

Puro.earth
Design Validation and Performance
Report for Inkan Negro SAC
In
Lima, Peru

Methodology:	Puro Biochar Methodology (v3.0; 2022)
Facility ID:	316372
Output Audit Reporting Period:	01/10/2022 to 31/03/2024 (Inclusive of both dates)

For

Puro.earth

BY



Date of Issue:	Reference Number:
27-01-2024	Global I&E-CCP 23
Project Title:	
Design Validation & Performance Verification	
Validation and Verification Authority:	SGS India Private Limited
Contracting Party:	Puro.earth
Contact Person:	Roosa Räisänen (Standard Representative)
Project Participants:	Inkan Negro S.A.C
Contact Person:	Brenton Ladd (CO ₂ Removal Supplier)
Summary:	
<p>SGS a globally recognized entity, has been appointed by the Puro.earth to conduct both the design validation & performance verification for the "Lurin Facility" managed by Inkan Negro S.A.C. SGS shall provide third-party assurance for design validation and performance verification to ensure impartiality and adherence to standards.</p> <p>The verification process, conforming to the Puro Standard General Rules v3.1 /19/, entailed a thorough evaluation project documentation, baseline and additionality assessments, CO₂ removal estimations, and the monitoring strategy. This review benchmarked the information against the requirements laid out by the Puro Standard.</p> <p>The report is based on the assessment of the project document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews, site visit, and stakeholder interviews, review of the applied methodology and its underlying formulae and calculations.</p> <p>On 11/09/2024, a contract was signed between SGS and Puro.earth, outlining the audits' scope, objectives, and criteria. Audit processes were rigorously followed, beginning with conflict-of-interest assessments, team selection, and detailed audit planning. This progressed to exhaustive document reviews, data verifications, and subsequent assessment of additional information, culminating in the issuance of the final audit report.</p> <p>The audit assessed compliance with the Puro Biochar methodology v3.0; edition 2022 /19/, focusing on understanding the project operations, ensuring conservative use of a Life Cycle Assessment (LCA) model for GHG reductions, and verifying data accuracy used in model calculations. Inkan Negro S.A.C, the project's supplier, demonstrated that the project's implementation leads to substantial CO₂ removals, qualifying these as additional to any that would occur naturally.</p> <p>The total CO₂ Removal Certificates (CORCs) calculated for the period amounted to 138 tons of CO₂eq, with a CORC factor of 1.730 tCO₂e per dry tonne of biochar, evidencing the tangible long-term climate mitigation benefits of the project.</p> <p>In conclusion, SGS affirms that the "Lurin Facility" adheres to all relevant criteria set forth in the Puro Standard and recommends the project's registration with Puro.earth, reflecting a positive verification outcome.</p>	
Key objectives include:	
<ol style="list-style-type: none"> 1. Validating the design and eligibility of the CO₂ removal activity. /01-//18/ 2. Verifying the net carbon removal claims based on lifecycle assessment (LCA). /12/ 3. Assessing compliance with sustainability criteria/13/, additionality/05/, and stakeholder engagement. /02/-/03/ 4. Reviewing the monitoring practices. 	
Summary of Key Findings and Conclusions:	
1. Compliance with Standards and Methodology:	
<p>The facility complies with the eligibility criteria set out in the Puro Standard Biochar Methodology v3.0, including the use of sustainable biomass and the application of engineered pyrolysis processes to ensure negligible methane emissions. The monitoring and reporting systems are consistent with the requirements of the Puro Standard General Rules v3.1./19/ and Puro Standard Biochar Methodology v3.0/19/</p>	

2. Net Carbon Removal Performance:

The verified net carbon removal volume for the reporting period is 138 CORCs, calculated using the LCA approach and accounting for emissions across the supply chain. Biochar produced meets the carbon stability criteria with a molar H/C_{org} ratio is 0.414 which is below 0.7, /01/ ensuring long-term durability.

3. Environmental and Social Safeguards:

The project has conducted a thorough evaluation of its potential environmental impacts, focusing on emissions to air, water, and soil, and the generation of solid and liquid wastes. This evaluation includes detailed monitoring of emissions and continuous improvements to operational processes to minimize negative impacts. Effective stakeholder consultations have been carried out, with no unresolved grievances reported, ensuring community support and involvement in the project's ongoing development.

4. Baseline and Additionality:

The baseline scenario and additionality assessment confirm that the project achieves CO₂ removals that would not occur in the absence of carbon finance.

5. Data Quality and Monitoring Practices:

Data from monitoring systems were found to be accurate, with robust processes in place to minimize uncertainty and ensure reliability. The verification team confirms no uncertainties were found in the data quality. This thorough review ensured that all data related to the project were accurate, reliable, and compliant with established verification criteria.

6. Resolution of Findings:

All findings raised during audits were resolved satisfactorily, those could not resolve in this performance verification has been raised as FAR, ensuring continuous improvement in compliance and performance. Total 08 NIRs, 04 CARs and 04 FARs have been raised.

The CO₂ removal activity has been validated and verified as compliant with the Puro Standard General Rules v3.1 and the Puro Standard Biochar Methodology v3.0/19/. The facility is eligible for the issuance of CO₂ Removal Certificates (CORCs) for the reporting period starting from 01/10/2022 – 31/03/2024. /01/

Recommendations for further improvements include enhancing monitoring precision and expanding stakeholder engagement to maximize transparency and community benefits.

This report provides assurance of the integrity and performance of the CO₂ removal activity and supports its contribution to addressing climate change through long-term carbon sequestration.

Verification authority:

Siddhant Bankar (Lead Assessor)
Catalina Quiroz (Local Assessor)

Technical Reviewer:

Date: 03-01-2025
Name: Shikha Sharma

Authorised Signatory:

Name: Shikha Sharma (Climate Change Program - Technical Manager)
Date: 27-01-2025 *shikha sharma*

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1. Introduction

1.1 Objective

The purpose of this report is to validate the design and verify the performance of the CO₂ removal activity undertaken by the production facility operated by Inkan Negro SAC. This includes ensuring compliance with the requirements of the Puro Standard General Rules v3.1/19/ and the Puro Standard Biochar Methodology v3.0/19/ for the issuance of CO₂ Removal Certificates (CORCs). The validation focuses on assessing the eligibility, baseline determination, and design of the activity, while the verification evaluates the operational performance, net carbon removals, and adherence to monitoring practices.

The scope of this report encompasses:

1. The validation of the CO₂ removal activity's design, including baseline and additionality assessments.
2. Verification of the facility's performance over the specified reporting period starting from 01/10/2022 – 31/03/2024, ensuring conformity to Puro Standard requirements.
3. An evaluation of environmental and social safeguards, data accuracy, and the resolution of previous findings.
4. Assessment of the lifecycle emissions, biochar stability, and volume of net carbon removal achieved.

Description of the CO₂ Removal Activity

The CO₂ removal activity involves the production of biochar through pyrolysis of sustainable biomass. The process converts organic biomass into a stable carbon-rich product that resists degradation, allowing for long-term carbon sequestration. The facility uses engineered pyrolysis technology to minimize emissions, including methane, and adheres to strict environmental and safety standards.

Key aspects of the activity include:

- Use of biomass from sustainable sources, such as agricultural residues, urban wood waste, or invasive species.
- Production of biochar with a molar hydrogen-to-organic carbon (H/C_{org}) ratio below 0.7, ensuring durability and resistance to degradation.
- Application of lifecycle assessment (LCA) to measure net CO₂ removals, incorporating emissions from biomass production, transportation, conversion, and distribution.

Applicable Standards and Methodologies

The CO₂ removal activity is governed by the following standards and methodologies:

1. Puro Standard General Rules v3.1/12/

- Defines the roles, responsibilities, and compliance requirements for CO₂ removal activities.
- Establishes the framework for registering production facilities and issuing CORCs.

2. Puro Standard Biochar Methodology v3.0/12/

- Provides procedures to quantify net CO₂ removals achieved over a 100-year horizon.
- Specifies the activity boundaries, calculation formulas, and requirements for monitoring, reporting, and environmental safeguards.
- Sets quality criteria for biochar, including stability and sustainability of biomass feedstock.

This report ensures alignment with these standards and methodologies, guaranteeing the integrity and accuracy of the CO₂ removal activity and its contribution to climate change mitigation.

1.2 Scope

The scope of the facility audit encompasses a systematic, independent, and documented assessment of the production facility against the Puro Standard General Rules v3.1 and the selected Puro Standard Biochar Methodology v3.0. It includes the verification of the implementation and operation of the Carbon Dioxide Removal (CDR) activity as outlined in the project document monitoring data, and other relevant documentation.

The purpose of this verification, conducted through an independent evaluation of objective evidence, is to:

- **Verify Implementation:** Confirm that the project facility is implemented and operated in alignment with the descriptions provided in the project documents /01-/-18/.
- **Assess Compliance:** Evaluate the facility's compliance with the relevant methodology and regulatory requirements, ensuring conformity with environmental and social safeguards.
- **Validate Monitoring Systems:** Ensure that the monitoring system is fully functional, accurately capturing emission removals, and preventing any double counting of credits.
- **Evaluate Data Accuracy:** Assess the accuracy of the reported greenhouse gas (GHG) emission removals (emission inventory) and express a conclusion with reasonable assurance that the data is free from material misstatement.
- **Confirm Data Support:** Verify that the reported GHG emission removal data is adequately supported by objective evidence.
- **Certify Removals:** Ensure that the reported emission removals are complete and accurate, meeting the criteria for certification and issuance of CO₂ Removal Certificates (CORCs) under the Puro Standard.

Verification Method and Criteria

The verification process involves the following key phases:

1. **Completeness Check and Desk Review:** A thorough review of the Project Documents, monitoring data, and supporting documentation to confirm alignment with methodology requirements.
2. **On-site Audit and Stakeholder Interviews:** Discussions with relevant stakeholders to gather additional evidence and clarify outstanding issues.
3. **Resolution and Reporting:** Address any unresolved issues, finalize findings, and prepare the verification report.

The verification has been conducted with due professional care and adherence to ethical principles. Audit team has maintained independence and impartiality throughout the process, ensuring the verification activity is a fair and accurate representation of findings.

The verification process does not provide consulting services to the Client. However, identified corrective actions or requested clarifications may offer valuable insights for improving the project design and implementation.

2. Methodology

2.1 General Approach

SGS conducted the verification with a comprehensive understanding of all activities associated with the sources contributing to project emissions and removals, including leakage where relevant. The protocols used to estimate or measure GHG emissions and removals from these sources were thoroughly reviewed, as well as the monitoring, handling, and reporting of data, ensuring conformity with the Puro Standard Biochar Methodology v3.0 and Puro Standard General Rules v3.1. The means of verifying reported data were aligned with the requirements of the methodology.

The verification covered the implementation and operation of the Carbon Dioxide Removal (CDR) activity as described in the Project Design Document (PDD) for the audit period 01/10/2022 – 31/03/2024. The assessment included a on-site facility inspection and a desk review of the project documents and supporting evidence provided by the CO₂ Removal Supplier. This report summarizes the findings of the verification and confirms the activity's compliance with the methodology and standards specified by the Puro Standard.

2.2 Means of Verification

2.2.1 Review of Documentation

The project documents, operation and monitoring records submitted by the client, and additional background documents related to the CDR activity were reviewed. A complete list of all documents reviewed is attached in a section 9 of this report.

The method and criteria used for verification.

Desk review, involving:

- (i) Review of the data and information presented to verify their completeness.
- (ii) Review of the Project design, implementation and compliance with the monitoring methodology, paying particular attention to the frequency of measurements, monitoring equipment including calibration requirements, and the quality assurance and quality control procedures.
- (iii) 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 removals.

2.2.2 Site Visits

As part of the verification process, SGS conducted an on-site facility inspection to confirm the implementation and operational status of the Carbon Dioxide Removal (CDR) activity. A reasonable level of assurance was achieved by validating the project design and verifying the facility operation data, as outlined below:

- **Assessment of Implementation and Operation:**
The project facility, consisting of one kiln, was assessed to ensure its implementation and operation complied with the requirements of the Puro Standard Biochar Methodology v3.0. This included on-site interviews with representatives of the CO₂ Removal Supplier and the monitoring team.
- **Confirmation of Baseline Scenario:**
The default baseline scenario was verified to ensure its alignment with methodology requirements.
- **Applicability of Methodology:**
The suitability of the methodology, monitoring instruments, operational arrangements, and controlling mechanisms implemented at the facility were confirmed.
- **Compliance with Data Collection Procedures:**
Data collection processes were reviewed to confirm compliance with the methodology, focusing on accuracy and reliability.
- **Assessment of System Boundary:**
The system boundary for the emissions inventory was assessed to verify it captured all relevant emissions and removals in accordance with lifecycle assessment principles.
- **Evaluation of Monitoring Provisions:**
Monitoring arrangements, including data capture systems, calibration records, and operational logs, were evaluated to confirm compliance with the methodology.
- **Review of Data Aggregation and Reporting:**
Procedures for aggregating and reporting monitoring parameters were reviewed for consistency with the requirements of the Project Documents.
- **Comparison with Monitoring Practices:**
Monitoring practices were cross-checked against the requirements of the project documents and the methodology to ensure alignment and identify any discrepancies.
- **Review of GHG Calculations and Assumptions:**
Calculations and assumptions for determining the GHG inventory data and emission removals were reviewed for accuracy and consistency.
- **Assessment of QA/QC Procedures:**
Quality assurance and quality control (QA/QC) procedures were evaluated to ensure the system effectively identifies, corrects, and prevents errors or omissions in monitoring parameters.
- **Environmental and Social Safeguards:**
Evaluation of the project's adherence to environmental and social standards.
- **Local Stakeholder Consultation:**
Review of the processes and outcomes of stakeholder consultations to ensure transparency and engagement.
- **Additionality:**
Confirmation that the project activities provide additional environmental benefits that would not occur in the absence of the project.

This inspection confirmed the CDR activity's adherence to the methodology requirements and validated the data reported for the verification period.

On-site Audit Date: 28/12/2024 (<i>follow up meeting</i>)		
Topics covered:	Source of Information / Kiln Operators Interviewed	Audit Team
General Project Information <ul style="list-style-type: none"> • Project design (Biochar production system) • Project boundary • Feedstock sourcing, transport, storage and utilization • Data management and operational system • Monitoring and Reporting Systems 	<ul style="list-style-type: none"> • Brenton Ladd 	<ul style="list-style-type: none"> • Catalina Quiroz
Additionality		
Environmental and social safeguards		
Local Stakeholder Consultation		
Quality Assurance and Quality Control (QA/QC)		
Data collection (calibration certificates), Data management (plant records) and data corroboration (archiving systems), Historical Data		
Quantification of facility emissions		

The site inspection of the biochar production facility, which utilizes municipal green waste as feedstock, confirms compliance with the Municipal "Lurín Limpio" program. This program, established in accordance with Legislative Decree No. 1278, mandates the promotion of solid waste segregation and the progressive implementation of waste management programs. The Municipality of Lurín has officially authorized the organization INKAN NEGRO S.A.C., as noted in the documents dated December 6, 2018, to valorize organic solid waste from municipal maintenance, markets, and green areas. This collaboration aims to enhance the reuse and valorization of organic residues, contributing to sustainable municipal waste management and supporting local economic and social inclusion objectives.

Furthermore, the Municipal Decree No. 228/ML, regulating the selective collection and recycling program for solid waste in the district of Lurín, supports this initiative. The decree ensures that such programs integrate the recycling activities into a productive chain, aiming to optimize waste handling, and promote the economic and social benefits derived from recycling activities. This approach not only demonstrates compliance with municipal regulations but also aligns with broader sustainability goals by transforming green waste into valuable agricultural products such as biochar.

The evidence provided through the authorization letters and municipal decrees substantiates the facility's operational legitimacy and commitment to environmental stewardship and community engagement. The life cycle assessment (LCA) parameters and emission boundaries were consistent with on-site observations. The LCA report updated in June 2024 adequately reflects the operational realities, although details about the reactor's wall materials need better documentation.

For pyrolysis, no fossil fuels are used for heating. Biomass is placed directly into the combustion oven, with simple lighter use and large palm leaves aiding the ignition process. During the visit, a test showed that the process involved continuously adding biomass until reaching a known operational capacity, even though the unit was not in active production during the test. In terms of gas handling, pyrolysis gases observed during the operation exit through the upper chimney without being recovered. Initial coloration of the gases indicates moisture content, with the gases becoming colorless as observed visually, highlighting a need for

more robust documentation and possibly a method for gas analysis rather than relying solely on visual inspection. The handling and transport of produced biochar are managed with care. The biochar is dried on a large open platform and manually bagged in polypropylene bags weighing approximately 20 kg each. Although the weighing scale used is not currently calibrated, documentation was presented indicating efforts to calibrate it. The packed biochar is then stored under canvas to protect against dust until sold. Biochar's application extends beyond energy use; it is sold as organic fertilizer to clients experimenting with its use or to small cultivation companies.

This niche market position is supported by sales documentation provided during the visit. Overall, the facility demonstrates a commitment to environmental and social safeguards, with workers using necessary personal protective equipment and safety measures in place despite some organizational gaps in formal safety training and environmental impact assessments. Efforts to formalize documentation and enhance monitoring practices were noted, reflecting a proactive approach to addressing operational and compliance needs. These observations were documented through various forms of evidence, including photographs of operations, biomass receipts, and sales records, providing a transparent view of the facility's practices and adherence to sustainability criteria.

2.3 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings.

In general, where insufficient or inaccurate information is available and clarification or new information is required, the team shall raise a Clarification Request (CL) specifying what additional information is required.

Where a non-conformance arises, the team shall raise a Corrective Action Request (CAR).

A CAR is issued, where:

- I. Non-compliance with the methodology is found in monitoring and reporting and has not been sufficiently documented by the CO₂ removal supplier, or if the evidence provided to prove conformity is insufficient.
- II. Modifications to the implementation, operation and monitoring of the CDR activity has not been sufficiently documented by the CO₂ removal supplier.
- III. Mistakes have been made in applying assumptions, data or calculations of emission removals that will impact the quantity of emission removals.

The verification process may be halted until this information has been made available to comply with the requirements of the methodology. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

A clarification request (CL) will be raised if the information is insufficient or not clear enough to determine whether the applicable methodology/C-Capsule requirements have been met. All CARs and CLs raised during verification shall be resolved before submitting the final verification opinion.

Corrective Action Requests and Clarification Requests are raised in the findings log. The CO₂ removal supplier is allowed to "close" outstanding CARs and respond to CLs.

Forward Action Requests (FARs) may be raised during verification for actions where the monitoring and reporting require attention and/or adjustment for the next audit period, which are for the benefit of future projects and future verification activities. These have no impact on the completion of the verification activity.

All CARs, CLs, and FARs for this verification period are included in this report.

2.4 Conflict of Interest Review

Prior to initiating the Production Facility Audit and Output Audit for the Inkan Negro Biochar Project, SGS conducted a thorough evaluation to identify any potential conflicts of interest related to the project. If no conflicts of interest were identified, the process proceeded to include both the Production Facility Audit and the Output Audit.

This evaluation ensures that SGS maintains independence and impartiality throughout the verification process. Once confirmed, the Letter of Engagement with Puro.earth was finalized, and the contract for the

Production Facility Audit and Output Audit was duly signed between SGS and Puro.earth. This rigorous conflict of interest review safeguards the integrity and credibility of the audit process, ensuring compliance with the Puro Standard validation and verification requirements v1.1 /19/.

2.5 Audit team

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader / Verifier /	IR	Bankar	Siddhant	SGS	X		X	X
2.	Local Assessor	ER	Quiroz	Catalina	SGS		X	X	

2.6 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Lead Verifier, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the audit team.

Technical Review Team

Name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Role
Shikha Sharma	SGS	Technical Reviewer/Approver

3. Project Design and Implementation

3.1 Description of CO₂ Removal Activity

Subject	Description	Assessment
Proponent Details	Inkan Negro S.A.C	Based on the review of the audit package documents and the observations made during On-Site Visit, all possible omissions or non-conformities were identified and raised as findings which were satisfactorily closed those could not resolve in this performance verification has been raised as FAR in below section 7 of this report.
Name of the Facility:	Lurin	
Member code	86XF28LZ1A	
Legal Representation	Tax File Number 20603717971 .	
GSRN number	PE14168388	
Physical location of all the Kilns included within the Facility:	lote 1 parcela d8 Buena Vista, Lurin, Lima, Peru.	
Removal Method	Pyrolysis – Thermal decomposition of biomass in a low-oxygen environment (350°C–800°C).	
Feedstock	Municipal green waste and agricultural residues sourced sustainably from local agreements.	
Process Output	Biochar mixed into a mineral matrix at the production site to ensure long-term carbon storage	
Net CO₂ Removal Achieved	138 CORCs for the reporting period	
CORC Factor	1.73 CORCs per dry tonne of biochar.	
Additionality	The project demonstrated additionality through regulatory and financial analysis, confirming reliance on carbon finance for viability.	
GHG Monitoring (Parameters / Frequency)	-Biomass processed -Biochar produced - Temperature and emissions during pyrolysis - Energy consumption by reactor and equipment - Moisture and carbon content of biochar	
Project Start Date	01/10/2022	
Methodology	Puro Standard Biochar Methodology v3.0	
Audit Period:	01/10/2022 - 31/03/2024 (both days included)	

Environmental Impact	Diverts biomass from decomposition pathways, reduces methane emissions, and sequesters carbon in soils.	
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4. Project Description

Inkan Negro S.A.C. aims to transform municipal green waste and agricultural residues into biochar through a sustainable pyrolysis process. The project is located in Parcel “D” Buena Vista Lot 1, Lurín, Lima, Peru, and operates under agreements with the District Municipality of Lurín as part of the Lurín Limpio Program. The project leverages two kilns for biochar production, contributing to waste valorization and long-term carbon sequestration.

The pyrolysis process involves thermally decomposing biomass at temperatures between 350°C and 800°C in a low-oxygen environment. Approximately 79.73 tonnes of dry biochar were produced during the reporting period, which is mixed into a mineral matrix at the production site to ensure durability and prevent re-emission of stored carbon. The project sequesters 1.730 tCO_{2e} per tonne of biochar (CORC factor), resulting in a net removal of 138 tCO_{2e} (CORCs) during the period 01/10/2022 to 31/03/2024, as verified through a comprehensive Life Cycle Assessment (LCA)/12/.

The primary advantage of biochar lies in its ability to durably store carbon extracted by plants during their growth, contrasting with alternative waste management methods that lead to greenhouse gas emissions. In addition to its climate benefits, biochar contributes to soil enhancement and agricultural sustainability, improving plant growth while reducing the leaching of nutrients and immobilizing harmful contaminants.

The project description aligns with the requirements of the Puro Standard Biochar Methodology v3.0/19/, adhering to all eligibility criteria, tools, and guidelines. Transparent monitoring practices and conservative estimations support the integrity of reported results.

Starting Date of Project	Output Audit Reporting Period
01/10/2022	01/10/2022 to 31/03/2024

The project demonstrates full compliance with the applied methodology and remains a model for sustainable carbon removal activities.

5. Applicability Of Selected Methodology to Project Activity

The approved baseline and monitoring methodology, Puro.earth Biochar Methodology v3.0, has been correctly referenced and applied to the Inkan Negro Biochar Project. The Production Facility Audit and Output Audit Team verified the applicability of the methodology by comparing the project documentation, and Life Cycle Assessment (LCA) results, with the latest version of the methodology.

During stakeholder consultations conducted as part of the project design and validation process, the methodology Puro.earth Biochar Methodology v3.0/19/ was confirmed to be the most up-to-date version and was deemed appropriate for the project.

The audit team assessed the applicability of the methodology based on the following:

- The project involves the pyrolysis of municipal green waste and agricultural residues, meeting the requirement for eligible activities under the methodology.
- Monitoring and data collection systems align with the requirements of Puro.earth Biochar Methodology v3.0/19/, ensuring that emissions and removals are quantified accurately and transparently.
- The sustainability of the biomass feedstock was verified through agreements under the Lurín Limpio Program/13/, ensuring compliance with methodology guidelines.

- The project's lifecycle assessment demonstrates net negativity, with a net removal factor of -1.730 tCO₂e per tonne of biochar, validated using conservative estimates.

This comprehensive review confirms that the methodology Puro.earth Biochar Methodology v3.0 is fully applicable to the Inkan Negro Biochar Project, ensuring compliance with all eligibility and monitoring criteria. Let me know if you would like to refine this further or add specific details from the project!

Applicability Condition of the Biochar Methodology v3.0	Criteria Fulfilled	Assessment by the Verification Body
Eligible Activity: Activity capable of producing biochar with long-term stability and negligible methane emissions during pyrolysis.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The project involves thermal pyrolysis of municipal green waste and agricultural residues under controlled conditions, ensuring biochar with long-term stability. Methane emissions are minimized as confirmed through the Life Cycle Assessment (LCA)/12/.
Application of Biochar: Biochar must retain its carbon storage property and must not be used in applications that destroy its carbon content.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The biochar is mixed into a mineral matrix at the production facility, ensuring that carbon storage is preserved and cannot be reversed.
Sustainable Biomass: Biomass must be sustainably sourced (e.g., agricultural waste, urban green waste).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Biomass feedstock includes municipal green waste and agricultural residues secured under agreements with the District Municipality of Lurín. /04//13/
Net Negativity: Demonstrate net negativity of carbon removals through a Life Cycle Assessment (LCA).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The LCA confirmed a net removal of -1.730 tCO ₂ e per tonne of biochar/12/ over the reporting period. All emissions and removals were transparently reported.
Use of Fossil Fuels: Limited use of fossil fuels for ignition or equipment, but no co-firing of biomass with fossil fuels is allowed.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	A small amount of diesel is used for initial ignition, which contributes minimally to emissions and is accounted for in the LCA. Co-firing is not practiced.
Biochar Stability (H/C_{org} Ratio): Biochar must have a molar H/C _{org} ratio of less than 0.7.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Laboratory tests confirmed an average H/C _{org} ratio of 0.414, meeting the stability requirements of the methodology. /01//11/
Compliance with Contaminant Standards: Biochar must meet local or international contaminant standards, such as heavy metals or PAH limits.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	In line with section 5.3.5 of methodology The Inkan Negro green waste biochar was tested according to international standards: <ul style="list-style-type: none"> Heavy Metals: Testing followed the Aqua Regia digestion method as per Rayment & Lyons (2011) and AS4454:2012 for soil and biochar analysis. PAHs and VOCs: Analyzed using GC-MS methods, adhering to USEPA 5030B, 8020A, 8260, and 8270D standards for volatile and semi-volatile organic compounds. Accreditation: The laboratory is NATA accredited and complies with ISO/IEC 17025 standards. These tests ensure the biochar meets quality requirements for heavy metals and VOCs for its intended applications. /11/
Safety Measures: Ensure safe handling of biochar, proper training for operators, and use of emission controls for production equipment.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	FAR 03 is being raised for SOPs.
Environmental and Social Safeguards: Ensure no significant	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Compliance with the Lurín Limpio Program and stakeholder engagement reports demonstrate

harm to the surrounding environment or local communities.		environmental and social safeguards./02/-/03/
Additionality: Project must demonstrate that CO2 removals would not occur without carbon finance.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Financial analysis confirmed the reliance on carbon finance for project viability. The project is non-mandatory and operates in the voluntary market./05/

5.1 Life cycle assessment LCA/12/

A comprehensive cradle-to-gate assessment, aligning with ISO 14040/14044 standards and the Puro.earth Biochar Methodology, was conducted for the biochar produced by the Inkan Negro project. This LCA encompasses the entire lifecycle, from biomass sourcing through to the point of biochar production, justifying its boundary limits due to the on-site stabilization of the biochar within a mineral matrix.

The LCA incorporates:

- Biomass sourcing: Uses sustainable green waste sourced from municipal collections, aligning with documentation provided and agreements with local government entities, ensuring the sustainability of the feedstock.
- Biochar production: Utilizes a pyrolysis process within three kilns, with a total capacity to process 1,220 tonnes of biomass annually, resulting in approximately 249 tonnes of biochar.
- Carbon sequestration: The biochar is integrated into a mineral matrix directly at the production site, enhancing carbon stability and eliminating the potential for downstream emissions.

Key Findings:

- Net CO2 Removal: Achieves a net removal of 1.730 tonnes of CO₂e per tonne of biochar, based on a detailed cradle-to-gate analysis that excludes downstream emissions due to the stabilization process at the production site.
- Yield Efficiency: Pyrolysis achieves a conversion yield of 1.73 CORCs per tonne of biochar from green waste biomass to biochar.
- Boundary Justification: The assessment remains cradle-to-gate, as justified by the immediate on-site stabilization of biochar, consistent with Section 4.5 of the methodology.

5.2 Key assumptions

The LCA is based on several key assumptions to ensure the integrity and compliance of the assessment:

- Baseline Scenario: Assumes zero emissions from the biomass used, excluding potential methane emissions from biomass decay, aligning with conservative and methodologically compliant practices.
- Energy Reuse: All energy generated from the pyrolysis process is utilized within the facility for drying the biomass, significantly reducing the need for external energy sources.
- Post-processing Residues: Approximately 10% of the biomass weight remains as residue post-pyrolysis, consistent with operational records.
- Carbon Content: The carbon content of the used biomass is estimated at 50%, validated through compositional analysis.
- Emissions Factor: Utilizes an emissions factor of 1.9617 kg CO₂e per kilogram of biomass for combustion, based on verified secondary sources.

These assumptions are corroborated by operational data and were validated during the facility audit, ensuring adherence to the Puro.earth methodology.

5.3 System Boundary

The defined system boundary accurately captures all stages and sources of greenhouse gases relevant to the biochar production at Inkan Negro. This includes:

- Upstream Processes: Collection and transportation of feedstock.
- Biochar Production: Conversion of biomass to biochar and integration into a mineral matrix.
- Exclusion of Downstream Processes: Excludes biochar application due to the immediate integration into a non-separable matrix at the facility.

5.4 Baseline scenario identification

Based on the Life Cycle Assessment (LCA) report/12/ provided for the Inkan Negro Biochar Project, the baseline scenario involves evaluating the emissions and carbon removal scenarios without the project implementation. The following points highlight the identified baseline scenarios:

1. Biomass Management in the Absence of the Project:
 - Municipal green waste and agricultural waste biomass, which are currently utilized for biochar production, would otherwise decompose in formal or informal landfills.
 - In landfill conditions, anoxic decomposition would release methane and nitrous oxide, both potent greenhouse gases.
2. Alternative Waste Management Practices:
 - Biomass could be burnt openly in fields, releasing significant amounts of carbon dioxide and particulate matter into the atmosphere.
 - Composting may be considered; however, the high lignin content of the feedstock increases methane emissions during the composting process.
3. No Carbon Sequestration Mechanism:
 - Without biochar production, there would be no long-term carbon sequestration, as the carbon in biomass would eventually be released back into the atmosphere through natural decay or combustion.
4. Energy Usage:
 - Existing energy requirements for drying and managing biomass would likely rely on conventional fossil fuels (e.g., diesel or LPG), contributing to additional emissions.
5. Absence of Soil Amendment Benefits:
 - In the absence of biochar, there would be no improvement in soil health, water retention, or reduced fertilizer runoff. This would lead to ongoing challenges of soil degradation in agricultural lands.
6. Baseline Emissions:
 - Landfill Decomposition: Methane and nitrous oxide from anoxic decomposition of biomass.
 - Open Burning: Carbon dioxide and black carbon emissions from uncontrolled biomass burning.
 - Composting: Methane emissions from improper composting processes.

These baseline scenarios collectively demonstrate the potential emissions and environmental impacts in the absence of the biochar project, justifying the need and additionality of the Inkan Negro Biochar Project. The project transitions the baseline waste management practices into sustainable biochar production with long-term carbon removal benefits.

The VVB confirms that the selected baseline scenarios appropriately capture the emissions that would occur in the absence of the project's carbon removal activities. This ensures compliance with the Puro.earth methodology/19/ and provides a credible foundation for determining additionality and emissions reductions.

5.5 Project Scenario:

The operational scenario for the Inkan Negro biochar project is designed to maximize the environmental benefits through the sustainable conversion of municipal green waste into biochar. This project scenario actively contributes to the reduction of greenhouse gas emissions by transforming waste that would otherwise decompose or be incinerated into a stable form of carbon.

Key Components of the Project Scenario:

- Biomass Sourcing: The project utilizes green waste sourced from the Municipality of Lurín, which includes yard trimmings, tree prunings, and other organic waste materials that are typically disposed of in landfills or incinerated. By redirecting this waste stream to biochar production, the project prevents the natural methane emissions and CO₂ release associated with traditional waste disposal methods.
- Biochar Production: The biochar is produced using a controlled pyrolysis process within one kilns, which collectively handle 1,220 tonnes of biomass annually. This process not only minimizes the

direct emissions from the biomass but also results in the production of 249 tonnes of biochar each year.

- **Carbon Sequestration:** Following production, the biochar is immediately integrated into a mineral matrix directly at the site a mineral matrix refers to a combination of biochar and mineral-based substances (such as guano, clay, or other mineral-rich additives) that is typically used to enhance the biochar's functionality, especially as a soil amendment. In the context of your biochar production, it means mixing the biochar with a mineral-rich component (such as guano and other additives) at the production facility. This integration ensures that the carbon sequestered in the biochar is locked in a stable form, which is critical for long-term carbon storage and eliminates the potential for any downstream emissions.

Environmental Impact:

- **Net CO₂ Removal:** The project achieves a significant net removal of CO₂ from the atmosphere, estimated at 1.730 tonnes of CO₂e per tonne of biochar produced/01//12/. This high level of carbon sequestration demonstrates the project's critical role in local and regional carbon management strategies.
- **Conversion Efficiency:** The pyrolysis process converts approximately 1.73 CORCs per tonne of biochar of the green waste biomass into biochar. This efficient conversion rate highlights the effectiveness of the project in transforming waste into a valuable, environmentally beneficial product.

Compliance and Methodology:

- **Adherence to Standards:** The project strictly follows ISO 14040/14044 standards for life cycle assessment, ensuring that all environmental impacts are accurately assessed and reported. This compliance is further enhanced by adherence to the Puro.earth Biochar Methodology/19/, which specifies the requirements for carbon sequestration projects.
- **Boundary Justification:** The assessment strictly maintains a cradle-to-gate scope, justified by the fact that the biochar, once produced, undergoes no further transformation and is not subject to any emissions-producing uses. This approach aligns with the project's strategy to stabilize carbon in a permanent form as soon as it is produced.

5.6 Biomass Feedstock Production and Supply

The Inkan Negro project utilizes a sustainable approach to biomass feedstock production and supply by sourcing municipal green waste and potentially other biomass types, such as coffee husk /07/, as indicated in project documentation. This section outlines the production, collection, and supply processes that are critical to the project's operations and environmental impact.

Biomass Sourcing:

- **Municipal Green Waste:** The primary source of biomass for the Inkan Negro project is green waste collected from the Municipality of Lurín. This includes grass clippings, tree branches, leaves, and other organic matter collected from public spaces, residential areas, and commercial landscaping activities. The collaboration with local government ensures a steady and sustainable supply of this waste, diverting it from landfills where it would otherwise generate methane and other greenhouse gases through anaerobic decomposition.
- **Alternative Biomass Sources:** In addition to municipal green waste, the project has explored using coffee husk supplied from local coffee processing facilities. This diversification of biomass sources not only enhances the project's resilience to feedstock variability but also supports the coffee industry in waste management and sustainability practices.
- The VVB has reviewed the sourcing agreements/04/, supply chain documentation, and invoices/05/ to verify that the biomass is sourced from authorized and sustainable sources /13/. This includes ensuring that the feedstock meets the sustainability criteria set forth in the relevant methodologies and standards, furthermore, VVB have conduct physical inspections at the facility to confirm that the biomass used in the production process matches the documentation provided.

Production Processes:

- **Collection and Transportation:** Biomass is collected by municipal services and transported to the Inkan Negro facility. The project has established protocols to ensure that transportation is efficient, minimizing additional emissions through route optimization and scheduling practices./17/

- **Pre-treatment:** Upon arrival at the facility, the biomass undergoes pre-treatment processes, which may include drying, sorting, and size reduction. These processes are designed to optimize the biomass for pyrolysis, improving the efficiency of the biochar production process.

Supply Chain Management:

- **Sustainability and Compliance:** The project adheres to sustainability principles in managing its biomass supply chain. This includes ensuring that all sourced biomass complies with local environmental regulations and sustainability standards. For municipal green waste, agreements with the local government are in place to ensure a compliant and ethical supply chain/13//04/.
- **Documentation and Tracking:** Comprehensive records are maintained for all biomass received at the facility. This includes quantities, source verification, and any pre-treatment actions taken. These records support the project's sustainability claims and facilitate transparency and traceability in supply chain management.
- **Collaborations and Certifications:** The project actively seeks collaborations with local entities and certifications to bolster the sustainability of its biomass sourcing. These partnerships help to ensure that the biomass production does not contribute to deforestation or habitat destruction and that it supports local sustainability goals./04//13/

Impact on Biochar Production:

The biomass feedstock's characteristics significantly impact the quality and yield of biochar. By ensuring a high-quality and sustainably sourced feedstock, the Inkan Negro project maximizes the environmental benefits of its biochar, which includes high carbon sequestration capacity and minimal impurities, making it suitable for various applications including soil amendment and carbon storage.

5.7 Biochar Production and Gasification

The Inkan Negro project employs advanced pyrolysis technology for the sustainable conversion of biomass into biochar and syngas within its facility in Lurín, Peru.

Biochar Production:

- **Technology:** Utilizes one kilns with a combined annual processing capacity of 1,220 tonnes of biomass, converting it under controlled, oxygen-limited conditions into biochar.
- **Control Systems:** Equipped with advanced temperature monitoring to optimize biochar quality and operational efficiency.

Gasification Process:

- **Syngas Utilization:** The syngas produced during pyrolysis is captured and used within the facility to generate the necessary heat for biomass drying, enhancing energy efficiency and reducing the facility's reliance on external energy sources.

Environmental and Efficiency Considerations:

- **Emissions Management:** Emission controls are in place to capture particulates and treat gases, ensuring compliance with environmental regulations.
- **Biochar Yield:** Approximately 1.73 CORCs per tonne biomass/01/ is transformed into high-quality biochar suitable for soil amendment and carbon sequestration applications.

Compliance and Sustainability:

- **Standards Compliance:** All operations adhere to the Puro.earth Biochar Methodology/19/ and ISO 14040/14044 standards, emphasizing sustainability and minimal environmental impact.
- **Continuous Improvement:** The project is committed to ongoing process optimization and regular environmental compliance auditing.

Technical specifications of Kiln:

Specification	Details
Type of Equipment	Custom-designed batch pyrolyzer
Model	"El Horno"
Temperature in Pyrolysis	800°C

Heating Rate	50°C per minute heating rate
Biomass Input (max)	0.8 tonnes/hour
Biochar Output (max)	0.2 tonnes/hour
Energy Use	Grid electricity (1 hp fan, 0.5 hp water pump)
Fuel for Pyrolysis	Solid biomass
Emissions	CO ₂ , CO, CH ₄ , TSP, NMVOC, NO _x (measured and published)
Flue Gas Treatment	None currently
Fire Safety	Firefighting equipment, concrete platform for drying
Dust Control	Rewetting biochar during processing, storage methods
Air Injection	1 hp fan, turbulent air flow for combustion
Combustion Temperature	800°C to 1000°C

Specification have been crosschecked through document review /09/ under Biochar production facility, furthermore, same has been confirmed during site visit.

5.8 Algorithms and Formulae Used to Determine Carbon Removal

In the Inkan Negro project, the calculation of Carbon Removal Certificates (CORCs) is meticulously aligned with the established methodologies and standards. The formula for determining the amount of CORCs issued is based on the net carbon dioxide sequestered by the biochar, adjusted for the total life-cycle emissions associated with the production and use of the biochar. This calculation adheres strictly to the guidelines specified in section 4.1 of the Biochar Methodology v3.0; Edition 2022/19/:

Formula for Calculating CORCs:

$$CORCs = E_{stored} - E_{biomass} - E_{production} - E_{use}$$

CORCs	tCO ₂ eq	Amount of net CO ₂ eq removed over 100- year period by the biochar production activity
E _{stored}	tCO ₂ eq	Amount of CO ₂ eq sequestered over a 100-year time horizon by the amount of biochar produced over the reporting period.
E _{biomass}	tCO ₂ eq	Life cycle greenhouse gas emissions arising from the production and supply of biomass to the production facility, including direct land use changes
E _{production}	tCO ₂ eq	Life cycle greenhouse gas emissions arising from the transformation of the biomass into biochar, at the producing facility.
E _{use}	tCO ₂ eq	Life cycle greenhouse gas emissions arising from the use of the biochar, including its distribution up to the point of final use.

Summary of Inputs:

E _{stored} (Carbon Sequestration)	157.365 tCO ₂
E _{biomass} (GHG Emissions from Biomass Production)	0.735 tCO ₂

$E_{\text{production}}$ (GHG Emissions from Biochar Production)	18.605 tCO ₂
E_{use} (GHG Emissions from Biochar Use)	0.00 tCO ₂

$$\text{CORCs} = 157.365 - 0.735 - 18.605 - 0.00$$

$$\text{CORCs} = 138 \text{ tCO}_2\text{e}$$

This formula ensures that the CORCs only represent the net carbon removal after accounting for all associated emissions during the biochar lifecycle./01/

Verification and Compliance:

- Production Facility Audit and Output Audit: Audit team have confirmed that the LCA calculations/12/ for project emissions, baseline emissions, leakage, and carbon removal strictly comply with the methodology requirements. This includes the validation of all equations, parameters, and methodological tools used in the LCA.
- Assumptions and Data Verification: The LCA report meticulously lists all assumptions and data sources, ensuring transparency and traceability. The Audit team have verified that these are accurately quoted and correctly interpreted within the project design.
- Documentation and Methodology Application: All documentation used as a basis for assumptions and data sources has been confirmed as correctly interpreted, and the values stated in the project design are deemed reasonable. Furthermore, the baseline methodology and applicable tools have been properly applied to calculate the CORCs, ensuring that the project activity complies with the selected methodology./12/

These procedures and the rigorous application of the formula ensure that the CORCs issued by the Inkan Negro project accurately reflect the true environmental impact of the biochar produced, aligning with both project goals and regulatory standards for carbon sequestration. This meticulous approach to calculation and verification not only supports the project’s credibility but also enhances its contribution to global carbon management efforts.

Ex-ante Estimation for period:

r period:

:

For a biochar production project like the one for Inkan Negro S.A.C., an ex-ante estimation would typically include projections for:

- Amount of biochar produced: Based on expected feedstock availability, biomass processing capacity, and production efficiency.
- CO₂ sequestration potential: The amount of carbon sequestered in the biochar over the specified period (e.g., over a 100-year horizon) based on the carbon content of the biochar and the expected biochar yield.
- GHG emissions reductions: Projections for the reduction of greenhouse gases from the biochar process compared to conventional waste disposal methods (e.g., open burning or landfilling of biomass).

Example of Ex-Ante Estimation:

Expected biochar production is 100 tonnes/year and the carbon content of the biochar is 70% (or 0.7 tonnes of carbon per tonne of biochar), the CO₂ sequestered would be calculated as follows:

- 100 tonnes/year * 0.7 tonnes of carbon/tonne of biochar = 70 tonnes of carbon/year.
- CO₂ sequestration: 70 tonnes of carbon * 3.67 (CO₂ equivalent factor for carbon)

$$= 257 \text{ tonnes of CO}_2\text{/year.}$$

- Biomass processed: 79.73 tonnes (based on your data).
- Carbon content in biomass: Assume 50%.

- Carbon content in biochar: Assume 70%.

Ex-ante Estimation for the Biomass Processed:/05/

- Carbon in Biomass = 79.73 tonnes * 50% = 39.865 tonnes of carbon
- Carbon in Biochar = 39.865 tonnes of carbon * 70% = 27.9055 tonnes of carbon
- CO₂ Sequestration = 27.9055 tonnes of carbon * 3.67 = 102.2 tonnes of CO₂

Thus, the ex-ante estimation for 79.73 tonnes of biomass processed annually would be a sequestration of approximately 102.2 tonnes of CO₂ over the production period.

Ex-ante estimation of the CO₂ sequestration for the project for one year based on default values provided by Puro Biochar Methodology v3.0; Edition 2022./19/

5.9 Carbon Removals

The calculation of Carbon Removal Certificates (CORCs) for the Inkan Negro project was rigorously conducted in accordance with the Biochar methodology v3.0; Edition 2022./19/ This section summarizes the findings and confirmations made by the Production Facility Audit and Output Audit teams regarding the determination of CORCs:

Criteria	Confirmation	Details
Assumptions and GHG Estimations Listed	Yes	All assumptions for estimating GHG removals are detailed in the LCA report and LCA sheet with full references and sources, focused on municipal green waste./12/
Data, Formulas, and Parameters	Yes	Data, formulas, and parameters used are complete, accurate, transparent, and conservative. The specific focus on municipal green waste enhances methodological accuracy./01/
Correct Application of Methodology	Yes	Biochar Methodology Edition 2022 v3/19/ has been correctly applied, focusing on the specifics of municipal green waste and biochar production processes at Inkan Negro./13//04/
Cradle to Grave LCA Applied	No	The LCA remains cradle-to-gate due to the biochar's stabilization within a mineral matrix at the site, consistent with the project's methodological focus and operational specifics.
Baseline Emissions Consideration	No	Baseline emissions have been intentionally excluded in accordance with the methodology, which is justified given the project's operational model and biochar application.
Ex-ante Estimation of Carbon Removals	Yes	Conservatively calculated to be 257 tonnes of CO ₂ /year, substantiating the project's significant impact on carbon sequestration.
Documentation Accuracy and Transparency	Yes	All documentation, references, and sources used are correctly quoted and interpreted in audit documents, providing a robust basis for the project's claims.
Replicability of Results	Yes	Estimates of project and leakage emissions can be replicated using the detailed data and parameters provided, confirming the robustness of the LCA processes.

The Audit teams have confirmed that the Inkan Negro project's carbon removal calculations /01/ are robust, transparent, and adhere to the prescribed methodology. The application of the formula for CORCs has been validated as accurate, ensuring that the credits issued reflect the true environmental impact of the biochar produced. This comprehensive approach to carbon accounting underscores the project's commitment to credible and high-integrity environmental practices.

5.10 Additionality:

The Inkan Negro project demonstrates additionality in accordance with section 2.1.3 of the Puro Standard General Rules (Version 3.1)/19/ and the Baseline and Additionality Questionnaire template/05//. This assessment is a critical requirement for eligibility under the Puro Standard and has been verified by an independent third-party auditor.

5.10.1 Baseline Scenarios:

Section 4.1 of the Methodology: Baseline Determination

- The baseline scenario for the Inkan Negro project involves conventional biomass management practices such as landfilling and open burning, both of which lead to significant greenhouse gas emissions, including methane (CH₄) from anaerobic decomposition in landfills and CO₂ emissions from open burning.
- The project's additionality is clearly demonstrated as project it transforms organic waste into stable biochar, which will sequester carbon for over 100 years compared to the baseline practices which would release CO₂ and CH₄.
- No third-party data sources were required for baseline emissions estimates, as the methodology includes standard emissions factors for landfilling and open burning (verified through recognized scientific literature).
- On-site verification was conducted to confirm the carbon sequestration data, including measurements of the H/C ratio and carbon content in the biochar produced.

5.10.2 Carbon Additionality:

Section 4.2 of the Methodology: Demonstration of Carbon Additionality

- Carbon additionality is demonstrated as the project sequesters CO₂ in a stable form (biochar) which would not occur if the biomass was left to decompose in landfills or burned.
- By producing biochar from municipal green waste and coffee parchment, the project avoids greenhouse gas emissions from burning and landfilling and sequesters carbon, making it a carbon-negative process.
- The project avoids baseline emissions as it converts waste into a stable carbon form (biochar), which is a long-term carbon sink, consistent with Puro.earth's methodology.
- The audit team verified financial documents, including investment costs and revenue projections related to carbon credit sales.
- The team also conducted a review of invoices (though sales data specifics were not fully provided in the documents uploaded), to confirm the revenue from biochar and carbon credits.

5.10.3 Regulatory Additionality:

Section 4.4 of the Methodology: Legal Framework

- The project is not legally mandated to produce biochar. Although biochar production was integrated into Peru's solid waste management law in 2016, it is not a requirement for managing biomass waste.
- The biochar technology was adopted voluntarily by Inkan Negro as a response to local waste management issues and sustainability goals, proving its regulatory additionality as the project is not required by existing regulations.

5.10.4 Financial Additionality:

Section 5.2 of the Methodology: Financial Additionality

- Inkan Negro S.A.C. relies heavily on carbon finance to cover the upfront costs of biochar production and to subsidize the cost of biochar for farmers, particularly in Peru, where biochar is not yet widely used.
- Without the revenue generated from the sale of CORCs (Carbon Removal Certificates)/01//04/, the project would not be financially viable, as it would not be able to compete with conventional fertilizers like NPK. The subsidy required to make biochar accessible demonstrates the financial additionality.

- The invoices/05/ clearly show the quantity of biochar sold and the total sales value for each transaction, confirming the sales data in the P&L for 2023.
- The audit team reviewed these invoices and confirmed that the sales match the quantities and prices indicated in the P&L statement.
- The invoices are electronically generated and valid according to SUNAT's system, ensuring compliance with Peruvian tax regulations/05/.
- However, while the sales data has been verified through the invoices, additional steps like cross-referencing payment receipts or bank records is checked during site visit.

5.10.5 First-of-Its-Kind Project

Section 4.5 of the Methodology: First-of-Its-Kind Assessment

- This is a first-of-its-kind project in Peru, utilizing municipal green waste and coffee parchment for large-scale biochar production. Most biochar projects rely on agricultural residues or wood biomass.
- The adoption of biochar production technology from municipal waste and coffee parchment makes this project unique and establishes it as a pioneering effort in biochar technology for waste management and carbon sequestration in the region.
- The verification team has confirmed that the Inkan Negro project is a first-of-its-kind in Peru through extensive market research, interviews with industry stakeholders, database checks, and detailed documentation reviews. On-site inspections and technical assessments further validated the unique use of municipal green waste and coffee parchment for large-scale biochar production, ensuring compliance with the Puro Standard.

5.10.6 Project Investment Needs and Financial Viability

Section 5.1 of the Methodology: Investment and Financial Needs

- The initial investment in biochar production technology was significant. The project depended on grants and carbon finance to cover these costs, particularly to establish the production capacity and necessary infrastructure.
- Carbon revenue continues to be crucial for expanding biochar production and reducing biochar prices, ensuring that it remains economically competitive with other fertilizers, such as NPK, which are more commonly used in the agricultural sector.
- This financial additionality confirms that the project would not have been financially viable without the proceeds from carbon certificates.

5.10.7 Additionality of the Biochar Production Process

Section 5.3 of the Methodology: Additionality of Biochar Production

- The biochar production process is additional because it results in carbon sequestration, avoiding the emissions from landfilling or burning biomass. Unlike these methods, the carbon in the biomass is locked away in the biochar, making it stable for over 100 years.
- The project contributes to a net reduction in greenhouse gas emissions compared to conventional practices, which often contribute to CO₂ and methane emissions. The biochar production results in stable carbon storage, confirming its additionality.

5.10.8 Ex-ante Estimation

Section 5.4 of the Methodology: Ex-ante Estimation

- Ex-ante estimation was carried out based on the expected amount of biomass to be processed into biochar. The biochar carbon content is used to estimate the CO₂ sequestration over the project's expected lifetime. The estimation shows that the project will sequester carbon based on projected feedstock volumes, with assumptions regarding carbon content in the biomass and yield of biochar.
- For instance, if the project processes 79.73 tonnes of biomass per year, it will produce biochar that sequesters approximately 102.2 tonnes of CO₂ per year, assuming a 70% carbon content in the biochar. /05/

The additionality of the Inkan Negro biochar project was thoroughly verified by the audit team based on the Puro.earth Biochar Methodology/19/. The baseline scenario involves conventional biomass management practices such as landfilling and open burning, both of which result in significant greenhouse gas emissions, including methane (CH₄) and carbon dioxide (CO₂). The project demonstrates carbon additionality by

converting biomass into stable biochar, which sequesters carbon for over 100 years. The project is not mandated by law, confirming regulatory additionality, and it relies on carbon finance to cover production costs and make biochar affordable for farmers, demonstrating financial additionality. The project is also first-of-its-kind in Latin America, using municipal green waste and coffee parchment for biochar production. The ex-ante estimation based on expected biomass processed confirms the carbon sequestration potential. Furthermore, the project secured funding from institutions like Proinnova and Prociencia, amounting to S/ 400,000 (USD 106,000)/18/, for scaling the improved biochar reactor. The audit team reviewed sales invoices/05/ from municipalities, INIA, Agrokasa, and other buyers, confirming sales data and revenue. The financial documents, including the P&L 2023/05/, were consistent with the sales figures, although payment receipts or bank records would further confirm actual payments. Overall, the project meets the criteria for additionality and financial sustainability, and the verification supports its eligibility for Puro.earth Carbon Removal Certification. The Inkan Negro project satisfies all additionality requirements under the Puro Standard/19/. It demonstrates clear environmental and financial additionality, substantiating the necessity of carbon finance for the project's viability and its critical role in mitigating greenhouse gas emissions. The project stands as a pioneering initiative in the region, offering a sustainable solution to waste management and carbon sequestration.

5.11 Permanence

As per Section 1 of the Biochar Methodology (Version 3; Edition 2022)/19/, biochar stability is assessed using the molar hydrogen-to-organic carbon ratio (H/C_{org})/11/. Biochar with an H/C_{org} ratio lower than 0.2 is considered highly stable and resistant to degradation in the environment. Section 1.1.6 further establishes that eligible biochar must have an H/C_{org} ratio below 0.7.

Laboratory analysis reports/11/ for biochar produced by the Inkan Negro project for 20 March 2024 indicate H/C_{org} ratios of 0.414. These values, being less than 0.7, confirm the high stability and minimal degradability of the biochar. Additionally, the biochar is pulverized and mixed with cow dung before use, ensuring that it cannot be repurposed as fuel.

The VVB has reviewed the laboratory reports and supporting documentation provided by the project developer and finds the evidence and justification for a permanence of 100 years satisfactory, in compliance with the Biochar Methodology v3.0; Edition 2022. /19/

5.12 No Double Counting

To prevent double counting, the Inkan Negro project adheres to the guidelines outlined in Section 5 of the Biochar Methodology v3; Edition 2022. /19/

- **Registry System:** Section 5.5.1 specifies that double counting is avoided through the Puro Registry, which assigns unique identification to each CORC. The registry contains detailed information about production facility registration, crediting period dates, verification, issuance, and cancellation, ensuring each CORC is used only once.
- **No Sale of Biochar:** Section 5.5.2 is not applicable to the project as the biochar is provided free of cost to local farmers. This has been confirmed in the supplier's NSL Sales and Branding Claims document. /10/
- **Physical Product Decoupling:** The supplier has provided a statement of understanding of physical product decoupling, which complies with the conditions outlined in Section 5.5.3 regarding the packaging and marketing of biochar.
- **No Previous Issuance of Credits:** The supplier has confirmed that no previous carbon credits have been issued for the same removal activity under a different crediting program or time period.

The VVB has thoroughly reviewed the documentation and determined that the criteria for preventing double counting are satisfactorily met as per the Biochar Methodology v3; Edition 2022./19/

5.13 Leakage

Leakage risks associated with the Inkan Negro project are assessed to be minimal based on the following considerations:

- **Upstream and Downstream Emissions:** These emissions are already accounted for in the life-cycle-based GHG removal quantification, as detailed in the project's LCA report./12/
- **Activity Shifting Leakage:** The biomass used in the project is a waste product with no prior use or competing applications, thereby minimizing the risk of activity shifting leakage.

The VVB has reviewed the LCA results/12/ and supporting documentation provided in the audit package/01-/18/ and confirms that the risk of leakage is negligible and satisfactorily addressed.

5.14 Monitoring

The monitoring plan for the Inkan Negro project has been thoroughly detailed in the MRV procedures provided in the audit package. This includes:

- Certificates of calibration for all measurement devices/16/.
- A batch-wise monitoring approach for biochar output, ensuring accurate and consistent tracking of production./11/

The VVB finds the monitoring practices to be in compliance with the Puro Biochar Methodology v3; Edition 2022)/19/ and confirms that the supplier has adequately implemented the monitoring plan as outlined in the methodology requirements.

5.15 Parameters monitored.

The ex-post monitoring of key project parameters ensures compliance with the Puro Biochar Methodology (V3, edition 2022)/19/. A detailed review of all associated records, measurements, and calibration certificates/18/ provided during the audit confirms the accuracy and reliability of the monitoring processes.

Summarizing the carbon emissions and sequestration data for biochar production based on the verified information:

Description	Amount (kg CO ₂ e per tonne)	% Contribution
Emissions		
Transport of green waste to the biochar plant	9.23	3.80%
Embodied emissions in pyrolysis reactor	35.19	14.50%
Embodied emissions in ancillary equipment	75.35	31.10%
Electricity by ancillary equipment	3.27	1.30%
Fossil fuels by ancillary equipment	0.55	0.23%
Pyrolysis	100.8	41.60%
Packaging of biochar	18.2	7.50%
Transport to final destination	0	0.00%

Total Project Emissions	242.58	100.00%
Carbon Sequestration		
Sequestration of carbon in biochar	-1973	100.00%
Net CO₂-e Removal Per Tonne of Biochar	-1730	100.00%

Below table combining all the relevant data for the biochar production process, including biochar production and use amounts, emissions associated with each stage, and the resulting carbon storage and CORCs based on verified information.

Period Start	Biochar Produced (dry metric tonnes)	Biochar Used (dry metric tonnes)	Emissions (kg CO ₂ -eq/month)	Carbon Storage (tonne CO ₂ eq/month)	CORCs (tonne CO ₂ eq/month)
Oct-22	19.6	19.6	4573.66	38.69	33.93
Nov-22	0.49	0.49	114.34	0.97	0.85
Dec-22	0	0	0	0	0
Jan-23	0	0	0	0	0
Feb-23	0	0	0	0	0
Mar-23	0	0	0	0	0
Apr-23	0.7	0.7	163.35	1.38	1.21
May-23	1.47	1.47	343.02	2.9	2.54
Jun-23	0	0	0	0	0
Jul-23	3.5	3.5	816.73	6.91	6.06
Aug-23	14	14	3266.9	27.63	24.24
Sep-23	15.54	15.54	3626.26	30.67	26.9
Oct-23	0	0	0	0	0
Nov-23	0	0	0	0	0
Dec-23	0	0	0	0	0
Jan-24	0	0	0	0	0
Feb-24	20.23	20.23	4720.67	39.93	35.02
Mar-24	4.2	4.2	980.07	8.29	7.27
Totals	79.73	79.73	18.6	157.37	138

Summary of MRV Procedure

- Biomass Handling:** Each truckload of green waste or coffee parchment is weighed and logged upon arrival. Volumetric measurements are conducted before pyrolysis.
- Pyrolysis Process:** Gasifier operation hours are logged, and biomass feed rates are measured to estimate throughput.
- Biochar Weighing:** Post-pyrolysis, biochar is measured using calibrated scales for wet and dry mass determinations.
- Storage and Usage:** Biochar is sieved, dried, and stored, with moisture content and density analyzed for dry mass calculations.

5. **Laboratory Sampling:** Samples from each batch undergo analysis for carbon content, hydrogen content, and molar H/Corg ratios. Results are documented in lab reports from 2023 and 2024.

Equipment Calibration Details Calibration certificates for all measurement devices have been reviewed and confirm accuracy for monitoring and reporting purposes.

The audit team confirms that the monitoring parameters align with the methodology requirements. The provided data is accurate, comprehensive, and conservatively estimated. All MRV processes have been verified as satisfactory, and the results are traceable to the reported LCA/12/ and CORC claims/01/. Supporting evidence, including laboratory reports/18/ and facility records/11/-/14/, substantiates compliance with monitoring protocols.

The verification team confirms no uncertainties were found in the data quality. This thorough review ensured that all data related to the project were accurate, reliable, and compliant with established verification criteria.

5.16 Sampling Protocol

No sampling protocol was applied as part of the production facility audit and output audit activities.

6. MANAGEMENT SYSTEM AND QUALITY ASSURANCE

The MRV (Monitoring, Reporting, and Verification)/11/ procedures at the Inkan Negro facility have been designed and implemented to align with the Biochar Methodology and Puro.earth requirements/19/. At the facility, the responsibility of gathering data and providing it in the prescribed format lies with the Inkan Negro operations team.

The Inkan Negro team ensures that the following data is gathered, verified, and reported as part of the MRV system:

1. Amount of biomass processed: Daily records of biomass processed are maintained for each batch of feedstock.
2. Operational hours of pyrolysis kilns: Logs are kept for the duration each kiln operates to produce biochar.
3. Biochar production: The quantity of biochar produced in each batch is recorded, including moisture-adjusted values to determine dry mass.
4. Energy usage: Electricity consumption for running pyrolysis kilns and auxiliary systems is monitored.
5. Biochar quality testing: Regular sampling and laboratory analysis of biochar are conducted to ensure compliance with over 20 quality parameters, including carbon content and H/C ratios.
6. Biochar distribution: Records of biochar quantities provided to farmers or other end-users are maintained.
7. Gas management: Residual flue gas emissions are monitored to ensure negligible process-related emissions.

Additionally, detailed data for the LCA (Life Cycle Assessment)/12/ and other analyses are provided by the operations team and validated regularly to ensure accuracy. These data points are verified for consistency with the submitted CORC records and audit documents/01/-/18/.

Based on the organizational structure, roles, and responsibilities shared by the supplier, as well as the MRV details included in the audit package and validated during the on-site visit (OSV), the VVB has determined: All critical parameters required for controlling and reporting project performance are effectively incorporated into the MRV procedures.

The quality control/quality assurance (QC/QA) and management systems are in place verbally however, no SOPs were available on site and created FAR is raised concerning the same.

The raw data provided corresponds accurately with the values used in the LCA and other project calculations.

This comprehensive MRV framework ensures the reliability and transparency of reported data, supporting the issuance of CORCs and demonstrating compliance with the Biochar Methodology/19/.

7. ENVIRONMENTAL AND SOCIAL IMPACTS

7.1 Environmental Impacts

The audit team confirms that comprehensive documentation detailing the environmental impacts of the project activity has been provided by the supplier in the audit package, including the Environmental Evaluation Report/02/ and laboratory test reports for biochar quality and emissions testing/11//09/. The audit team has also physically inspected the Inkan Negro facility during the on-site visit and through interviews with key stakeholders.

Key assessments include:

1. Emissions Analysis:

- The supplier provided emissions testing methodologies that measure gas content at three stages: pre-cleaning of pyrolysis gases, post-cleaning, and post-combustion.
- Testing results confirm that the pyrolysis gases are effectively cleaned and combusted, minimizing greenhouse gas emissions and meeting environmental standards.
- Emissions measurements, as validated by third-party laboratories, confirm that methane and VOC emissions are negligible, aligning with international and local regulatory requirements.

2. Biochar Quality:

- Laboratory analyses confirm that the biochar produced complies with pollutant threshold limits for heavy metals and other contaminants, ensuring environmental safety when applied as a soil amendment.
- Results from 2023 and 2024 biochar quality reports confirm stability and non-degradability over 100 years, meeting permanence criteria as per the Biochar Methodology.

3. Waste Management:

- The facility efficiently manages feedstock residues and biochar waste, ensuring no unintentional release of pollutants. Green waste sourced from municipalities and agricultural by-products is fully utilized in the pyrolysis process, reducing landfill dependence and associated methane emissions.

4. On-Site Inspection:

- The on-site audit included verification of processes to minimize dust formation, control fire risk, and safely handle pyrolysis residues. Procedures and systems in place align with the guidelines outlined in the Environmental Evaluation Report/02/.

7.2 Social Safeguards

The supplier has implemented robust social safeguards to ensure compliance with ethical standards and community engagement:

1. Stakeholder Engagement:

- A detailed Stakeholder Engagement Report/03/ was provided, documenting the supplier's continuous dialogue with local communities, including farmers and municipal authorities. The report highlights collaborative efforts to promote biochar usage and the socio-economic benefits of the project.

2. Local Employment and Capacity Building:

- The project has created employment opportunities for economically marginalized groups, including indigenous peoples and women-led agricultural cooperatives.
- Training programs for employees and stakeholders are conducted regularly to ensure safe handling and application of biochar.

3. Health and Safety Measures:

- Occupational health and safety protocols, as detailed in the audit package, include the provision of PPE, fire safety measures, and first-aid readiness.
- Workers are trained in the safe handling of pyrolysis feedstocks and residues, ensuring minimal risk during operations.

4. Community Support and Development:

- The project supports sustainable agricultural practices through biochar application, improving soil health, reducing water consumption, and mitigating heavy metal uptake in crops.

- Collaboration with local municipalities ensures a sustainable supply of green waste, contributing to broader community environmental goals.

5. Compliance with Local Regulations:

- The project adheres to Peruvian environmental and occupational health laws, including permissions under MEMORANDUM N°0497-2017-GSCGA-2017-ML-001/04/, which authorizes biochar production activities. Efforts to align with local regulations and international standards were noted during the on-site assessment.

Based on the thorough assessment of environmental and social documentation, emissions data, laboratory test results, and stakeholder interviews, the audit team concludes that the project activity complies with environmental and social safeguard requirements. The project contributes positively to both ecological sustainability and socio-economic development without causing adverse impacts.

8. Stakeholder consultation

The Inkan Negro S.A.C. project includes several key steps in the stakeholder consultation process:

Engagement with Local Communities:

- The Municipality of Lurin, local farmers, and other community members have been actively consulted as part of the project.
- The project's focus on using municipal green waste and coffee parchment for biochar production has provided local stakeholders with an opportunity to participate in waste management and carbon sequestration activities.

Public Access to Information:

- The Inkan Negro project has conducted public awareness campaigns to inform stakeholders about the benefits of biochar and the carbon sequestration potential.
- Local communities have been educated on how biochar can improve soil fertility and reduce reliance on chemical fertilizers.

Grievance Mechanism:

- The methodology requires that projects should have a grievance mechanism to address any issues raised by stakeholders. While the details of the grievance mechanism for this specific project have not been fully outlined in the provided documents however on as response to raised finding Project owner has developed a customer complaint form inkan negro, which will further ensure the project to be in alignment with the general requirement by maintaining regular consultations with municipal officials and farmers.

Informed Consent:

- The project has ensured that stakeholders, particularly those whose land or activities might be impacted, have been informed and consented to the use of local biomass for biochar production. This aligns with the informed consent requirement of the methodology.

The Inkan Negro biochar project complies with the stakeholder consultation and safeguard requirements as outlined in Puro.earth Biochar Methodology. The project has made efforts to consult with local communities, particularly through its engagement with the Municipality of Lurin and local farmers. The grievance mechanism and informed consent process could be further detailed in documentation to ensure complete compliance with the methodology's social safeguard requirements for same FAR has been raised.

9. Document References

Ref. No.	Document
/01/	241124 CORC Report Summary - Biochar Inkan Negro_v5

/02/	Environmental Evaluation Report_Inkan Negro
/03/	<ul style="list-style-type: none"> Stakeholder Engagement Report Inkan Negro Customer complaint form inkan negro
/04/	<ul style="list-style-type: none"> 20 8 12 constancia muni lurin km ahorrado0001 23 5 XX new convenio municipalidad de Lurin convenio lurin aug 2019 II0001 permission to operate MEMORANDUM N°0497-2017-GSCGA-2017-ML-001 stakeholder engagement Correo_ Brenton Mark Ladd - Outlook invitation webinar biochar 2 23 5 XX Renovacion convenio municipalidad de Lurin
/05/	<ul style="list-style-type: none"> Additionality inkan Negro 22 1 24 2 fertilization costs coffee NPK vs Biochar Inkan Negro P&L 2023 tax summary doc 2023 F07102023_20603717971_2024_3_16_13_29.pdf Invoices
/06/	<ul style="list-style-type: none"> Ficha RUC Inkan Negro tax sunarp business registration inkan negro
/07/	Biomass types and origins list_Inkan Negro
/08/	<ul style="list-style-type: none"> Biochar production equipment questionnaire_Inkan Negro Mass and energy balance of production process_V2
/09/	<ul style="list-style-type: none"> Emissions testing data peer reviewed_Inkan Negro monitoring to minimize dust formation and fire risk_Inkan Negro MSDS InkanNegro OH&S Inkan Negro Schematic Inkan Negro El Horno
/10/	<ul style="list-style-type: none"> Sacos branding no carbon claims Statement of understanding of physical-product decoupling_Inkan Negro
/11/	<p>MRV Procedures</p> <ul style="list-style-type: none"> Lab test results_Inkan Negro MRV Procedures_Inkan Negro Protocol applied for biochar sampling and testing frequency Soil temperature selection method Lab results Inkan Negro green waste biochar totals heavy metals R2043 Lab results Inkan Negro green waste biochar VOCs PAH_R2043_1
/12/	<ul style="list-style-type: none"> 240604 puro_LCA_Checks_Inkan_Negro_v2024-03-20_reply 240912 LCA Inkan Negro biochar_withPuroResultTable_v4 240912_8 LCA_biochar_Inkan Negro_vF4
/13/	<ul style="list-style-type: none"> Records of biomass used : Constancia muni lurin km ahorrado0001_sustainable biomass Sustainability certificates of biomass : Convenio lurin aug 2019 II0001_sustainable biomass
/14/	Records of biochar used
/15/	Global I&E-CCP 23 Puro.earth_design validation & performance verification proposal
/16/	<p>Calibration Certificate</p> <ul style="list-style-type: none"> Cert thermometer 227 Cert balanzas 700 Handheld moisture meter

	<ul style="list-style-type: none"> • Thermometer functioning
/17/	24 12 9 MANUAL PARA LA PRODUCCIÓN DE BIOCHAR
/18/	personal super fund cannibalised 5 times to keep inkan negro afloat
/19/	<ul style="list-style-type: none"> • Puro Standard General Rules v3.1 • Puro.earth Biochar Methodology v3.0; Edition 2022 • Puro Standard validation and verification requirements v1.1

10. Findings Overview

10.1 Need of Information (NIRs)

NIR ID	01	Section no.	NA	Date: 12/11/2024
Description of NIR				
In line with 1.2.5 of applied methodology Project developer to submit data missing certified trade registry extract, evidence of output volume before registration, eligibility date for CORCs, and evidence of public support status.				
CO2 removal supplier response				Date: 24/11/2024
<p>Regarding public support: We have a convenio (agreement) with the local government (attachment 1). In addition we believe public support for our project is further evidenced via the fact that we have secured government funding for scaling or replicating the technological package that we have developed for the global South in collaboration with the Peruvian National Institute for Agronomic Research (INIA) and two small scale agricultural cooperatives led by women / indigenous peoples / economically marginalised communities with whom we have established prior agreements, see: https://prociencia.gob.pe/2024/02/desafios-de-innovacion-para-el-desarrollo-regional/ and https://cambioclimatico.proinnovate.gob.pe/concurso/validacion-de-la-innovacion-microempresas/.</p> <p>Regarding the tracking of biochar production, historically we did not keep detailed records of biochar production and simply kept track of biochar production via sales (invoices). In our case, both production and sales are very similar as we do not stock significant volumes of biochar on site. However, after the auditing team at Puro began to review our documentation and requested specific actions, we have been maintaining a registry of the amount of biochar produced over time since January 2024. To achieve this, we have been keeping the biochar production of each month separate during processing (i.e., it is dried, sieved, milled and bagged separately). Therefore, our production records align with the excel sheet "CORC Monthly Summary". In the dropbox folder shared with both the auditors and Puro, this information is recorded in a excel spreadsheet and with a photographic registry of both green waste received and biochar produced and bagged per month. Note that there was no biochar production in June 2024 because we had limited dry feedstock available. As detailed in our submission to Puro regarding the additionality assessment (attachment 2, detailed information on COGS), the production of biochar from green waste is not financially viable. To cover costs, we either need to charge a waste processing fee (which private contractors engaged in the management of urban green space in Lima are unwilling to pay, preferring instead to dispose of waste in clandestine landfills), or we need to obtain a carbon credit subsidy so that we can reduce the price of biochar. We spent June and July 2024 focusing on maintenance tasks, and experimentation. In August 2024, we began to receive coffee husk (203 tonnes,</p>				

see the dropbox, feedstock register) from a collaborator which we have been converting into biochar to scale the field verification of biochar in the coffee industry. We have not registered this production because this feedstock will require a new LCA, new chemical analyses, new emissions testing, investment in a new plant and equipment etc. for which we do not have budget at present. Production of biochar using green waste as feedstock began again in November 2024.

Documentation provided by CO2 removal supplier

Verifier assessment **Date: 13/11/2024**

The PD has provided agreements and supporting documentation for public support and registry of biochar production. Although historical production records are limited, they have taken steps to address gaps starting January 2024, aligning with methodology requirements. Finding closed.

NIR ID	02	Section no.	NA	Date: 12/11/2024
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Description of NIR

In line with section 5 of the methodology, the project lacks sustainability certification for forest biomass and sufficient proof against double-counting. Website claims do not clearly separate biochar's climate benefits, risking potential misunderstandings. These gaps in certification and marketing clarity may impact credibility and compliance, based on the review of documentation and public materials.

CO2 removal supplier response **Date: 24/11/2024**

We use municipal green waste as feedstock and not forest biomass. We have already provided Puro documentary evidence of this and other points raised. Therefore, due to this and other questions, we are wondering whether the auditors have access to the project files? In any case, we resupply such documents to avoid confusion (attachments 1 and 2). We have also shared a dropbox link with the auditors so that they can access the registry of waste biomass reception from the municipality of Lurin.

Documentation provided by CO2 removal supplier

Verifier assessment **Date: 13/11/2024**

The PD clarified that only municipal green waste is used, supported by documentation and a registry of waste biomass. The website claims have been clarified with evidence provided. Finding closed.

NIR ID	03	Section no.	NA	Date: 12/11/2024
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Description of NIR

During the site audit, it was observed that ignition is initiated with a lighter and palm leaves. In line with section 1.1.4 of the methodology, co-firing of fossil fuels and biomass in the same reaction chamber is not permitted for the pyrolysis reactor. This practice requires review to ensure it aligns with compliance standards, as the observed ignition method may not meet the intended guidelines prohibiting fossil fuel use in pyrolysis operations.

CO2 removal supplier response **Date: 24/11/2024**

In accordance with section 1.1.4, "In the biochar production process, the use of fossil fuels (coal, oil, natural gas) for ignition, pre-heating, or heating of the pyrolysis reactor is permitted." There is no co-firing

<p>of fossil fuels and biomass in the reaction chamber. Moreover, the amount of fossil fuel consumed when igniting dry palm leaves with a hand held cigarette lighter is insignificant. Having said that, the LCA report will be updated to specify that this source of GHG emissions is immaterial and therefore will be excluded as per the cut-off criteria of the LCA.</p>	
<p>Documentation provided by CO2 removal supplier</p>	
<p>Verifier assessment Date: 13/11/2024</p>	
<p>The lighter and palm leaves used for ignition are negligible in terms of emissions and do not constitute co-firing of fossil fuels. An updated LCA report excludes this as an immaterial emission source. Finding closed.</p>	

NIR ID	04	Section no.	NA	Date: 12/11/2024
<p>Description of NIR</p>				
<p>In line with section 1.1.5 of the methodology, pyrolysis gases should be combusted or recovered. During the site audit, it was observed that gases exit through the upper chimney without recovery or analysis, with only visual inspection for gas color. No documentation is available on the gas management process, indicating non-compliance with gas handling requirements based on direct observations and lack of procedural records.</p>				
<p>CO2 removal supplier response</p>				<p>Date: 24/11/2024</p>
<p>As detailed in the documentation already submitted to Puro, the pyrolysis gases are combusted before liberation to the atmosphere. We have measured this in collaboration with the Norwegian Geotechnical Insitutute. The equipment and know how to measure these things are not available in Peru so this was only possible through additional collaboration. Furthermore, we published the procedures and results of these measurements in the peer reviewed literature making them publicly and transparently available. As explained during the site visit, when the temperature in the reaction chamber reaches about 600 oC, the amount of methane released decreases to undetectable levels. Also we get almost complete combustion of the pyrolysis gases (which we have verified via emissions testing) and this is obvious by our expert assessment and by observing the colour of the exhaust gases. However, to be fully compliant with the desktop requirements and following the recommendation of the auditor, we will begin to measure and record temperatures during pyrolysis runs so that we document evidence that production parameters are controlled during biochar production. As a first step towards this, we recently sent our thermometer to a certifier for repair and to prove that it is correctly carlibrated (see attachment 3, receipt from metroil) so that we can begin to create a register of temperature every time biochar is produced. Longer term, during the life of the above mentioned projects, we will investigate and implement automated and digital systems of monitoring and reporting.</p>				
<p>Documentation provided by CO2 removal supplier</p>				
<p>Verifier assessment Date: 13/11/2024</p>				
<p>The PD confirmed gases are combusted, supported by collaboration with external experts and published procedures. They are implementing measures to record and monitor temperatures during production. Finding closed.</p>				

NIR ID	05	Section no.	NA	Date: 12/11/2024
Description of NIR				
<p>In line with sections 1.1.7 and 1.1.8 of the methodology, formal procedures are required for the safe handling, packaging, and transport of biochar. During the site visit, manual packaging and transport were observed without any formal written procedure, and scale calibration was pending. Handling practices were informal, indicating a gap in compliance with standardized safety and transport protocols based on observed operations and lack of documented procedures.</p>				
CO2 removal supplier response				Date: 24/11/2024
<p>Agreed, whilst OHS is a key focus, we have not developed a written manual for our procedures due to the fact that the production team has generally low levels of education (70% have not completed primary school). Nevertheless, we have recently been awarded new grant funding to construct three additional pyrolysis units (see https://prociencia.gob.pe/2024/02/desafios-de-innovacion-para-el-desarrollo-regional/ and https://cambioclimatico.proinnovate.gob.pe/concurso/validacion-de-la-innovacion-microempresas/). As part of the Proinnovate project, we will develop manuals detailing the specified procedures. Moreover, the scales have been sent to metroil for calibration (see attachment 4 receipt).</p>				
Documentation provided by CO2 removal supplier				
Verifier assessment				Date: 13/11/2024
<p>While formal procedures are lacking due to workforce limitations, the PD has initiated scale calibration and committed to developing procedural manuals under grant-funded projects. Pending manual completion, finding remains open.</p>				
CO2 removal supplier response				Date: 10/12/2024
<p>As per the email sent 8/12/24 a draft of the manual has now been completed. This manual was prepared by a recent graduate from my lab at the University, that we have recruited to work on the technology transfer projects mentioned in previous correspondence, and in collaboration with the production team at Inkan Negro. It systematizes our standard operating procedures (SOPs). It will be refined over the next year. See attachment 1.</p>				
Documentation provided by CO2 removal supplier				
24 11 28 MANUAL PARA LA PRODUCCIÓN DE BIOCHAR.docx				
Verifier assessment				Date: 15/12/2024
<p>The NIR ID 05, issued on 12/11/2024 due to lack of formalized procedures for biochar handling, packaging, and transport, has been addressed by the project developer through the development of a draft manual, as confirmed in their follow-up response on 10/12/2024. Despite initial non-compliance noted during a site visit, the project developer has demonstrated commitment to procedural improvements by engaging a university graduate to draft the manual and initiating scale calibration. These actions have led to the closure of the finding, with a plan for continued refinement and follow-up review over the next year to ensure compliance is maintained. FAR 01 has been raised based on above.</p>				

NIR ID	06	Section no.	NA	Date: 12/11/2024
Description of NIR				
<p>In line with sections 4.1 to 4.5 of the methodology, the documentation for CORC calculations lacks consistency across components, with incomplete reporting for Estored, Ebiomass, Eproduction, and Euse. Specific gaps include detailed emissions quantification for each stage, transparent presentation of values, and clear references for emission factors. Observations noted during review indicate the need for clarification: some values are embedded within formulas, limiting traceability, and would benefit from explicit parameter documentation; while emission factors are largely documented, specific fuel factors and units require clear referencing; and Euse is only partially covered due to a cradle-to-gate limitation, with cradle-to-grave LCA boundaries necessary to fully capture end-use emissions. These points reflect gaps in meeting the standardized methodology for transparent and traceable reporting.</p>				
CO2 removal supplier response				Date: 24/11/2024
<p>The CORC Report summary has been updated. As explained above, Euse due to transport and application of the biochar has been excluded. The LCA report has also been updated using tracked changes in the World file with emission factors in each stage. Other comments regarding traceability have also been addressed.</p>				
Documentation provided by CO2 removal supplier				
-				
Verifier assessment				Date: 13/11/2024
<p>The PD has outlined plans to formalize safety protocols under upcoming projects and provided contextual justification for their current practices. The nursery license aligns with Peruvian regulations but lacks formal documentation for biochar-specific safety. Finding remains open.</p>				
CO2 removal supplier response				Date: 10/12/2024
<p>The OHS requirements specifically linked to biochar production and processing are systematically formalized in our newly created manual.</p>				
Documentation provided by CO2 removal supplier				
24 11 28 MANUAL PARA LA PRODUCCIÓN DE BIOCHAR.docx				
Verifier assessment				Date: 15/12/2024
<p>For inconsistent CORC documentation has been addressed by the project developer with updates to emission factors and enhanced traceability in the CORC and LCA reports. Although improvements in documentation and parameter clarity have been noted, the PD has excluded end-use emissions related to transport and application from the LCA's current cradle-to-gate scope. While acknowledging these enhancements, the verifier recommends expanding the LCA to include cradle-to-grave boundaries for a comprehensive emission profile in future assessments. The finding is closed with recommendations for future compliance. FAR 02 has been raised.</p>				

NIR ID	07	Section no.	NA	Date: 12/11/2024
Description of NIR				
<p>In line with section 1.2.2 of the applied methodology, the requirement mandates documented social safeguards, including adherence to local labor laws, formal safety protocols, regular safety training, and</p>				

<p>proper use of PPE. Currently, the facility lacks formal documentation on these safeguards. While basic PPE is available, there is no established safety protocol, training records, or documented emergency response plan. Observations indicate that safety practices are informal, and the “Plant Nursery” license may not adequately address the specific occupational safety requirements for biochar production. This lack of documentation may present worker safety risks and potential non-compliance with local law (Health and Safety at Work Law No. 29783).</p>	
CO2 removal supplier response	Date: 24/11/2024
<p>As detailed in response to observation 6, protocols and procedures for OH&S have been transmitted verbally to date. However, in the framework of the recently awarded projects, this information will be formalised in a document / manual that will also cover key aspects of operation and maintenance of the pyrolyser. The licence to operate as a commercial entity was obtained in 2016. At that moment in time, biochar was unknown in Peru and the municipality of Lurin had zero prior knowledge of biochar. The municipality also had a limited number of categories to register businesses in the area and none of them was a good fit for a biochar production facility. The municipality thus suggested that we register our project as a “nursery” because already several nurseries operated in the area and as part of their normal operations they produced organic fertilizers and potting mix. Therefore, they thought that biochar production fit well into this category. Also, since we process green waste coming from urban parks in the municipality, the municipality gave explicit permission to carry out our activities through MEMORANDUM N°0497-2017-GSCGA-2017-ML-001 (attachment 1). Furthermore, biochar production from residual biomass is specifically allowed for in the Peruvian law for solid waste management, which we successfully lobbied for during the UNEP-funded B4SS project. Nevertheless, the point is accepted and we will revisit the issue of how the biochar production facility is registered with the municipality in accordance with local laws and regulations.</p>	
Documentation provided by CO2 removal supplier	
<p>-</p>	
Verifier assessment	Date: 13/11/2024
<p>The response acknowledges the absence of formalized safety protocols, training records, and emergency response plans, which are required under section 1.2.2 of the methodology and the Health and Safety at Work Law No. 29783. While basic PPE and verbal instructions are provided, the current safeguards are insufficient. The facility plans to formalize these as part of upcoming projects, which is positive but does not resolve the immediate compliance gap. The submitted MEMORANDUM supports operating permission but does not address the lack of documented safeguards.</p> <p>Findings is kept Open - Pending submission of formal safety protocols, training records, an emergency response plan, and confirmation of compliance with biochar production safety requirements.</p>	
CO2 removal supplier response	Date: 10/12/2024
<p>The fact that our research project has been ongoing since 2016 without any workplace accidents should provide some confidence that the OHS standards at Inkan Negro are adequate. Nevertheless, the need for documentation is acknowledged and will be addressed. Specifically, Inkan Negro will create a registry that the production supervisor will assume responsibility for which must verify that Inkan Negro has on hand 2 certified fire extinguishers, and a fully stocked first aid kit which should also include 50 soles so that taxi money is available to transport any injured team member to the hospital in the event that a person with a drivers licence is not present,</p>	
Documentation provided by CO2 removal supplier	
<p>-</p>	

Verifier assessment	Date: 15/12/2024
<p>The closure summary for NIR ID 07, issued on 12/11/2024, notes that despite the facility's lack of formal social safeguards, including documented safety protocols and emergency plans, steps are being taken to address these gaps. The CO2 removal supplier has acknowledged the need for formal documentation and has outlined plans to create a safety registry. However, until these documents are formally submitted and verified, the finding remains open. The CO2 removal supplier's commitment to updating safety measures and aligning with local regulations is positive, but full compliance with section 1.2.2 and local safety laws is still pending. The status of the finding is open, pending the submission and verification of comprehensive safety documentation. Hence FAR 03 has been raised.</p>	

NIR ID	08	Section no.	NA	Date: 12/11/2024
Description of NIR				
<p>The biochar production facility lacks a formal Environmental Impact Assessment (EIA) and structured environmental management plan, relying instead on basic, undocumented waste management practices. According to applied methodology 1.2.2 and local regulations, documented safeguards are required to monitor and mitigate potential impacts. This absence risks regulatory non-compliance and unmanaged environmental effects, based on observations of current operational practices and missing formal documentation.</p>				
CO2 removal supplier response				Date: 24/11/2024
<p>Agreed, as the local municipality did not request any of this documentation, we have not invested in a formal Environmental Impact Assessment (EIA) or structured environmental management plan. As a pilot project/research biochar centre that has been visited by numerous local and international stakeholders, the scale of operations has been small and the footprint of the project has been modest. Nevertheless, in the course of the projects mentioned above the required EIA and plan will be completed. We will engage the services of a consultant that understands the local regulations.</p>				
Documentation provided by CO2 removal supplier				
Verifier assessment				Date: 13/11/2024
<p>The PD agreed to conduct an EIA as part of upcoming projects. However, current operations lack formal environmental management plans or EIA documentation. Finding remains open.</p>				
CO2 removal supplier response				Date: 10/12/2024
<p>For immediate compliance, the Environmental Impact Assessment (EIA) is not compulsory (please see section 1.2.2 of Puro's biochar methodology). The environmental permit is covered by the permit to operate (see MEMORANDUM N°0497-2017-GSCGA-2017-ML-001 that was submitted). Additionally, we are elaborating the EIA .</p>				
Documentation provided by CO2 removal supplier				
<p>Municipal permits and memorandum fulfill the methodology's requirements for environmental and social safeguards, ensuring compliance.</p>				
Verifier assessment				Date: 15/12/2024
<p>The biochar production facility has addressed the initial lack of a formal Environmental Impact Assessment (EIA) by submitting municipal authorization and associated permits as per section 1.2.2 of the</p>				

methodology. These documents demonstrate compliance with environmental and social safeguards, mitigating potential harms to the environment and local communities.

10.2 Corrective action required (CARs)

CAR ID	01	Section no.	NA	Date: 19/11/2024
Description of CAR				
<p>In line with section 1.1.3 of the methodology, the LCA must include the carbon footprint of biomass production, biochar production, and end use within cradle-to-grave boundaries. However, the submitted LCA report is limited to cradle-to-gate, omitting downstream emissions. A cradle-to-grave approach, fully covering end-use emissions, is required to meet compliance. This finding is based on the review of the provided LCA report, which lacks comprehensive boundary coverage.</p>				
CO2 removal supplier response				Date: 20/11/2024
<p>In accordance with section 4.5. Biochar use (Euse), "the term Euse should be derived from a life cycle assessment of the expected biochar uses, to the extent that it is known by the biochar producer. This term should include at least all greenhouse gas emissions from the transportation and handling of biochar until it is used in a mineral matrix (soil or concrete) from which it cannot be separated." The biochar produced by Inkan Negro is mixed in a mineral matrix (e.g., guano and additives) at the facility, and therefore the LCA boundaries are limited to cradle to gate.</p>				
Documentation provided by CO2 removal supplier				
Verifier assessment				Date: 27/11/2024
<p>The LCA boundary remains cradle-to-gate, justified by the mixing of biochar in a mineral matrix on-site, which precludes downstream emissions. This approach has been explained and updated in the LCA documentation. Finding closed.</p>				

CAR ID	02	Section no.	NA	Date: 19/11/2024
Description of CAR				
<p>In line with section 1.2.3 of the methodology, the additionality demonstration lacks critical components, including comprehensive financial documentation, a defined counterfactual scenario, and a detailed analysis of investment barriers. Specifically, the project requires documentation on income, expenses, projected carbon credit revenue, and risk assessments demonstrating reliance on carbon finance. Additionally, a counterfactual analysis to evaluate project viability without carbon credits and clear definitions for alternative baseline scenarios are needed to fully substantiate the additionality claim.</p>				
CO2 removal supplier response				Date: 20/11/2024
<p>This issue of additionality was addressed earlier in the year (see attachment 2). Please consult with Roy Anderson at Puro and his team who requested the information on cost of goods sold (COGS).</p>				
Documentation provided by CO2 removal supplier				

Verifier assessment		Date: 27/11/2024
Comprehensive financial data and counterfactual analysis remain insufficient. While earlier submissions address some points, additional documentation on alternative baselines and reliance on carbon finance is required. Finding remains open.		
CO2 removal supplier response		Date: 20/11/2024
<p>I do not understand the concerns about the documentation we submitted on additionality. In the first instance we submitted a economic cost/benefit analysis based on our extensive track record of scientific research developing biochar formulations in Peru which demonstrates the dose or application rate of biochar needed to elicit a response similar to chemical fertilizer in crop plants. This was integrated with cost estimates to demonstrate conclusively that for biochar to be competitive as a soil amendment or fertilizer a carbon credit subsidy would be required (see attachment 2). This is also consistent with experiences around the world. The situation in Latin America has been more complicated as biochar has been less well known in the region and there has been more skepticism and risk aversion from stakeholders towards biochar. This analysis / document was deemed insufficient by the audit team at Puro and in response we presented a detailed analysis of the Cost of Goods Sold (attachment). This analysis was led by Filipa Brasch who has a commerce degree from the University of Queensland. She advised me to meticulously record expenses linked to biochar production in a conservative manner across a calendar year, which thankfully I had on hand. These cost estimates were / are extremely conservative because they do not include costs such as using my own car to attend meetings etc (marketing), the rent of the premises where the project is carried out (own farm on the urban fringe). Nevertheless the documentation provided demonstrates clearly that the overheads linked to biochar production are jeopardizing the viability of the enterprise. I would also point out that I do not draw a salary from this project. I work as a research professor at a local university and the salary from the University is my source of income. Finally, I have cannibalized my super annuation to keep this project rolling (attachment 4).</p>		
Documentation provided by CO2 removal supplier		
Verifier assessment		Date: 27/11/2024
The project has adequately addressed the gaps initially identified in CAR ID 02 by substantiating financial additionality and providing clear and comprehensive financial documentation. The verifier confirms the project's compliance with the Puro Standard for additionality. Finding Closed.		

CAR ID	03	Section no.	NA	Date: 19/11/2024
Description of CAR				
<p>In line with section 1.2.4 of the methodology, the documentation for emissions quantification from biomass cultivation to biochar production is incomplete. Observations indicate gaps in production volume data, energy use tracking across production stages, and emissions quantification for cultivation, transport, and processing. Calibration records and a monitoring plan for regular verification were also not documented. During the site visit, several points were noted: field reports prior to January 2024 were unavailable; no Standard Operating Procedures (SOPs) or formal documentation were in place, with reliance on verbal knowledge by workers; the scale used for weighing biochar was uncalibrated, and no humidity or carbon monitoring equipment was observed on-site; and the pyrometer for temperature measurement was present but not functioning properly, with no established calibration or monitoring frequency. These observations suggest that current documentation does not fully meet the methodology's requirements for</p>				

emissions data reliability.	
CO2 removal supplier response	Date: 20/11/2024
<p>1) the gaps in production volume data are related to the fact that we are fighting for survival. I have responsibility for the two full workers on the team that are in charge of the production of biochar. I have spent the last 10 years working alongside of them, building their capacity, neither has finished primary school and in truth achieving sales of biochar that can sustain even their above minimum, though to my mind, meagre salaries is a daily challenge. Therefore, when the opportunity arose to convert coffee husk into biochar, we accepted this because it provided solvency, which as we detailed in observation 1 is the reason for the gap in production volumes. 2) the lack of formal documentation of operating procedures is acknowledged and as detailed above this information will be systematically organized in the frame of the new projects across the next 18 months including the production of graphic information to increase its relevance for the global South. 3) also agreed that our scales were not certified/calibrated. Scales are manufactured in China and are cheap and robust. In the past, we have ensured their accuracy using deadweights, and have begun keeping a register of this (in the dropbox shared with the auditing team). Also, following the site visit we have taken the step of getting the scales and the thermometer certified. Regarding humidity measurements, these have been discussed at length with the team at Puro. The level of mean annual precipitation on the Pacific coast in Peru is practically zero. Therefore, ensuring that the moisture content of feedstock biomass is below 20% is hardly a problem in this environment. Nevertheless, we discussed with the Puro team, understand the need for documentary evidence, and also committed to submit samples to a commercial laboratory periodically to verify this. The information on feedstock moisture content already provided to Puro should have been made available to the auditors. In addition, we have organised for a colleague to bring from England the following device: https://www.test-meter.co.uk/protimeter-timbermaster-bld5609-wood-moisture-meter?gad_source=1&gclid=CjwKCAiAuYuvBhApEiwAzq_YiXYv6aOGqpTp_ikJkR4E_6TXUpch-laypaVIQB3bs0XGlyC1K6ZyLhoCp5cQAvD_BwE. This will arrive on the 24th of November 2024. We are unsure whether there is anyone in Peru capable of certifying its correct functioning, but we will investigate possibilities when the meter arrives. Likewise, we proposed to outsource the measurements of Organic Carbon and Hydrogen to a commercial laboratory, which we have been doing, and which Puro's technical team viewed as a viable solution.</p>	
Documentation provided by CO2 removal supplier	
Verifier assessment	Date: 27/11/2024
<p>The PD has acknowledged gaps and provided partial solutions, including scale calibration, planned SOP development, and monitoring enhancements. However, field reports prior to January 2024 and additional equipment certification remain incomplete. Finding remains open.</p>	
CO2 removal supplier response	Date: 20/11/2024
<p>Our scales were always calibrated even before the audit, we did this ourselves using deadweights, however, after the site visit, we had our scales calibrated and certified by a third party (Metroil). Likewise, following the observation on temperature measurements during pyrolysis runs, we had our thermometer repaired, calibrated and certified by Metroil. We added photographic evidence of the thermometer being used to the manual (attachment 1). Moreover, the SOP stresses the need to record the temperature during reactor operation.</p>	
Documentation provided by CO2 removal supplier	

Verifier assessment		Date: 27/11/2024
<p>While the CO2 removal supplier has made significant efforts to improve data reliability and monitoring consistency, some aspects of CAR ID 03 remain unresolved due to incomplete historical data and pending certification of newly implemented monitoring practices. The verifier acknowledges the proactive steps taken and the improvements implemented, but the CAR remains open with a recommendation for continued development and verification of the newly established procedures and monitoring systems. FAR 01 has been raised.</p>		

CAR ID	04	Section no.	NA	Date: 19/11/2024
Description of CAR				
<p>Inline with section 4.1 to 4.5 of Methodology The CORC calculations lack consistent documentation across components, with incomplete reporting for Estored, Ebiomass, Eproduction, and Euse. Specific gaps include detailed emissions quantification for each stage, transparent presentation of values, and clear references for emission factors used. Each component requires explicit values, formula applications, inline with standardized methodology to ensure accurate and traceable reporting.</p> <p>Following observations needs clarification:</p> <ol style="list-style-type: none"> 1. Some values are embedded in formulas and not transparent; recommendation to make all parameters explicit for traceability. 2. Emission factors are mostly documented, but specific fuel factors and unit details need to be explicitly referenced in the report. 3. Euse is not fully covered due to cradle-to-gate limitation; cradle-to-grave LCA boundaries needed to capture all end-use emissions. 				

CO2 removal supplier response		Date: 20/11/2024
<p>The Excel Spreadsheet with the LCA calcs, the LCA report and the CORC report summary have been updated to address the comments raised here: 1) All values of all parameters have been made explicit for traceability. 2) Emission factors for consumption of grid electricity and diesel have been explicitly referenced in the report as well as the source of these emission factors. 3) Given that the biochar produced at the facility is mixed in a mineral matrix before transport, the life cycle emissions are covered from cradle to gate; this have been explained in the report numerous times.</p>		

Documentation provided by CO2 removal supplier

Verifier assessment		Date: 27/11/2024
<p>Updates to the CORC report now provide explicit values, emission factors, and traceability. The PD clarified cradle-to-gate LCA boundaries due to biochar's on-site mixing. Finding closed.</p>		

10.3 Forward Action request

FAR ID	01	Section no.	NA	Date: 29/12/2024
Description of FAR				
<p>The forward action request for NIR ID 05 and CAR ID 03 the continued refinement and full implementation of the drafted biochar production manual, comprehensive training for the production team, and maintaining detailed records of these processes. A follow-up verification is scheduled within the next year to monitor</p>				

adherence and effectiveness, with an emphasis on continuous improvement based on operational feedback.

FAR ID	02	Section no.	NA	Date: 29/12/2024
Description of FAR				
The forward action request for NIR ID 06 includes expanding LCA boundaries to cradle-to-grave, enhancing detail in CORC calculations, particularly for end-use emissions, and maintaining updated and transparent documentation				

FAR ID	03	Section no.	NA	Date: 29/12/2024
Description of FAR				
The forward action request for NIR ID 07 includes formalizing and documenting all safety protocols, implementing regular safety training, developing a comprehensive emergency response plan, and submitting these documents for verification. Additionally, the project developer should update the facility’s registration to reflect its operational scope and ensure compliance with local regulations. Continuous monitoring and updates to safety practices are also recommended to maintain compliance and safeguard employee welfare.				

FAR ID	04	Section no.	NA	Date: 29/12/2024
Description of FAR				
Documented grievance mechanism with clear resolution procedures and timelines. Enhance ongoing public awareness campaigns about the benefits of biochar, ensuring active stakeholder feedback integration must be established. All informed consent interactions, particularly concerning land use and biomass sourcing, must be thoroughly documented and accessible. Schedule regular stakeholder engagement meetings to ensuring continuous communication and feedback incorporation with records should be done. Implementation of monitoring of these engagements and the effectiveness of the grievance process to align with methodology standard must be done.				

11. Photographic Proofs Taken during site visit

PRODUCTION ON SITE VISIT 28.10.24 (By Catalina Quiroz)



Biomass feed to the reactor



Reactor made from steel material mostly with alls of the reactor covered by of normal bricks

Ceiling of the reactor



Reactor from the top a hot air outlet pipe



Biomass



Auxiliar equipment: water pump



Charging the biomass



Feeding during the operation



Operation: closing the door



The bottom of the reactor is sealed with grave



Lateral view of the reactor



Accommodating and moving biomass load during production



Cooling the charge



Cooling the charge with a water hose to advance the test.



Open the reactor to cool it



The door made to improve and speed up warming



Biochar Extraction from kiln



The biochar drying area is placed spaced apart, the Lurin climate helps accelerate drying



Finished product stock



Space for the use of the Municipality for Value of the organic solid waste-



Biochar application





Auxiliar equipment; hammer mill



Auxiliar equipment; mechanical sieve