



VERIFICATION REPORT KAMIRANGA CERAMIC FUEL SWITCHING PROJECT



Document Prepared by Earthood Services Private Limited

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Summary:

Brief summary of the project activity

The project activity involves fuel switching from native firewood from Amazon biome to sawdust, açai pits and wood residue. Thus, GHG emission reduction is achieved.

The project applies the CDM approved methodology AMS-I.E – Switch from Non-Renewable Biomass for Thermal Applications by the User – version 07.0.

Scope of verification

Sustainable Carbon – Projetos Ambientais Ltda has contracted ESPL to conduct the 1st verification of the 2nd Crediting period of the project “Kamiranga Ceramic Fuel Switching Project” for the period from 01/01/2018 to 31/03/2021 (both days included).

The scope of the verification is to establish/verify that:

- the latest available MR template + Social Carbon (v.4.0) was used and correctly filled up;
- the project activity has been implemented and operated as per the registered PD and that all physical features (technology and monitoring equipment) of the project are in place;
- the monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of VCUs, verifiable, and in accordance with applicable requirements of the VCS Version 4;
- the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and approved methodology;
- the data are recorded and stored as per the monitoring methodology.

In addition, ESPL has also been contracted to conduct the verification of SOCIALCARBON Standard of the project activity at Point SEVEN (7), with regard to its relevant requirements, for the same monitoring period.

Conclusion

ESPL has performed the verification of the VCS project “Kamiranga Ceramic Fuel Switching Project”, with VCS Project ID 197, for the monitoring period above mentioned.

During the present VCS verification, 02 CLs were raised and successfully closed. And regarding the Social Carbon Standard, 01 CAR has been raised and successfully closed.

The verification team has confirmed the implementation of the grouped project as per description in the VCS-PD, the monitoring plan of the PD and the application of the monitoring methodology (AMS-I.E –version 07.0). In addition, it was confirmed that the monitoring system is in place and the emission reductions are calculated without material misstatements.

The verified emission reductions amount to **172,068 tCO₂e** in the above mentioned monitoring period.

In addition, the verifier states that project DOES meet all relevant requirements established by the SOCIALCARBON Standard. The SOCIALCARBON report identifies the social economic and environmental impacts of the project activity and presents the results obtained by meeting the “Brazilian Red Ceramic factories Indicators” – version 1.1.

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1 INTRODUCTION

1.1 Objective

Sustainable Carbon – Projetos Ambientais Ltda has contracted ESPL to conduct the 1st verification of the 2nd Crediting period of the project “Kamiranga Ceramic Fuel Switching Project” for the period from 01/01/2018 to 31/03/2021 (both days included) according to the requirements of the VCS Version 4 to conduct the verification from point SEVEN of SOCIALCARBON for the same period.

1.2 Scope and Criteria

The scope of the verification is to establish/verify that:

- the project activity has been implemented and operated as per the registered PD and that all physical features (technology, project equipment and monitoring) of the project are in place;
- the monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of VCUs, verifiable, and in accordance with applicable VCS Version 4 requirements;
- the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan, the approved methodology including applicable tool(s) and/or, where applicable, the approved standardized baseline;
- the data are recorded and stored as per the monitoring methodology including applicable tool(s) and, where applicable, the standardized baseline.

The verification of this monitoring period is based on the registered VCS-PD, MR and GHG emission reduction calculation spreadsheet and supporting documents.

In addition, the scope of the SOCIALCARBON verification is to establish/verify that:

- to have an independent third party assessment in order to evaluate the accuracy and consistency of the SOCIALCARBON Standard – version 5.0 and “Brazilian Red Ceramic factories Indicators” – version 1.1, for this specific point in time – Point SEVEN; and
- to verify the consistency of these Indicators and their evolution since last evaluation, with the established criteria to maintain the designation as SOCIALCARBON, following the SOCIALCARBON Standard.

1.3 Level of Assurance

The verification of this monitoring period has achieved a reasonable level of assurance. Moreover, the threshold for materiality with respect to the aggregate of errors, omissions and misrepresentations

relative to the total reported GHG emission reductions and/or removals was below 5% from Project scales, which is required by VCS Standard.

Particulars / Monitoring Report	MR Version (Public)	MR Version (Revised/Final)
Emission Reductions Achieved (tCO ₂ e) in this monitoring period	117,116	172,068
Applicable Threshold (%) as VCS Standard para 4.1.8	5,855 (5%)	8,603 (5%)

The verification team has identified errors during the verification as below.

Monitored Parameter (Symbol / Description)	Reporting Frequency	Number of Discrete Data (Total) Total (100%)	Sample selected for verification Sample (100%)	Type of error identified	Impact on ERs	
					ERs impacted (Sample)	ERs impacted (Population based on extrapolation)
PR _y	Monthly and Yearly aggregated from daily monitoring	2,657 ¹	All aggregation steps were checked. The total amount of data verified was 246 ²	CL 03	No impact	No impact.
NCV _{biomass}	Default value from IPCC	1 data	1 data (100%)	N/A	No impact	No impact.
Q _{renbiomass}	Monthly and Yearly aggregated	3,570	All aggregation steps were checked.	N/A	No impact	No impact.

¹ Amount of available raw data along the monitoring period

² Data corresponds to the amount of raw data checked. As per Guideline for Sampling and Surveys ^{/12/}, the level of confidence of 90% and 10% precision has been applied. To the minimum samples required, refer to explanation below.

	from daily monitoring		The total amount of data verified was 252 ³			
Origin of renewable biomass	Each biomass type	3 (sawdust, wood residue and açai pits)	3 (100%)	N/A	N/A	Not applicable as 100% of data was checked
Leakage of non-renewable biomass	Annually	3 (sawdust, wood residue and açai pits)	3 (100%)	CL 05	N/A	Not applicable as 100% of data was checked
f _{NRB}	Annually	Parameter calculated. Therefore, no sampling has been carried out by verification team	N/A	CL 04	No impact	N/A
Renewable Biomass surplus	The analysis is carried out at the start of crediting period. Comparison with biomasses used is done in the MR	3 biomass types is used	3 (100%)	CL 05	no impact	Not applicable as 100% of data was checked

³ Data corresponds to the amount of raw data checked. As per Guideline for Sampling and Surveys ^{/12/}, the level of confidence of 90% and 10% precision has been applied. To the minimum samples required, refer to explanation below.

D _{f,y}	Every transportation	42 sources of biomass were identified	42 (100%)	N/A	N/A	Not applicable as 100% of data was checked
FR _{f,m}	Monthly and Yearly aggregated from daily monitoring	3,570	All aggregation steps were checked. The total amount of data verified was 252 ⁴	N/A	No impact	No impact.

Sampling carried out by DOE during verification

At the virtual site visit, a sampling approach was applied to verify the reported values for the monitored parameter of **PR_y** as the whole amount of data could not be checked with reasonable effort.

The sampling approach was carried out in accordance with “Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities” and the “Standard for Sampling and Surveys for CDM Project Activities and Programme Activities”^{/15/}. Simple random sampling method was applied for verification of the parameters.

Sample Size Calculation

According to “Best practices examples focusing on sample size and reliability calculations”, the following equation is applied for sample size calculation.

$$n \geq \frac{z^2 \times N \times V}{(N - 1) \times \text{precision}^2 + z^2 \times V}$$

Where:

$$V = \frac{p \times (1 - p)}{p^2}$$

n Number of elements to be sampled.

⁴ Data corresponds to the amount of raw data checked. As per Guideline for Sampling and Surveys ^{/12/}, the level of confidence of 90% and 10% precision has been applied. To the minimum samples required, refer to explanation below.

N	Total number of elements in the population, (see table below for each of the parameters)
p	Proportion: Set to 0.5 based on the very conservative estimation that 50% of the values checked are found to be incorrect.
z	Constant referring to the level of confidence (for this case 1.645 for 90% as per Guideline for Sampling and Surveys Appendix 1 §9 for small scale project activities)
precision	Required precision (for this case 10%=0.1 as per Guideline for Sampling and Surveys Appendix 1 §9).
n	Number of elements to be sampled.
N	Total number of elements in the population, (see table below for each of the parameters)

A sampling approach was carried out during verification for the following parameters

- **PR_y (Tonnes of ceramic units produced per month):**
 - o Population: **2,657** data (Data corresponds to the raw data available – manual spreadsheets). These values were observed in the manual records/^{03/}

The calculation details for sample size for this example is:

$$n \geq \frac{1.645^2 \times 2,657 \times \frac{0.5 \times (1-0.5)}{0.5^2}}{(2,657 - 1) \times 0.1^2 + 1.645^2 \times \frac{0.5 \times (1-0.5)}{0.5^2}} = 246$$

The sample size is equal to 246.

During the on-site verification, the following samples were taken

Py brcks	Samples	
sep/18	76	All month
aug/19	78	All month
may/20	64	All month
mar/21	44	All month
Total	262	

262 samples were checked. Hence, more than the required number for the daily reports have been verified. From all data checked, no mistakes were found. Therefore, the results found with the sampling applied are reliable and within the 90% confidence level and 10% precision. No inconsistencies were found in the sampled data.

By applying 262 samples, the precision achieved is equal to 4.82% which is below the 10% precision required, thus, the result is accepted by verification team. The reliability of the sampling applied is within the 90% confidence level and 10% precision.

- **Q_{renbiomass} (amount of renewable biomass utilized) / FR_y (Total mass of freight transported in freight transportation activity f in monitoring period m)**
 - o Population: **3,570** data (Data corresponds to the raw data available – manual spreadsheets). These values were observed in the manual records^{02/}

The calculation details for sample size for this example is:

$$n \geq \frac{1.645^2 \times 3,570 \times \frac{0.5 \times (1-0.5)}{0.5^2}}{(3,570 - 1) \times 0.1^2 + 1.645^2 \times \frac{0.5 \times (1-0.5)}{0.5^2}} = 252$$

The sample size is equal to 252.

During the on-site verification, the following samples were taken

Q _{renbiomass} / FR _y	Samples	
jan/18	84	All month
jul/19	75	All month
apr/20	77	All month
feb/21	16	Partial month
Total	252	

252 samples were checked. Hence, more than the required number for the daily reports have been verified. From all data checked, no mistakes were found. Therefore, the results found with the sampling applied are reliable and within the 90% confidence level and 10% precision. No errors were found.

By applying 252 samples, the precision achieved is equal to 10%, thus, the result is accepted by verification team. The reliability of the sampling applied is within the 90% confidence level and 10% precision.

1.4 Summary Description of the Project

The verification of this monitoring period has achieved a reasonable level of assurance.

1.5 Summary Description of the Project

The project activity involves fuel switching from native firewood from Amazon biome to sawdust, açaí pits and wood residue in Kamiranga at the city of São Miguel do Guamá, State of Pará, Brazil. Thus, GHG emission reduction is achieved.

Cerâmica Kamiranga Indústria e Comércio LTDA is the project owner.

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

http://vcsprojectdatabase.org/#/project_details/197

The project contributes to the following sustainable development actions in the host country

- Use of clean technologies
- Development of new technologies within the country
- Use of renewable biomass

The sustainable development actions were assessed through SOCIALCARBON Standard – version 5.0 and “Brazilian Red Ceramic factories Indicators” – version 1.1

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification process is conducted as per internal CDM Quality Manual and in accordance with criteria laid down by VCS. It includes the following steps:

- contract with PP for the scope and appointment of verification team and technical review team;
- completeness check of Monitoring Report;
- desk review of Monitoring Report and corresponding ER sheet by verification team and planning of onsite audit;
- physical on-site inspection by verification team (not conducted due to COVID-19 Pandemic. Alternative means have been applied which were considered reliable by verification team. Refer to section 2.4 below;
- follow up activities e.g., interviews;
- reporting and closure of findings (CARs/CLs/FARs) and preparation of draft verification report;
- independent technical review of the draft verification report and final/revised documentation (e.g., Monitoring Report, corresponding ER sheet and evidences);
- reporting and closure of TR comments/findings (CARs/CLs/FARs) and final approval for the decision made;

- issuance of final verification report to contracted PP (or authorized representatives).

2.2 Document Review

A desk review was conducted by the verification team that included:

- a review of the data and information presented to verify its completeness;
- a review of the registered monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- an evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions;
- supporting documents.

A complete list of documents/evidences reviewed is included as Appendix I.

A complete list of documents/evidences reviewed for SOCIALCARBON purposes is included as Appendix II.

2.3 Interviews

#	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation / Role			
1.	Oliveira	Ivan	Kamiranga	17/08/2021	Project activity management,	Marcelo Sebben
2.	Fernandes	Nonato	Kamiranga	17/08/2021	Social Carbon Production operation and monitoring	Marcelo Sebben
3.	Silva	Yara	Sustainable Carbon	17/08/2021	Project activity monitoring Excel calculations	Marcelo Sebben

2.4 Site Inspections

Duration of on-site inspection: 17/08/2021				
#	Activity performed on-site	Site location	Date	Team member
1.	Opening Meeting	Video call	17/08/2021	Marcelo Sebben
2.	Implementation and operation of project activity as per registered PD/previous verifications.	Video call	17/08/2021	Marcelo Sebben

3.	Management and monitoring procedures followed at project site.	Video call	17/08/2021	Marcelo Sebben
4.	Physical inspection of the project activity: site visit and interview of monitoring personnel.	Video call	17/08/2021	Marcelo Sebben
5.	Verification checklist: compliance of monitoring procedures followed at project site with registered PD and monitoring methodology.	Video call	17/08/2021	Marcelo Sebben
6.	Management and operational system: documentation, allocation of responsibilities, qualification and training, data recording & archiving, internal audit and management review and emergency procedures.	Video call	17/08/2021	Marcelo Sebben
7.	Review of estimated ER calculations in accordance with applied methodology and relevant tools.	Video call	17/08/2021	Marcelo Sebben
8.	Review of monitored data and relevant document in accordance with registered monitoring plan and applied monitoring methodology.	Video call	17/08/2021	Marcelo Sebben
9.	Presentation of findings	Video call	17/08/2021	Marcelo Sebben

The on-site inspection was not conducted by the team leader during this verification process due to the COVID-19 pandemic.

Instead, the VVB used other standard auditing techniques for verification, as follows:

- Current pictures of main equipment^{20/}.
- Document review
- Real time Videoconference with all involved personnel from project activity.

These audit techniques used have been considered sufficient and credible by the verification team for the purpose of the present verification.

2.5 Resolution of Findings

The findings may be of following types: CAR – Corrective Action Request, CL – Clarification Request and FAR – Forward Action Request.

During the present verification, findings were raised and successfully closed. No FAR has been raised.

For the SOCIALCARBON verification, also findings were raised and successfully closed. No FAR has been raised.

The list of findings and their resolution are presented at Appendices IV and V of this report.

2.5.1 Forward Action Requests

No FAR was raised.

2.6 Eligibility for Validation Activities

ESPL holds the accreditation for validation and verification of the sectoral scope.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity has no participation under any other GHG program.

3.2 Methodology Deviations

The project activity complies with the applied methodology AMS-I.E – Switch from Non-Renewable Biomass for Thermal Applications by the User – version 07.0 and all applicable tools.

No deviations were observed.

3.3 Project Description Deviations

For the present monitoring period, no change is being requested.

3.4 Grouped Projects

The project activity is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity involves fuel switching from native firewood from Amazon biome to açai pits, Brazilian nut husks, wood residue and wood from forest management. During this monitoring period, Kamiranga used sawdust, açai pits and wood residues. The ceramic operates with 4 "Paulista" kilns (with two chamber each) and 1 Hoffmann kiln.

As per the on-site assessment, observations, interviews and collected evidences, it was possible to assess that, in general, the project activity has been implemented as described in the VCS-PD, with all changes already approved in the previous crediting period.

There is no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology.

In addition, the GHG emission reductions generated by the project have not become included in any emissions trading program or any other mechanism that includes GHG allowance trading. Moreover, the project has not received nor sought any other form of environmental credit, and neither has become eligible to do so since validation or previous verification. Finally, the project has not participated nor been rejected under any other GHG programs since validation or previous verification.

Some of the characteristics of the project activity are described below:

- Project Proponents: Cerâmica Kamiranga Indústria e Comércio LTDA and Sustainable Carbon – Projetos Ambientais Ltda.;
- Project Category: project ($\leq 300,000$ t CO₂e/y);
- Methodology: AMS-I.E – Switch from non-renewable biomass for thermal applications by the user – version 07.0;
- Start Date: 01/09/2007 – date on which the project proponent began employing renewable biomass as fuel;
- Crediting Period: 2nd Crediting Period – from 01/01/2018 to 31/12/2027 – 10 years and zero months – renewable;
- Project Location: Kamiranga Ceramic – Estrada Santa Rita da Barreira, s/n° - km 04 - Zona Rural, São Miguel do Guamã - Pará, Brazil, Postal Code: 68660-000– geographical coordinates (SAD69): 1° 36'53.0"S and 47° 26'31.6"W / Meridian Convergence: 0° 4' 7.9";
- Technical Data: 4 "Paulista" kilns (with two chamber each) and 1 Hoffmann kiln.
- The main sustainable development contributions are:
 - a. use of clean and efficient technologies through the use of renewable biomass as fuel;
 - b. pioneer initiative that encourages the development of new technologies throughout the country;
 - c. use of renewable biomasses resulting in GHG emission reductions.

Moreover, the sustainable development parameters were assessed through application of SOCIALCARBON Standard – version 5.0 and “Brazilian Red Ceramic factories Indicators” – version 1.1. The following SDGs are assessed through Social Carbon Standard (Refer to section 4.6 below:

- SDG 3: Goodhealth and well-being
- SDG 4: Quality education
- SDG 7: Affordable and Clean Energy
- SDG 8: Decent Work and Economic Growth

- SDG 9: Industry, Innovation and Infrastructure
- SDG 11: Sustainable Cities and Communities
- SDG 12: Responsible Consumption and Production
- SDG 13: Climate Action
- SDG 15: Life on Land

4.2 Safeguards

4.2.1 No Net Harm

The burning of the biomasses emits particulate material and CO₂ identified as negative impact. This also occurs when using fossil fuel. Nevertheless, as they are renewable biomasses, they have carbon neutral lifecycle.

All ashes resulting from the burning are used as fertilizer.

Regarding social contribution, the SOCIALCARBON standard measures the positive or negative impacts social and environmentally.

Thus, the negative impacts caused by the project activity are being mitigated.

4.2.2 Local Stakeholder Consultation

The formal local stakeholder consultation was carried out during the validation of the project under VCS. Regarding communication with stakeholders, the project participant has a good relationship with local community and has open channels in order to receive comments from local stakeholders. Thus, the project activity has a stakeholder communication access in place and working. There were no comments regarding the project activity during the period. However frequently, stakeholders, especially from community use the informal channel directly with company's owner, in order to do their requests.

4.2.3 AFOLU-Specific Safeguards

Not applicable as it does not comprehend an AFOLU project.

4.3 Accuracy of GHG Emission Reduction and Removal Calculations

- the approved CDM methodology AMS-I.E – Switch from non-renewable biomass for thermal applications by the user – version 07.0 is applied to the project activity. GHG emission reduction is calculated as baseline emissions;
- project emissions are not envisaged by the methodology for the project activity;
- no leakage is considered for this kind of project, in accordance with the applied methodology and “General guidance on leakage in biomass project activities”, as all possible sources of leakage are demonstrated at the MR as:

- there is no transference of equipment;
- the amount of biomasses to provide thermal energy for the project activity represents a non-representative quantity of these kind of biomasses, which avoids the possibility of leakage;
- the project is expected to decrease the use of non-renewable biomass by similar users, especially due to the incentive of carbon credits;
- all methods and formulas used in the calculations of emission reductions have been followed in accordance to the applied methodology and monitoring plan of the validated at VCS-PD;
- all monitored data is traceable.

Fixed parameters (as per Section 4.1 of VCS-PD):

- $EF_{\text{projected fossil fuel}}$ – Emission factor for the substitution of non-renewable woody biomass by similar consumers: 81.6 tCO₂/TJ;
- ρ_{wood} – Specific gravity of non-renewable wood: 0.67 ton/m³;
- BF_y – Baseline consumption of non-renewable biomass per tons of ceramic units produced in year y: 0.81 ton of wood / tonnes of ceramic fired
- $EF_{\text{CO}_2, f}$ – Default CO₂ emission factor for freight transportation activity f : 129 gCO₂/t.km for heavy vehicles and 245 gCO₂/t.km for light vehicles

Monitored parameters:

- PR_y – Tonnes of ceramic devices (refer to Section 4.2 of the MR);
- NCV_{biomass} : Net Calorific Value of non-renewable woody biomass that is substituted – 0.015 TJ/tonne of wood (as per applied methodology)
- $Q_{\text{renbiomass}}$ – Amount of renewable biomass utilized (refer to Section 4.2 of the MR);
- Origin of Renewable Biomass – all biomasses used at the project activity are renewable and from a legalized source;
- Leakage of non-renewable biomass – Leakage resulted from the non-renewable biomass: 0 tCO₂e;
- $f_{\text{NRB}, y}$ – 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 or government data or approved default country specific fraction of non-renewable biomass values available on the CDM website. After the CL 04 raised and duly closed (refer to appendix III below) the applied values are to:
 - 2018: 93.84%
 - 2019: 93.77%
 - 2020: 93.65%
 - 2021: 94.25%
- Renewable biomass surplus – Amount of renewable biomass available (refer to Sections 4.2 and 5.3 of the MR);

- $D_{f,m}$: Return trip distance between the origin and destination of freight transportation activity f in monitoring period m. Value has been yearly determined as per monitoring plan (km):
 - 2018: 10,803.40
 - 2019: 10,215.00
 - 2020: 4,561.60
 - 2021⁵: 1,719.20
- $FR_{f,m}$: Total mass of freight transported in freight transportation activity f in monitoring period m. Value has been yearly determined as per monitoring plan (tonnes of biomass):
 - 2018: 15,284.08
 - 2019: 17,791.26
 - 2020: 14,657.44
 - 2021⁶: 3,221.73

The emission reduction spreadsheet is transparent, traceable and correct, with no manual transposition errors.

Baseline emissions (BE_y)

The baseline emissions are calculated as follows:

$$BE_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil_fuel}$$

Where:

- BE_y : Baseline emissions during the year y;
- B_y : Quantity of woody biomass that is substituted or displaced;
- $f_{NRB,y}$: Fraction of non-renewable biomass (wood) used in the absence of the project activity in year y;
- $NCV_{biomass}$: Net calorific value of non-renewable biomass;
- $EF_{projected_fossil_fuel}$: Emission factor for the projected fossil fuel consumption in the baseline.

The calculation of the parameter $f_{NRB,y}$ is duly demonstrated in the ER calculation spreadsheet tab “fNRB” and is carried out in accordance with following equation.

$$f_{NRB} = \frac{NRB}{NRB + RB}$$

Where:

- f_{NRB} Fraction of non-renewable biomass (fraction or %)
- NRB Non-renewable biomass (t/yr)
- RB Demonstrably renewable biomass (t/yr)

Evidences of each parameter used in the calculation have been duly provided/^{12/}. Calculations are in accordance with “TOOL30: Calculation of the fraction of non-renewable biomass” version 01.0.

⁵ From 01/01/2021 to 31/03/2021

⁶ From 01/01/2021 to 31/03/2021

So, BE_y (tCO₂e) =

- 2018: 56,021
- 2019: 54,089
- 2020: 54,573
- 2021⁷: 9,693
- Total: 174,376

Project emissions (PE_y)

Project emissions due to transportation are applied as follows

$$PE_{TR,m} = \sum_f D_{f,m} \cdot FR_{f,m} \cdot EF_{CO_2,f} \cdot 10^{-6}$$

Where:

- PE_{TR,m} = Project emissions from road transportation of freight monitoring period *m* (t CO₂)
- 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* (g CO₂ / t km)
- f* = Freight transportation activities conducted in the project activity in monitoring period *m*

Thus, PE_y (tCO₂e) =

- 2018: 1,011
- 2019: 888
- 2020: 358
- 2021⁸: 51
- Total: 2,308

Leakage emissions (LE_y)

Monitoring using the latest available data/^{11/} has been carried out and it could be evidenced that there is surplus of the biomass types in the geographic region where the project activity belongs to. It has been demonstrated that the surplus of biomass available is higher than 25% when comparing to all biomass consumption, including the project activity. The project proponents follows international recognized guidance for this assessment such as Attachment C to Appendix B Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories⁹ and CDM TOOL16 ver 4, para 42)e)i)¹⁰. All biomasses consumed during the monitoring period have been considered. This assessment was carried out in

⁷ From 01/01/2021 to 31/03/2021

⁸ From 01/01/2021 to 31/03/2021

⁹ https://cdm.unfccc.int/methodologies/SSCmethodologies/AppB_SSC_AttachmentC.pdf

¹⁰ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-16-v4.pdf>

accordance with requirements of monitoring plan, which evaluates the leakage in competing use of biomass. This assessment was based on public available data and therefore considered reliable. Considering that this public available data^{11/} takes into account information from whole State of Pará, the VVB considers that this assessment achieved a reasonable level of assurance, and for that reason, the ERs are conservative. Therefore no leakage is applied.

Thus, $LE_y = 0 \text{ tCO}_2\text{e}$

Emission Reductions

Therefore, according to the applied methodology, ER_y are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y : Emission reductions in year y;
 BE_y : Baseline reductions in year y;
 PE_y : Project reductions in year y;
 LE_y : Leakage reductions in year y.

Thus, $ER_y = BE_y - PE_y$. So, $ER_y = 172,068 \text{ tCO}_2\text{e}$.

4.4 Quality of Evidence to Determine GHG Emission Reductions and Removals

- records were submitted by the project proponent as evidences to determine emission reduction;
- the records, data and information provided were found valid for the current verification period. The documents were verified during site visit and when possible, were checked directly from its source;
- interviews were performed during site visit with involved personnel and PP's representatives;
- the GHG emission reduction calculations were check step by step with PP's representatives;
- the quality of evidences was found of adequate level by the verification team to ensure an accurate quantification of the emission reductions.

4.5 Non-Permanence Risk Analysis

Not applicable for this project type.

4.6 SOCIALCARBON Results

4.6.1 Social Resource

Indicator	1. Diversity													
Situation	The Ceramic factory employs workers from different social groups, like women, illiterate and elderly people. According to the data collected from RAIS – Annual Report of Social Information, there are currently 64 people working in the ceramic factory. The table below shows that 17% of the employees are from minority groups. <table><tr><th>Excluded social groups</th><th>Number of workers</th></tr><tr><td>Women employees</td><td>6</td></tr><tr><td>senior employees</td><td>4</td></tr><tr><td>illiterate employees</td><td>1</td></tr></table>						Excluded social groups	Number of workers	Women employees	6	senior employees	4	illiterate employees	1
Excluded social groups	Number of workers													
Women employees	6													
senior employees	4													
illiterate employees	1													
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	4 (four)													
Justification	The ceramic has currently 17% of employment from excluded social groups and has intention to improve the index from minority groups.													
Evidence	Interviews performed with ceramic representatives and human resources documents.													

Indicator	2. Community development				
Situation	Kamiranga Ceramic factory makes monthly donations of financial resource and construction material to institutions, such as ABRINQ Foundation for the Rights of Children and Adolescents, NGO Doctors Without Borders, João Baroni Freemason's House Foundation and the Gente Livre Recovery Center, and community members. Beyond that, periodically, Kamiranga carries out a cleaning action in the community of São Miguel do Guamá - which doesn't have waste collection by the corresponding body - using its own equipment and employees				
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:	In addition to scenario 3, the factory lends out equipment, space and/or provides manpower for activities that	The factory is formally involved in the development and implementation of social and/or environmental	In addition to scenario 5, the factory has formalized planning in order to maximize their contribution to

		- Regularly: one per month; OR - Significant: at least 10 different parties were benefited.	benefit the local community.	projects in partnership with public entities and/or civil society organizations.	local community development, through survey with the community, establishing new partnerships, etc.
Score	4 (four)				
Justification	It was verified by the performed interviews and donation receipts that the ceramic supports the cited organizations but have no forecasted further improvement.				
Evidence	Pictures, receipts and interviews performed during site visit.				

Indicator	3. Employee satisfaction surveys				
Situation	The Ceramic factory has a suggestion box to consult the workers' opinions. To discuss suggestions, the factory holds a meeting with the employees' participation during CIPA's reunions. That way, the ceramic owner can improve the factory working system and increase the employees' satisfaction.				
Lack of a consultation system for employee feedback.	There are attempts to implement an employee consultation system, but it is not being properly utilized. Example: There is a suggestion box, but employees do not use it.	The system for employee consultation is being utilized but is limited to a suggestion box.	In addition to scenario 3, the factory has implemented or is currently implementing one or more suggestions made by employees.	The factory promotes periodic satisfaction surveys among employees. Example: monthly meetings, book for documenting information, etc.	In addition to scenario 5, the factory has stipulated targets and timelines for solutions to employee complains.
Score	3 (three)				
Justification	A suggestion box is in place. The suggestions and complaints are taken to the manager's evaluation.				
Evidence	Interviews and site visit.				

4.6.2 Human Resource

Indicator	4. Additional employee benefits
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Situation	The Ceramic factory offers to all the employees: - Life insurance for all employees; - Discounts for employees on ceramics products; - Some of the workers receive food staples in commemoratives dates; - Uniform for all employees; - Commission for bricks produced				
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	4 (four)				
Justification	It was verified by the performed interviews with employees that the ceramic has implemented benefits to all employees as well as award programs				
Evidence	Interviews and site visit.				

Indicator	5. Health and safety practices
Situation	The Kamiranga Ceramic factory accomplishes all the mandatory programs and some complementary programs as follows: - PPRA: Program for Prevention and Environmental Risks; - PCMSO: Program for Controlling Medical and Occupational Health; - CIPA: Internal Commission for Accident Prevention; - PPR: Respiratory Protection Program; - PCA: Hearing Conservation Program. The company has a safety engineer called Barbara Bastos Fernandes, which goes once a week in the Ceramic to ensure best practices in the company, and offers all the personal protective equipment necessary for the workers to carry out their activities safely. Also, she monitors the use of PPEs by the workers and files all control forms of delivery and return. The ceramic factory provides lectures, trainings and courses to the Ceramic factory employees regarding security in the workplace.

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 (b) has signs encouraging the use of PPE in the factory and/or (c) The factory promotes lectures and events addressing issues related to health and safety in the workplace.	In addition to scenario 4, the factory contracts or has a technical professional or safety engineer on staff to ensure best practices in the company.	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.
Score	6 (six)				
Justification	It was verified by the performed interviews and by the presented pictures that the ceramic promotes CIPA meetings where several subjects can be discussed and where lectures are presented. In addition, the PCMSO and PPRA of the company were presented to the verification team. Moreover, additional health programs are also provided to the employees.				
Evidence	Pictures, interviews, PCMSO, PPRA.				

Indicator	6. Training and capacity building programs				
Situation	The ceramic factory offered weekly lectures on health and security themes to all employees, with a visit from an occupational health and safety professional. In addition, some training courses to individual employees.				
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	In addition to scenario 4, the factory has an internal campaign to encourage employees to complete their high school	In addition to scenario 5, the Ceramic factory has established a strategic plan regarding training and capacity building programs.

			lectures to other employees; and/or Regular lectures were offered to employees (at least two per semester).	education; and/or The factory promotes a literacy program for youth and adults.	
Score	4 (four)				
Justification	It was verified by the performed interviews that the ceramic provides courses to some employees. Moreover ceramic factory intends to keep investing in training and capacity building programs to the workers.				
Evidence	Interviews and certificates				

4.6.3 Financial Resource

Indicator	7. Biomass supply				
Situation	Kamiranga Ceramic factory uses sawdust, açai pits and wood residues as fuel: 100% comes from agro-industrial waste.				
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 (six)				
Justification	It was verified by the performed interviews that the ceramic has total control of the suppliers and accounts for 100% of the used biomass that comes from agro-industrial waste.				
Evidence	Records of purchase of biomass and report of daily production of ceramic device.				
Indicator	8. Planning and control:				
Situation	The factory has control of the income received from carbon credit sales, as they are aware of the destination of the income. The Ceramic factory has control of the				

	expenses from the carbon project, and the income was used mostly in investments of the ceramic infrastructure and donations to community members and institutions.				
The factory has no organized controls of the income received from carbon credit sales nor the destination for proceeds.	The factory has partial control of the income received from carbon credit sales and the destination for proceeds.	The factory has organized controls of the income received from carbon credit sales, but control of the destination for proceeds is partial.	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.	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 incomplete future planning.	The factory has organized 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 (four)				
Justification	The ceramic has records of the income received from carbon credit sales and entrepreneur intends to evaluate and plan its investments and future donations for the development of the ceramic factory and local community.				
Evidence	Receipts of payment of the VCUs and interviews to the representatives.				

Indicator	9. Carbon credit investments				
Situation	The Ceramic factory has control of the expenses of the carbon project. In the period analyzed Kamiranga invested in factory improvements.				
The income generated by carbon credit sales was not invested in the factory nor in the community, or there are no organized controls of the allocation of proceeds.	Less than 20% of the income generated by carbon credit sales was invested the factory or in the community development.	Between 20 and 40% of the income generated by carbon credit sales was invested the factory or in the community development.	Between 40 and 60% of the income generated by carbon credit sales was invested the factory or in the community development.	Between 60 and 80% of the income generated by carbon credit sales was invested the factory or in the community development.	Between 80 and 100% of the income generated by carbon credit sales was invested the factory or in the community development.
Score	6 (six)				
Justification	The ceramic has records of the income received from carbon credit sales. It only has not organized the amount that goes to each beneficiary. However the amount received is invested either in the factory as in the community.				

Evidence	Receipts of payment of the VCUs and spreadsheet with total received and total invested.
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4.6.4 Natural Resource

Indicator	10. Environmental management				
Situation	The company does not have a formalized environmental management system; however, its voluntary initiatives to reduce the main environmental impacts caused by the ceramic factory, allow for the achievement of an important elements of an EMS, the continuous improvement. The main initiatives carried out by Kamiranga Ceramic Factory are: - The residues not burned are returned into the clay mixture and reused in the production process; - The ashes and broken ceramic pieces generated in the productive process are used in maintenance of roads; - The ceramic has selective collection; - The ceramic factory has a water reuse system; - The ceramic buy energy from renewable sources, reducing its impacts through energy consumption.				
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	4 (four)				
Justification	It was evidenced by the performed interviews with ceramic representatives and at the site visit that the ceramic factory intends to elaborate a study to assess the possibility of implementing an environmental management system in the next years				
Evidence	Interviews and site visit.				

Indicator	11. Brazilian environmental legislation
Situation	The Ceramic factory possess all the mandatory licenses:

- Operating License (LO): nº 045/2020 emitted by the Municipal Secretary of the Environment (SEMMA) on August 11th, 2020, valid until November 11th of 2022. - Clay Extraction License: nº 40/2020 emitted by the State Secretary of the Environment and Sustainability (SEMAS/PA) on June 25th of 2020, valid until October, 26th of 2022. - Water Grant: declaration of waiver of water grant nº 2303/2018 emitted by the State Secretary of the Environment and Sustainability (SEMAS/PA) in February 2018, valid until June, 20th of 2023. - Federal Technical Registry (CTF): Regular. The CTF is a document emitted by the Brazilian Institute of Environment and the Natural Renewable Resources					
The factory does not possess any of the following: -operating license -license for clay extraction -water grant - federal technical registry	The factory only posses two of the following: -operating license -license for clay extraction -water grant - federal technical registry	The factory only posses three of the following: -operating license -license for clay extraction -water grant - federal technical registry	The factory posses all of the following: -operating license -license for clay extraction -water grant - federal technical registry However, they do not meet all the conditions established by them.	All licenses are up to date and all conditions established by them are being met.	In addition to the previous scenario, the factory collaborates with public administration and/or civil society organizations for cooperation with environmental projects
Score	5 (five)				
Justification	All licenses are up to date and all conformity conditions to require their renovations are in place.				
Evidence	Licenses.				

Indicator	12. Voluntary environmental initiatives				
Situation	The factory has constructed a rainwater collection and reuse system and has waste collection program. Besides, the ceramic reduces the generation of waste by allocating ashes and shards of ceramic pieces for the maintenance of highway roads, helps with public cleaning of the city and carried out the planting of 160 seedlings in the region. In addition, from 2018 onwards, Kamiranga ceramic factory began to buy certified bioenergy from the free market.				
The factory is not involved in voluntary environmental initiatives.	The factory has implemented only one internal environmental initiative.	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	In addition to the previous scenario, the factory promotes

	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.	extend to community members.	voluntary environmental initiatives with civil society organizations and/or public administration.
Score	5 (five)				
Justification	It was evidenced by the performed interviews with ceramic representatives and pictures that the company has implemented the mentioned systems.				
Evidence	Pictures, site visit and interviews.				

4.6.5 Biodiversity/Technology Resource

Indicator	13. Technological advances to improve efficiency of the production process				
Situation	The factory meets the following aspects: - <u>Brick drying methods</u>: The factory possesses eight caipira dryers and two dryers that recycles the heat from kilns; - <u>Kiln temperature control</u>: The Ceramic controls the temperature of the kilns in the firing process using an electronic thermometer in each kiln (in this monitoring period, the ceramics purchased 20 units of thermometers). The monitoring system of the burning is manual, all data is filed in the Kamiranga office. - <u>Efficiency of kilns</u>: The Ceramic operates with four "Paulista" kilns which is a medium efficiency kiln and one Hoffman kiln that is considered a high efficiency kiln. - <u>Kiln feeds</u>: The Hoffman kiln has infrastructure for semi-automatic feeding, while the Paulista kiln are fed manually; - <u>Infrastructure</u>: The ceramic owner made some improvements in the factory infrastructure. In this monitoring period, it is possible to mention (I) the renovation and maintenance of the kilns for improvement and efficiency in the burning process; (II) the expansion of the shed for storage and drying of raw materials; and (III) the readjustment of the sanitary facilities, in compliance with the instructions of the Ministry of Labor, in prevention and control of the COVID pandemic19;				
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 (five)
Justification	It was evidenced by the performed interviews with ceramic representatives and during the site visit that the ceramic has several equipment that enables an improvement in the efficiency of the production process.
Evidence	Interviews and site visit.

Indicator	14. Technological advances to improve the general conditions of the working environment					
Situation	The factory meets the following aspects: - <u>Cleanliness</u>: The ceramic factory has selective collection and all metal from productive process is forwarded to a recycling company. Also, there is a cleaning team that cleans the whole factory every day to result in less dust. In addition, employees use specific PPE, such as a filtering semi-facial mask to protect the respiratory tract against dust; - <u>Noise control</u>: Kamiranga has a Hearing Conservation Program to evaluate and control the noise in the factory. - <u>Heat</u>: The Ceramic factory has fans in the productive process that reduces the employees' exposure to a warm environment. In addition, Kamiranga ceramics offer EPIs for visual protection in green acrylic (which also helps protect the eyes when working close to the kilns) and a long-handled nozzle shovel, preventing flame approach; - <u>Lighting</u>: The Ceramic factory has translucent tiles to maintain a well-lit working environment. - <u>Appropriate signage</u>: The factory uses 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 (five)					
Justification	It was evidenced by the performed interviews with ceramic employees and during the site visit that the ceramic has several features that improve the general conditions of the working environment.					
Evidence	Interviews and site visit.					

Indicator	15. Product quality
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Situation	Kamiranga has a quality control lab and a trained employee conduct the tests of flatness, squareness, strength and water absorption in two of the three products offered by the ceramic factory.					
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	2 (two)					
Justification	Analysis reports have been provided. Entrepreneur intends to include all products in the quality test in the future					
Evidence	Interviews and site visit.					

4.6.6 Carbon Resource

Indicator	16. Stakeholder consultation					
Situation	During the present monitoring period the ceramic Kamiranga did not conducted a stakeholder consultation.					
During the time period analyzed, the factory did not conduct a stakeholder consultation.	During the time period analyzed, the factory conducted an informal (no record) stakeholder consultation.	During the time period analyzed, the factory conducted a formal (with records) stakeholder consultation; however negative comments were made regarding the project.	During the time period analyzed, the factory conducted a formal (with records) stakeholder consultation, and no negative comments were made regarding the project.	As well as the previous scenario, there are continuous means of communication with stakeholders.	As well as the previous scenario, the next consultation is being planned together with stakeholders.	
Score	1 (one)					
Justification	No evidence has been provided but entrepreneur intends to conduct a new stakeholders consultation in the future.					
Evidence	Interviews.					

Indicator	17. Green marketing					
Situation	Kamiranga ceramic factory benefits from the marketing strategies used by Sustainable Carbon, such as the project's page on the company's website and the carbon project presentation video.					
The factory does not have	The factory markets their	The factory markets their	The factory has an established	The factory has an established	As well as the previous	

marketing strategies based on their environmental practices.	environmental practices only using one means of communication. Example: magazine advertisement.	environmental practices using more than one means of communication. Example: magazine advertisement and billboard.	green marketing strategy, but still has not seen positive results.	green marketing strategy and sees positive results.	scenario, the factory has plans to invest in Green marketing.
Score	2 (two)				
Justification	No evidence of green marketing have been presented to the verification team.				
Evidence	Interviews.				

Indicator	18. Project performance:				
Situation	The Ceramic owner is satisfied with the project because since it was implemented the ceramic factory is more organized and the workers are happier with the benefits they receive. Also, now he is aware about the importance of the environment and the sustainability.				
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	5 (five)				
Justification	The project representative is satisfied with the carbon project due to the organization generated in the factory, and he sees advantages in the business.				
Evidence	Interviews.				

5 ANALYSIS OF SOCIALCARBON RESULTS

5.1 Current Performance

Resource	Critical	Satisfactory	Sustainable	Average Score	Performance
Social	0.0%	100%	0.0%	3.7	Satisfactory
Human	0.0%	66.7%	33.3%	4.7	Satisfactory
Financial	0.0%	33.3%	66.7%	5.3	Sustainable
Natural	0.0%	33.3%	66.7%	4.7	Satisfactory
Biodiversity/Tech	33.3%	0.0%	66.7%	4.0	Satisfactory
Carbon	66.7%	0.0%	33.3%	2.7	Critical

5.2 Historical Performance

Social	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six	Point Seven
Score	2.3	2.1	3.0	3.6	3.3	4.3	3.0	3.7
Historic Analysis: For this monitoring period, the ceramic increased its performance when compared to the previous one. There was an increase in the people from minority groups employed by the company								
Human	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six	Point Seven
Score	1.7	1.8	3.2	3.3	4.7	3.7	4.0	4.7
Historic Analysis: during this monitoring period, the ceramic increased its score. The factory offered a lot of benefits and training courses for the employees, so they could improve their skills and performance.								
Financial	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six	Point Seven
Score	4.3	3.3	3.7	3.7	5.0	4.7	4.7	5.3
Historic Analysis: This resource had a sustainable performance in this current period. The ceramic factory had complete control over the income and the investments made using the money from the								

carbon credit sales. Besides, Rio Negro invested 93% of the total income from the carbon credits in improvements over the factory.

Natural	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six	Point Seven
Score	2.2	2.6	3.2	3.2	3.0	4.3	3.3	4.7

Historic Analysis: during this period, the ceramic increased its score in this resource especially due to voluntary environmental initiatives, besides selective collection.

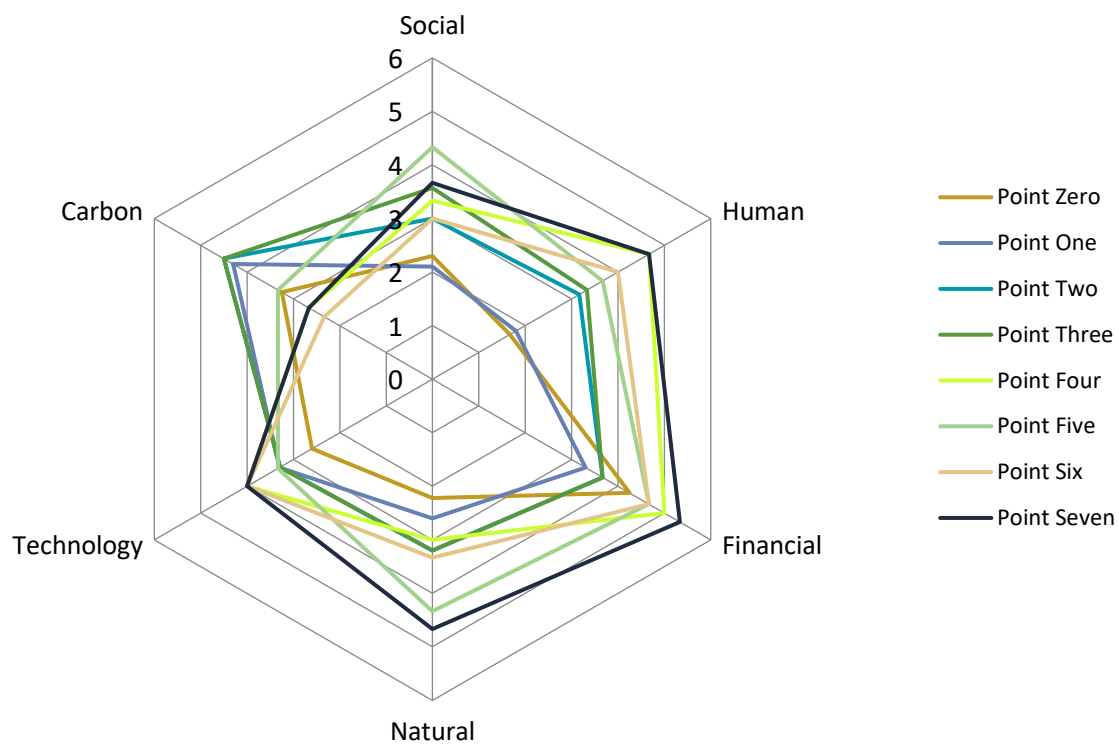
Biodiversity	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six	Point Seven
Score	2.6	3.3	3.3	3.3	4.0	3.3	4.0	4.0

Historic Analysis: Although the ceramics does not perform quality tests in all products anymore, the investments made to improve the factory infrastructure were sufficient to maintain its performance in the Technology resource comparing to the last monitoring period.

Carbon	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six	Point Seven
Score	3.3	4.3	4.5	4.5	2.7	3.3	2.3	2.7

Historic Analysis: this resource has increased during this monitoring period especially due to marketing strategy adopted by entrepreneur.

5.3 Performance Hexagon



6 VERIFICATION CONCLUSION

ESPL, contracted by Sustainable Carbon – Projetos Ambientais Ltda., has performed the independent verification of the emission reductions of the VCS project “Kamiranga Ceramic Fuel Switching Project”, with VCS Project ID 197, for the period from 01/01/2018 to 31/03/2021 (both days included).

Sustainable Carbon – Projetos Ambientais Ltda. is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

ESPL commenced the verification based on the baseline and monitoring methodology AMS-I.E – version 07.0, the monitoring plan contained in the VCS-PD and draft Monitoring Report.

ESPL's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

The verification team confirms that:

- The project activity has been verified in accordance with requirements of ISO 14064-3:2019^{14/}
- the project activity was found completely implemented as per the description given in the registered VCS-PD; and
- the actual operation conforms to the description in the VCS-PD.
- the project conforms with the verification criteria for projects and their GHG emission reductions or removals set out in VCS Version 4

Moreover, the verification team states that the GHG statement is the responsibility of the project proponent.

Thus, the GHG emissions reductions reported for the project activity for the period above mentioned are fairly stated in the final version of the Monitoring Report. The GHG emission reductions were calculated correctly based on the approved baseline and monitoring methodology AMS-I.E – version 07.0 and the monitoring plan contained in the VCS-PD.

Therefore, ESPL is able to certify that the emission reductions from the VCS project “Kamiranga Ceramic Fuel Switching Project” are accurate, conservative and in accordance with applied requirements

In addition, as a result of the SOCIALCARBON verification, the verifier confirms that:

- the indicators and reports are in accordance with SOCIALCARBON Standard and “Brazilian Red Ceramic factories Indicators” – version 1.1;
- the project is being periodically monitored and Point Zero is being used as the baseline;

- there are perspectives of improvement and the efforts to seek for this improvement are being done. No decrease in performance have been observed in all indicators.
- the report has been verified by an accredited entity, a virtual on-site visit has been carried out and this verification report has been issued.

In addition, the verifier confirms that the indicators for “Brazilian Red Ceramic factories Indicators” – version 1.1 are accurate and the calculations are correct. The SOCIALCARBON template and SOCIALCARBON Guidelines were correctly used.

ESPL herewith states that the project is in line with SOCIALCARBON requirements. All other applicable criteria for the verification are in accordance with applicable rules and requirement.

The characterization of the Point SEVEN for the project as “SATISFACTORY”, as described in the referenced documents, is accurate.

Verification period: From 01/01/2018 to 31/03/2021

SOCIALCARBON verification period: From 01/01/2018 to 31/03/2021

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

Year	Baseline emissions or removals (tCO2e)	Project emissions or removals (tCO2e)	Leakage emissions (tCO2e)	Net GHG emission reductions or removals (tCO2e)
2018	56,021	1,011	0	55,010
2019	54,089	888	0	53,201
2020	54,573	358	0	54,215
2021 ¹¹	9,693	51	0	9,642
Total	174,376	2,308	0	172,068

Year	Net GHG ERs estimated in PD (tCO2e)	Net GHG ERs achieved during this MP (tCO2e)	% difference
Total	96,941	172,068	77

¹¹ From 01/01/2021 to 31/03/2021

When comparing to the estimated values in the VCS-PD, the ERs achieved are 77% higher. This result is mainly due to two factors:

1. The factor f_{NRB} achieved during this period was 18.3 % higher than the factor applied in the ex-ante calculations. This factor is monitored ex-post based on public available data, and therefore not in control of PP. The verification team considers that the calculation has been carried out in accordance with applicable version of TOOL30.
2. An increase of 53% in the production of ceramic pieces when comparing to the estimated values. It is important to point out that this estimate in the PD took into account the 10 years of the previous crediting period. Nevertheless, the amount of pieces produced increases or decreases in function of demand. In the latest years, the demand for bricks has significantly increased/^{13/} and that's the main reason for the increase in production. It is important to point out that the production value depends on market demand and therefore variations can occur. The verification team concludes that the amount of pieces produced is correctly set during this monitoring period as all information on production was duly provided to the verification team. However, the VVB highlights that the additionality of this project activity was based on barriers faced for implementing the project activity and DOES NOT depend on the amount of production. The project activity does not correspond to increase the plant capacity, but it corresponds to switching fuel from non-renewable biomass to renewable biomass.

Among the barriers raised for demonstrating the additionality, the project faced financial barrier (purchasing equipment to consume renewable biomass, purchasing new kiln types and higher prices of renewable biomass when comparing to non-renewable biomass), technological barriers (lack of know-how on the use of renewable biomass), institutional barriers (lack of qualified work force to manage the biomass logistics). In case the project activity would not have been implemented, none of these costs will occur but the production will be exactly the same.

Specifically, regarding the investment analysis, all the costs listed in section 2.5 step 2 from the registered PD (dated 27 October 2009) would not be spent without the project activity. But the production will be kept the same, as it depends on market demand.

Therefore, it can be concluded that even with the increase in production in 53%, the additionality analysis carried out during the validation phase is not affected as it does not depend on the production, but it depends on the barriers found, which would not occur in absence of project activity. Thus, the project remains additional [new analysis of investment has been carried out: the project proponents analysed the cost comparison between the renewable biomass \(current fuel\) and the non- renewable biomass \(biomass fuel\). The increase in values of non-renewable biomass has been estimated based on inflation since the start date of project activity, since the ceramic does not consume this biomass type.](#)

Conservatively, the highest inflation rate (6.5% p.a)¹⁶/has been applied throughout the period. For the renewable biomass, costs applied at the start of monitoring period have been used.

It could be observed that the cost per energy (R\$/TJ) for the non-renewable biomass was only 36% of the cost using renewable energy (1,639 R\$/TJ / 4,531 R\$/TJ = 36% - Financial Barrier tab in ER calculations spreadsheet). A sensitivity analysis has been carried out in the same spreadsheet where it could be observed that the use of renewable biomass is not financially attractive even if renewable biomass costs decrease in 25%. The verification team considered the assumptions reasonable and based on reliable available data (official National Inflation, actual costs spent on renewable biomass and actual costs of non-renewable biomass extrapolated for the monitoring period). Information has been duly included in the section 3.1 of the MR and concluded in the section 5.4 of the MR.

Therefore, although a difference in 77% of ERs has been achieved when comparing to estimated values, the increase partially depends on public data (factor f_{NRB}) and partially on increase in the production during these years. None of these parameters affect the additionality as it could be assessed in the paragraph above.

The verification team confirms that the Emission reductions achieved during this monitoring period were duly evidenced and, according to the verification carried out, achieved reasonable assurance level. For the assessment on the achievement of reasonable level of assurance, refer to section 1.3 above.

APPENDIX I: REFERENCES

No.	Title	References
1.	<u>Methodology</u> AMS-I.E – Switch from non-renewable biomass for thermal applications by the user	version 07.0
2.	<u>Biomass</u> Records of biomass purchase from this monitoring period	2018 to 2021
3.	<u>Production</u> Records of production by type of ceramic devices from this monitoring period	2018 to 2021
4.	<u>Licenses</u> - LO production # 438/99-10 issued on 13/03/2015 - LO production # 438/99-10 issued on 04/04/2017 valid two years - Renewal protocol 11/03/2019 IPAAM Process #0989/99-V2 - Mining License LO 028/00-11 issued by IPAAM on 27/12/2018 - Mining License LO 028/00-10 issued by IPAAM on 10/11/2016 – valid for two years. - Lavra title – issued by DNPM - # 880.044/2008 – 08/09/2017 – valid for 5 years - Lavra title – issued by DNPM - # 880.044/2008 – 15/10/2015 valid for one year - -Water grant – 0869/j/08 issued by IPAAM on 12/03/2008	Validity: 12/03/2017 Validity: 04/04/2019 Validity: 26/12/2020 Validity: 09/11/2018 Validity: 07/09/2022 Validity: 14/10/2016 Validity: no expiring date
5.	<u>Parameter B_{F_y}</u> Registered VCS PD.	Version 05 – 12/06/2018
6.	MR – draft	version 01 – 23/07/2021
7.	MR +SC report– revised / final	version 02 – 01/12/2021 version 03 – 26/01/2022 version 03 – 28/01/2022 version 04 – 11/03/2022 version 05 – 08/06/2022 Version 06 – 03/08/2022

		Version 07 – 03/08/2022
		Version 08 – 24/01/2023
		Version 09 – 22/03/2023
8.	ER Spreadsheet – draft	version 1
9.	ER Spreadsheet – final	version 09
10.	VCS-PD (Registered)	Version 05 – 12/06/2018
11.	<u>Information related to leakage</u> 25% of forest residues are either burned or destined for landfills, therefore, 75% of the forest residues generated in the North region of Brazil are reused in other economic activities. 53% of Açaí Pits have incorrect disposal and destination: - Açaí pits weight proportion	Imazon. A atividade madeireira na Amazônia brasileira: produção, receita e mercados. 2010. available at: https://imazon.org.br/a-atividade-madeireira-na-amazonia-brasileira-producao-receita-e-mercados/ https://www.scielo.br/j/asoc/a/xLtkfCv9jZpzvYzhBwsMwDv/?format=html https://cidades.ibge.gov.br/brasil/pa/pesquisa/16/12705?ano=2018 http://minhasfrutas.blogspot.com/2008/12/importancia-economica-do-aai.html
12.	<u>Evidences of calculation of parameter f_{NFB} in accordance with TOOL30 v.1</u> Official statistics of total annual consumption of wood issued by Brazilian Geographic and Statistic Institute (Instituto Brasileiro de Geografia e Estatística - IBGE) - "Extração vegetal e Silvicultura" 2018 to 2020.	https://cidades.ibge.gov.br/brasil/pesquisa/16/12705?ano=2018 - Last visit: Jan/2023.

	2. Specific gravity of wood: According to IPCC. Mean average of all species in Tropical America. Available at 3. Values of MAI (tC/ha/y) - Mean Annual Increment of woody biomass: According to Brazilian DNA source, Third National Communication of Brazil to the United Nations Framework Convention on Climate Change. Available at: < >Volume III, page 180. Last visit: Jan-2023. 4. Carbon Ratio: Carbon Ratio of 47%. According to Brazilian DNA source, Third National Communication of Brazil to the United Nations Framework Convention on Climate Change. Volume III, page 240. Last visit: Jan/2023. 5. Forest areas - SNIF – Sistema Nacional de Informações Florestais. Os Biomas e Suas Florestas 6. Parameter $P_{forest,i}$: a. Protected areas in conservation units - 250,209,200 ha - According to Cadastro Nacional de Unidades de Conservação (CNUC). b. Permanent Preservation Areas (Areas de Preservação Permanente - APP) - 56,800,000 ha - According to Food and Agriculture Organization - FAO. Corresponds to extent of non-accessible area in private properties. c. Not designated public federal forests - 42,383,431 ha.	https://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf_files/GPG_LULUCF_FULL.pdf> Table 3A.1.9-2 https://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/Comunicacao_Nacional/Comunicacoes_Nacionais.html#:~:text=A%20submiss%C3%A3o%20da%20Comunica%C3%A7%C3%A3o%20Nacional,de%20feito%20estufa%20(GEE). <https://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/Comunicacao_Nacional/Comunicacoes_Nacionais.html#:~:text=A%20submiss%C3%A3o%20da%20Comunica%C3%A7%C3%A3o%20Nacional,de%20feito%20estufa%20(GEE). <https://snif.floresta.gov.br/pt-br/os-biomas-e-suas-florestas>Last visit: Jan/2023. https://repositorio.unb.br/bitstream/10482/37802/1/2019_FernandoAlmeidaCosta.pdf>page 46 <http://www.fao.org/3/a-az172e.pdf> page 72. topic a): <https://www.gov.br
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	d. Not designated public stadual forests - 22,187,596 ha. Available at topic b): e. Indigenous Lands - 114,883,420.2994 ha "Geoprocessamento e Mapas". (total indigenous land disconsidering delimited areas, because the latter has not been analysed by the Brazilian Justice Ministry, an therefore, have not been created and do not have their boundaries specified yet). According to National Indigenous Foundation (Fundação Nacional do Índio - FUNAI).	/agricultura/pt-br/assuntos/servico-florestal-brasileiro/cadastro-nacional-de-florestas-publicas/cadastro-nacional-de-florestas-publicas-atualizacao-2018> https://www.gov.br/agricultura/pt-br/assuntos/servico-florestal-brasileiro/cadastro-nacional-de-florestas-publicas/cadastro-nacional-de-florestas-publicas-atualizacao-2018 <http://www.funai.gov.br/index.php/indios-no-brasil/terras-indigenas>
13.	<u>Information regarding increase in bricks demand</u> 1. Paper regarding increase in job demand in civil construction mainly from 2020- SARAIVA, L. Sinduscon Pará atua de forma efetiva para o aquecimento da construção civil. 2022. 2. Paper article regarding the increase in civil construction demand from 2015 onwards - SINDUSCON PARÁ. Construção: setor no Pará volta apresentar resultados expressivos no saldo de empregos.	https://www.oliberal.com/estudio/sinduscon/sinduscon-para-atua-de-forma-efetiva-para-o-aquecimento-da-construcao-civil-1.562360 https://www.sindusconpa.org.br/post/construcao-setor-no-par%C3%A1-volta-apresentar-resultados-expressivos-no-saldo-de-empregos-segundo-o-ca

14.	ISO 14064-3:2019 - Greenhouse gases Specification with guidance for the verification and validation of greenhouse gas statements	=
15.	1. "Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities" 2. "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities"	- (Version 03.0) (https://cdm.unfccc.int/Reference/Guidclarif/index.html) (version 4.1) (http://cdm.unfccc.int/Reference/Standards/index.html)
16.	<u>Additionality analysis</u> 1. Highest Inflation rate in Brazil (IPCA) for the period has been used 2. Inflation calculator	http://agenciabrasil.ebc.com.br/noticia/2012-01-06/inflacao-oficial-registra-em-2011-maior-taxa-desde-2004 https://www.idinheiro.com.br/calculadoras/calculadora-correcao-de-valor-por-indice/
17.	IPCC publications	www.ipcc-nggip.iges.or.jp
18.	UNFCCC	http://cdm.unfccc.int
19.	VCS	http://www.v-c-s.org/

APPENDIX II: REFERENCES

SOCIALCARBON

[illegible]

	- PPRA (Program of Prevention of Environmental Risks) – SESI - PPE records	
5.	<u>Financial Resource:</u> - Records of purchase of sawdust, wood residue and acai pits. - Report of daily production of ceramic device - Receipts of payment of the VCUs	2018 to 2021 for all evidences
6.	<u>Voluntary environmental initiatives</u> - Certificate of green energy purchase issued by UNICA (Green Stamp) # 07/2020 valid for the year 2020 - Rain water collection evidences (receipts, pictures, etc.)	2020
7.	<u>Natural Resource:</u> - Pictures - Licenses: - Environmental License # 045/2020 – Production of ceramic pieces – Municipality of São Miguel do Guamá. Environmental Secretariat - SEMMA - Environmental License # 040/2020 – Clay extraction – Municipality of São Miguel do Guamá. Environmental Secretariat - SEMMA - Dispense of water grant # 2303/2018 issued by Environment and Sustainability Secretariat from State of Para – SEMAS/PA. - Conformity License # 27719 – factory operation – issued by IBAMA	Validity: 17/11/2022 Validity: 26/10/2022 Issue: 23/02/2018 Validity: 17/06/2021
8.	<u>Technological resource</u> - Bricks analysis report carry out for “6 holes” bricks	2018 to 2021
9.	<u>Carbon Resource:</u> - Sales invoices - Pictures - Evidences from green marketing	2018 to 2021 https://www.sustainablecarbon.com/pinweb/kamiranga/
10.	Brazilian Red Ceramic factories Indicators	version 1.1
11.	Guidance for Completing SOCIALCARBON Reports	version 4.0
12.	SOCIALCARBON Standard	version 5.0
11.	SOCIALCARBON	http://www.socialcarbon.org/

APPENDIX III: ABBREVIATIONS

Abbreviations	Full texts
BE	Baseline Emission
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CL	Clarification Request
DOE	Designated Operational Entity
DOF	Document of Forest Origin
ER	Emission Reduction
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Greenhouse gas(es)
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PCMSO	Program for Medical Control of Labour Health
PE	Project Emission
PP	Project Participant
PPE	Personal Protection Equipment
PPRA	Program for Prevention of Environmental Risks
QA/QC	Quality Assurance / Quality Control
SC	SOCIALCARBON
SCR	SOCIALCARBON Report
SEMACE	Secretariat of Environment of the State of Ceará
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCS-PD	VCS – Project Description
VCU	Verified Carbon Unit
XLS	Emission Reduction Calculation Spread Sheet

APPENDIX IV: FINDINGS

Table 1. CL from this verification

CL ID	01	Section no.	4.1	Date: 15/02/2022
Description of CL				
MR template is not the latest available and page numbers are not visible in the template.				
1.11: the section is not being completed in accordance with MR instructions (template version 4.1) regarding SDGs and table 1 in this section has not been included.				
Project participant response				Date: 14/03/2022
According to the VCS program update report ¹² , the VCS Monitoring Report Template v. 4.1 will become a mandatory requirement only from 20 July 2022 onwards. Therefore, the version 4.0 template is still valid.				
Documentation provided by project participant				
VCS MR Kamiranga_period_08_01 01 2018_31 03 2021_v04				
DOE assessment				Date: 24/05/2022
As per 2022 Q1 VCS PROGRAM UPDATE, the new templates are to be applied from 20/07/2022. Therefore, the applied version is still compliant with VCS rules and requirements.				
CL is closed				

CL ID	02	Section no.	4.1	Date: 13/10/2021
Description of CL				
MR Section A.1: The relevant implementation dates (e.g., dates of construction, commissioning, and continued operation periods) have not been included in the section unlike required by the instructions for completing the MR.				
Project participant response				Date: 01/12/2021
The required information was included in the monitoring report.				
Documentation provided by project participant				
VCS MR Kamiranga_period_08_01 01 2018_31 03 2021_v02				
DOE assessment				Date: 31/01/2022
The information has been included in the MR as required by instructions for completing the MR. Dates of construction and actual operation are duly included				
CL is closed				

CL ID	03	Section no.	4.3	Date: 13/10/2021
Description of CL				

¹² Available at: <https://verra.org/wp-content/uploads/2022/01/VCS-Summary-of-Effective-Dates-2022-Q1.pdf>.

The project proponents have provided a support spreadsheet where the production amount (PR_y - in amount of pieces) is described. Nevertheless, it is not clear how the unit conversion from pieces to tonnes has been carried out in the calculations spreadsheet.

Project participant response	Date: 01/12/2021
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The conversion from number of ceramic pieces to tonnes is carried out in the monitoring spreadsheets, on the “Dados – Produção” tab. When updating the weight of the pieces on the ‘Cadastro Cerâmica’ tab, the formula in column M (Weight) on the “Dados – Produção” tab pulls this information and multiplies it by the number of pieces produced per day. Finally, on the “Relatório Produção” tab, there is a summary with the production values in tons per month. This final value is transferred to the monitoring calculation sheet.

Documentation provided by project participant

Cer Kamiranga planilha de monitoramento YYYY_v.2 (from 2018 to 2021)
MR v 03.1

DOE assessment	Date: 31/01/2022
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It is now clear in the support spreadsheets the unit conversion from pieces to tons. The calculations are traceable and the conversion factor is based on the average weight of the pieces each year (based on monthly analysis).

CL is closed

CL ID	04	Section no.	4.3	Date: 15/02/2022
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Description of CL

Section 4.2:

- f_{NRB}: if the value is to be annually monitored, it is not clear which is the year of the value and why just one value is presented;
- Renewable biomass surplus: if the value is to be annually monitored, it is not clear why just the value of 2018 is presented;

Project participant response	Date: 14/03/2022
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- According to the Methodological tool for Calculation of the fraction of non-renewable biomass V.01 (TOOL30)¹³, “where available, the same vintage of data should be used for all parameters applied in this tool to calculate f_{NRB}”.
- According to the “General guidance on leakage in biomass project activities”¹⁴, the project participant shall evaluate ex ante if there is a biomass surplus in the region of the project activity, which is not utilized. If it is demonstrated (e.g., using published literature, official reports, surveys etc.) at the beginning of each crediting period that the quantity of available biomass in the region, is at least 25% larger than the quantity of biomass that is utilized including the project activity, then this source of leakage can be neglected; otherwise, this leakage shall be estimated and deducted from the emission reductions. During the monitoring period, Sustainable Carbon annually analysed if the quantity of available biomass in the region (which was determined ex ante), was at least 25% larger than the quantity of biomass that was utilized by the project activity during the monitoring period, as it was and as can be seen in Section 5.3 Leakage.

Documentation provided by project participant

¹³ Available at <<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v3.0.pdf>>, paragraph 10.

¹⁴ Available at: <http://cdm.unfccc.int/methodologies/SSCmethodologies/AppB_SSC_AttachmentC.pdf>, paragraph 18.

VCS MR Kamiranga_period_08_01 01 2018_31 03 2021_v04	
DOE assessment	Date: 25/05/2022
1. The information provided do not refer to the applied version of this TOOL30 (v1). Moreover, this paragraph mentions that for determination of yearly f_{NRB}, same vintage are to be used, unless not all parameters used for its determination is available. Moreover, the methodology refers to determination either yearly or fixed ex-ante, at a choice of PP. <u>Therefore, issue remains opened</u> 2. It is clear now to the verification team that, in accordance with “General Guidance on leakage in biomass project activities”, the leakage analysis is carried out based on ex-ante data. For that reason, the 2018 year has been used. The amount of biomass produced during this year (fixed ex-ante) is then compared to the amount consumed during this monitoring period. As a conclusion, the analysis is being carried out in accordance with the general guidance mentioned above.	
<u>Due to the 1st issue, the CL remains open</u>	
Project participant response	Date: 08/06/2022
In order to conform to the methodology, the calculation of the f_{NRB} was rectified to monitor this parameter annually.	
Documentation provided by project participant	
VCS MR Calculation Kamiranga_period_08_01 01 2018_31 03 2021_v5	
VCS MR Kamiranga_period_08_01 01 2018_31 03 2021_v05	
DOE assessment	Date: 30/01/2023
The project participants provided a spreadsheet with the complete calculation of the parameter f_{NRB} which has been determined in accordance with requirements of TOOL30 v.01, which is the correct version applied in the valid VCS-PD. The data from 2018 to 2020 have been used for the calculations as it was the latest data available, consistently for all inputs used in the determination of the parameter. The application of this vintage was considered correct and consistent by the verification team. All evidences were provided and could be dully accessed^{/12/}.	
<u>CL is closed</u>	

CL ID	05	Section no.	4.3	Date:	15/02/2022
Description of CL					
Section 5.3 the following issues have been raised: 1. For leakage assessment, taking into account that only 2018 monitoring has been included for açai pits and for Brazilian nut husk, it is not clear how the annual monitoring as required by monitoring plan, has been fulfilled. 2. the leakage assessment related to Native wood from forest management is not clear in the MR considering that no data and/or evidences have been provided					
Project participant response					Date: 14/03/2022

1. According to the "General guidance on leakage in biomass project activities"¹⁵, the project participant shall evaluate ex ante if there is a biomass surplus in the region of the project activity, which is not utilized. If it is demonstrated (e.g., using published literature, official reports, surveys etc.) at the beginning of each crediting period that the quantity of available biomass in the region, is at least 25% larger than the quantity of biomass that is utilized including the project activity, then this source of leakage can be neglected; otherwise, this leakage shall be estimated and deducted from the emission reductions. During the monitoring period, Sustainable Carbon annually analyzed if the quantity of available biomass in the region (which was determined ex ante), was at least 25% larger than the quantity of biomass that was utilized by the project activity during the monitoring period, as it was and as can be seen in Section 5.3 Leakage.
2. The phrase was rectified in order to provide the information required.

Documentation provided by project participant

VCS MR Kamiranga_period_08_01 01 2018_31 03 2021_v04

DOE assessment

Date: 24/05/2022

1. Açaí Pits were only consumed on February and March 2019 as per evidences provided. For that reason, the leakage assessment only took into account data from 2018 as it was the latest full set of data prior biomass consumption. It is clear now in the MR that the Açaí consumption by the project activity is much smaller than the total available quantity of Açaí produced in the state of Para. Therefore, it has been demonstrated that the Açaí consumption does not surpass the 25% of biomass available during the monitoring period.
2. The information has been duly excluded as it was not part of this monitoring period.

CL is closed

CL ID	06	Section no.	3.1	Date:	15/02/2022
Description of CL					
Section 5.3					
1. the information related to QA/QC procedures (from table 4 onwards) is not placed in the correct location (section 4.3) unlike required by Instructions for completing MR.: 2. in the justification that "This difference probably indicates that parameters on the VCS PD do not provide accurate criteria for comparison of the current operating conditions" is not clear as the section is exactly to perform a correct comparison, which is not being done. 3. The statement that "it was built a shed to store sawdust which interfere on energy levels calculations" it is not clear when the shed has been built and whether this difference will be considered in all monitoring periods;					
Project participant response					Date:
					14/03/2022

¹⁵ Available at: <http://cdm.unfccc.int/methodologies/SSCmethodologies/AppB_SSC_AttachmentC.pdf>, paragraph 18.

1. The information is allocated according to the instructions for filling in the VCS Monitoring Report Template v. 4.0; 2. The statement was deleted from the monitoring report in order to give a better explanation of the data assessed in this monitoring period; 3. The shed was built in 2010, and expanded in this monitoring period, allowing that Kamiranga Ceramics storage a higher volume of biomass since then. The effects of this interfere in the projections until today, as shown in the report, where there was a greater acquisition of biomass than expected in the PDD.	
Documentation provided by project participant	
VCS MR Kamiranga_period_08_01 01 2018_31 03 2021_v04	
DOE assessment	Date: 24/05/2022
1. It has been clarified that the information is in accordance with valid version of the MR template (version 4.0). 2. The unclear information has been deleted. The information regarding the difference in biomass consumption per biomass type has been justified. The information that the project participants expanded the storage shed during the monitoring period, allowing an increase in the storage capacity. Nevertheless, it also can be observed that the energy consumed per ton of pieces (0.00408 during the period <i>versus</i> 0.00399 in the registered PDD) is practically the same (+2.1%), which confirm that in general, there was not an increase in biomass consumption per tonnes of pieces during this monitoring period.	
<u>CL is closed</u>	

Table 2. CAR from this verification

CAR ID	x	Section no.		Date:
Description of CAR				
N/A				
Project participant response				Date:
1.				
Documentation provided by project participant				
DOE assessment				Date:

Table 3. FAR from this verification

Not applicable.

Table 4. FAR from previous verification

Not applicable.

APPENDIX V: FINDINGS – SC

Table 1. CL from this verification

CL ID	xx	Section no.	xx	Date:	-
Description of CL					
Project participant response					Date-
DOE assessment					Date: -

Table 2. CAR from this verification

CAR ID	01	Section no.	4.6	Date:	13/10/2021
Description of CAR					
The following issues were found in Social Carbon Report 1) Diversity: a) the amount of illiterate and senior employees is not in accordance with evidences provided b) in the evidence provided (Controle_Funcionários_Kamiranga (2018-2021)), the number of employees is not taken from the whole table presented in tab “RAIS” from line 28 onwards. 2) Natural resource: a) Indicator 12: it is said that “the ceramic reduces the generation of waste by allocating ashes and shards of ceramic pieces for the maintenance of highway roads”. Nevertheless at section 2.1 of the VCS MR it is said that ashes are used as fertilizer; b) Indicator 12: it is classified with index 5, but at the Excel it is classified as index 4; 3) Technological resource a) Indicator 17: the index highlighted in the table is 2, but at the line below, Index 1 is mentioned; 4) Carbon Resource a) Green marketing: no evidences have been provided 2) SCR Monitoring report Section 4 – Resource Technology: the value of Point 7 is not in accordance with Excel calculation. Also the analysis is not coherent;					
Project participant response					Date: 14/03/2022
1) Diversity: The information in the spreadsheet were corrected, and the information is rectified in the SocialCarbon report version 2. 2) – a) The information was rectified in the monitoring report; b) The score was correct in the Excel file, as well as figure 2 and tables 3 and 4 were updated in the SocialCarbon report; 3) The index score was rectified; 4) Green Marketing: the evidences are being made available to the auditing team. 5) Table 3 was updated					

Documentation provided by project participant	
Spreadsheet employees control (Controle_Funcionários_Kamiranga (2018-2021).xls) SocialCarbon Report v.02	
DOE assessment	Date: 25/05/2022
1. The amount of illiterate and senior employees is now in accordance with evidences provided and the spreadsheet provided is now corrected. 2. . a. Information has been duly corrected in the MR and it is in accordance with evidences obtained during the interviews performed. b. The information is now coherent in all documents and in accordance with evidences provided. 3. .The information is now coherent in all documents and in accordance with evidences provided 4. Evidences from green marketing have been provided to the verification team/09 – Appendix III/ 5. Information is now corrected in the MR and it is coherent with evidences provided.	
<u>CAR is closed</u>	

Table 3. FAR from this verification

Not applicable.

APPENDIX VI: TEAM COMPETENCE

Competence Statement			
Name	Marcelo Sebben		
Country	Brazil		
Education	M.Sc. (Sustainable Energy System) B. Eng. (Chemical Engineering)		
Experience	+12.5 Years		
Field	Chemical process industry, CDM, Energy, Climate Change		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	Yes (ACM0001, ACM0002, ACM0006, AM0065, AMS ID, AMS-I.E, AMS-I.C, AM0026, AMS-I.A, AMS-I.F, GS: Ecologically Sound Fuel Switch to Biomass with Reduced Energy Requirement, GS: Technologies and Practices to Displace Decentralized Thermal Energy Consumption)		
Local expert	Brazil, Chile, Honduras, Colombia		
Financial Expert	Yes		
Technical Reviewer	No		
TA Expert	Yes (TA 1.1, 1.2, 4.1, 5.1, 9.1, 13.1)		
Reviewed by	Shreya Garg	Date	02/09/2019
Approved by	Anshika Gupta	Date	02/09/2019

Competence Statement			
Name	Sergio Bonanno Cruz		
Country	Brazil		
Education	Post Graduate Diploma in Environment		
Experience	25 Years		
Field	Environmental Law, CDM, Energy, Climate Change		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	Yes (ACM0001, ACM0002, AM0026, ACM0006, AMS ID)		
Local expert	Brazil, Chile, Colombia		
Financial Expert	Yes		
Technical Reviewer	No		
TA Expert	Yes (TA 1.2, 13.1)		
Reviewed by	Shreya Garg	Date	29/08/2019
Approved by	Anshika Gupta	Date	29/08/2019