used to determine this parameter. **CL20 -** Please provide evidence of the representativeness of the value of NCV - net calorific value, since the arithmetic mean was used with 11 different species and on the representativeness of these species use their front.	CL12 CL20	OK
h. Did the Project participants determine the share of renewable and non-renewable biomass in the total biomass consumption using nationally approved methods (e.g. surveys or government data if available) in order to determine *fNRB,y* ?	AMS I.E V.1	7	Yes, To the file "VCU estmates", in the spreadsheet $fNRB_{,y}$ it was verified that value used is more conservative than the comparative ceramics unit used, and the formulas demonstrate using Total of wood in ten years to all ceramics projects estimates.	OK	OK

i.The definition of renewable biomass was correctly applied ?	AMS I.E V.1	7	No. It's necessary answer de following. Refer to **CL04.** The other biomass is accordance with the criteria 05 to clause 07, from methodologies Category AMS-I.E: Switch from Non–Renewable Biomass for Thermal Application by the User – Version 01 from February 1st 2008 onwards.	CL04	OK
ii. The definition of non-renewable biomass was correctly applied ?	AMS I.E V.1	7	No. **CL13 –** Please clarify that the non-renewable biomass is in accordance with the indicators describe at the non-renewable biomass definition.	CL13	OK

i. If the project activity includes substitution of non-renewable biomass by renewable biomass, leakage in the production of renewable biomass was considered using the general guidance on leakage in biomass project activities (attachment C of appendix B) ?	AMS I.E V.1	8	Yes, In accordance Category AMS-I.E: Switch from Non–Renewable Biomass for Thermal Application by the User – Version 01 from February 1st 2008 onwards the project activities was justified and based on 3 step at leakage item. (a) If the project activity includes substitution of non-renewable biomass by renewable biomass, leakage in the production of renewable biomass must be considered The leakage from biomass projects, like the project activity, shall also be estimated according to the "General guidance on leakage in biomass project activities" (attachment C of appendix B) of Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories, which identifies different emission sources based on the type of biomass considered (described in the table 13) (b) Leakage relating to the non-renewable biomass shall be assessed from ex-post surveys of users and areas from where biomass is sourced, and; (c) If the equipment is transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered. This leakage is not applicable for this project activity as there is no transference of equipment, in spite of new equipments had to be acquired. Due to all the explanations described above, the present project activity does not encompass any type of leakage.	OK	OK

j. For small-scale energy CDM project activities involving renewable biomass, there are three types of emission sources that are potentially significant (>10% of emission reductions) and attributable to the project activities: A. Shifts of pre-project activities. Decreases of carbon stocks, for example as a result of deforestation, outside the land area where the biomass is grown, due to shifts of preproject activities. B. Emissions related to the production of the biomass. C. Competing uses for the biomass. The biomass may in the absence of the project activity be used elsewhere, for the same or a different purpose. These emission sources may be project emissions (if under the control of project participants, i.e. if the land area where the biomass is grown is included in the project boundary) or sources of leakage (if the source is not under control of project participants). Table 1 summarizes, for different types of biomass, the cases where the emission source is relevant and the cases where it is not. Are there the 3 conditions above applicable and considered in the definition of Project emissions or leakage? If not applicable is there a clear and reasonable justification at the PDD?	Att. C App. B	4 till 18	No , it's necessary clarify some informations. For step 1(item 08) from de methodologies: Observing the table above, the sources of leakage of the present project activity are the competing use of biomass for biomass residues or waste and the emissions from biomass generation/cultivation in case of biomass from cropland. The source of leakage of the present project is showed below according to each type of biomass: - Native wood with sustainable forest management plan (5.7% to the total); - Sugar Cane Briquette (than 1% of the total production of sugar cane bagasse in the state of Pernambuco); - Algaroba wood(less than0.02% to the total); - Eucalyptus wood (less than 0.1% to the total); - Cashew tree pruning (less than 8% to the total); - Wood residues from constructions and industries (less than 5% to the total); - Coconut Husk (less than 0.02% to the total); - Sawdust, (less than 1% of the biomass availability in the state of Bahia) - Elephant grass . Considering to Emissions from biomass generation / cultivation X In the absence of the project the land would be used as cropland, to following biomass: - Sugar Cane Briquette, only, and Considering competing use of biomass for biomass residues or waste to the rest of biomass indicates. To thee renewable biomasses used and calculated into the VCS PD are to the accordance with step "C - Competing uses for the biomass "from methodologies.	CL09 CL08	OK

			CL09 - Please clarify how the Project participants are monitor the type and quantity of fertilizer applied to the land areas if use elephant grass as renewable biomass and which fertilizers are using, if synthetic and organic one. If yes, it must be estimated according to provisions outlined in the Revised 1996 IPCC Guidelines for National GHG Inventories (Chapter. 4.5). **CL08 -** Please clarify to the Project emissions from clearance of lands, in case to the type of renewable biomass that is not a biomass residues or waste in the following, " The potential of deforestation due to the implementation of the CDM project activity must be addressed by considering the following applicability condition. Project participants should demonstrate that the area where the biomass is grown is not a forest (as per DNA forest definition) and has not been deforested, according to the forest definition by the national DNA, during the last 10 years prior to the implementation of the project activity."		

k. Is the leakage relating to the non-renewable biomass assessed from ex-post surveys of users and areas from where biomass is sourced ?	AMS I.E V.1	9	No, it's necessary to answer de following Refer to **CL07** It is expected that the carbon credits incomes will stimulate the use of renewable biomass to other ceramics presenting a huge possibility for sustainable development in the region. Therefore, the sources of leakages mentioned above will probably not be applicable as it is predicted the project activity will not displace the use of renewable biomass of a non-project user due to the likely decrease in the use of non-renewable biomass in the region, and there is currently great amount of renewable biomasses available locally as described before. The non-renewable biomass that would be utilized in this project activity will not being saved for other project activity, since other ceramic companies were already consuming wood from non sustainable forest management (common practice). With the implementation of the project activity, the ceramic company will avoid the consumption of about 20,580 m³ per year of non-renewable wood helping the conservation of forests in Caatinga biome, besides the ecological and social benefits to the region. This leakage will be monitored in order to guarantee the project conservativeness.	CL07	OK

l. The following potential sources of leakage were identified ? (a) Use/diversion of non-renewable biomass saved under the project activity by non-project households/users who previously used renewable energy sources. If this leakage assessment quantifies an increase in the use of non-renewable biomass used by the nonproject households/users attributable to the project activity then By is adjusted to account for the quantified leakage. (b) Use of non-renewable biomass saved under the project activity to justify the baseline of other CDM project activities can also be potential source of leakage. If this leakage assessment quantifies a portion of non-renewable biomass saved under the project activity that is used as the baseline of other CDM project activity then By is adjusted to account for the quantified leakage. (c) Increase in the use of non-renewable biomass outside the project boundary to create nonrenewable biomass baselines can also be potential source of leakage. If this leakage assessment quantifies an increase in use of non-renewable biomass outside the project boundary then By is adjusted to account for the quantified leakage.	AMS I.E V.1	9	No. it's necessary to answer the following. **CL07 -** Please send a copy to the research about the ceramics industries in the state of Pernambuco that Carbono Social Serviços Ambientais LTDA made to the validation team to analyze accordance with the indicate text "The non-renewable biomass that would be utilized in this project activity will not being saved for other project activity, since other ceramic companies were already consuming wood from non sustainable forest management (common practice)."	CL07	OK
m. Is equipment transferred from another activity or if the existing equipment is transferred to another activity ? If yes , leakage is to be considered.	AMS I.E V.1	10	NA, This leakage is not applicable for this project activity as there is no transference of equipment, in spite of new equipments had to be acquired. Due to all the explanations described above, the present project activity does not encompass any type of leakage.	OK	OK
n. Is monitoring consist of an annual check of all appliances or a representative sample thereof to ensure that they are still operating or are replaced by an equivalent in service appliance ?	AMS I.E V.1	11	Yes, in accordance with MR Calculations.	OK	OK

o. In order to assess the leakages specified under paragraph 9 of AMS I.E methodology , is monitoring including data on the amount of biomass saved under the project activity that is used by non-project households/users (who previously used renewable energy sources). Other data on non-renewable biomass use required for leakage assessment shall also be collected.	AMS I.E V.1	12	No. it's necessary to clarify **CL07.**	CL07	OK
p. Should monitoring confirm the displacement or substitution of the non-renewable biomass at each location?	AMS I.E V.1	13	Yes. The MR calculations confirm the biomass that used in the Bom Jesus Ceramics.	OK	OK
i. In the case of appliances switching to renewable biomass the quantity of renewable biomass used shall be monitored.	AMS I.E V.1	13			
q. In case option (b) in paragraph 6 of AMS I.E methodology is chosen for baseline calculations, the monitoring plan include the amount of thermal energy generated by the new renewable energy technology in the project in year y, where applicable ?	AMS I.E V.1	14	NA, The option used is "a"	OK	OK

TABLE 3 RESOLUTION OF CORRECTIVE ACTION AND CLARIFICATION REQUESTS

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
CAR BQA 1 – the project proponent didn't justified with references the following investment analysis assumptions: - Scenario: Non-renewable wood Monthly consumption of the fuel, fuel price, electrical energy consumption and energy costs. -Scenario: Renewable biomass Monthly consumption of the fuel and fuel price of each one of renewable biomass, electrical energy consumption and energy costs.	VCS 5.8	The references utilized in order to make the investments analysis, for both scenarios, will be sent to the validation team.	It was checked by validation time The answer to CAR BQA 01 was accepted. OK, CAR BQA 01 was closed.
CAR01 - There are differences between the values of table 03 from VCS PD and validated values in the site visit. A correction is necessary.	PD temp 1.9	The table 03 was corrected according to the consumption of renewable biomasses, which was calculated through invoices of each biomass. The invoices that were not seen in the site visit will be sent to the validation team.	The correct value was assigned. The answer to CAR01 was accepted. OK, CAR01 was closed.

CAR02 - Applicable laws have not been identified to the biomass used, and have not been described what are the evidences of care the law of renewable biomass.	PD temp 1.10	Section 1.10 encompasses the Law requirements about the utilized biomasses.	The laws were included in the VCS PD with its assessment and evidence of compliance. Basically there was compliance with the LO. The answer to CAR02 was accepted. OK, CAR02 was closed.
CAR03 - Calculation of Amount of native firewood needed to produce a certain amount of product in tonnes / thousand of ceramic devices (efficiency of the furnaces at baseline - BFy), the production of parts and consumption of non-renewable biomass before the start of the project (baseline), however these values were not validated because the evidence of discrepancies found in the values on site visits.	PD temp 4.1	The production was calculated through the financial transactions of the ceramic. The quantity of non-renewable wood acquired by the ceramic was achieved through receipts from the providers. The BFy value for the ceramic industry was corrected either at the VCS PD as at the VCU Estimative sheet.	It was validated to the validation team. The answer to CAR03 was accepted. OK, CAR03 was closed.
CAR04 – The ceramics needs to proof that non-renewable biomass has been used since 31 December 1989. Send a proof to the validation time.	AMS I.E V.1 3	The proof that the ceramic company exists at the same local since December 31st, 1989, will be sent to the validation team.	It was verified a document that proof the ceramics facility was working since 1986. The answer to CAR04 was accepted. OK, CAR04 was closed.

CAR05 - The fraction indicates in the VCS PD of each renewable biomasses utilized are around: sugar cane briquette (11%), Algaroba wood (4%), Eucalyptus wood (9%), native wood with sustainable forest management plan (75%), and wood residues from constructions and industries (1%) are differents values validated during site visit.	PD temp 1.9	The fraction of each renewable biomass that was indicated in the VCS PD was corrected according to the invoices verified in the site visit. The invoices that were not seen in the site visit will be sent to the validation team.	It was checked by validation time the corrective values. The answer to CAR05 was accepted. OK, CAR05 was closed.
CAR06 - Data Production of ceramic devices and Consumption of non renewable biomass per appliance and By, used in the calculation of emission reductions, described in the spreadsheet for monitoring were not validated because the evidence of discrepancies found in the values on site visits.	PD temp 4.1	The production of ceramic pieces was calculated through the financial transactions of the ceramic. The quantity of non-renewable wood acquired by the ceramic was achieved through receipts from the providers.	It was checked the production of the ceramics devices since December 2005 to January 2006 and was considered satisfactory the evidences. The answer to CAR06 was accepted. OK, CAR06 was closed.
CAR07 – It's necessary that the project proponent made available to the validator, all supporting information and data needed do evidence statements and data in the VCS PD, for examples: - parameters NVC biomass to Quirino W. F., Vale A. T.; Andrade A. P. A., Abreu,V.L. S.; Azevedo A. C. S. Calorific Value of Wood and Wood Residues It's necessary to check all PD regarding this subject.	VCS 5.14	All the articles and studies needed in order to evidence the statements in the VCS PD will be sent to the validation team.	The references were checked and validated. The answer to CAR07 was accepted. OK, CAR07 was closed.

CAR08 – the values cited in the text," of a total of 1,384.3 tons of native wood utilized at the baseline scenario, 61.5% or 851.3 tons would be utilized at the "Tunnel" kiln, and 38.5% or 533 tons would be utilized at the "Hoffman" kiln. Moreover, of a total of 2,011,145 ceramic pieces produced per month, each kiln produces 50% of Bom Jesus Ceramic production", are not validated yet.	PD temp 2.4	As informed by the ceramic owner in the site visit, each kiln produces around the same quantity of ceramic pieces per month. Moreover, when utilizing native wood, according to historical experience, the average consumption of this fuel was around 1.6m³ to produce a thousand of ceramic pieces at the Tunnel kiln, and 1.0m³/thousands of ceramic pieces at the Hoffman kiln. Thus, to produce a thousand of ceramic pieces at Bom Jesus ceramic industry, it was utilized around 2.6 m³ of native wood, or 61.5% at the Tunnel kiln and 38.5% at the Hoffman kiln. In addition, the production of ceramic pieces was calculated through the financial transactions of the ceramic. The quantity of non-renewable wood acquired by the ceramic was achieved through receipts from the providers.	These values was validate by validation time after site visit and data productions from ceramics facilities. The answer to CAR08 was accepted. OK, CAR08 was closed.
CAR09 - Please present proof of consumed amount of wood per year, in accordance with VCU Estimatives file in the *f*NRB,y calculations sheet (informed that BOm Jesus ceramics is 20,580 m3/year)	PD temp 1.7	The receipts of non-renewable native wood evidencing the quantity utilized by the ceramic industry will be sent to the validation team.	The answer to CAR09 was accepted. OK, CAR09 was closed.

CAR10 - It's necessary that the project proponent made available to the validation, all supporting information and data needed do evidence statements and data in the VCS PD, for examples: - SEYE, O. Análise de ciclo de vida aplicada ao processo produtivo de cerâmica estrutural tendo como insumo energético capim elefante (Pennisetum Purpureum Schaum). It's necessary to check all PD regarding this subject.	PD temp 1.7	All the articles and studies needed in order to evidence the statements in the VCS PD will be sent to the validation team.	It was analyzed the reference with Project proponent and considered satisfactory. The answer to CAR10 was accepted. OK, CAR10 was closed.
CAR11 - It was not identified the use of sawdust as a renewable biomass in the project, but it was seen during the site visit of ceramic Bom Jesus, using this biomass. For example, in the item 1.9 from VCS PD this biomass was indicated as "…possible renewable biomasses that are available in the region and could be utilized in the future…."	PD temp 1.4	The sawdust was included as a utilized renewable biomass, and its fraction was included in the VCS PD, financial barrier spreadsheet, and thermal energy of the kiln.	All renewable biomass that were seen on the site visit were include into VCS PD and financial barrier spreadsheet, and thermal energy of the kiln. The answer to CAR11 was accepted. OK, CAR11 was closed.
CAR12 – It was not described the origin of Datas in the table 10 for the following: - Articles and database from renewable biomass and Leakege; - Bibliography from NCVbiomass, rbiomass, fNRB,y This informations should be included in the VCS PD.	PD temp 3.2	The origin of data in table 12 was better described, specifying the locals to find the bibliographies, articles, and database.	OK, It was cross checked the references informed on October 26th 2008. http://www.ufsm.br/cienciaflorestal/artigos/v12n1/A8V12N1.pdf The answer to CAR12 was accepted. OK, CAR12 was closed.

CAR13 - Data Amount of renewable biomasses employed in the monitoring period, used in PRy Double check with biomass as described in the spreadsheet monitoring were not validated because the evidence of discrepancies found in the value on site visits.	PD temp 4.1	The amount of renewable biomasses was calculated through invoices of each biomass verified in the site visit. The invoices that were not seen in the site visit will be sent to the validation team.	The renewable biomasses employed in the monitoring period were validated with the project proponent, all renewable biomass used. The answer to CAR13 was accepted. OK, CAR13 was closed.
CAR14 - Not confirmed the coordinates of the Ceramics Unit. GPS was not used, but only approximation in Google earth and does not include the "GPS project boundaries " too.	PD temp 1.4	The GPS coordinates of the ceramic boundaries were included in the VCS PD.	The new coordinates were made forming a quadrilateral containing the site of the ceramics. The answer to CAR14 was accepted. OK, CAR14 was closed.
CAR15 – the CPRH state register is not available on the site visit. A proof of this register must to send to the validation team to approval.	PD temp 1.10	This document will be sent to the validation team.	It was checked CPRH register and receipts to the payment of taxes. The answer to CAR15 was accepted. OK, CAR15 was closed.
CL01 – Please provide evidences about the Project start date and Date of initiating the project activity	PD temp 1.6	The evidences of the beginning of use of renewable biomasses will be sent to the validation team.	It was validated by validation time evidences to the project start date as receipts renewable biomasses from providers and investment to improvement to kilns. The answer to CL01 was accepted. OK, CL01 was closed.

CL02 - As described in the project "the use of wood represents about 98% of the total fuel employed.", please source of such data.	PD temp 1.7	It is in accordance with: SEYE, O. Análise de ciclo de vida aplicada ao processo produtivo de cerâmica estrutural tendo como insumo energético capim elefante (Pennisetum Purpureum Schaum). Campinas, SP: [s.n.], 2003., which is available at: http://biblioteca.universia.net/html_bura/ficha/params/id/37243108.html. Last visit on: October 9th, 2009.	It was validated to the validation team. The answer to CL02 was accepted. OK, CL02 was closed.
CL03 - The suppliers of biomass are different (checked in the site visit) and not just those listed in the PD, is necessary to clarify this situation in PD, including selection criteria for identifying them, ahead of the requirements process and requirements of applicable legislation	PD temp 1.9	All providers of each renewable biomass were included in section 1.9 of the VCS PD.	All suppliers were identified and are the same to the receipts validated to the validation team. The answer to CL03 was accepted. OK, CL03 was closed.
CL04 - Please clarify why in the project of Bom Jesus the Eucalyptus wood was considered option I and now, in this project, as option II.	PD temp 2.2	It was not mentioned in the Bom Jesus PD the utilization of Eucalyptus wood. At Bom Jesus Ceramic Fuel Switching Project activity, the Eucalyptus wood is considered as option I.	The answer to CL04 was accepted. OK, CL04 was closed.

CL05 - Please clarify how was the estabilish the control of documents and datas.	VCS 5.11	Internal Record controlled documents and data.	The internal control the data of documents has been estimated by the DOE and requires a significant improvement on the recovery and tracing its. The ceramic could not prove some amount of biomass used in the project activity harming the CER's, with this it's so important an improvement to the control of those records for the next period of monitoring. The documents that were seen were validated by the DOE. The answer to CL05 was accepted. OK, CL05 was closed.
CL06 – Please send a internal audit report of the monitoring was not verified. Please send a copy to the validation time.	PD temp 3.2	The internal audit report will be realized by Mário Henrique de Mattos e Silva, Director of Bom Jesus Ceramic.	The answer to CL06 was accepted. OK, CL06 was closed.

CL07 - Please send a copy to the research about the ceramics industries in the state of Pernambuco that Carbono Social Serviços Ambientais LTDA made to the validation team to analyse accordante with the indicate text "The non-renewable biomass that would be utilized in this project activity will not being saved for other project activity, since other ceramic companies were already consuming wood from non sustainable forest management (common practice)."	AMS I.E V.1 9	It was made a survey in order to analyze the ceramic industries that consume non-renewable wood. This survey was made by interviewing directors of ceramics and a SENAI consultant. As the ceramic sector is a very closed segment, it was very difficult to obtain a precise information about them. Thus, it was necessary to consult a SENAI consultant that knows about the ceramic industries in the region to obtain more detailed information. The consumption of non-renewable wood of the Caatinga biome is still a common practice among the ceramics in the region, therefore, the non-renewable native wood that would be utilized in this project activity will not being saved for other project activities. There are many studies regarding the consumption of native wood at the ceramic industries (these studies were included in the VCS PD, section 4.1): *<http://www.ambienteemfoco.com.br/?p=457>; <http://ambienteacreano.blogspot.com/2008/04/produo-de-lenha-em-pernambuco-e-rio.html>; <http://noticias.ambientebrasil.com.br/noticia/?id=41624>,* among others.	The answer to CL07 was accepted. OK, CL07 was closed.

CL08 - Please clarify to the Project emissions from clearance of lands, in case to the type of renewable biomass that is not a biomass residues or waste in the following: a- The potential of deforestation due to the implementation of the CDM project activity must be addressed by considering the following applicability condition. Project participants should demonstrate that the area where the biomass is grown is not a forest (as per DNA forest definition) and has not been deforested, according to the forest definition by the national DNA, during the last 10 years prior to the implementation of the project activity.	Att. C - App. B 4 till 18	According to "General guidance on leakage in biomass project activities," emission sources based on biomass type for this project activity are derived from the competing use and from biomass cultivation. The potential of deforestation due to the implementation of the CDM project activity is possible only with respect to the cultivation of renewable biomasses, which in this project would be the cultivation of elephant grass. However, as described in the VCS PD, since the cultivation of elephant grass would be in abandoned land areas, the emissions from the cleared land would be omitted as suggested by the "General guidance on leakage in biomass project activities." Furthermore, sugarcane bagasse cannot be considered as a source of emissions from biomass generation or cultivation as only the cultivation of sugarcane is considered, not the residue, or bagasse.	The answer to CL08 was accepted. OK, CL08 was closed.

CL09 - Please clarify how the Project participants are monitor the type and quantity of fertilizer applied to the land areas if use elephant grass as renewable biomass and which fertilizers are using, if synthetic and organic one. If yes, it must be estimated according to provisions outlined in the Revised 1996 IPCC Guidelines for National GHG Inventories (Chapter. 4.5).	Att. C - App. B 4 till 18	The elephant grass is currently cultivated in order to feed the cattle. However, its utilization in the future by the ceramic will be determined by the VCS secretariat, which will study the case and decide whether to include it as a renewable biomass and provide the proper documents, or that will not be possible its inclusion in the project activity. In this case, a new VCS PD must be done in order to permit the utilization of this biomass.	If so, it will be a new project as discussed between the projects participants and DOE. As this is not being used so far the validation team accepted the current situation. The answer to CL09 was accepted. OK, CL09 was closed.
CL10 - In accordance reference 130 from item 6.0 "Stakeholders comments" to the VCS PD, a letter " SINDICER sent a letter stating their support to the present project activity to the DOE". Please send a copy to evidence this letter.	PD temp 6.0	The letter that was sent from SINDICER supporting the project activity at Bom Jesus ceramic will be sent to the validation team.	It were seen all letter sent to the Stakeholders and was validated by validation time. The answer to CL10 was accepted. OK, CL10 was closed.

CL11 - Please clarify how this is been compliance the item 2 from methodology: "If any similar registered small-scale CDM project activities exist in the same region as the proposed project activity then it must be ensured that the proposed project activity is not saving the nonrenewable biomass accounted for registered by the other project activities"	AMS I.E V.1 2	At the *f*NRB,y sheet in the VCUs calculation, it was excluded from the total of non-renewable wood available at Caatinga biome, the non-renewable wood that would be consumed by the ceramics that Social Carbon has project activities at the same biome in the period of 10 years. Therefore, it is guarantee that: "it must be ensured that the proposed project activity is not saving the nonrenewable biomass accounted for by the other registered project activities." Thus, it was made two sheets to calculate the amount of wood consumed. The first one encompasses the amount of wood consumed by the ceramics located at the Caatinga biome. The other sheet calculates de amount of wood consumed regarding only Bom Jesus Ceramic. Therefore, it was taken the smaller value in order to be more conservative.	The requirement 2 of the methodology IE: If any similar registered small-scale CDM project activities exist in the same region as the proposed project activity then it must be ensured that the proposed project activity is not saving the nonrenewable biomass accounted for by the other registered project activities. Therefore at the fNRBy rate, excluded from the total of non-renewable wood, all wood not to be consumed by renewable ceramics that we project in Caatinga biome in 10 years. So make sure that: "it must be ensured that the proposed project activity is not saving the nonrenewable biomass accounted for by the other registered project activities." The answer to CL11 was accepted. OK, CL11 was closed.

CL12 - Please clarify the calculation of the parameter of NCV kcal / kg and how you obtain the lower calorific value. Please clarify, which methodology was used to determine this parameter.	AMS I.E V.1 6	The source where was acquired the NCV of the species of Caatinga biome provided the NCV and not the GCV. Therefore, the calculations from GCV to NCV were not necessary anymore. In order to achieve the NCV value utilized in this project activity, it was taken the average NCV value of the species presented in the article. Afterwards, this value was multiplied by the conversion factor from kcal to tj.	It was checked web site correspondent. The answer to CL29 was accepted. OK, CL29 was closed.
CL13 – Please clarify that the non-renewable biomass is in accordance with the indicators describe at the non-renewable biomass definition.	AMS I.E V.1 7	At section 2.2 of the VCS PD, it is explained that: "The utilization of firewood from areas without any kind of management can not be considered a renewable source of biomass, since it interferes in the carbon pools and increases the carbon emissions to the atmosphere, turning greenhouse effect even worse. Moreover, the native wood provided from areas without a reforestation management plan does not fit any of the options of UNFCCC definition of renewable biomass in Annex 18, EB 23."	The utilization of firewood from area without any kind of management cannot be considered a renewable source of biomass, since it involves a decrease of carbon pools and increases the carbon emissions to the atmosphere, turning green house effect even worse. Moreover, the native wood provided from areas without a reforestation management plan does not fit any of the options of UNFCCC definition of renewable biomass in Annex 18, EB 23. The answer to CL13 was accepted. OK, CL13 was closed.

CL14 – Please send a copy of the letter you sent to the Stakeholders and it's acknowledgement receipt	PD temp 6	A copy of the letter that was sent to the stakeholders will be sent to the validation team.	It was checked the letters sent to the SINDICER. The answer to CL14 was accepted. OK, CL14 was closed.
CL15 - Clarify the event that defined the start date to the Project Start Date for non-AFOLU projects for the VCS 2007.1 shall not be before 1 January 2002	VCS 5.2.1	This date was defined as when the project proponent began utilizing renewable biomass in the ceramic industry.	The receipts show that the early replacement of renewable biomass was after November 2006. The answer to CL15 was accepted. OK, CL15 was closed.
CL16 – Please send the calibration report of all instruments that were used to measurement and monitoring the parameters from table 12., item 3.3, or identified in the VCS PD how you guarantee that parameters used are reliable.	VCS 5.11	There are no equipments to be calibrated at the ceramic.	The answer to CL16 was accepted. OK, CL16 was closed.
CL17 – Please provide all sources for all conversions factors adopted and assumptions, in the file VCU Estimates and VCS PD.	VCS 5.12	It was included all sources for all conversion factors adopted and assumptions at the VCS PD and VCU Estimative spreadsheet.	It was observed into the documents. The answer to CL17 was accepted. OK, CL17 was closed.

CL18 – Please provide de source of information and the survey performed to guarantee that is not project be mandated by any enforced law, statute or other regulatory framework	VCS 5.8	The section 1.10 encompasses the law requirements.	This project is in accordance to the CONAMA Resolution, no. 237/97 that establishes that clay extraction activities and ceramic production must be supported by specific licenses, such as operational license, clay extraction license, environmental licenses and the permission of the State Agency of Environment and Water Resources of Pernambuco (CPRH), which must run under the valid time. According to the IBAMA Normative Instruction Nº 112 from August 21st, 2006; the entrepreneur who uses raw material from native forests is obliged to use the DOF (Document of Origin Forestry) to control the origin, transport, and storage of forest products and by-products. Therefore, to use firewood obtained from native forests in a sustainable manner, it is necessary to use the DOF. The DOF's asked from Bom Jesus Ceramic are available at IBAMA website. On the other hand, the Normative Instruction N° 8, from August 24th, 2004, Article 5, affirms that owners or holders of exotic forest species do not have to present information regarding the extraction of the wood.

			Therefore, the legal requirements regarding the use of Algaroba wood do not necessitate documents demonstrating the origin of extraction, transport and storage. As from February 2009, it is necessary the cutting information for exotic and fruit species. Furthermore, MDF does not require documents for residues which do not fall under the by-product definition of IBAMA Normative Instruction N° 112. The project is also in accordance to Federal Constitution, Article 20, which establishes the payment of a Financial Compensation by the Mineral Resources Exploitation. This financial compensation is annually performed to DNPM (National Department of Mineral Production) The answer to CL18 was accepted. OK, CL18 was closed
CL19 - Please clarify to the table 6, item 2.4 does not demonstrate equivalence in type and level of activity of products or services provided between the project and the baseline scenario, neither any significant differences between the project and the baseline scenario.	ISO 14064.2 5.4	All calculations were made based on the baseline scenario.	It was demonstrate equivalence in type and level of activity of products in baseline scenario. The answer to CL19 was accepted. OK, CL19 was closed.

CL20 - Please provide evidence of the representativeness of the value of NCV - net calorific value, since the arithmetic mean was used with 11 different species and on the representativeness of these species use their front	AMS I.E V.1 6	It was utilized the species that are usually employed as fuel from Caatinga Biome in the ceramic sector according to "Nascimento, W. S. A. Avaliação dos impactos Ambientais Derados Por Uma Industria Cerâmica Típica da Região do Seridó/RN; Dissertação (Mestrado em Engenharia Mecânica) Universidade Federal do Rio Grande do Norte, Natal, 2007. Available at: <http://bdtd.bczm.ufrn.br/tedesimplificado//tde_busca/arquivo.php?codArquivo=1239>. Last visit on: October 8th, 2009." These species present such good characteristics in order to be applied as fuel in the ceramic's kilns.	It was cross-checked the web site indicated. The answer to CL20 was accepted. OK, CL20 was closed.

CL21 - Theses web sites are not available : reference 31 - "http://www.celso-foelkel.com.br/artigos/Palestras/Silvicultura%20&%20Meio%20Ambiente.%20Vers%E3o%20final.pdf" reference 113 - "http://sbrtv1.ibict.br/upload/sbrt4555.pdf?PHPSESSID=76a9111889defa6787039ca56b380c58"	PD temp 2.2	The website: <http://www.celso-foelkel.com.br/artigos/Palestras/Silvicultura%20&%20Meio%20Ambiente.%20Vers%E3o%20final.pdf> could be accessible on October 8th, 2009. The website: <http://sbrtv1.ibict.br/upload/sbrt4555.pdf?PHPSESSID=76a9111889defa6787039ca56b380c58> was not available. The article will be sent to the validation team. However, the NCV values were referenced with this source: <http://www.aalborg-industries.com.br/downloads/poder-calorifico-inf.pdf>. Last visit on October 19th, 2009.	It was cross-checked the web site indicated. The answer to CL21 was accepted. OK, CL21 was closed.