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	Enable Earth Co., Ltd.
Company address	65/127 Wireless Road, Patumwan, Bangkok 10330, Thailand
Business ID	0105567162439
KYC status	Completed (2024-11-15)
CO_2 Removal Project	
Methodology	**Biochar, Edition 2022, Version 3**
Production Facility name	Enable Earth Co., Ltd. (managed by Accend AS, acting as project developer)
Facility registration date	2024-08-29
Production Facility ID	423775
Production Facility location	Wiang Pa Pao, Chiang Rai, Thailand
Host Country of removal	Thailand
Has this facility been registered in another registry?	☒No ☐Yes, additional information:
Assessment Details	
Date of assessment	2025-01-28
Status of assessment	Final
Conclusion of assessment	Passed

2. Non-Technical Project Summary

Enable Earth is launching a pioneering biochar production project in Wiang Pa Pao, Chiang Rai, Thailand, to tackle air pollution and improve soil health. The project focuses on converting leftover corn plant residues—usually burned in fields, worsening air pollution—into biochar, a material that enhances soil fertility while capturing carbon. Using specialized pyrolysis technology, the project aims to produce biochar efficiently, selecting Earth Systems' equipment for initial operations. The biochar will be mixed with compost and distributed to local farmers to improve crop yields and reduce reliance on chemical fertilizers. The initiative is expected to remove and store carbon dioxide (CO_2), with each ton of biochar offsetting around 1.8 tons of CO_2. Since the biochar market in Thailand is still developing, the project relies on selling carbon credits through the Puro.Earth platform to sustain operations. Beyond environmental benefits, the project aligns with global sustainability goals by creating jobs, reducing air pollution-related health risks, and promoting sustainable agriculture. Enable Earth is working closely with local communities, government agencies, and researchers to ensure long-term success. Once proven, the model could expand to other provinces and neighbouring countries, scaling its positive impact on climate and agriculture.

3. Criteria Assessment Report

Reminder: Criteria/Sub-criteria assess either the *technical eligibility* of the facility or its *maturity and quality*, determining whether the facility qualifies for CO_2 Removal Certificates (CORCs) and evaluating its development stage and operational quality. There are three types of sub-criteria:

- **Required to be Passed**: These core criteria are crucial for determining the Supplier's facility eligibility as they may be otherwise impossible or costly to change at a later stage. For example, if the supplier is at a such an early stage of development that the *capture technology is not yet identified*, the PA won't be able to provide useful insights regarding the facility's eligibility.

- **Required to be Assessed**: These criteria are important for evaluation, but they do not necessarily determine whether the facility will pass or fail at this stage. Suppliers may be at different stages of development, and some criteria (e.g., demonstrating the necessary permits) may not yet be fully met. In such cases, disclosing the status of permit acquisition is sufficient.

- **Not Required**: These criteria are optional and do not impact the facility's eligibility for listing at this stage. They may provide additional context or information about the facility's maturity but are not essential for passing the preliminary evaluation.

For a facility to be considered eligible for listing, all the sub-criteria that condition eligibility must be met (i.e. passed or assessed), as specified in Table 1. **If any of these critical sub-criteria are not met, the facility will not be eligible for listing in its current development stage.**

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 PA 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 PA does not guarantee a success in the third-party audit.**

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

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

ID	Criteria / Sub-Criteria	Outcome	Comment	Evidence Received	Required to be Listed	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**	Corn residues (stalks, leaves, small cobs) are used as biomass feedstock, and are compatible with category Ag-05 (residues from agriculture) of the EBC/WBC Positive List of Feedstock.	Enable - Biomass types and origins list (7).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 within a 10-km radius of the facility site. However, the biomass feedstock traceability remains to be demonstrated. • For this type of feedstock, proof of sustainability is not applicable/required.	Enable - Biomass supply (2).xlsx; Enable - Records of biomass used (3).docx	Required to be passed	Technical eligibility
c1.3	*Bioenergy leakage related to feedstock use is minimal*	**Assessed**	Corn residues are typically left and burned in-field. The supplier has not identified alternative uses for corn residues that could entail energy production in the local context. Hence, bioenergy leakage is deemed minimal.	Enable - Biomass types and origins list (7).xlsx ; Enable - Puro additionality questions to suppliers v1.8 (9 Nov 24)(signed).pdf	Required to be assessed	Technical eligibility
c1.4	*Land use change related to feedstock use is minimal*	**Assessed**	The feedstocks selected and their sourcing approach are deemed to have minimal to no effects on land use change.	Enable - Biomass types and origins list (7).xlsx	Required to be assessed	Technical eligibility
c1.5	*Sourcing of biomass is secured (e.g. letters of intent, contracts)*	**Assessed**	Specific feedstock sources have been identified, but no information was provided on whether the sourcing has been secured yet.	No information provided.	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**	After evaluating three potential technology providers, the Charmaker CPP500 from Earth System was selected for this project.	Enable Earth_Draft PDD_6 Nov24.pdf; Puro - Biochar production equipment questionnaire (Dec 24).xlsx	Required to be passed	Technical eligibility
c2.2	*Reactor design has been decided, contracted, or purchased*	**Assessed**	The Charmaker CPP500 reactor has been ordered and will be installed in 2025.	Enable Earth_Draft PDD_6 Nov24.pdf; Puro - Biochar production equipment questionnaire (Dec 24).xlsx; Earth Systems' technology package	Required to be assessed	Maturity & Quality
c2.3	*Reactor design is vetted, regarding production of biochar with H/C ratio below 0.7*	**Passed**	The reactor is expected to produce biochar of sufficient quality to meet the threshold H/C_{org} ratio of 0.7, considering the feedstock and the targeted operating conditions (temperature, residence time).	Puro - Biochar production equipment questionnaire (Dec 24).xlsx	Required to be passed	Technical eligibility
c2.4	*Reactor design is vetted, regarding risk for CH_4 emissions*	**Passed**	If operated according to its specification, the reactor is expected to have negligible CH_4 emissions, as demonstrated by measurements performed by the manufacturer on a similar reactor.	Puro - Biochar production equipment questionnaire (Dec 24).xlsx; ; Earth Systems' technology package; 08_StackEmissionsReport.pdf	Required to be passed	Technical eligibility

c2.5	*Reactor design is vetted, regarding air pollutant emissions in line with local regulation*	**Passed**	Enable Earth is aware of the applicable local regulation, the Thai Factory Act B.E. 2535 (1992). If operated according to its specification, the pyrolysis process is expected to be able to meet the Thai regulation for air pollutant emissions, as demonstrated by measurements performed by the manufacturer on a similar reactor. Compliance will need to be demonstrated on-site prior to Audit.	Puro - Biochar production equipment questionnaire (Dec 24).xlsx; ; Earth Systems' technology package; 08_StackEmissionsReport.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 reactor is expected to combust all excess syngas in the thermal oxidizer, preventing pyrolysis oil and tar formation, and not to produce wastewater. The facility is deemed to generate minimal waste, with only trace ash accumulating in the kiln-oxidizer connecting duct. This ash can be discarded as waste or repurposed as a pH-enriching compost. This will have to be verified during the Audit.	Puro - Biochar production equipment questionnaire (Dec 24).xlsx; statement regarding waste products.docx; Mass and energy balance of production process.xlsx	Required to be passed	Technical eligibility
c2.7	*Facility is co-producing bioenergy (e.g. heat, power) for internal use*	**Assessed**	Thermal energy generated from the combustion of pyrolysis gases is used to sustain the pyrolysis process and to dry feedstock.	Puro - Biochar production equipment questionnaire (Dec 24).xlsx	Required to be assessed	Maturity & Quality
c2.8	*Facility is co-producing bioenergy (e.g. heat, power, fuel) for external use*	**Assessed**	Enable Earth has currently no plans to produce bioenergy for external uses, although the reactor considered can be upgraded to accommodate for energy recovery.	Puro - Biochar production equipment questionnaire (Dec 24).xlsx	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**	Biochar will be used as a soil-amendment on farmland in Thailand.	Enable - Evidence that planned end-uses are eligible and real (2) (1).docx	Required to be passed	Technical eligibility
c3.2	*Plans of biochar end-uses are tangible*	**Assessed**	Pilot plots for biochar application are planned, with the support of local universities, organizations, and technology startups. These pilot demonstrations aim to create awareness among local farmers about biochar's benefits, and ultimately establish a market for biochar.	Enable - Evidence that planned end-uses are eligible and real (2) (1).docx; Enable - Evidence that planned end-uses are eligible and real (30 Oct 24)(clean).docx	Required to be assessed	Maturity & Quality

			However, evidence demonstrating that these end-use plans are tangible remains to be provided.			
c3.3	*Biochar environmental quality thresholds are known for the identified end-uses*	**Assessed**	• The supplier has identified biochar environmental quality thresholds in Thailand, (Thai National Environment Board's Soil Quality Standards). Monitoring procedures have been outlined but require further details. • Enable Earth has conducted analyses on corn residues-based biochar produced with one of the identified reactors. Because PAH measurements exceed maximum acceptable values, design changes were implemented. Once a reactor design is selected, further quality analyses will be required and must be conducted regularly during operations.	Notification of the National Environmental Board - Soil Quality Standard - 11 March 2021[97].pdf; Enable - Biochar sampling protocol (markup) (17 Sept 24).docx; PB-2024-10-29-345639 (official).pdf; PAH Reduction Process Report.pdf;	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**	Without the project, there would be no carbon removal as the straw is left in-field and burnt.	Enable - Puro additionality questions to suppliers v1.8 (9 Nov 24)(signed).pdf	Required to be passed	Technical eligibility
c4.2	*Financial additionality of facility*	**Passed**	The supplier has demonstrated with a cash flow model that the biochar project is financially additional. Carbon removal credits (in the form of credit offtake agreements) will be the main source of incomes for this project—biochar itself does not have an established market value in Thailand, therefore biochar sales will only represent a small portion of the project's revenues.	Enable - Puro additionality questions to suppliers v1.8 (9 Nov 24)(signed).pdf; Enable - Financial Feasibility (confidential)(9 Nov 24).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	Enable - Puro additionality questions to suppliers v1.8 (9 Nov 24)(signed).pdf	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 pyrolysis equipment was used in a commercial trial over a limited time span, 6 - 8 weeks in 2024 and will be fully refurbished for the project.	Puro - Biochar production equipment questionnaire (Dec 24).xlsx	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**	Enable Earth has provided a plan to monitor and report its day-to-day biochar production. The plan needs to be converted into more precise operating procedures.	Enable - Biochar sampling protocol (markup) (17 Sept 24).docx	Required to be assessed	Maturity & Quality
C5.2	*Protocol for dry mass determination of biochar is prepared*	**Assessed**	Protocol for dry mass determination of biochar has not been prepared yet, but is known by the supplier to be required.	Enable - Biochar sampling protocol (markup) (17 Sept 24).docx	Required to be assessed	Maturity & Quality
C5.3	*Protocol for biochar sampling and laboratory analysis is prepared (permanence and environmental quality)*	**Assessed**	Protocol for biochar sampling and laboratory analysis has been prepared. The supplier will follow Biochar Quality Standards and Certification Programs, e.g. IBI Certification Program, EBC Guidelines. As part of the protocol, specific procedures will be refined during the project's implementation.	Enable - Biochar sampling protocol (markup) (17 Sept 24).docx	Required to be assessed	Maturity & Quality
C5.4	*Monitoring and reporting plan of facility emissions is prepared*	**Assessed**	A monitoring and reporting plan has been drafted. 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.	Enable - Biochar sampling protocol (markup) (17 Sept 24).docx	Required to be assessed	Maturity & Quality
C5.5	*An LCA model specific to the facility's operation is prepared*	**Assessed**	A preliminary LCA model was provided, with a supporting spreadsheet model, illustrating that LCA modelling has started. At this stage, project emissions have been estimated, with a high level of detail and are in-line with methodology requirements.	LCA_Enable Earth_Prelim v0.9 (1).xlsx; Emission factors Enable Earth (2).pptx; Enable - Information regarding packaging, storage (3).docx	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**	Multiple facility-specific potential co-benefits have been identified: i) biochar combined with compost is intended to be used as an alternative to other fertilizer in animal feed corn cultivation, ii) producing biochar from corn residues, rather than	Enable Earth_Draft PDD_6 Nov24; Enable - Puro SDG Report Template (8).docx	Required to be assessed	Maturity & Quality

			burning them, avoids air pollutant emissions into the atmosphere, ultimately contributing to air quality and health, iii) the project will provide jobs and indirectly supports education of youth in local ethnic groups, and more directly support education of farmers. In the longer term, the supplier also hopes to contribute to restoration of tree cover in the area, via biochar use for land restoration and fruit-tree planting, helping against floods.			
c6.2	*Facility-specific SDG targets or indicators have been identified*	**Assessed**	The potential co-benefits described by the supplier have been linked to various SDG targets (2.4, 4.4, 8.2, 9.4, 11.6, 12.2, and 15.2). However, the plans for monitoring and verification of these co-benefits are at a very early stage of development.	Enable - Puro SDG Report Template (8).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**	EnableEarth's CEO has experience as a venture capitalist in the climate space. No technical or operational expertise relevant for biochar production and use has been demonstrated, likely related to the early stage of the project development. Accend AS, a project developer listed as Puro Partner, acts as the carbon project proponent, managing certification and developing LCA models and other monitoring and reporting procedures.	Enable Earth_Draft PDD_6 Nov24	Not required	Maturity & Quality
c7.2	*Relating to thermochemical processes*	**Assessed**			Not required	Maturity & Quality
c7.3	*Relating to biochar use*	**Assessed**			Not required	Maturity & Quality
c7.4	*Relating to monitoring and carbon accounting*	**Assessed**			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**	Preliminary stakeholder engagement has already been conducted, including local farmers, business, villagers, as well as multiple local NGOs and authorities. EnableEarth is still open to public comment, and awaiting for feedback. Procedures for continued dialogue with stakeholders have not been described yet.	Enable - Stakeholder Engagement Report (3) (1).docx	Required to be assessed	Maturity & Quality

c8.2	*Regulation applicable to facility has been identified*	**Assessed**	The supplier has identified all Thai regulations and permits relevant to the biochar facility's activities. This includes air, water, and soil environmental requirements, as well as preventative mechanisms.	Enable - Environmental permits and studies (4).docx; Enable - Environmental Evaluation Report (signed).pdf	Required to be assessed	Maturity & Quality
c8.3	*Procedures to acquire relevant permits have been identified, started, or completed*	**Assessed**	Factory Permit with local municipality and regional authorities has been identified. In the process of granting this permit, the authority will evaluate many factors, including performing on-site air, water and soil environmental emission testing, emission control systems and procedures. The supplier is not required to conduct an Environmental Impact Assessment.	Enable - Environmental permits and studies (4).docx	Required to be assessed	Maturity & Quality