



CENOL AND TELHA FORTE CERAMICS SWITCHING FUEL PROJECT



Document Prepared by Sustainable Carbon – Projetos Ambientais Ltda

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Carbono Social Serviços Ambientais LTDA. (Social Carbon Company) developed this project activity in 2009, and has changed its company name to Sustainable Carbon – Projetos Ambientais LTDA.

The project activity is the project of *Cenol* and *Telha Forte* Ceramics, which are two ceramic companies located in *São Miguel do Guamá* municipality, in the State of Pará, north of Brazil. Both ceramic companies produce structural ceramic pieces as bricks, mainly for the regional market in *Belém* and for the northeast region of the State.

The main goal of this project activity is to minimize the negative impacts of the deforestation of the Amazon biome by discouraging the exploration of the area. This Switching Fuel project is reducing the greenhouse gas (GHG) emissions through the substitution of native wood for renewable biomasses to generate thermal energy, considering that the GHG emissions generated from native wood combustion were not compensated by replanting. An opposite scenario occurs with the renewable biomasses employed in this project activity, which have carbon neutral lifecycle, generate thermal energy without stimulating deforestation and uses abundant renewable biomass.

Even though the use of native wood was a credible and more financially attractive scenario, considering the damage caused to the environment by the production of ceramic pieces, the factories implemented a carbon credit project at 01/03/2007. At this date, the ceramic acquired the first mechanic burners and started applying the Social Carbon Standard. Therefore, this project could only be feasible when considering the income derived from commercializing the resulting carbon credits. This move was originally unattractive due to the high investment costs of the adaptation of machineries to the new biomass and other barriers.

The project has been fully operational since the starting date of the first crediting period. During the revalidation process and the current monitoring period, Cenol remains operating with 11 “Paulista” kilns and the Telha Forte Ceramics is operating with 8 “Paulista” kilns (which corresponds to 30% of production) and 2 “Mobile” kilns (which corresponds to 70% of production).

The emission reductions due to the switching of non-renewable to renewable biomasses were equal to **40,116 tCO₂e** during the monitoring period from 01/01/2021 to 31/12/2021. The contribution to sustainability is being monitored applying the SOCIALCARBON® Standard, which is based in six main pointers: Technology; Natural; Financial; Human; Social and Carbon Resources.

In addition to reducing GHG emissions and reducing pressure on the Amazon biome, the project generates income and contributes with other social and environmental benefits to workers and

the surrounding community, such as the community development throughout sponsorship of the local capoeira group, prevention of environmental impacts by waste reuse in the production process, recovery of degraded areas, and fish farming at the clay extraction site.

1.2 Sectoral Scope and Project Type

The project is associated to the following scope, as per UNFCCC definitions:

1 - Energy industries (renewable / non-renewable sources);

This is not an AFOLU project. This is not a grouped project.

1.3 Project Proponent

Organization name	Cenol and Telha Forte Ceramics: Industrial Establishment: Cenol Cerâmica do Norte Ltda Industrial Establishment: Cerâmica Telha Forte Ltda
Contact person	Mr. Francisco Valdir and Mrs. Heronita Silva Sobrinho
Title	Mr. Francisco Valdir, Director and owner: Information about the ceramic companies, detailed information on process and production lines, environmental challenges, technological challenges, research and development history, ceramics devices market challenges. Mrs. Heronita Silva Sobrinho. Secretary and Monitoring data responsible: General data and information on inputs and outputs of the ceramic companies, detailed information on the acquisition of renewable biomasses and how this data is kept by the controller's office.
Address	BR 010, Km 1808 São Miguel do Guamá - Pará - Brazil Postal Code: 68.660-000
Telephone	+55 91 3446-2341
Email	fortetelha@yahoo.com.br

Organization name	Sustainable Carbon - Projetos Ambientais Ltda
Contact person	Marcelo Hector Sabbagh Haddad Carolina Pendl Abinajm Aline de Paulo Costa Lara de Paula Lyara Carolina Montone do Amaral Júlia Pícoli Palhares

	Yara Fernandes da Silva
Title	Marcelo Hector Sabbagh Haddad: Technical coordinator Aline de Paulo Costa: Technical analyst Lara de Paula: Technical analyst Carolina Pendl Abinajm: Technical analyst Lyara Carolina Montone do Amaral: Technical analyst Júlia Pícoli Palhares: Technical analyst Yara Fernandes da Silva: Technical analyst
Address	R. Doutor Bacelar. 368 - Conj. 23 - Vila Clementino Postal Code: 04.026-001 São Paulo - SP. Brazil
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1.4 Other Entities Involved in the Project

There are no other entities involved in the Project. Sustainable Carbon is also responsible for the social and environmental development and monitoring of Social Carbon.

1.5 Project Start Date

According to version 05 of the VCS PD¹, project start date was defined as 01/03/2007. On this date, the project began reducing or removing GHG emissions, i.e. the ceramic started using renewable biomass as fuel, and started monitoring the socioenvironmental impact. At this date, the ceramic acquired the first mechanic burners.

1.6 Project Crediting Period

The first crediting period for this project started on 01-November-2007 and ended on 31-October-2017. This is the second crediting period, which starts on 01-November-2017 and ends on 31-October-2027.

¹ Document available at: <http://www.vcsprojectdatabase.org/#/project_details/54>. Last visit on: 03/04/2018.

VCS project crediting period: 10 years, two times renewable.

1.7 Project Location

According to the applied methodology, the project boundaries for the bundled project are the physical, geographical areas of the renewable energy generation. Thus, the ceramics limits.

Cenol and Telha Forte ceramics are located in Brazil, in the State of Pará which is indicated in Figure 01.

Cenol and Telha Forte Ceramics
Rodovia BR 010 – KM 1808 – Bairro Industrial
São Miguel do Guamá - Pará, Brazil
Postal Code: 68660-000
Geodetic Coordinates (SAD69):
Cenol Ceramic: 1° 32' 12.06"S and 47° 30' 48.59"W
Telha Forte Ceramic: 1° 32' 12.41"S and 47° 30' 48.65"W

Table 1. Localization of the ceramics companies

Ceramic	City	State	Ceramic Company Coordinates
Cenol	São Miguel do Guamá	Pará	1° 32' 12.06" S 47° 30' 48.59" W
Telha Forte	São Miguel do Guamá	Pará	1° 32' 12.41" S 47° 30' 48.65" W



**Figure 1. Geographic location of São Miguel do Guamá which has the following coordinates:
1° 37' 09.22"S and 47° 28' 33.68"W.**

1.8 Title and Reference of Methodology

The project applies a small-scale methodology approved under the Clean Development Mechanism, as follows:

Category AMS-I.E.: Switch from Non-Renewable Biomass for Thermal Applications by the User – Version 07, valid from 22-July-2016 to 31-October-2017². This category comprises small thermal appliances that displace the use of non-renewable biomass by introducing new renewable energy end-user technologies.

In addition, project emissions will be calculated using the Methodological tool “Project and leakage emissions from transportation of freight” – 0.1.1.0³.

The SOCIALCARBON Indicators used for realizing the diagnostic:

Brazilian Red Ceramic factories Indicators. Version 1.1.September, 2013.

1.9 Participation under other GHG Programs

- Emission Trading Programs and Other Binding Limits: The project activity is not included in an emission trading program or any other mechanism that includes GHG allowance trading.
- Other Forms of Environmental Credit: The project activity is not creating any other form of environmental credit under any specific program.
- Participation under Other GHG Programs: The project activity is not registered under any other GHG program.

1.10 Other Forms of Credit

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 standard.

1.11 Sustainable Development

The project activity contributes to the reduction of greenhouse gas (GHG) emissions by avoiding the use of non-renewable fuels. In addition, the project activity will contribute to sustainable development of the host country, such as:

- The use of clean and efficient technologies through the use of renewable biomass as fuel. By these means, the project is in accordance to Agenda 21 and with Brazilian Sustainable Development Criteria;

² This version of the methodology is available at: <<https://cdm.unfccc.int/methodologies/DB/9LFOR81TCT5FL1AJYP46CQY8O2J79>>. Last visit on: 23-August-2021.

³ Available at: <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-12-v1.pdf>. Last visited on 25/08/2021

- A pioneer initiative that encourages the development of new technologies throughout the country, which replaces the use of non-renewable fuels with renewable biomass which presents an efficient thermal energy generation potential as shown in the project demonstration.
- The use of renewable biomasses results in GHG emission reductions. This way the project does not cause any relevant negative impacts as all generated energy is a result of the best exploitation of the natural resources available. In addition, the project improves the local environmental conditions by establishing proper treatment for the renewable biomasses and also by contributing to the reduction on the use of non-renewable fuels.

Furthermore, the project contributes to the following UN Sustainable Development Goals (SDG), which are better described in the SOCIALCARBON Report:

- SDG 7: Affordable and Clean Energy – the carbon project requires the fuel switching in the ceramic factories, therefore assures the renewable biomass usage. This SDG is monitored in the Financial resource (7. Biomass supply) in the SOCIALCARBON Report. For more information, please verify section 6.1 below.
- SDG 8: Decent Work and Economic Growth – the carbon project promotes safe and secure workplace while stimulates higher efficiency in the factories production process. This SDG is monitored in the following resources: Social (3. Employee satisfaction surveys), Human (4. Additional employee benefits, 5. Health and safety practices, 6. Training and capacity building programs), and Technology (14. Technological advances to improve the general conditions of the working environment) in the SOCIALCARBON Report. For more information, please verify section 6.1 below.
- SDG 12: Responsible Consumption and Production – the carbon project nurtures a better environmental management system in the ceramic factories since assists the factories to amplify better waste practices, such as reuse and donate of waste generation in the productive process, but also, actions that increase the stakeholder awareness concerning the climate changes mitigations, and whichever environmental management the factories intends to apply. This SDG is monitored in the following resources: Social (2. Community development), and Natural (10. Environmental management, 11. Brazilian environmental legislation, 12. Voluntary environmental initiatives,) in the SOCIALCARBON Report. For more information, please verify section 6.1 below.
- SDS 13: Climate Action – the carbon project itself enhances sustainable practices in order to mitigate the climate changes, also, the SOCIAL CARBON Report possibilities guidance to the ceramic factories to develop continuously initiatives regarding socioenvironmental practices aligned with direct and indirectly better carbon management practices and increasing awareness in the stakeholder on climate changes mitigations. This SDG is monitored in the following resources: Financial (9. *Carbon credit investments*), Natural (12. *Voluntary environmental initiatives*), Carbon (16. *Stakeholder consultation*, 17. Green marketing, 18. Project performance) in the SOCIALCARBON Report. For more information, please verify section 6.1 below.

2 SAFEGUARDS

2.1 No Net Harm

The only negative impact identified is that the project activity will generate ashes due to the burning of the biomass, but this impact has been mitigated since the ceramic factories occasionally donate the storage ashes to employees use as fertilizer.

The burning of the new biomasses also emits particulate material and CO₂, as well as when using native wood. However, GHG emission reductions will be improved since they are renewable biomasses which have carbon neutral lifecycles.

The SOCIALCARBON indicators will evaluate if there are positive social and environmental impacts from the Project Activity. The SOCIALCARBON methodology uses a set of analytical tools that assess the social, environmental and economic conditions of communities affected by the project and demonstrates the project's contribution to sustainable development through continuous monitoring.

2.2 Local Stakeholder Consultation

The formal stakeholder consultation was carried out during the validation of the project. Currently, the company's environmental management area is available to receive any kind of suggestions and comments from the community through the website, CSC, telephone, e-mail or even personally. For this current monitoring period there were no registration of complaints.

2.3 AFOLU-Specific Safeguards

Not applicable. This is not an AFOLU project.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Activity

This Monitoring Report refers to the seventh monitoring period of this project activity and includes data from 01-January-2021 to 31-December-2021. The VCS PD of the second crediting period was validated by the Designated Operational Entity Earthood Services Private Limited and the present monitoring report will be verified by the Designated Operational Entity Earthood Services Private Limited.

The project has been fully operational since the starting date of the first crediting period. This means the ceramic factories are operating using exclusively renewable biomass (sawdust and açai pits), thus mitigating their baseline emissions.

During the validation process, *Cenol* and *Telha Forte* ceramics utilized two different types of kilns in their burning process: *Round*⁴ kilns and *Paulista*⁵ kilns. During the first crediting period, the implementation of the project activity saved 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 equipment;
- Injection of biomasses controlled by equipment, avoiding surplus of fuel often occurred when using wood.

Most of these improvements were made using the income derived from the carbon credits trade, since the implementation of the project as the construction of new kilns during the first crediting period. In addition, with the construction of new kilns, eight Intermittent kilns still operating in Telha Forte Ceramic Industry. Besides that, Cenol Ceramic Industry operates with 11 Intermittent kilns. Thus, Telha Forte Ceramic presents 2 Intermittent (Mobile) kilns and 8 Intermittent (Paulista), totalizing 10 Intermittent Kilns. Cenol Ceramic presents 11 Intermittent (Paulista) kilns.

During the revalidation process and the current monitoring period, none of the ceramics factories built new kilns. Thus, Cenol remains operating with 11 “Paulista” kilns and the Telha Forte Ceramics is operating with 8 “Paulista” kilns (which corresponds to 30% of production) and 2 “Mobile” kilns (which corresponds to 70% of production).

Table 02 below illustrates the status of the project activity according to the kilns change during time.

Table 2. Status of the Ceramic Project Activity

Ceramic	Quantity of kilns (units)						
	PD v.05	4th MR	5th MR		6th MR	7th MR	8th MR
		Kilns Deactivated	Kilns Constructed	Kilns activated	Kilns currently active		
Cenol	7 Round kilns	1 Round kiln	-	6 Round kilns	11 Paulista kilns		
	3 Paulista kilns	3 Paulista kilns	13 Paulista kilns	-			
Telha Forte	8 Round kilns	8 Round kilns	2 Mobile kilns	-	2 Mobile kilns		
	5 Paulista kilns	-	3 Paulista kilns	8 Paulista kilns	8 Paulista kilns		

The table below demonstrates the emission reductions verified in the last monitored periods:

⁴ The “Round” kiln is a kind of intermittent kiln with Round shape and lateral furnaces. Its internal diameter is about 9 meters. It is usually employed to burn tiles and bricks.

⁵ The “*Paulistinha*” is a kind of intermittent kiln with rectangular shape and lateral furnaces. It is usually employed to burn tiles.

Table 3. Status of the Ceramic Project Activity

First crediting period	Emission Reduction (tCO2e)		
	1° Monitoring Period	January to December of 2008	8,814
		January to April of 2009	2,510
	Total in the monitoring period		11,324
	2° Monitoring Period	May to December of 2009	20,655
		January to May of 2010	13,430
	Total in the monitoring period		34,085
	3° Monitoring Period	June to December of 2010	16,769
		January to December of 2011	19,946
		January to February of 2012	3,282
	Total in the monitoring period		39,997
	4° Monitoring Period	June to December of 2010	16,769
		January to December of 2011	19,946
		January to February of 2012	3,282
	Total in the monitoring period		39,997
	5° Monitoring Period	June to December of 2010	16,769
		January to December of 2011	19,946
		January to February of 2012	3,282
	Total in the monitoring period		39,997
	6° Monitoring Period	March to December of 2012	31,227
		January to December of 2013	46,147
		January to February of 2014	45,817
		January to December of 2015	23,834
		January to December of 2016	36,801
		January to October of 2017	31,322

	Total in the monitoring period		215,148
	Total in the first crediting period		380,548
Second crediting period	7° Monitoring Period	November to December of 2017	4,085
		January to December of 2018	26,517
		January to December of 2019	28,607
		January to December of 2020	32,337
	Total in the monitoring period		91,546
	Total in the second crediting period		91,546

Regarding social and environmental components, *Cenol* and *Telha Forte* ceramics have invested the revenue provided by the sale of carbon credits in benefits to workers, donations to surrounding community, improvements in work conditions and in the ceramic factories' infrastructure. The table below presents the major social, economical, and environmental impacts of the emissions reductions project.

Table 4. Main social, economic and environmental impacts of the emission reduction project.

Activity	Aspect	Impact	Effect		Comments/ Observation
			Beneficial	Adverse	
Fuel Switch	Use of renewable biomass	Greenhouse Gas Emissions Reductions	X		Monitored by the: Monitoring Report
Fuel Switch	Use of renewable biomass	Creation of new markets through use of renewable biomass	X		Monitored by the Carbon Resource: Indicator – Green marketing
Fuel Switch	Use of renewable biomass	Need for financial investment		X	Monitored by the Financial Resource: Indicator - Carbon credit investments
Carbon Credit Project	Commercialization of credits	Income generation for ceramics	X		Monitored by the Financial Resource: Indicator – Planning and control
Carbon Credit Project	Validation and Verification	Greater rigor in compliance with Brazilian environmental legislation	X		Monitored by the Natural Resource: Indicator - Brazilian environmental legislation

Carbon Credit Project	Application of the SOCIALCARBON Methodology	Encourages improvement in working conditions and product quality	X		Monitored by the Human Resource: Indicator: Additional employee benefits Indicator: Health and safety practices Monitored by the Technological Resource: Indicator: Technological advances to improve efficiency of the production process Indicator: Technological advances to improve the general conditions of the working environment Indicator: Product quality
Carbon Credit Project	Application of the SOCIALCARBON Methodology	Encouraging corporate social responsibility	X		Monitored by the Social Resource: Indicator: Diversity Indicator: Community development Indicator: Employee satisfaction surveys Monitored by the Human Resource: Indicator: Training and capacity building programs
Carbon Credit Project	Application of the SOCIALCARBON Methodology	Encouraging good environmental practices	X		Monitored by the Natural Resource: Indicator: Environmental management Indicator: Voluntary environmental initiatives

3.2 Deviations

3.2.1 Methodology Deviations

There were no methodology deviations during this monitoring period.

3.2.2 Project Description Deviations

According to the PD v.8 and the 6th monitoring report, Cenol Ceramic presents 13 Intermittent (Paulista) kilns. However, during the previous monitoring period the total of Paulista kilns in the factory was reduced to 11 .

The deviation was verified in 2022 by the VVB. Thus, it is possible to guarantee that this adjustment does not influence or interfere with the baseline, additionality, and conservatism of this project.

Also, during the 8th monitoring period, Sustainable Carbon's Team verified that the reference used in the VCS PD v.8 to assess the biomass surplus of forest residues is no longer available. Then, even though the biomass surplus was already validated during the revalidation, in order to maintain credible data in leakage emissions calculus Sustainable Carbon's team has updated the value of forest residues and sawdust generation' reference. Before the exchanges, it was considered that only 22% of the wood produced generated forest residues in Pará's state. Yet, after the literature update, the total forest residues generated by wood produced increased from 22% to 55%, therefore the total production of forest residues went from 1,181,149 m³ to 2,952,873 m³.

In this monitoring period, the quantity of biomass utilized in the region, including the project activity's consumption, was larger than 25% of the available biomass in the project region. Thus, according to "General guidance on leakage in biomass project activities" this update does not generate leakage emissions since the quantity of biomass availability was around 31% in the project region.

This adjustment in the reference used does not have impact in the applicability of the methodology, additionality, or the appropriateness of the baseline scenario.

3.3 Grouped Projects

Not applicable. This is not a grouped project.

3.4 Safeguards

Safeguards were addressed at Section 2 of the present VCS + SOCIALCARBON Monitoring Report.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data/Parameter	EF _{projected fossil fuel}
Data unit	tCO ₂ /TJ
Description	Emission factor for the substitution of non-renewable woody biomass by similar consumers.
Source of data	AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user - Version 7.0. Available at: https://cdm.unfccc.int/methodologies/DB/9LFOR81TCT5FLI1AJYP46CQY802J79 Last visit in August, 2021.
Value applied	81.6
Justification of choice of data or description of measurement methods and procedures applied	This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50 per cent weight is assigned to coal as the alternative solid fossil fuel (96 t CO ₂ /TJ) and a 25 per cent weight is assigned to both liquid and gaseous fuels (71.5 t CO ₂ /TJ for kerosene and 63.0 t CO ₂ /TJ for liquefied petroleum gas (LPG)).
Purpose of the data	The fossil fuel likely to be used by similar consumers is taken from the applied methodology. This parameter was used to calculate baseline emissions from the use of the fossil fuel that would be used in the baseline scenario, in the absence of non-renewable wood.
Comment	Applicable for stationary combustion in the manufacturing industries and construction.

Data/Parameter:	ρ wood
Data unit	tonne/m ³
Description	Specific gravity of non-renewable wood
Source of data	Sources:

	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.2. 4.ed. Nova Odessa. SP: Instituto Plantarum. 2002. QUIRINO. W. F. et al. Poder Calorífico da Madeira e de Resíduos Lignocelulósicos. Biomassa & Energia. v.1. n.2. p. 173-182. 2004. Available at: < https://web.archive.org/web/20180516220207/http://www.renabio.org.br/06-B&E-v1-n2-2004-173-182.pdf>. Last visit in August, 2021.
Value applied	0.67
Justification of choice of data or description of measurement methods and procedures applied	The species used to calculate the value are typical trees of Amazon Biome that are usually employed as fuel in the ceramic factories of the region. The amount of wood used in the baseline was measured in volume unit.
Purpose of the data	This parameter was used to calculate baseline emissions from the use of non-renewable fuel that would be used in the baseline scenario. The amount of wood used in the baseline was measured in volume units, so this data is used to convert measured values to tonnes.
Comments	The species used to calculate the average value are typical trees of Amazon Biome that are usually utilized as fuel in the ceramic industries of the region. 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	BF _y
Data unit	Tonnes of native wood per tonnes of ceramic units fired
Description	Baseline consumption of non-renewable biomass per tonnes of ceramic units produced in year y
Source of data	Historical data from the project proponent

Value applied	Cenol Ceramic	Telha Forte Ceramic	
	<i>Paulista</i> Kiln	<i>Paulista</i> Kiln	Mobile Kilns
	0.64	0.62	0.46
Justification of choice of data or description of measurement methods and procedures applied	This second crediting period presents three BF _y values. The value presented to <i>Paulista</i> Kiln in Cenol and Telha Forte Ceramics are the same calculated in the first crediting period, changing only the unit of measurement. One different value of BF _y is applied due to the construction to the two Mobile Kilns. The value used to Mobile Kilns was acquired through the average consumption and production of ceramic devices during the years when the ceramic used to consume non-renewable biomass. In addition, was provided a document of third part indicated when the mobile kiln is more efficiency than <i>Paulista</i> kiln already existent in Ceramic. The Mobile Kiln is 25% more efficient than <i>Paulista</i> kiln and this value was subtracted of total BF _y (0.62), using only real percentage of new kiln (0.46) to this Mobile Kiln BF _y .		
Purpose of the data	The purpose of the data is to provide the consumption of non-renewable biomass per tonnes of ceramic units produced in a year in the baseline scenario.		
Comments	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	EFCO2,f							
Data unit	g CO2/t km							
Description	Default CO2 emission factor for freight transportation activity f							
Source of data	TOOL12 Methodological tool: Project and leakage emissions from transportation of freight Version 01.1.0 Available at: https://cdm.unfccc.int/methodologies/PAmethodologies/tools/a-m-tool-12-v1.1.0.pdf Last visit in August, 2021.							
Value applied	<table><tr><th>Vehicle class</th><th>Vehicle class Emission factor (g CO2/t km)</th></tr><tr><td>Heavy vehicles</td><td>129</td></tr><tr><td>Light vehicles</td><td>245</td></tr></table>	Vehicle class	Vehicle class Emission factor (g CO2/t km)	Heavy vehicles	129	Light vehicles	245	
Vehicle class	Vehicle class Emission factor (g CO2/t km)							
Heavy vehicles	129							
Light vehicles	245							

Justification of choice of data or description of measurement methods and procedures applied	The emission factor has been derived based on custom design transient speed-time-gradient drive cycle (adapted from the international FIGE cycle), vehicle dimensional data, mathematical analysis of loading scenarios, and dynamic modelling based on engine power profiles, which, in turn, are a function of gross vehicle mass (GVM), load factor, speed/acceleration profiles and road gradient.
Purpose of the data	This parameter is utilized to calculate the project emission due to the freight transportation of biomass from the suppliers to the ceramic industry.
Comments	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.

4.2 Data and Parameters Monitored

Data/Parameter	PRy																									
Data unit	Tonnes of ceramic devices																									
Description	Production of ceramic devices																									
Source of data	Controlled by the project proponent.																									
Description of measurement methods and procedures to be applied	The amount of ceramic pieces produced is monitored by counting the total production of one year, based on data from last crediting period. This parameter will be monitored by the project proponent (meaning the ceramic owner). The amount will be acquired by counting the total production of the period considered for the ceramic factory and data will be aggregated on a monthly and yearly basis.																									
Frequency of monitoring/recording	Annually.																									
Value monitored	<table><tr><th colspan="4">Production (tonnes of ceramic units)</th></tr><tr><th colspan="2" rowspan="2">Period</th><th>Cenol</th><th>Telha Forte</th></tr><tr><th>Production</th><th>Production</th></tr><tr><td rowspan="4">2021</td><td>January</td><td>2,298</td><td>3,982.91</td></tr><tr><td>February</td><td>2,069</td><td>3,124.34</td></tr><tr><td>March</td><td>1,469</td><td>3,666.58</td></tr><tr><td>April</td><td>1,285</td><td>3,560.40</td></tr></table>			Production (tonnes of ceramic units)				Period		Cenol	Telha Forte	Production	Production	2021	January	2,298	3,982.91	February	2,069	3,124.34	March	1,469	3,666.58	April	1,285	3,560.40
Production (tonnes of ceramic units)																										
Period		Cenol	Telha Forte																							
		Production	Production																							
2021	January	2,298	3,982.91																							
	February	2,069	3,124.34																							
	March	1,469	3,666.58																							
	April	1,285	3,560.40																							

		May	1,359	3,641.46
		June	1,351	3,398.78
		July	1,922	3,771.39
		August	2,663	3,490.16
		September	2,427	2,633.00
		October	2,362	2,880.57
		November	2,480	3,103.39
		December	1,843	3,595.62
		Total 2021	23,527	40,849
	Total of monitoring period	64,375.70		
Monitoring equipment	No monitoring equipment is used to determine this parameter. Production is counted by trained personnel on Cenol and Telha Forte ceramics.			
QA/QC procedures to be applied	Data concerning PRy measurement points are from an internal control documents used by Cenol and Telha Forte Ceramics. These documents are organized per month and daily filled according to data based on ceramic units burned in the kilns. Data was rechecked according to the biomass employed and the kiln consumption of renewable biomass.			
Purpose of the data	This parameter is used to calculate baseline emissions and the total energy produced in order to compare to the thermal energy necessary in the VCS PD (QA/QC table).			
Calculation method	The ceramic industry has an internal control of the quantity of ceramic tonnes produced. It was rechecked according to the biomass employed in the ceramic kilns.			
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	$Q_{renbiomass}$
Data unit	Tonnes per month
Description	Amount of renewable biomass utilized
Source of data	The ceramic owner measure the dimensions of the trucks that delivery the biomass and with this information a receipt is issue by ceramic employees containing the total volume of biomass and the price paid, as an internal control
Description of measurement methods	The amount of biomass was monitored in accordance to the volume measured from the truck dimensions.

and procedures to be applied

The VCS PD establishes that values in the receipts described in m³ (when applicable), shall be converted into tonnes through the specific gravity of each biomass. The specific gravity values of each renewable biomasses used in this project are:

Biomass	Sawdust	Açaí Pits
Specific gravity (tonne/m ³)	0.35	0.72

The sources of these data are:

Sawdust:

SIMIONI. F. J. **Análise diagnóstica e Prospectiva da cadeia produtiva de energia de biomassa de origem florestal no planalto sul de Santa Catarina.** Curitiba. 2007. Available at: <<http://hdl.handle.net/1884/10294>>. Last visit in August, 2021.

Açaí pits:

PADILHA et al. **Avaliação do Potencial dos Caroços de Açaí para a geração de energia.** Biomassa & Energia. v. 2. n. 3. p. 231-239. 2005. Available at: <<https://web.archive.org/web/20180516220207/http://www.renabio.org.br/06-B&E-v1-n2-2004-173-182.pdf>>. Last visit in August 2021.

Frequency of monitoring/recording

Monthly

Value monitored

Q _{renbiomass} - Amount of renewable biomass					
		Cenol		Telha Forte	
Period		Açaí pits (ton)	Sawdust (ton)	Açaí pits (ton)	Sawdust (ton)
2021	January	150.07	865.45	124.98	720.74
	February	98.37	712.91	130.85	948.29
	March	142.75	675.26	159.30	753.58
	April	142.10	624.08	132.86	583.48
	May	126.62	797.59	46.07	290.20
	June	99.91	581.15	99.01	575.96
	July	166.52	633.26	54.65	207.82
	August	192.26	559.64	143.94	418.98
	September	187.29	750.10	111.51	446.59
	October	377.75	1,012.46	35.55	95.28
	November	340.78	961.92	62.57	176.63

		December	191.41	915.51	64.75	309.70
	TOTAL 2021		2,215.83	9,089.32	1,166.04	5,527.25
	Total in the monitoring period		11,305.15		6,693.29	
			17,998.45			
Monitoring equipment	No monitoring equipment is used to determine this parameter					
QA/QC procedures to be applied	Amount of biomass was checked according to receipts of purchase and written declarations. The energy balance was verified according to the amount of biomass applied. The thermal energy generated with the use of the biomass per thousand of ceramic devices produced during the current monitoring period was compared to the VCS PD. The thermal energy generated per tonnes of ceramic units produced at Cenol Ceramic and Telha Forte Ceramic was higher than estimated on the VCS PD.					
Purpose of the data	This parameter was used to: a. Compare the total energy produced in the current monitoring period to the thermal energy that would be necessary according to the VCS PD estimates (QA/QC table); b. Demonstrate that the Project fits in small scale category (<45MWth/year); c. Calculation of leakage emissions due to competing use of biomass					
Calculation method	The energy generated by the amount of renewable biomass during the current monitoring period was calculated based on the Net Calorific Value of each biomass, as can be seen on the VCS MR Calculation spreadsheet.					
Comment	Data was measured for each purchase/acquisition of biomass and aggregated monthly. 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	Controlled by the ceramic owner
Description of measurement methods	This information was given by the biomasses providers. The guarantee of acquiring renewable biomass was achieved by invoices from the providers. The biomasses (sawdust and açai pits)

and procedures to be applied	are considered renewable as fulfilling the options described in the methodology applied.
Frequency of monitoring/recording	Each monitoring period.
Value monitored	Not applicable.
Monitoring equipment	No monitoring equipment was used to determine this parameter.
QA/QC procedures to be applied	The biomasses were considered renewable as they were in accordance with the definition given by the Annex 18, EB 23 of UNFCCC definition ⁶ .
Purpose of the data	Not directly applied for the calculation. This parameter is used to guarantee that the amount of biomass acquired by the project proponent has a renewable origin. It is also necessary to comply with procedures required by the methodology AMS-I.E, Version 07.
Calculation method	Not applicable
Comment	All the renewable biomasses utilized in the monitoring period were already described in the VCS PD and are in accordance with definitions of renewable biomass set in the applied methodology. 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	tCO ₂ e
Description	Leakage resulted from the non-renewable biomass
Source of data	AMS-IE, version 05, paragraph 10
Description of measurement methods and procedures to be applied	The sources of leakages predicted in the applied methodology were monitored. Scientific articles official statistical data regional and national surveys were provided in order to ensure that there was no leakage from non-renewable biomass (or to estimate the leakage). Please see Section 5.3: "Leakage".
Frequency of monitoring/recording	Annually
Value monitored	0
Monitoring equipment	No monitoring equipment is used to determine this parameter.

⁶ CDM – Executive Board. Annex 18 definition of renewable biomass. EB 23. Available at: <http://cdm.unfccc.int/EB/023/eb23_repan18.pdf>. Last visit on: 25/08/2021.

QA/QC procedures to be applied	Data available regarding the ceramic industries fuel consumption were utilized to monitor the leakage.
Purpose of the data	Calculation of leakage emissions. This parameter is used to evaluate if there is any source of indirect emission related to non-renewable biomass. If applicable, leakage emissions are used to adjust emission reductions resulting from the project.
Calculation method	Not applicable.
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	Percentage
Description	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods or government data or approved default country specific fraction of non-renewable biomass (f_{NRB}) values available on the CDM website.
Source of data	“Methodological Tool TOOL30 - Calculation of the fraction of non-renewable biomass” version 01.0. Available at: https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-30-v1.pdf Last visit in November 2022.
Description of measurement methods and procedures to be applied	The monitoring of this parameter was based on national and international articles, databases and data monitored by the project developer such as project activities at the same region. The sources provided information about the availability of woody biomass in the Amazon biome.
Frequency of monitoring/recording	Annually
Value monitored	93.84 %
Monitoring equipment	No monitoring equipment is used to determine this parameter.
QA/QC procedures to be applied	The monitoring of this parameter was based in national and international articles and database every monitoring period. The sources provided information about the sustainable use of Amazon biome
Purpose of the data	The purpose of the data is to determine the fraction of biomass (wood) which would be used in the absence of the project activity in year y.

Calculation method	The fraction of woody biomass used in the absence of the project activity in year y is essentially captured in the equation below: $fNRB = \frac{NRB}{NRB + RB}$ Where: $fNRB$ Fraction of non-renewable biomass (fraction or %) NRB Non-renewable biomass (t/yr) RB Demonstrably renewable biomass (t/yr) Calculations are in accordance to "Calculation of the fraction of non-renewable biomass" version 01.0. Available at: https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-30-v1.pdf For detailed information please check the "$fNRB,y$" tab available in the "VCS MR Calculations Cenol_Telha Forte" spreadsheet
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	tonnes or m ³		
Description	Amount of renewable biomass available		
Source of data	Monitored		
Description of measurement methods and procedures to be applied	It was used to calculate the leakage of renewable biomass. The measurement of the leakage was based on national and international articles and databases every monitoring period. These sources provided information about the biomass availability in the project activity's region. The bibliographic references are described on the section 5.3 "Leakage".		
Frequency of monitoring/recording	Annually		
Value monitored	Biomass surplus	Surplus	Year
	Açaí pits	112,060 tonnes/year	2016
	Forest residues (sawdust, wood residue)	2,952,873m ³ /year	2016
	Detailed information in Section 5.3.: "Leakage".		

Monitoring equipment	No monitoring equipment is used to determine this parameter.
QA/QC procedures to be applied	Data available regarding the ceramic industries fuel consumption was employed to monitor the leakage.
Purpose of the data	Calculation of leakage emissions due to competing use of biomass.
Calculation method	The amount of biomass used by the project activity in each year of the crediting period is compared to total biomass available, as estimated on the VCS PD.
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	D _{f,m}										
Data unit	Kilometre										
Description	Return trip distance between the origin and destination of freight transportation activity f in monitoring period m										
Source of data	Monitored										
Description of measurement methods and procedures to be applied	Determined once for each freight transportation activity f for a reference trip using the vehicle odometer or any other appropriate sources (e.g. on-line sources)										
Frequency of monitoring/recording	To be updated whenever the distance changes										
Value applied		<table><tr><th rowspan="2">Year</th><th colspan="2">D_{f,m} (km)</th></tr><tr><th>Cenol</th><th>Telha forte</th></tr><tr><td>2021</td><td>0.00</td><td>17,268</td></tr></table>		Year	D _{f,m} (km)		Cenol	Telha forte	2021	0.00	17,268
Year	D _{f,m} (km)										
	Cenol	Telha forte									
2021	0.00	17,268									
Monitoring equipment	No monitoring equipment is used to determine this parameter.										
QA/QC procedures to be applied	Data available regarding the ceramic industry freight of biomass transportation.										
Purpose of data	This parameter is used to calculate project emissions for freight that exceeds 200 km.										
Calculation method	Information in section 5.2 – Project Emissions										
Comments	This parameter was not monitored during the first crediting period. Values are being monitored at this Monitoring Period onwards. 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	FR _{f,m}																													
Data unit	Tonnes																													
Description	Total mass of freight transported in freight transportation activity f in monitoring period m																													
Source of data	Records by project participants or records by truck operators																													
Description of measurement methods and procedures to be applied	This parameter is record by the ceramic in a sheet with the distance between the ceramic and the furnisher. Information in section 5.2 – Project Emissions																													
Frequency of monitoring/recording	Annually																													
Value applied	<table><tr><td></td><th colspan="5">FR_{f,m} in tonnes</th></tr><tr><td></td><th colspan="2">Cenol</th><th colspan="2">Telha Forte</th><th rowspan="2">Total</th></tr><tr><td></td><th>Açaí pits</th><th>Sawdust</th><th>Açaí pits</th><th>Sawdust</th></tr><tr><td>2021</td><td>2,215.83</td><td>9,089.32</td><td>3,381.88</td><td>14,616.57</td><td>29,303.60</td></tr><tr><td colspan="5">Total in the monitoring Period</td><td>29,303.60</td></tr></table>		FR _{f,m} in tonnes						Cenol		Telha Forte		Total		Açaí pits	Sawdust	Açaí pits	Sawdust	2021	2,215.83	9,089.32	3,381.88	14,616.57	29,303.60	Total in the monitoring Period					29,303.60
	FR _{f,m} in tonnes																													
	Cenol		Telha Forte		Total																									
	Açaí pits	Sawdust	Açaí pits	Sawdust																										
2021	2,215.83	9,089.32	3,381.88	14,616.57	29,303.60																									
Total in the monitoring Period					29,303.60																									
Monitoring equipment	No monitoring equipment is used to determine this parameter.																													
QA/QC procedures to be applied	Data available regarding the ceramic industry freight of biomass transportation.																													
Purpose of data	This parameter is used to calculate project emissions for freight that exceeds 200 km.																													
Calculation method	Information in section 5.2 – Project Emissions																													
Comments	This parameter was not monitored during the first crediting period. Values are being monitored in this Monitoring Period onwards. 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	NCV _{biomass}
Data unit	TJ/tonne of wood
Description of measurement methods and procedures applied	Net Calorific Value of non-renewable woody biomass that is substituted.
Source of data	AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user - Version 7.0. Available at:

	https://cdm.unfccc.int/methodologies/DB/9LFOR81TCT5FLI1AJYP46CQY802J79 Last visit in August 2021. The value informed in the applied methodology is based on IPCC default for wood fuel.
Frequency of monitoring/recording	Annually.
Value monitored	0.015
Justification of choice of data or description of measurement methods and procedures applied	The source of data is the IPCC default for wood fuel, as recommended in the applied methodology.
Purpose of Data	This value provides the energy generated by the amount of wood that would be used in the absence of the project.
Comments	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.

4.3 Data Monitored and SOCIALCARBON

Resource: Social

Indicator	Diversity.
Data unit	Quantity of women, seniors (older than 60 years), disabled and illiterate employees.
Description	Evaluates the employment opportunities provided by the Ceramic industry to historically excluded social groups, such as: women, ex-convicts, the elderly, the indigenous, the illiterate and the disabled.
Source of data	RAIS (Annual Social Information Report), CAGED (General Register of Employed and Unemployed Persons) Social inclusion policies and programs that value diversity.

Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	Less than 15% of employees belong to a minority group.
Comments	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.
Indicator	Community development.
Data unit	Quantity of initiatives, frequency and partnership with public entities and/or civil organizations.
Description	Evaluates the existence of management practices that contribute to local community development.
Source of data	Interviews and / or questionnaires. Complementary or supplementary evidence may include receipts, invoices, partnership contracts, statements.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.

Purpose of the data	The factory supports community members or civil society organizations: - Regularly: one per month; OR - Significant: at least 10 different parties were benefited.
Comments	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.

Indicator	Employee satisfaction surveys.
Data unit	Existence of a system to evaluate employee satisfaction.
Description	Evaluates existing systems for employee feedback (questions, suggestions and complaints) and the measures taken in response to the feedback to make improvements.
Source of data	Suggestion slips, suggestion box, employee satisfaction surveys, meeting attendance lists, photos.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	The system for employee consultation is being utilized, but is limited to a suggestion box.
Comments	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.

Resource: Human

Indicator	Additional employee benefits.
Data unit	Quantity of additional benefits, quantity of employees who receive additional benefits, and the existence award programs based on merit.
Description	Evaluates the additional benefits provided to employees. Benefits required by law are not considered.
Source of data	Questionnaires, invoices, receipts, statements, pay stubs and signed list by employees stating receipt of benefits.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	All employees receive more than one additional benefit monthly.
Comments	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.

Indicator	Health and safety practices.
Data unit	Compliance to the Mandatory and/or complementary programs, and monitoring usage of PEE (Personal Protective Equipment).
Description	Evaluates the existing health and safety practices in the factories, including the distribution and supervised use of PPE (Personal Protective Equipment) by all employees as well as health and safety programs.

	Mandatory Programs: PPRA: Program for Prevention and Environmental Risks; PCMSO: Program for Controlling Medical and Occupational Health and CIPA: Internal Commission for Accident Prevention. Complementary programs: PPR: Respiratory Protection Program; PPRPS: Program for Protection from risks in presses and Similar and PCA: Hearing Conservation Program.
Source of data	Participatory meetings, interviews, PPE control records, health and safety programs (CIPA PCMSO, PPRA), supervised EPI use (warnings, suspension), participant sign-in lists for lectures, contracts with health and safety professionals.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	In addition to scenario 5, the factory develops complementary programs such as PPR, PPRPS and PCA; and/or The factory encourages physical activity or conducts activities for disease prevention.
Comments	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.
Indicator	Training and capacity building programs.
Data unit	Training and capacity building programs.

Description	Evaluates whether the factory encourages and invests in the professional development of its employees.
Source of data	Contracts, certificates, statements, planning controls.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	Training courses were offered to individual employees, but not to all employees.
Comments	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.

Resource: Financial

Indicator	Biomass supply.
Data unit	Control of the source and amount of renewable biomass.
Description	Evaluates the type, source and quantity of renewable biomass used as fuel, as well as the profile of suppliers.
Source of data	Questionnaires and monitoring report spreadsheets.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all

	documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	The factory has total control of the source and amount of renewable biomass used and 100% of the fuel is coming from agro-industrial waste.
Comments	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.

Indicator	Planning and Control.
Data unit	Financial planning and control spreadsheet.
Description	Evaluates the existence of financial planning and controls in regards to carbon credits sold by factory.
Source of data	Planning and control spreadsheets.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	The factory has organized controls of the income received from carbon credit sales, as well as of the destination for proceeds. However, the factory presents no future planning.
Comments	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.

Indicator	Carbon credit Investments.
Data unit	Carbon Credit Investments Percentual.
Description	Evaluates whether proceeds from the sale of carbon credits was invested in factory improvements or activities that benefit the local community.
Source of data	Questionnaire and/or control spreadsheets.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	Between 80 and 100% of the income generated by carbon credit sales was invested the factory or in the community development.
Comments	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.

Resource: Natural

Indicator	Environmental Management.
Data unit	Quantity of initiatives and implementation of environmental management system.
Description	Evaluates initiatives and structured/certified environmental management systems in regards to managing waste, water, air, soil, energy and nature conservation. Note: the use of renewable fuel shall not

	be deemed an initiative, since it is a prerequisite for becoming a carbon project.
Source of data	Questionnaires, interviews, photos, site visits. Complementary or supplementary evidence main include receipts, invoices, partnership contracts, statements among other documents.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	There are more than two initiatives to prevent / reduce the main environmental impacts caused by Ceramic factory.
Comments	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.
Indicator	Brazilian environmental legislation.
Data unit	Updated Licenses.
Description	Evaluates whether the factory has a water grant (for those making use of a well or pond), - federal technical registry, operating license and license for clay extraction and is in compliance with the conditions established by the documents. It also evaluates the promotion and fulfillment of agreements with local stakeholders.
Source of data	Licenses.

Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	All licenses are up to date and all conditions established by them are being met.
Comments	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.

Indicator	Voluntary environmental initiatives.
Data unit	Quantity of voluntary environmental initiatives and benefits extension.
Description	Evaluates voluntary environmental initiatives that improve or establish new environmental assets and services, as well as those that raise environmental awareness of workers, their families and the surrounding community.
Source of data	Questionnaires, interviews, invoices, partnership contracts, photos, and any document that evidence established projects/initiatives.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all

	documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	In addition to the previous scenario, the benefits of the initiatives also extend to community members.
Comments	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.

Resource: Technology

Indicator	Technological advances to improve efficiency of the production process.
Data unit	Not applicable.
Description	Evaluates the general condition of infrastructure and machinery/equipment used in the production process, in regards to the following: - Brick drying methods: The factory possesses a dryer that recycles the heat from kilns or a small drying furnace. - Efficiency of kilns: The factory utilizes continuous furnaces (ex: hoffman, mobile, tunel) or the factory uses intermittent kilns, but which are adapted to improve their efficiency. - Kiln temperature control: The factory keeps a record of thermocouples or uses digital controls. - Kiln feeds: The factory feeds kilns using automatic or semi-automatic equipment. - Production: The factory control and records production at different stages of the production process (eg sales, ceramic devices that enter in the kiln). - Infrastructure: During the period analysed, infrastructural improvements in the factory were carried out, for instance: construction/renovation of toilets, refectory, cloakroom lecture hall, among others.
Source of data	Interviews with staff, receipts, contracts, photos.

Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	The factory meets all of the characteristics described.
Comments	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.

Indicator	Technological advances to improve the general conditions of the working environment
Data unit	Not applicable.
Description	Evaluates the following general conditions of the working environment: cleanliness, noise, heat, lighting and appropriate signage. - Cleanliness: There is not excess dust and debris (ex: broken bricks and iron) around the factory. - Noise: The factory applies programs for noise control that comply with legislation. - Heat: The factory uses equipment to reduce employee exposure to heat (eg fans, exhaust, etc). - Lighting: The factory uses equipment to maintain a well-lit working environment (ex: translucent tiles, LED or mercury lamps, etc). - Appropriate signage: - Warning signs indicating danger, or caution; - Warning signs indicating inflammable liquids; - Warning signs encouraging PPE use;

	Signs identifying and indicating location of fire fighting equipment.
Source of data	Questionnaires and interviews, on-site visits, evidence of existing respiratory protection, hearing conservation, or other relevant programs.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	The factory meets all of the characteristics described.
Comments	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.

Indicator	Product quality.
Data unit	Third party audit quality control reports.
Description	Evaluates whether the quality of the products was evaluated during the time period analyzed.
Source of data	Internal or third party audit reports.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all

	documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	No efforts were made to analyze or improve product quality.
Comments	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.

Resource: Carbon

Indicator	Stakeholder consultation.
Data unit	Stakeholder consultation meetings.
Description	Evaluates the existence of a stakeholder consultation system (local community, workers, suppliers, local authorities, civil society organizations, and other social parties involved).
Source of data	Informative letter, satisfaction questionnaire, occurrence book, etc.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	During the time period analyzed, the factory conducted an informal (no records) stakeholder consultation.
Comments	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.

Indicator	Green Marketing.
Data unit	Green marketing strategy efficiency <i>and quantity</i> .
Description	Evaluates whether the factory has marketing strategies geared towards selling their products based on highlighting socio-environmental practices.
Source of data	Questionnaires, interviews and marketing material.
Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	The factory markets their environmental practices only using one means of communication. Example: magazine advertisement.
Comments	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.

Indicator	Project Performance.
Data unit	Level of satisfaction about the carbon project.
Description	Evaluates the factory's perception about the results of the project, considering the generation and sale of carbon credits and also external aspects of project.
Source of data	Questionnaires and interviews.

Description of methods to collect information and procedures to be applied	The Sustainable Carbon team conducts an interview with the ceramic personnel and applies a questionnaire, aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources. Moreover, the Sustainable Carbon team collects the evidence provided by the ceramic personnel. Then, a cross-check is made in order to guarantee that all documentations were sent and complies with the information provided during the interview. For more Information, please verify section 6.1 below.
Purpose of the data	In addition to the previous scenario, the factory considers the carbon project a competitive advantage for their business and encourages other factories to adopt similar practices.
Comments	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.

4.4 Monitoring Plan

The monitoring is done with the aim of determining the most approximate quantity of non-renewable wood that, in the absence of the project, would be used in the ceramics' kilns and consequently the amount of GHG that would be emitted in tonnes of CO₂e. Section 4.2 describes data and parameters monitored, as well as the procedures involved on the monitoring plan.

Ceramic personnel are responsible to monitor the operating conditions on the factory, including the amount of renewable biomass consumed and the monthly production of ceramic devices (parameters $Q_{renbiomass}$ and PR_y). Ceramic personnel are also responsible to store invoices, receipts of sales and other documents related to purchase or acquisition of biomass.

Based on this information, Sustainable Carbon is responsible to assess if the biomasses are from renewable origin, to evaluate if there is a surplus of renewable biomass and to calculate emission reductions, including an assessment of leakage emissions and the determination of parameter $f_{NRB,y}$. Sustainable Carbon also assists the Ceramic personnel to double check the monitored data on biomass consumption and ceramic units production.

Analysis on production data is performed by a series of comparisons between different measurement points of production (molding machine, kiln loading and kiln unloading) to detect inconsistencies or suspicious data. Analysis on biomass data is performed by a series of comparisons between the amount of biomass and the cost over months to identify inconsistencies or unexpected variations in these parameters.

Sustainable Carbon is responsible for providing the required guidance to the ceramic factory, to register Biomass and Production data, in order to minimize errors, including assisting the factory in case the person in charge of the project monitoring is replaced.

The responsible for the monitoring plan are Mr. Francisco Valdir and Mrs. Heronita Silva Sobrinho, from Cenol and Telha Forte ceramics. Sustainable Carbon technical team (including those members described on Section 1.3) was also involved in the project monitoring.

Regarding the SOCIALCARBON Standard indicators application method was conducted as follows:

Stage 01: Forward the questionnaire to the Ceramic, by the Sustainable Carbon team. The questionnaire is aimed to indirectly obtain information regarding the six SOCIALCARBON Standard resources.

Stage 02: Solicitation of the answered questionnaires, including all documents and evidence.

Stage 03: It was completed by the participants listed in the Table of Social Carbon interviews attendance list in appendix., by telephone interview and internet survey.

Stage 04: Conception of the SOCIALCARBON Report.

Stage 05: Collection of evidence, such as pictures and documents to support the actions in the report, during the visit carried out together with the certifying entity.

The stakeholders involved in gathering the data were selected by Cenol and Telha Forte Ceramic factories, which contacted those individuals with the knowledge necessary to provide the required information and evidence. For more ceramic personnel responsibilities and competencies information, please, verify the Table of Social Carbon interviews attendance list in appendix.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Switch from Non-Renewable Biomass for Thermal Applications by the User - Version 07, valid from 22/07/2016 to 31/10/2017⁷. The project activity in this monitoring period (12 months) generated 252.92 TJ per year. Converting this number to MWh, it was generated 70,255.72 MWh per year, which corresponds to the use of 8.02 MW_{thermal} on average of the kilns capacity during the monitored period, which is less than the limits of 45 MW_{thermal} for Type I Small scale project activities.

⁷ This version of the methodology is available at: <https://cdm.unfccc.int/methodologies/DB/9LFOR81TCT5FLI1AJYP46CQY802J79>. Last visit on: 23-August-2021.

Baseline emissions were calculated according to equations below.

$$BE_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossilfuel} \quad (\text{Equation 01})$$

Where:

BE_y: Baseline emissions during the year y in tCO₂e

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

f_{NRB,y}: Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods.⁸

NCV_{biomass}: Net calorific value of non-renewable biomass that is substituted in TJ/tonne

EF_{projected_fossil fuel}: Emission factor for the projected fossil fuel consumption in the baseline in tCO₂/TJ⁹.

B_y is determined using the following option:

Calculated from the thermal energy generated in the project activity as:

$$B_y = \frac{HG_{p,y}}{\eta_{old} \times NCV_{biomass}} \quad (\text{Equation 02})$$

Where:

HG_{p,y}: Quantity of thermal energy generated by the renewable energy in the project in year y in TJ.

η_{old}: Efficiency of the system being replaced

$$HG_{p,y} = SGE \times PR_y \quad (\text{Equation 03})$$

Where:

SGE: Specific energy which has to be generated in the process to produce a certain amount of ceramic units in TJ/thousands of ceramic units.

PR_y: Amount of product produced in year y in units of ceramic pieces fired

⁸ According to Methodological Tool TOOL30 - Calculation of the fraction of non-renewable biomass - version 01.0. Document available at: <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v1.pdf>. Last visit on: 15/12/2022.

⁹ The fossil fuel likely to be used by similar consumers is taken the IPCC default value of residual fossil fuel.

$$\eta_{old} = \frac{SGE}{SFE} \quad (\text{Equation 04})$$

Where:

SFE: Specific fuel energy needed for the process to produce a certain amount of ceramic units in TJ/ thousands of ceramic units.

$$SFE = BF_y \times NCV_{biomass} \quad (\text{Equation 05})$$

Where:

BF_y: Consumption of non-renewable biomass per thousand of ceramic units fired in year y

Using the Equations 3, 4 and 5 in the Equation 2 it results to:

$$B_y = PR_y \times BF_y \quad (\text{Equation 06})$$

As shown in the calculations above, the η_{old} is not required to calculate the Baseline emissions, thus it was excluded.

The exact production (PR_y) was monitored by the project proponent based on data from ceramic units which comes out from the molding machine. Data is aggregated on a monthly and yearly basis. Measurements are done by an internal control sheet monitored by the ceramic owner.

This second crediting period presents three BF_y values. The value presented to Paulista Kiln in Cenol and Telha Forte Ceramics are the same calculated in the first crediting period, changing only the unit of measurement, which 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.

One different value of BF_y is applied due to the construction to the two Mobile Kilns during the previous crediting period. The value used to Mobile Kilns was acquired through the average consumption and production of ceramic devices during the years when the ceramic used to consume non-renewable biomass. In addition, was provided a document of third part indicated when the mobile kiln is more efficiency than Paulista kiln already existent in Ceramic. The Mobile Kiln is 25% more efficient than Paulista kiln and this value was subtracted of total BF_y (0.62), using only real percentage of new kiln (0.46) to this Mobile Kiln BF_y .

Baseline emissions during the monitored period are summarized in the following table:

Table 5 - Baseline emissions for Cenol and Telha Forte Ceramics

Baseline Emissions (tCO2e)		
Period	Cenol	Telha Forte

2021	January	1,689	2,323
	February	1,520	1,823
	March	1,079	2,139
	April	944	2,077
	May	999	2,124
	June	993	1,983
	July	1,412	2,200
	August	1,957	2,036
	September	1,783	1,536
	October	1,736	1,680
	November	1,823	1,810
	December	1,354	2,098
Total 2021		17,289	23,829
Total of monitoring period		41,118	

5.2 Project Emissions

According to applied Methodology¹⁰ the project emissions could be a result of biomass transportation of a distance over 200Km or emissions from energy consumption associated with processing of biomass residue. If the biomass providers are located over a distance of 200 Km of the Ceramic factory, project emissions will be calculated using the Methodological tool “Project and leakage emissions from transportation of freight” – 0.1.1.0¹¹ where the option B “using conservative default values” was used. The emissions caused by transportation of biomass over distances greater than 200km was calculated through the following equation:

$$PE_{TR,m} = \sum_f D_{f,m} \cdot FR_{f,m} \cdot EF_{CO2,f} \cdot 10^{-6} \text{ (Equation 07)}$$

Where:

PE_{TR,m} = Project emissions from road transportation of freight monitoring period *m* (tCO₂e)

D_{f,m} = Return trip road distance between the origin and destination of freight transportation activity *f* in monitoring period *m* (km)

FR_{f,m} = Total mass of freight transported in freight transportation activity *f* in monitoring period *m* (t)

EF_{CO2,f} = Default CO₂ emission factor for freight transportation activity *f* (gCO₂/tkm)

¹⁰ Available at <<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-16-v4.pdf>> Last visit on: 25/08/2021.

¹¹ Available at: <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-12-v1.pdf>. Last visited on 25/08/2021.

f = Freight transportation activities conducted in the project activity in monitoring period *m*

Table 6. Project Emissions for Cenol and Telha Forte Ceramics

Period	Project Emissions (tCO ₂ e)	
	Cenol	Telha Forte
2021	0	1,002
Total in this monitoring period	0	1,002
	1,002	

5.3 Leakage

Leakage is estimated as 0 (zero) tCO₂e during the entire monitoring period.

The Methodology AMS-I.E v.7 and the General guidance on leakage in biomass project activities predicts the following possible three sources of leakage:

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 this project activity, should also be estimated according to the “General guidance on leakage in biomass project activities” (attachment C of appendix B)¹² 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 below).

Table 7. Sources of leakage according to the type of the biomass

Biomass Type	Activity/ Source	Shift of pre project activities	Emissions from biomass generation/ cultivation	Competing use of biomass
Biomass from forests	Existing forests	-	-	X
	New forests	X	X	-
Biomass from croplands or grasslands (woody or non-woody)	In the absence of the project the land would be used as a cropland/wetland	X	X	-

¹² Document available at: <http://cdm.unfccc.int/methodologies/SSCmethodologies/AppB_SSC_AttachmentC.pdf>. Last visit on: 21/03/2018.

	In the absence of the project the land will be abandoned	-	X	-
Biomass residues or waste	Biomass residues or wastes are collected and use.	-	-	X

Observing the Table above, the possible sources of leakage of the present project activity is the competing use of forest residues (sawdust, wood residue), Açaí pits, Brazilian nut husk and Native wood from forest management. All of these biomasses have enough availability as shown below demonstrating the lack of leakage for each biomass.

Forest Residues (Sawdust, Wood residues)

Forest Residues are used for the ceramic devices burning. The production of wood generates a large amount of residues, which can be reused to generate thermal energy. Considering that around 55% of the wood produced generates forest residue¹³ and that the production of wood in the State of Pará (PA) was of 5,368,861 m³ ¹⁴ in 2016, then the production of forest residues was around 2,952,873.55 m³ per year.

The project activity average consumption of forest residues in this monitoring period was 41,761.63 m³ per year which represent less than 2% of the total wood residues in Pará. In addition, due to the usage of 75% of these residues in project region according to Imazon¹⁵, it is demonstrated that there is a 30.9%¹⁶ biomass surplus. This way, this renewable biomass did not have potential to generate leakage emissions due to its availability, even considering the forest residues consumption at both ceramic factories.

Açaí pits

In terms of açaí pits, the State of Pará is the largest producer of açaí (*Euterpe oleraceae*) in Brazil. The pits are easily found, once the açaí is the basis of the daily diet of the population in this state,

¹³ The value applied refers to the mean Volumetric Yield Coefficient of different types of log wood according to IBAMA according to IBAMA (Brazilian Institute of Environment and Renewable Natural Resources. Available at: <http://www.ibama.gov.br/sophia/cnia/legislacao/CONAMA/RE0474_2-060416.pdf> Last visit on: 18/03/2022.

¹⁴ According to IBGE (Geographic and Statistic Brazilian Institute). Available at: <<https://cidades.ibge.gov.br/brasil/pa/pesquisa/16/12705>> Last visit on: 21/03/2018.

¹⁵ According to Imazon (Amazon Institute of People and the Environment). 2009. Available at: <<https://imazon.org.br/a-atividade-madeireira-na-amazonia-brasileira-producao-receita-e-mercados/amp/>> Last visited on: 15/08/2022.

¹⁶ In accordance with calculus provided in the monitoring spreadsheet.

where is widely cultivated. Nevertheless, its residues are still without adequate economic destination.

The production of açai¹⁷ in the State of Pará in the year of 2016 was 131.836 tonnes¹⁸. The pit corresponds to 85% of the weight of açai¹⁹; therefore the açai pit production was around 112,060 tonnes in the year of 2016.

The project activity average consumption of açai pits would be around 3,381.88 tonnes per year, which represents 3% of the total production of these residues generated in the State of Pará. Moreover, considering that approximately 47% of the residues result in available biomass²⁰, it is observed that there is an excess of açai pits in the region, near 99%²¹, even taking into account the quantity of biomass that is utilized by the project activity. Hence this renewable biomass did not have potential to generate leakage emissions

B) Leakage relating to the non-renewable biomass shall be assessed from ex-post surveys of users and areas from where biomass is sourced.

The following potential sources of this type of leakage could be identified:

- 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 non-project households/users attributable to the project activity then baseline is adjusted to account for the quantified leakage.
- Use of non-renewable biomass saved under the project activity to justify the baseline of other 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 project activity then baseline is adjusted to account for the quantified leakage.
- Increase in the use of non-renewable biomass outside the project boundary to create non-renewable biomass baselines can also be potential source of leakage. If this leakage

¹⁷ Source: <<http://minhasfrutas.blogspot.com/2008/12/importancia-economica-do-aai.html>>. Last visit in February 2022.

¹⁸ IBGE. Extração vegetal e silvicultura 2007. Available at: <<https://cidades.ibge.gov.br/brasil/pa/pesquisa/16/12705>>. Last visit on: 21/03/2018.

¹⁹ Source: <<http://minhasfrutas.blogspot.com/2008/12/importancia-economica-do-aai.html>>. Last visit on: 21/03/2018.

²⁰ Source: Discarding and final destination of açai in the Oriental Amazon – Brazil, 2022. <https://doi.org/10.1590/1809-4422asoc2020138r2vu2022L2OA>. Last visit on: 25/07/2022.

²¹ In accordance with calculus provided in the monitoring spreadsheet.

assessment quantifies an increase in use of non-renewable biomass outside the project boundary then baseline is adjusted to account for the quantified leakage.

The carbon credits incomes stimulate the use of renewable biomass to other ceramic companies presenting a huge possibility for sustainable development in the region. Therefore, the sources of leakages mentioned above are not applicable as the project activity does 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 current great amount of renewable biomasses available locally as described before. The non-renewable biomass employed which would be employed in this project activity is not being saved for other project activity, since other ceramics were already consuming wood from non-sustainable forest management (common practice).

The project contributes to reduce the use of non-renewable biomass, especially due to the incentive of carbon credits. Therefore, it can be concluded that this source of leakage, until the date of this monitoring report, is not considered for this project activity. This leakage was monitored in order to guarantee the project conservativeness.

C) If the equipment is transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered.

The leakage is not applicable for this project activity as there was no transference of equipment, in spite of new equipment had to be acquired.

Due to all the explanations described above, the present project activity does not encompass any type of leakage.

Table 8. Production – Q_{renblomass} - QA/QC Procedure

		VCS PD	Monitoring Period	Double Check (QA/QC Procedure)
Cenol	Production (tonnes of ceramic units)	20.743	23.527	The thermal energy generated per tonne of ceramic units produced at <i>Cenol</i> Ceramic during the monitored period was higher than in the VCS PD.
	Sawdust Consumption (tonne)	2.903	9.089	
	Açaí Consumption (tonne)	2.929	2.216	
	Thermal Energy generated in this MR (TJ)	76	158,6	
	Thermal energy per ton of pieces produced (TJ/tonnes of pieces)	0,004	0,007	
Telha Forte	Production (tonnes of ceramic units)	37.963	40.849	The thermal energy generated per thousand of ceramic pieces produced at <i>Telha Forte</i> Ceramic during the monitored period was lower than in the VCS PD.
	Sawdust Consumption (tonne)	6.390	5.527	
	Açaí Consumption (tonne)	8.893	1.166	
	Thermal Energy generated in this MR (TJ)	195,59	94,35	
	Thermal energy per ton of pieces produced (TJ/tonnes of pieces)	0,005	0,002	
	Thermal energy per ton of pieces produced (TJ/tonnes of pieces) for Cenol and Telha Forte	0,005	0,004	The thermal energy generated per tonne of ceramic pieces produced at <i>Cenol</i> and <i>Telha Forte</i> Ceramic during the monitored period was lower than the VCS PD.

As can be verified on Table above, the thermal energy generated with the use of biomass per tonnes of ceramic devices produced during the current monitoring period was higher in this monitoring period than the estimated in VCS PD for Cenol Ceramic Factory. This occurs because a great amount of biomass was storage at the ceramic factory from the previous monitoring period which has purchased at Cenol 23,858 tonnes, 29% more than the expected by the VCS-PD (18,467 tonnes). The Cenol Ceramic Factory' thermal energy is also higher than the VCS PD.

For Telha Forte Ceramic Factory, the thermal energy generated with the use of Sawdust and Açaí per tonne of ceramic devices produced, during the current monitoring period, was lower when compared to the projections on the VCS-PD Version 08, as was the amount of renewable biomass utilized. In addition, as observed in the table above, the thermal energy generated per tonne of ceramic pieces produced at both ceramic factories was lower than the estimated in the VCS PD due to the Telha Forte Ceramic Factory's thermal energy generated per tonnes of ceramic pieces.

Although, concerning Telha Forte Ceramic Factory, when it is calculated how many tonnes of ceramic units were produced with the corresponding tonnes of renewable biomass, it is possible to conclude that more tonnes of ceramic units were produced with a lesser amount of renewable biomass in the Monitoring Period (6.11 tonnes of ceramic units per tonne of renewable biomass) than in the VCS-PD's estimates (2.48 tonnes of ceramic units per tonne of renewable biomass).

Furthermore, the purchased biomass corresponds for both ceramic factories, and the ceramic personnel distributes the biomass amount for each factory. Concerning this division, the ceramic factory Telha Forte may have received less biomass due to the calculation method, which considers that the renewable biomass was used immediately. Nevertheless, the Telha Forte factory has a greater storage capacity to store all biomasses than Cenol.

Therefore, based on Category AMS-IE: Switch from Non – Renewable Biomass for Thermal Application by the User (Version 07, valid from July 22nd, 2016 to October 31st, 2017) this project activity contributes to sustainable development, once the ceramic company is using renewable biomass and applying the SOCIALCARBON methodology.

5.4 Net GHG emission reductions and removals

Table below summarizes the emission reductions for this monitoring period.

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2021	41,118	1,002	0	40,116
Total	41,118	1,002	0	40,116

Table below summarizes the emission reductions estimated (ex-ante) and the achieved (ex-post)

Year	Estimated net GHG emission reductions or removals (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2021	31,878	40,116
Total	31,878	40,116

The Net GHG emission reductions were around 26% higher in this monitoring period than the Estimated Net GHG for the period. This increase was due to the resumption and increase in production after the Pandemic period. Updating the parameters for calculating the availability of renewable biomass in the region also caused this difference in values.

6 SOCIALCARBON RESULTS

6.1 Results

6.1.1 Social Resource

Indicator	1. Diversity	
Description	Evaluates the employment opportunities provided by the Ceramic industry to historically excluded social groups, such as: women, ex-convicts, the elderly, the indigenous, the illiterate and the disabled.	
Situation	Excluded social groups	Number of workers
	Women employees	6
	Senior employees	11
	Disabled employees	4
	Illiterate	9

	The Ceramic factories have 224 employees; around 10% of the workers are from excluded social groups.				
There are currently no employees at the factory from minority groups and there are no plans to hire minorities.	There are currently no employees from minority groups, but the factory has made plans to hire minorities.	Less than 15% of employees belong to a minority group.	Between 15 ≤ 30% of employees are from minority groups.	More than 30% of employees are from minority groups.	In addition to more than 30% of employees being minorities, the factory presents initiatives or combat forms of discrimination.
Score	3				
Prospects	There are currently no foreseen improvements.				

Indicator	2.Community development
Description	Evaluates the existence of management practices that contribute to local community development.
Situation	<i>Cenol and Telha Forte</i> factories make constant donations of bricks, money, medication, but also, surgery and electric bills payments. During the current period, the ceramic factories made donations of 755 food staples to the community and lent out equipment, provided manpower and construction material to a wall construction for a community member. Also, the factories have donated to <i>Gente Livre</i> , a civil society which is a local recovery center that offers lectures on prevention and awareness about drugs, moreover, has an inpatient detox program. <i>Gente Livre</i> is not only concerned with the patient's detoxification but also with the rehabilitation and insertion of the patient in the labor market, providing a professional training course and follow-up. Therefore, <i>Cenol and Telha forte</i> have established a partnership between the ceramics factories and <i>Gente Livre</i> . In addition, in order to encourage sportive practices for the local community, the factories donated uniforms, provided snacks and financial assistance to the project called <i>Associação de Capoeira Raízes de Angola</i> since 2014. The ceramic factories, also, have offered financial support to the syndicate and AMBU – <i>Associação de moradores do Bairro Umarizal</i> .

The factory has no initiatives/ activities planned that benefit the local community.	The factory responds to occasional (not continuous) requests for assistance.	The factory supports community members or civil society organizations : - Regularly: one per month; OR - Significant: at least 10 different parties were benefited.	In addition to scenario 3, the factory lends out equipment, space and/or provides manpower for activities that benefit the local community.	The factory is formally involved in the development and implementation of social and/or environmental projects in partnership with public entities and/or civil society organizations .	In addition to scenario 5, the factory has formalized planning in order to maximize their contribution to local community development , through survey with the community, establishing new partnerships, etc.
Score	4				
Prospects	There are currently no foreseen improvements.				

Indicator	3.Employee satisfaction surveys				
Description	Evaluates existing systems for employee feedback (questions, suggestions and complaints) and the measures taken in response to the feedback to make improvements.				
Situation	The ceramics factories used to utilize suggestion boxes to evaluate employees' satisfaction. However, due to COVID 19 pandemic, the suggestion boxes have been removed to avoid spreading the disease. Eventually, whenever it is possible, the factories will use the suggestion box again. In the meantime, the suggestions and objections, eventually, are discussed in informal conversation with the staff then analyzed by the managers.				
Lack of a consultation system for	There are attempts to implement an employee	The system for employee consultation is being	In addition to scenario 3, the factory has	The factory promotes periodic satisfaction	In addition to scenario 5, the factory has

employee feedback.	consultation system but it is not being properly utilized. Example: There is a suggestion box, but employees do not use it.	utilized, but is limited to a suggestion box.	implemented or is currently implementing one or more suggestions made by employees.	surveys among employees. Example: monthly meetings, book for documenting information, etc.	stipulated targets and timelines for solutions to employee complains.
Score	1				
Prospects	The ceramics factories expects to use suggestion boxes again for the next monitoring period.				

6.1.2 Human Resource

Indicator	4.Additional employee benefits
Description	Evaluates the additional benefits provided to employees. Benefits required by law are not considered.
Situation	The company offers additional benefits, such as: - Food staples are offered every month to all workers; - Celebration parties at the end of the year, on employees' birthdays, and other events the company holds; - End-of-the-Year gifts; - Food donation during Easter; - Daily breakfast; - Medication and medical appointments are offered to employees to treat their diseases; - Facilitated payment on construction material; - Biweekly commissions for production; and - To combat the spread of COVID-19, donation of facial masks and hand sanitizer.

The factory offers no additional benefits to employees.	Some employees receive an additional benefit.	All employees receive sporadic additional benefits, independent of frequency.	All employees receive an additional benefit monthly.	All employees receive more than one additional benefit monthly.	All employees receive more than one additional benefit monthly and there are also award programs based on merit.
Score	6				
Prospects	There are currently no foreseen improvements.				

Indicator	5.Health and safety practices
Description	Evaluates the existing health and safety practices in the factories, including the distribution and supervised use of PPE (Personal Protective Equipment) by all employees as well as health and safety programs. Mandatory Programs: PPRA: Program for Prevention and Environmental Risks; PCMSO: Program for Controlling Medical and Occupational Health and CIPA: Internal Commission for Accident Prevention. Complementary programs: PPR: Respiratory Protection Program; PPRPS: Program for Protection from risks in presses and Similar and PCA: Hearing Conservation Program.
Situation	The company offers all personal protective equipment necessary for the workers to carry on their activities with safety. There is an internal registered control of the IPEs' usage and return. The safety and health technician, Rosângela Queiroz, is responsible for monitoring the IPEs usage daily and writes a weekly report. There are also regular meetings to discuss labor health and safety that include awareness on IPEs usage, first aid, firefighting training, and notions about environmental risks in the labour workplace. Still, during the pandemic, this practice continues in small groups. In addition, the factories, to combat the spread of COVID-19, have donated reusable face masks and offered hand sanitizer to employees. Moreover, the ceramic factories have provided a safety

practices guide to increase employees' knowledge about the disease and to preserve the employees' health. The reduction of physical and mental health risks not only enables better working conditions but also contributes to continuous improvement of production methods. Health and safety are used as a strategy to increase corporate competitiveness in the market[1]. Environmental Risk Prevention Program (PPRA) and, Medical Control in Occupational Health Program (PCMSO), and Internal Commission for Accident Prevention (CIPA) exist, Internal Commission for Accident Prevention was not conducted during 2021 due to a municipality decreed prohibid. Also, the ceramic factory holds weekly training on labor health and safety, such as lectures to create awareness and to prevent alcohol abuse, drug use, buccal hygiene, and STIs. Additionally, the factories have organized Pink October and Blue November campaigns for all employees. Also, there were attempts to provide vaccine shots for the employees against common diseases in the region. Nevertheless, due to the covid 19 pandemic and long travel distance was not possible to arrange the public health workers' transport to the ceramics factories. Also, before the outbreak of COVID-19, the ceramic factoryies used to conduct Internal Commission for Accident Prevention (CIPA) and weekly training on labor health and safety, such as lectures to create awareness and to prevent alcohol abuse, drug use, buccal hygiene, and STIs. However, attempteing reducing the infection risk, the governmen has prohibited such practices in person²².					
There is no control of PPE distribution. None of the health and safety programs required by law are being implemented .	PPE distribution is being controlled OR there is at least one health and safety program required by law being implemented	The factory meets all legal requirements .	The factory meets all legal requirements and: (a) penalizes employees who do not properly use the PPE and/or	There is no control of PPE distribution. None of the health and safety programs required by law are being implemented .	PPE distribution is being controlled OR there is at least one health and safety program required by law being implemented
Score	6				
Prospects	The ceramic owner intends to provide vaccination for the employees.				

²² Available at: <http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2020/mpv/mpv927.htm> . Last visited in March, 21th 2022.

Indicator	6.Training and capacity building programs.					
Description	Evaluates whether the factory encourages and invests in the professional development of its employees.					
Situation	The Cenol and Telha forte ceramics presents training courses to individual employees, but not all employees: - “Occupational medicine” remote course to health and security department employees, Reginaldo Lopes da Silva and Rosângela Siqueira Queiroz;					
The company has not invested in lectures nor professional training courses for staff.	The factory organized occasional lectures.	Training courses were offered to individual employees, but not to all employees.	In addition to item 3, the individual employees who were contemplated by the training courses replicate the knowledge via lectures to other employees; and/or Regular lectures were offered to employees (at least two per semester).	In addition to scenario 4, the factory has an internal campaign to encourage employees to complete their high school education; and/or The factory promotes a literacy program for youth and adults.	In addition to scenario 5, the Ceramic factory has established a strategic plan regarding training and capacity building programs.	
Score	3					
Prospects	The ceramic factory intends to promote regular training courses to workers.					

6.1.3 Financial Resource

Indicator	7.Biomass supply				
Description	Evaluates the type, source and quantity of renewable biomass used as fuel, as well as the profile of suppliers.				
Situation	Cenol and Telha Forte's ceramics use two types of renewable biomass, Sawdust and Açai Pits, in which all of the fuel comes from agro-industrial waste. Moreover, the factory has great control of the source and the amount of renewable biomass used.				
The factory has no control of the source and amount of biomass used; and/or the factory is using non-renewable fuel in the production process.	The factory only has partial control of the source and amount of biomass used.	The factory has total control of the source and amount of renewable biomass used, however 100% of the biomass comes from renewable wood.	The factory has total control of the source and amount of renewable biomass used and less than 50% of the fuel is coming from agro-industrial waste.	The factory has total control of the source and amount of renewable biomass used and more than 50% of the fuel is coming from agro-industrial waste.	The factory has total control of the source and amount of renewable biomass used and 100% of the fuel is coming from agro-industrial waste.
Score	6				
Prospects	There are currently no foreseen improvements.				

Indicator	8.Planning and control				
Description	Evaluates the existence of financial planning and controls in regards to carbon credits sold by factory.				
Situation	The ceramic factories have organized controls of the income received from carbon credit sales through spreadsheets that demonstrate the entry of carbon credit revenues as well as the destination for proceeds. However, there is no future planning for investments in the factories or the community.				
The factory has no organized	The factory has partial control of the	The factory has organized	The factory has organized	The factory has organized	The factory has organized

controls of the income received from carbon credit sales nor the destination for proceeds.	income received from carbon credit sales and the destination for proceeds.	controls of the income received from carbon credit sales, but control of the destination for proceeds is partial.	controls of the income received from carbon credit sales, as well as of the destination for proceeds. However, the factory presents no future planning.	controls of the income received from carbon credit sales, as well as of the destination for proceeds. However, the factory presents incomplete future planning.	controls of the income received from carbon credit sales, as well as of the destination for proceeds. The factory presents satisfactory future planning (timeline, budget, responsible involved and benefits).
Score	4				
Prospects	The factories intend to establish future planning for the destinations for the carbon credits sold.				

Indicator	9. Carbon credit investments				
Description	Evaluates whether proceeds from the sale of carbon credits was invested in factory improvements or activities that benefit the local community.				
Situation	100% of the income generated by carbon credit sales was invested in the factories and community development.				
The income generated by carbon credit sales was not invested in the factory nor in the community, or there are no organized controls of	Less than 20% of the income generated by carbon credit sales was invested the factory or in the community	Between 20 and 40% of the income generated by carbon credit sales was invested the factory or in the community	Between 40 and 60% of the income generated by carbon credit sales was invested the factory or in the community	Between 60 and 80% of the income generated by carbon credit sales was invested the factory or in the community	Between 80 and 100% of the income generated by carbon credit sales was invested the factory or in the community

the allocation of proceeds.	development	development	development	development	development
Score	6				
Prospects	There are currently no foreseen improvements.				

6.1.4 Natural Resource

Indicator	10.Environmental management				
Description	Evaluates initiatives and structured/certified environmental management systems in regards to managing waste, water, air, soil, energy and nature conservation. Note: the use of renewable fuel shall not be deemed an initiative, since it is a prerequisite for becoming a carbon project.				
Situation	Cenol and Telha Forte Ceramics present the following nature conservation initiatives to reduce the main environmental impacts: - Waste: selective collection campaigns, reuse of scrap in the facilities of the factories, and reuse of oil residues in the productive process; - Energy: use of LED lamps and translucent tiles favoring a well light environment; and - Nature conservation: degraded area recovery.				
There are no environmental management initiatives.	There are up to two specific initiatives to prevent/reduce the main environmental impacts caused by the Ceramic factory.	There are more than two initiatives to prevent / reduce the main environmental impacts caused by Ceramic factory.	In addition the scenario 3, the factory is structuring an environmental management system in the company.	The factory has implemented a formal environmental management system.	The factory's environmental management system has been certified by a third party.

Score	3
Prospects	The manager intends to donate the ashes generated in the productive process for local floriculture.

Indicator	11.Brazilian environmental legislation				
Description	Evaluates whether the factory has a water grant (for those making use of a well or pond), federal technical registry, operating license and license for clay extraction and is in compliance with the conditions established by the documents. It also evaluates the promotion and fulfillment of agreements with local stakeholders.				
Situation	The ceramic factory possess all the mandatory licenses: - Operating License (LO): nº 010/2020 emitted by the Municipality Institute of Environment (SEMMA) valid until February 07th, 2026; - Clay Extraction License: nº 046/2020 emitted by the Municipality Institute of Environment (SEMMA) valid until December 01st, 2024; - Rural Activity License (LAR): nº 015/2019 emitted by the Municipality Institute of Environment (SEMMA) valid until August 30th, 2021; - Water Grant: nº 2725/2019 the factory has a dispensation statement to water grant. The document was emitted by the Municipality Institute of Environment (SEMMA) in June 2018 valid until October 27th, 2024; - Federal Technical Registry (CTF): Regular. The CTF is a document emitted by the Brazilian Institute of Environment and the Natural Renewable Resources valid until May, 09th 2022. Telha Forte - Operating License (LO): nº 29/2021 emitted by the Municipality Institute of Environment (SEMMA) valid until June 28th, 2024; - Clay Extraction License: nº 046/2020 emitted by the Municipality Institute of Environment (SEMMA) valid until December 01st, 2024; - Water Grant: nº 3034/2021 the factory has a dispensation statement to water grant. The document was emitted by the Municipality Institute of Environment (SEMMA) in July, 2018 valid until January 03th, 2026; - Federal Technical Registry (CTF): Regular. The CTF is a document emitted by the Brazilian Institute of Environment and the Natural Renewable Resources valid until May, 09th 2022.				
The factory does not possess any	The factory only posses	The factory only posses	The factory posses all of the following:	All licenses are up to date and all	In addition to the previous scenario, the

of the following: -operating license -license for clay extraction -water grant - federal technical registry	two of the following: -operating license -license for clay extraction -water grant - federal technical registry	three of the following: -operating license -license for clay extraction -water grant - federal technical registry	-operating license -license for clay extraction -water grant - federal technical registry However, they do not meet all the conditions established by them.	conditions established by them are being met.	factory collaborates with public administration and/or civil society organizations for cooperation with environmental projects.
Score	5				
Prospects	There are currently no foreseen improvements.				

Indicator	12.Voluntary environmental initiatives				
Description	Evaluates voluntary environmental initiatives that improve or establish new environmental assets and services, as well as those that raise environmental awareness of workers, their families and the surrounding community.				
Situation	During the period analyzed the factory performed some voluntaries environmental initiatives such as: - Selective collection campaigns; - Signs are displayed around the Ceramic facility reminding of the environmental conservation importance; - Reuse of residues, as scrap, oil and broken bricks, in the production process; and - Broken tiles or bricks are reutilized to repair potholes on roads.				
The factory is not involved in voluntary environmental initiatives.	The factory has implemented only one internal environment	The factory has implemented more than one internal initiative or is	The factory has implemented more than one initiative or ongoing	In addition to the previous scenario, the benefits of the initiatives also extend	In addition to the previous scenario, the factory promotes voluntary

	al initiative. Example: Planting ten tree saplings on factory grounds.	showing continuity for an existing Initiative. Example: Periodic planting of saplings on factory grounds.	initiative whose benefits extend to workers families.	to community members.	environmental initiatives with civil society organizations and/or public administration.
Score	5				
Prospects	There are currently no foreseen improvements.				

6.1.5 Biodiversity/Technology Resource

Indicator	13.Technological advances to improve efficiency of the production process
Description	Evaluates the general condition of infrastructure and machinery/equipment used in the production process, in regards to the following: - Brick drying methods: The factory possesses a dryer that recycles the heat from kilns or a small drying furnace. - Efficiency of kilns: The factory utilizes continuous furnaces (ex: hoffman, mobile, tunel) or the factory uses intermittent kilns, but which are adapted to improve their efficiency. - Kiln temperature control: The factory keeps a record of thermocouples or uses digital controls. - Kiln feeds: The factory feeds kilns using automatic or semi-automatic equipment. - Production: The factory control and records production at different stages of the production process (egsales, Ceramic devices that enter in the kiln). - Infrastructure: During the period analysed, infrastructural improvements in the factory were carried out, for instance: construction/renovation of toilets, refectory, cloakroom lecture hall, among others.

Situation	The factories meet all of the characteristics described: - Brick drying methods: the factories possess in each ceramic factory a dryer that recycles the heat from kilns; - Kiln temperature control: the ceramic controls the temperature of the kilns in the firing process using an electronic thermometer on the kilns and by using temperature monitoring spreadsheets; - Efficiency of kilns: the factory uses intermittent kilns which are medium efficiency; - Kiln feeds: the factory utilizes semi-automatic equipment to feeds kilns; - Production: Cenol and Telha Forte factories record production an excel spreadsheet. - Infrastructure: improvements such as the renovation of toilets, shed expansion, and purchase of new Maromba equipment which enhances productivity combined with workers' well-being.				
The factory does not meet any of the characteristics described.	The factory meets one of the characteristics described.	The factory meets 2-3 of the characteristics described.	The factory meets 4 of the characteristics described.	The factory meets all of the characteristics described.	In addition to scenario 5, the factory has organized planning to improve general conditions of the production process.
Score	5				
Prospects	There are currently no foreseen improvements.				

Indicator	14. Technological advances to improve the general conditions of the working environment
Description	Evaluates the following general conditions of the working environment: cleanliness, noise, heat, lighting and appropriate signage. - Cleanliness: There is not excess dust and debris (ex: broken bricks and iron) around the factory.

	- Noise: The factory applies programs for noise control that comply with legislation. - Heat: The factory uses equipment to reduce employee exposure to heat (eg. Fans, exhaust, etc). - Lighting: The factory uses equipment to maintain a well-lit working environment (ex: translucent tiles, LED or mercury lamps, etc). - Appropriate signage: ☐ Warning signs indicating danger, or caution; ☐ Warning signs indicating inflammable liquids; ☐ Warning signs encouraging PPE use; ☐ Signs identifying and indicating location of fire fighting equipment.				
Situation	The factories meet all the characteristics: - Cleanliness: there is no excess of dust and debris around the ceramics factories; - Noise: Noise control programs according to legislation; - Heat: the ceramic factories use equipment to reduce employees' exposure to furnace heat, such as semi-automatic feeds in kilns, temperature monitoring spreadsheets, and a ventilator to make the environment work better; - Lighting: the factories use translucent tiles and LED lamps to improve working environment; and - Appropriate signage: the factories use signing according to the applicable norms.				
The factory does not meet any of the characteristics described.	The factory meets one of the characteristics described.	The factory meets 2-3 of the characteristics described.	The factory meets 4 of the characteristics described.	The factory meets all of the characteristics described.	In addition to scenario 5, the factory has organized planning to improve general conditions of the working environment.
Score	5				
Prospects	The manager intends to hire an engineer for monitoring the Silica dust generated in the clay extraction.				

Indicator	15.Product quality				
Description	Evaluates whether the quality of the products was evaluated during the time period analyzed.				
Situation	The ceramic factories have no certification to evaluate its o products' quality.				
No efforts were made to analyze or improve product quality.	Samples of some products were evaluated by quality tests.	Samples of all products were evaluated by quality tests.	Some of the products have quality certification.	All products have quality certification.	In addition to scenario 5, the factory has an in-house quality lab.
Score	1				
Prospects	There are currently no foreseen improvements.				

6.1.6 Carbon Resource

Indicator	16.Stakeholder Consultation				
Description	Evaluates the existence of a stakeholder consultation system (local community, workers, suppliers, local authorities, civil society organizations, and other social parties involved).				
Situation	In a measure to avoid spreading the COVID-19, no stakeholder consultation took place since the pandemic. Yet, Cenol and Telha Forte ceramics conducted an informal stakeholder consultation informing the co-benefits implemented due to the carbon credits sale to employees and members of the local community positively affected by the carbon project, such as personnel from "Gente Livre" and "Raízes de Angola". The employees and the community members demonstrate that they are pleased with the project, and no negative comments were made.				
During the time period analyzed, the factory did not conduct a	During the time period analyzed, the factory conducted an informal (no records)	During the time period analyzed, the factory conducted a formal (with records)	During the time period analyzed, the factory conducted a formal (with records)	As well as the previous scenario, there are continuous means of communicati	As well as the previous scenario, the next consultation is being planned

stakeholder consultation.	stakeholder consultation.	stakeholder consultation; however negative comments were made regarding the project.	stakeholder consultation, and no negative comments were made regarding the project.	on with stakeholders.	together with stakeholders.
Score	2				
Prospects	There are currently no foreseen improvements.				

Indicator	17.Green marketing				
Description	Evaluates whether the factory has marketing strategies geared towards selling their products based on highlighting socio-environmental practices.				
Situation	The factories make sure to display their environmental concerns by adding the Social Carbon logo on their business cards, walls on the ceramic factory, billboards in the municipality, and on employees' uniforms. Also, the manager has seen positive results from the green marketing strategy since it has amplified the factories' advertisements regarding socio-environmental practices.				
The factory does not have marketing strategies based on their environmental practices.	The factory markets their environmental practices only using one means of communication. Example: magazine advertisement.	The factory markets their environmental practices using more than one means of communication. Example: magazine advertisement and billboard.	The factory has an established green marketing strategy, but still has not seen positive results.	The factory has an established green marketing strategy and sees positive results.	As well as the previous scenario, the factory has plans to invest in Green marketing.
Score	5				
Prospects	There are currently no foreseen improvements.				

Indicator	18.Project performance					
Description	Evaluates the factory’s perception about the results of the project, considering the generation and sale of carbon credits and also external aspects of project.					
Situation	The ceramic factories showed satisfaction with the carbon project and reported that the project does not only help the ceramic itself but the local community too. Also, developing the carbon project stimulated other ceramic factories in the region to adopt too.					
The factory is very dissatisfied and threatens to abandon the carbon project.	The factory is dissatisfied, but does not plan to abandon the carbon project.	The factory is indifferent about the carbon project.	The factory believes the carbon project is something positive, but has complaints.	The factory is very satisfied with the carbon project.	In addition to the previous scenario, the factory considers the carbon project a competitive advantage for their business and encourages other factories to adopt similar practices.	
Score	6					
Prospects	There are currently no foreseen improvements.					

6.2 Analysis of Results

6.2.1 Current Performance

Cenol and Telha Forte factories' overall performance is satisfactory. Aside from the Financial and human resource which achieved a sustainable performance and the Social resource which scored a critical status, all other resources have established an average 3 through 4 indicator score. The social resource was lowest since, during the monitoring period, the ceramic factories did not apply none employee satisfaction due to the covid pandemic as a measure to avoid unnecessary employee's exposition.

Nevertheless, are examples of social, economic, and natural sustainable improvements, such as monthly commissions for production and food staples are offered by the ceramic factories for all workers, daily IPEs control, compliance to all health and safety programs required, source and amount control of sawdust and açai Pits (agro-industrial waste), all the carbon credits revenue was invested in the factories facilities and donated to the local community, compliance with all conditions established by the Brazilian environmental legislation, selective collection campaigns, residues donation or reutilized, also, well-lighting and ventilated workplace.

The following table summarize the overall performance of the project for each resource.

Resource	Critical	Satisfactory	Sustainable	Average Score	Performance
Social	33.3%	66.7%	0%	2.7	Critical
Human	0%	33.3%	66.7%	5.0	Sustainable
Financial	0%	33.3%	66.7%	5.3	Sustainable
Natural	0%	33.3%	66.7%	4.3	Satisfactory
Biodiversity/Tech	33.3%	0%	66.7%	3.7	Satisfactory
Carbon	33.3%	0%	66.7%	4.3	Satisfactory

6.2.2 Historical Performance

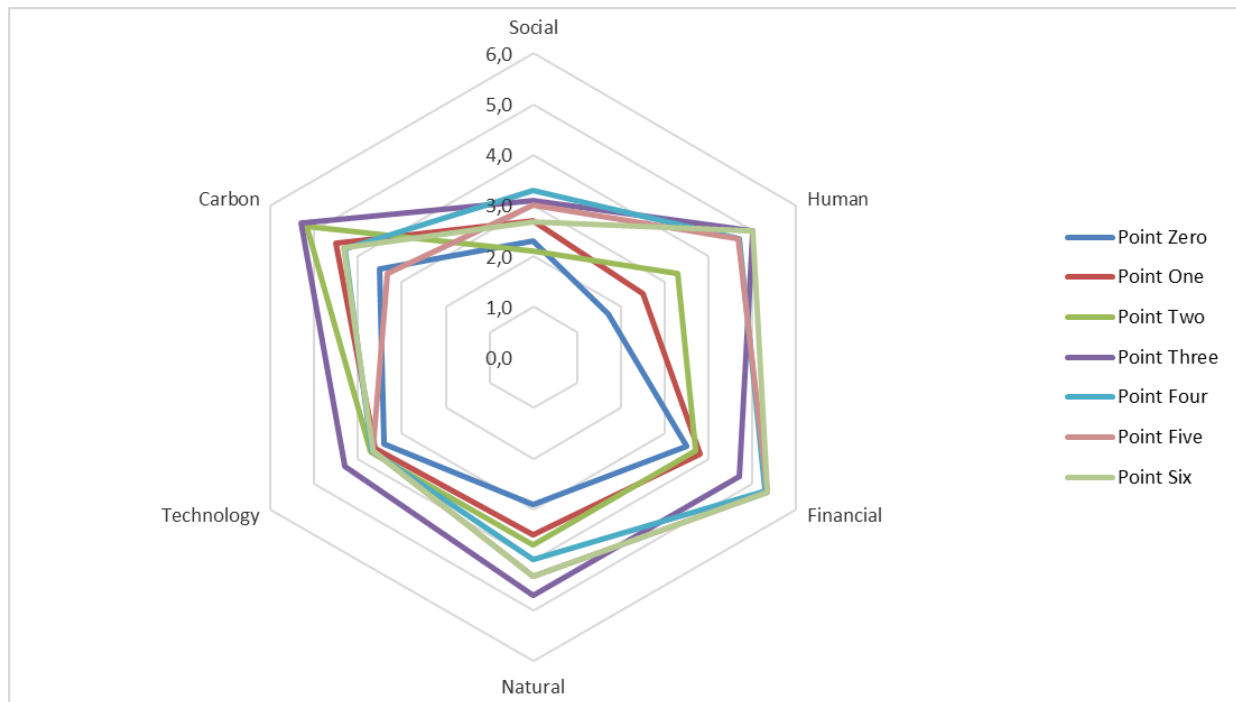
Social	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	2.3	2.7	2.1	3.1	3.3	3.0	2.7
Historic Analysis: The Social resource has decreased in comparison with the previous reports. This is due to, even though the ceramic factories have suggestion boxes to evaluate employees' satisfaction, their useability have been limited to avoid unnecessary exposure to COVID 19. In the other hand, the Community development indicator has remained with the same score, as the ceramic factories have established a partnership with <i>Gente Livre</i>, a civil society that offers rehabilitation, insertion of the patient in the labor market, and drug awareness lectures, which shows that the factories are formally involved and contribute with the development and implementation of social benefits for the community. Regarding the diversity indicator, the ceramic factories have hired 10% of their employees from excluded groups, such as women and seniors.							

Human	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	1.7	2.5	3.3	5.0	4.7	4.7	5.0
Historic Analysis: The Human resource had increased in comparison with the previous report, mainly, due to the factories have offered, to all employees, new additional benefits, such as monthly food staples, biweekly commissions, and daily breakfast. Furthermore, both factories have created a guide concerning safety practices to avoid COVID-19, offered hand sanitizer, and donated reusable masks as a measure to preserve the employees' health against COVID-19. Moreover, they have organized Pink October and Blue November campaigns in order to create awareness of the importance of cancer pre-diagnosis. Some employees, as well, have participated in technical training courses.							
Financial	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	3.5	3.8	3.7	4.7	5.3	5.3	5.3
Historic Analysis: The Financial resource has remained with the same score, as the factories have total control of the biomass utilized, and all of the biomasses have come from agro-industrial waste. Likewise, both factories have full control over the carbon credits expenses and invested 100% of the income in community development and factories facilities.							
Natural	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	2.9	3.5	3.7	4.7	4.0	4.3	4.3
Historic Analysis: The Natural resource has maintained the same performance in comparison with the previous report since the Ceramics factories comply with all national environmental legislation and understand the environmental obligations set out by the license, thus develop a fish farming project in the clay extraction area that aims to recover the degraded area. In addition, both factories, regarding the mitigation of environmental impacts, donate recyclable material to a waste collector, and reuse residues in the productive process, aside from implemented selective collection campaigns. In addition, the residues that are not burned are donated to the City Hall to recover roads and grounding.							
Technology	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	3.4	3.6	3.7	4.3	3.7	3.7	3.7
Historic Analysis: Cenol and Telha Forte factories has maintained with the same performance in comparison from the previous point. Furthermore, both ceramic factories uses medium efficiency kilns, drying system, temperature spreadsheets, among others technological advances to improve efficiency of the production process and the the general conditions of the working environment . Nevertheless, neither factories present a quality control of products.							
Carbon	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	3.5	4.5	5.2	5.3	4.3	3.3	4.3

Cenol and Telha forte have increased the score from the previous report, especially due to the positive results from the green marketing plan which includes more than 3 means of communication. Also, there was an informal stakeholder consultation during this monitoring period. In addition, concerning the project performance indicator, the ceramic owner is pleased with the carbon project since it gave business advantage and increased awareness of socioenvironmental practices.

6.2.3 Performance Hexagon

Graphic 1. Performance showing the average score obtained for each resource.



6.3 Prospect Status

6.3.1 Achieved Prospects

Social	
Indicator	Community development
Prospect	The ceramic factory intends to organize a special day for employee's children with joyful activities and sort out gifts.

Details	At the end of 2021, the ceramics factories have organized a festive day for the employee's children, including playful activities and gifts distribution.
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Natural	
Indicator	Environmental management
Prospect	The ceramic factory intends to develop environmental projects.
Details	<i>Cenol</i> and <i>Telha Forte</i> factories have established waste better practices such as reusing scraps in the facilities of the factories and oils residues in the productive process.

Financial	
Indicator	Planning and control
Prospect	The factory intends to control all the destinations for the proceeds.
Details	The manager has developed better control practices for the destinations for the proceeds.

Technology	
Indicator	Technological advances to improve the general conditions of the working environment
Prospect	The factory intends to organize a planning to improve general conditions of the working environment.
Details	The manager and the safety and health technician are hiring an engineer for monitoring Silica dust as a measure to improve conditions of the working environment.

Carbon	
Indicator	Green Marketing
Prospect	The ceramic factory intends to create billboards advertising the carbon project.

Details	The ceramics factories have established a new set for Green Marketing means of communications, such as billboards and business cards with Social Carbon's logo.
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6.3.2 Not Achieved Prospects

Human	
Indicator	Training and capacity building programs
Prospect	The ceramic factory intends to promote a literacy program for youth and adults with a partnership with the municipal government.
Details	By 2022, the ceramic factories expect to offer literacy programs for workers.

6.3.3 Identified Prospects

Social	
Indicator	Employee satisfaction surveys
Details	The ceramics factories expects to use suggestion boxes for the next monitoring period.
Responsible	The manager
Timescale	2024

Human	
Indicator	Health and safety practices
Details	The ceramic owner intends to provide vaccination for the employees.
Responsible	The manager
Timescale	2024

Natural	
Indicator	Environmental management
Details	The manager intends to donate the ashes generated in the productive process for local floriculture.
Responsible	The manager
Timescale	2024

Financial	
Indicator	Planning and control
Details	The factories intend to establish future planning for the destinations for the carbon credits sold.
Responsible	The manager
Timescale	2024

Technology	
Indicator	Technological advances to improve the general conditions of the working environment
Details	The factories intend to organize a planning to improve general conditions of the working environment.
Responsible	The manager
Timescale	2024

Carbon	
Indicator	Stakeholder Consultation
Details	The ceramics factories intends to conduct a stakeholder consultation.
Responsible	The manager

Timescale

2024

Appendix: Table of indicators results

Social Resource		Score	Analysis	Human Resource			Score	Analysis	Financial Resource		Score	Analysis
1°	Diversity	🟡 3	SA	4°	Additional employee benefits		🟢 6	SU	7°	Biomass supply	🟢 6	SU
2°	Community development	🟡 4	SA	5°	Health and safety practices		🟢 6	SU	8°	Planning and control	🟡 4	SA
3°	Employee satisfaction surveys	🔴 1	C	6°	Training and capacity building programs		🟡 3	SA	9°	Carbon credit investments	🟢 6	SU
Average		🔴 2,7	C	Average			🟢 5,0	SU	Average		🟢 5,3	SU
Indicators evaluated		3		Indicators evaluated			3		Indicators evaluated		3	
C	Critical	1	33,3%	C	Critical		0	0,0%	C	Critical	0	0,0%
SA	Satisfactory	2	66,7%	SA	Satisfactory		1	33,3%	SA	Satisfactory	1	33,3%
SU	Sustainable	0	0,0%	SU	Sustainable		2	66,7%	SU	Sustainable	2	66,7%
Natural Resource		Score	Analysis	Technology Resource			Score	Analysis	Carbon Resource		Score	Analysis
10°	Environmental management	🟡 3	SA	13°	Efficiency of the production process		🟢 5	SU	16°	Stakeholder consultation	🔴 2	C
11°	Brazilian environmental legislation	🟢 5	SU	14°	Working environment		🟢 5	SU	17°	Green marketing	🟢 5	SU
12°	Voluntary environmental initiatives	🟢 5	SU	15°	Product quality		🔴 1	C	18°	Project performance	🟢 6	SU
Average		🟡 4,3	SA	Average			🟡 3,7	SA	Average		🟡 4,3	SA
Indicators evaluated		3		Indicators evaluated			3		Indicators evaluated		3	
C	Critical	0	0,0%	C	Critical		1	33,3%	C	Critical	1	33,3%
SA	Satisfactory	1	33,3%	SA	Satisfactory		0	0,0%	SA	Satisfactory	0	0,0%
SU	Sustainable	2	66,7%	SU	Sustainable		2	66,7%	SU	Sustainable	2	66,7%

Appendix: Table of Social Carbon interviews attendance list

Relation of Ceramic Personnel participants on the Social Carbon Report	
Name	Function
Camila Moura	Office Auxiliary (Administration) - responsible for administrative activities related to the carbon project, such as the development of environmental and social initiatives, financial planning and control of carbon credit revenues as well as the destination for proceeds, also, is responsible for providing evidence and necessary documents to complete Social Carbon report by the Sustainable Carbon team.
Marta Machado	Office Auxiliary (Administration) - responsible for administrative activities related to the carbon project, such as the development of environmental and social initiatives, financial planning and control of carbon credit revenues as well as the destination for proceeds, also, is responsible for providing evidence and necessary documents to complete Social Carbon report by the Sustainable Carbon team.
Rosângela Siqueira Queiroz	Health and Safety Technician - responsible for monitoring the IPEs usage daily, providing evidence and necessary documents Social Carbon report by the Sustainable Carbon team, conducting weekly training on labor health and safety, such as lectures to create awareness and to prevent alcohol abuse, drug use, and STIs.