Preliminary Assessment Public Summary

This *Preliminary Assessment Public Summary*, prepared by Puro.earth, contains general information about the CO_2 Removal Supplier and its project, as evaluated at the time of the Preliminary Assessment (PA). It also includes a *Non-Technical Project Summary* and a *Criteria Assessment Report* detailing: i) key criteria assessed and their associated outcomes, ii) Puro's comments, and iii) evidence provided by the CO_2 Removal Supplier.

The *PA Public Summary* serves as a transparent communication tool, enabling potential investors, buyers, and stakeholders to quickly understand the supplier's carbon removal capabilities and assessment status.

The supplier has also received an extended *Preliminary Assessment Report*. This confidential document offers in-depth insights, including specific remarks and actionable recommendations to guide the supplier's progression through the certification journey.

1. Supplier and Project Information*

CO_2 Removal Supplier	
Company name	ecoX, LLC
Company address	900 W FM 1885, Weatherford TX 76088, United States
Business ID	99-4402938
KYC status	11/31/2024
CO_2 Removal Project	
Methodology	**Biochar, Edition 2022, Version 3**
Production Facility name	ecoX-1
Facility registration date	11/05/2024
Production Facility ID	310689
Production Facility location	Farm Hamburg 75, Otjiwarongo 12001, Namibia
Host Country of removal	Namibia
Has this facility been registered in another registry?	☒No ☐Yes, additional information:
Preliminary Assessment Details	
Date of assessment	09/07/2025
Status of assessment	Draft
Conclusion of assessment	Passed

2. Non-Technical Project Summary**

Project Evergreen, operated by ecoX in Kalkfeld, Namibia, leverages encroacher bush biomass to produce biochar for durable carbon sequestration. The project repurposes existing pyrolysis infrastructure to convert invasive bush, typically cleared via open burning, into a stable carbon sink, while simultaneously enhancing soil health and restoring degraded savanna ecosystems.

Operating within a hub-and-spoke model, feedstock is sourced from over 17,000 hectares of ecoX-managed land and processed within 7 km of harvest sites, minimizing transport emissions. The facility uses a EURO KILN CK-3 and adheres to robust MRV protocols, ensuring traceability and verifiability of every tonne of biochar produced and applied.

The project is financially additional, with CORC revenue enabling operations in a high-unemployment region lacking viable alternatives for land management. It also delivers co-benefits including local employment, FSC-certified harvesting practices, and community-driven development programs. Evergreen exemplifies a scalable, low-emissions approach to nature-based carbon removal in sub-Saharan Africa.

*The definition of CO_2 Removal Supplier and Production Facility can be found in the Puro Standard.
**Filled by the Supplier. Between 150-200 words

3. Criteria Assessment Report

Reminder: Sub-criteria either concern the Production Facility's technical eligibility or its maturity and quality. There are three types of sub-criteria:

- **Required to be passed:** These correspond to the core criteria related to the eligibility of a Production Facility. Suppliers must meet these criteria, as they may otherwise be impossible or costly to change at a later stage of the certification journey.
- **Required to be assessed**: These criteria are important for evaluation but do not necessarily determine pass or fail at this stage, as it is understood that the suppliers may be at different stages of development.
- **Not required:** These criteria are optional at this stage. They may provide additional information about the project maturity but are not essential for passing the preliminary assessment.

For a facility to be considered eligible for listing, all the sub-criteria that condition eligibility must be met (i.e. passed or assessed). If one of those sub-criteria is not met, the facility in its current state of development is not eligible for listing.

Disclaimer: The assessment has been made against the criteria in the current version of the methodology. Puro.earth relied on the CO_2 Removal Supplier for the correctness of the provided information during the time of the preliminary assessment and will make no representation as to the accuracy or completeness of this report. The CO_2 Removal Supplier must undergo a third-party audit before issuing CO_2 Removal Credits (CORCs). **Passing the preliminary assessment does not guarantee a success in the third-party audit.**

Overall evaluation: Preliminary Assessment is **passed**.

Important Notice Regarding Biochar Methodology Update: This Preliminary Assessment has been conducted against Edition 2022, but to some extent, reflected some important changes in the updated Biochar Methodology – Edition 2025.

Table 1. Criteria and sub-criteria assessment by Puro based on the documents submitted.

ID	Criteria / Sub-criteria	Outcome	Comment	Evidence reviewed	Requirement for listing	Purpose of criteria
C1	**Planned biomass feedstock(s) is(are) eligible**	**Passed**			*Passed if required sub-criteria are met*	
C1.1	*Biomass feedstocks are identified and compatible with EBC positive list*	Passed	Identified biomass feedstocks are invasive encroacher bush in Namibia. Feedstocks include 16 different species, and are compatible with category So-04 (Biomass from nature conservation) of the EBC/WBC Positive List of Feedstocks.	[ecoX] Biomass Types and Origins List – BCH.xlsx	Required to be passed	Technical eligibility

c1.2	*Biomass feedstock sustainability and chain-of-custody can be demonstrated, if applicable*	Passed	The supplier has identified feedstock sources exclusively from FSC-certified farms across its 17,000+ hectares of owned land. During year one, ecoX has partnered with an FSC-certified farm for biomass sourcing operations before transitioning to direct internal management. Traceability is expected from the start of feedstock procurement for the CO_2 removal activity; however, comprehensive record-keeping will be necessary for the Audit.	[ecoX] Project Description v1.0.docx; [ecoX] Biomass Types and Origins List – BCH.xlsx; [ecoX] Permitting and Operational Structure Between ecoX and [redacted]CC.docx	Required to be passed	Technical eligibility
c1.3	*Bioenergy leakage related to feedstock use is minimal*	Assessed	According to the supplier, encroacher bush—an invasive species—covers over 45 million hectares in Namibia. The supplier's biochar reactor was previously used to produce charcoal for export to European markets, utilizing only a negligible fraction of the available biomass from this invasive species. The risk of bioenergy leakage would arise if biomass became scarce, potentially diverting resources from other uses. However, given the vast abundance of encroacher bush in Namibia, this risk is considered minimal. *Bioenergy leakage risks may require further re-assessment under the forthcoming Biochar Methodology – Edition 2025.*	[ecoX] Project Description v1.0.docx; [ecoX] Biomass Types and Origins List – BCH.xlsx; [ecoX] Baseline and Additionality Questionnaire v1.9.docx	Required to be assessed	Technical eligibility
c1.4	*Land use change related to feedstock use is minimal*	Assessed	The selected feedstocks and their sources are deemed to have minimal to no effects on land use change, supported by FSC-certified harvesting practices and the use of valid permits for harvesting invasive species.	[ecoX] Biomass Types and Origins List – BCH.xlsx	Required to be assessed	Technical eligibility
c1.5	*Sourcing of biomass is secured (e.g. letters of intent, contracts)*	Assessed	An agreement between EcoX and an FSC-certified farm on EcoX's own land has been provided for the first year, securing biomass. . As the biomass originates from land owned and controlled by EcoX, long-term sourcing is expected to remain secured.	[ecoX] Project Description v1.0.docx; [ecoX] Biomass Types and Origins List – BCH.xlsx; [ecoX] Permitting and Operational Structure Between ecoX and [redacted] Farming CC.docx	Not required	Maturity & Quality
c2	**Planned biochar production equipment is technically sound**	**Passed**			*Passed if required sub-criteria are met*	
c2.1	*Several options of reactor design have been identified*	Passed	The supplier has selected the CK-3 EURO kiln, a retort-based pyrolysis reactor operating in a batch/semi-continuous mode. The system features two chambers that alternate functions—one chamber dries the biomass while the other conducts pyrolysis to convert the biomass into biochar. The kiln has been modified to better manage excess energy generated during the process. These design enhancements allow for more efficient combustion of pyrolysis gases, improving thermal regulation and reducing emissions.	[ecoX] Biochar production equipment questionnaire.xlsx	Required to be passed	Technical eligibility

c2.2	*Reactor design has been decided, contracted, or purchased*	Assessed	Reactor design has already been purchased, as the supplier repurposed the equipment for the EverGreen project. It has been operational under this project since February 2025.	[ecoX] Biochar production equipment questionnaire.xlsx	Required to be assessed	Maturity & Quality
c2.3	*Reactor design is vetted, regarding production of biochar with H/C ratio below 0.7*	Passed	Pyrolysis temperatures are expected to be between 250–500°C. The equipment and feedstocks selected are deemed possible to produce biochar with an H/C below 0.7, which will need to be confirmed by laboratory analysis.	[ecoX] Biochar production equipment questionnaire.xlsx	Required to be passed	Technical eligibility
c2.4	*Reactor design is vetted, regarding risk for CH_4 emissions*	Passed	Combustion occurs at 550–800°C with a residence time of 1.5–4 seconds, followed by secondary combustion in the afterburner at 800–1,000°C to fully oxidize pyrolysis gases. Emission control features include a deflector-equipped chimney, a water lock with a liquid level sensor, and manually controlled combustion supported by thermocouples for temperature monitoring. Butterfly valves and airflow controls enhance turbulence and combustion efficiency. If operated according to specifications, the risk of CH_4 emissions is anticipated to be minimal. Although CH_4 emissions testing is not required, it is encouraged for the audit.	[ecoX] Biochar production equipment questionnaire.xlsx; [ecoX] General Process Flow Diagram.pdf; [ecoX] Kiln Operating Principle.jpg; [ecoX] Quantified PFD.pdf	Required to be passed	Technical eligibility
c2.5	*Reactor design is vetted, regarding air pollutant emissions in line with local regulation*	Passed	• No bio-oil condensation occurs in the system. The afterburner operates at 800°C to 1,000°C, with a supply control mechanism ensuring complete combustion of pyrolysis gases and the full breakdown of pollutants such as carbon monoxide and hydrocarbons. • The supplier will monitor air and water emissions during biochar production to ensure environmental compliance. Specifically, key pollutants (SOx, NOx, PM, VOCs) will be measured through a third-party emissions test conducted once at startup. • The supplier reported that the equipment is compliant with Namibia's Environmental Management Act No. 7 of 2007, the key environmental regulation governing industrial emissions to air, water, and soil. Under this regulation, an Environmental Clearance Certificate (ECC) is required but has not yet been submitted for this project.	[ecoX] Biochar production equipment questionnaire.xlsx; [ecoX] Comprehensive Monitoring, Reporting, and Verification (MRV) Plan.docx; [ecoX] Quantified PFD.pdf	Required to be passed	Technical eligibility
c2.6	*Facility design is vetted, regarding disposal of waste streams, including any liquid streams (wastewater, oil, tars)*	Passed	The equipment is designed to operate without generating wastewater or condensing bio-oil, though small amounts of oil and tar are produced during reactor cleaning. Minor ash content is also produced during normal operations. Additionally, liquid waste from is collected the water locks—mainly a mix of condensed pyrolysis vapors and water used for pressure stabilization— containing wood	[ecoX] Biochar production equipment questionnaire.xlsx; [ecoX] Mass and energy balance of production process.xlsx; [ecoX] Process Flow Diagram.pdf; [ecoX]	Required to be passed	Technical eligibility

			vinegar (pyroligneous acid), tar, water. These streams have been properly identified and quantified, with the supplier providing sufficient information on their end-use or disposal.	Kiln Operating Principle.jpg; [ecoX] Quantified PFD.pdf		
c2.7	*Facility is co-producing bioenergy (e.g. heat, power) for internal use*	Assessed	During pyrolysis, the kiln generates pyrolysis gases that are redirected and burned in the combustion chamber to sustain the process, recycling thermal energy and improving overall efficiency.	[ecoX] Biochar production equipment questionnaire.xlsx; [ecoX] Mass and energy balance of production process.xlsx	Required to be assessed	Maturity & Quality
c2.8	*Facility is co-producing bioenergy (e.g. heat, power, fuel) for external use*	Assessed	The supplier is not planning to recover energy for external use.	[ecoX] Biochar production equipment questionnaire.xlsx; [ecoX] Mass and energy balance of production process.xlsx; [ecoX] Baseline and Additionality Questionnaire v1.9.docx	Required to be assessed	Maturity & Quality
c3	**Biochar planned end-use(s) is(are) eligible**	**Passed**			*Passed if required sub-criteria are met*	
c3.1	*Biochar end-uses are eligible*	Passed	The primary end use of the biochar will be as a soil amendment applied directly to grassland areas cleared of encroacher bush. In some cases, the biochar may be pre-treated—such as by inoculating it with beneficial microbes or nutrients—before application.	[ecoX] Project Description v1.0.docx; [ecoX] Evidence Submission for Facility Audit - Biochar Use and CO_2 Removal Claims.docx	Required to be passed	Technical eligibility
c3.2	*Plans of biochar end-uses are tangible*	Assessed	The biochar will not be sold or externally distributed; instead, it will be applied directly—at no cost—to grassland areas cleared of encroacher bush. This application is intended to support the rehabilitation of native perennial grasses and, ultimately, the restoration of ecological balance and the reintroduction of critically endangered species. The planned end-use appears realistic; however, it must be substantiated with detailed documentation—beyond general evidence such as photographs—including records of application dates, locations, and quantities applied, for the Audit.	[ecoX] Project Description v1.0.docx; [ecoX] Evidence Submission for Facility Audit - Biochar Use and CO_2 Removal Claims.docx; [ecoX] Comprehensive Monitoring, Reporting, and Verification (MRV) Plan.docx	Required to be assessed	Maturity & Quality
c3.3	*Biochar environmental quality thresholds are known for the identified end-uses*	Assessed	Environmental quality thresholds for the intended end-uses have not yet been shared. These thresholds must be demonstrated during Audit.	[ecoX] Evidence Submission for Facility Audit - Biochar Use and CO_2 Removal Claims.docx	Required to be assessed	Maturity & Quality
c4	**Additionality is demonstrated**	**Passed**			*Passed if required sub-criteria are met*	

c4.1	*Carbon storage additionality to baseline*	Passed	Encroacher bush—an invasive species—is typically managed through open burning, harvesting followed by natural decomposition, or chemical herbicide application. Only a negligible share was previously used by the supplier for charcoal production. None of these scenarios result in anthropogenic or natural carbon storage; thus, the project is deemed additional to the baseline.	[ecoX] Project Description v1.0.docx; [ecoX] Baseline and Additionality Questionnaire v1.9.docx	Required to be passed	Technical eligibility
c4.2	*Financial additionality of facility*	Passed	The supplier provided a cash flow model indicating that carbon removal credits will be the only source of income for the project—the biochar will initially be applied back to Namibian grasslands on their own property for free. A sensitivity analysis was conducted to test the robustness of this conclusion. Even if the supplier were to sell biochar, carbon credits would be necessary for the profitable running of the project and the payback of the initial investment.	[ecoX] Baseline and Additionality Questionnaire v1.9.docx; CONFIDENTIAL 20250414 ecoX Financial Model.xlsx	Required to be passed	Technical eligibility
c4.3	*Regulatory additionality*	Passed	The project is not required by existing laws, regulations, or other binding obligations in Namibia.	[ecoX] Baseline and Additionality Questionnaire v1.9.docx	Required to be passed	Technical eligibility
c4.4	*Production equipment is newly built (i.e. not an existing facility or a retrofit of existing facility)*	Assessed	The supplier declared that the production equipment was manufactured in 2016 and since then used for producing charcoal intended for export to the European market. It has been repurposed since February 2025 and has only been operational for biochar production since.	[ecoX] Baseline and Additionality Questionnaire v1.9.docx	Required to be assessed	Maturity & Quality
c5	**Facility has monitoring, reporting, and LCA capabilities or tangible plans**	**Passed**			*Passed if required sub-criteria are met*	
c5.1	*Protocol for biomass and biochar record keeping is prepared*	Assessed	A protocol for monitoring and data collection has not yet been prepared. However, the supplier intends to partner with Offstream, an MRV provider, to implement a comprehensive tracking system covering the full life cycle of the biochar — from feedstock sourcing to final soil application. A preliminary MRV plan has been outlined, highlighting key features for tracking biomass feedstock, monitoring biochar production, and documenting the end use of the biochar.	[ecoX] Comprehensive Monitoring, Reporting, and Verification (MRV) Plan.pdf	Required to be assessed	Maturity & Quality
c5.2	*Protocol for dry mass determination of biochar is prepared*	Assessed	A protocol to quantify the dry mass of the biochar has not been prepared yet. However, the preliminary MRV plan indicates when the biochar will be weighed and how frequently samples will be taken to determine moisture content. This plan must be further refined and turned into actual protocol, i.e. with step-by-step operating procedures that can be followed.	[ecoX] Comprehensive Monitoring, Reporting, and Verification (MRV) Plan.pdf	Required to be assessed	Maturity & Quality

c5.3	*Protocol for biochar sampling and laboratory analysis is prepared (permanence and environmental quality)*	Assessed	The MRV plan includes a preliminary list of parameters for biochar sampling and laboratory analysis — such as organic carbon content and hydrogen content — along with initial indications of how composite samples will be prepared (e.g., for each batch). This plan must be further refined and developed into actual protocol.	[ecoX] Comprehensive Monitoring, Reporting, and Verification (MRV) Plan.pdf	Required to be assessed	Maturity & Quality
c5.4	*Monitoring and reporting plan of facility emissions is prepared*	Assessed	The MRV plan includes monitoring of pyrolysis temperature and residence time, as well as high-level guidelines for tracking pollution emissions. It needs to be expanded to include a more comprehensive evaluation of the biochar project's supply chain emissions before being converted into more precise operating procedures.	[ecoX] Comprehensive Monitoring, Reporting, and Verification (MRV) Plan.pdf	Required to be assessed	Maturity & Quality
c5.5	*An LCA model specific to the facility's operation is prepared*	Assessed	An LCA model was provided, with a supporting spreadsheet model (using Puro's template), illustrating that LCA modelling has started. The LCA mode has adequate type of emission factors, and a mostly complete inventory modelling.	ecoX Puro Facility Audit LCA_April 2025.xslx	Not required	Maturity & Quality
c6	**Facility has likely co-benefits and positive SDG impacts**	**Passed**			*Passed if required sub-criteria are met*	
c6.1	*Facility-specific co-benefits have been identified*	Assessed	The supplier work with local communities to develop benefit plans aligned with their priorities, including land access for retired farm workers to boost income. The project also enhances soil health and supports the regeneration of native grasses—Blue Buffalo, Bushman, and Stipagrostis—contributing to ecosystem restoration and the reintroduction of endangered species like the black rhino and cheetah.	[ecoX] Project Description v1.0.docx; [ecoX] Evidence Submission for Facility Audit - Biochar Use and CO_2 Removal Claims.docx; [ecoX] Executive Summary.docx	Required to be assessed	Maturity & Quality
c6.2	*Facility-specific SDG targets or indicators have been identified*	Assessed	The supplier has declared that they intend on being certified as contributors to SDG 7 – Increase in renewable energy.	[ecoX] Project Description v1.0.docx; [ecoX] SDG Reporting v1.1.docx	Required to be assessed	Maturity & Quality
c7	**Facility team has access to relevant knowledge and skills**	**Passed**			*Passed if required sub-criteria are met*	
c7.1	*Relating to biomass sourcing, handling, processing*	Assessed	The Project Manager & Co-founder has 10+ years of experience in biomass value chains, carbon project development, and international carbon markets.	[ecoX] Executive Summary.docx	Not required	Maturity & Quality
c7.2	*Relating to thermochemical processes*	Assessed	The Site Manager has nine years of hands-on experience managing retort operations, indicating strong expertise in thermochemical conversion and production oversight.		Not required	Maturity & Quality

c7.3	*Relating to biochar use*	Assessed	While direct experience with biochar application is not explicitly stated, the team's combined background in production and carbon markets suggests familiarity with its uses and market integration.		Not required	Maturity & Quality
c7.4	*Relating to monitoring and carbon accounting*	Assessed	The Project Manager's involvement in carbon project development and international carbon markets, along with the Team & Compliance Administrator's six years in compliance and administration, provide a solid foundation for monitoring, reporting, and carbon accounting activities.		Not required	Maturity & Quality
c8	**Environmental and social safeguards**	**Passed**			*Passed if required sub-criteria are met*	
c8.1	*Stakeholder consultations have been planned or conducted*	Assessed	Stakeholder consultations were conducted with local landowners and community representatives (including members of the local Trust), Directors of Namibia Resource Consultants (NRC), nearby landholders and residents, and employees of the supplier's partner. Plans for continued dialogue are outlined, with a focus on engaging residents in the immediate vicinity and encouraging feedback through accessible channels.	[ecoX] Puro Environmental and Social Safeguards.docx	Required to be assessed	Maturity & Quality
c8.2	*Regulation applicable to facility has been identified*	Assessed	The supplier has identified all relevant Namibian regulations governing the biochar facility, including those from local municipalities, regional authorities, and key bodies such as the Ministry of Agriculture, Water, and Land Reform; the Ministry of Environment, Forestry and Tourism; the Ministry of Labor; the Charcoal Association of Namibia; and the Namibian Biomass Industry Group.	[ecoX] Puro Environmental and Social Safeguards.docx	Required to be assessed	Maturity & Quality
c8.3	*Procedures to acquire relevant permits have been identified, started, or completed*	Assessed	Harvesting permits were required for this project, which the supplier submitted. Additionally, they acknowledged that under Namibia's Environmental Management Act No. 7 of 2007, projects with potential significant environmental impacts must obtain an ECC. To date, the ECC for this project has not been submitted.	[ecoX] Project Description v1.0,docx; [ecoX] Puro Environmental and Social Safeguards.docx; [ecoX] Harvesting Permit 1/2.pdf	Required to be assessed	Maturity & Quality