Preliminary Assessment Public Summary

This is a *Preliminary Assessment Public Summary* prepared by Puro.earth, which contains general information about the CO2 Removal Supplier, a non-technical summary of the project, and a table containing details about the criteria assessed. The CO2 Removal Supplier has received an extended Preliminary Assessment Report that includes additional remarks and recommendations for the continuation of the certification journey.

1. Supplier and project information

CO_2 Removal Supplier	
Company name	Renergi Pty Ltd
Company address	71 Brushwood Brook Drive, Yallingup, WA 6282, Australia
Business ID	ACN: 160 694 388
KYC status	Completed 2022-03-15
CO_2 Removal Project	
Methodology	**Biochar, Edition 2022, Version 3**
Production Facility name	Renergi Pyrolysis Plant in Collie
Facility registration date	15/03/2022
Production Facility ID	931538
Production Facility location	Lot 500, Gibbs Road, Collie, WA 6225, Australia
Host Country of removal	Australia
Has this facility been registered in another registry?	☒No ☐Yes, additional information:
Assessment details	
Date of assessment	2024-07-24
Status of assessment	Final
Conclusion of assessment	Passed

2. Non-technical project summary

Renergi Pty Ltd has developed a suite of proprietary bioenergy technologies, aiming to achieve a negative-emission bio-based circular economy using a wide variety of wastes. In this project, Renergi has built its first commercial scale pyrolysis plant in Collie, Western Australia, using its own patented grinding pyrolysis technology integrated with its own patented indirect drying technology. The plant will convert biomass and/or municipal wastes into biochar, bio-oil and wood vinegar. Biochar will be used as a soil conditioner or as a construction material, resulting in permanent sequestration of carbon. Bio-oil will be used as a renewable liquid fuel or chemical, replacing fossil fuels. Bio-oil may also be used in the future as a feedstock for the production of drop-in biofuels, chemicals and biocarbon materials. Wood vinegar will be used as a renewable organic fertiliser. The sale of biochar-derived carbon credits will greatly help Renergi to deploy this modern pyrolysis technology in many parts of Australia and globally, achieving a large scale of carbon removals.

Between 150-200 words (written by the supplier)

The definition of CO_2 Removal Supplier and Production Facility can be found in the Puro Standard.

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**.

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	Facility intends to process 3 types of biomass feedstocks: wood residues from forest or tree plantations, and municipal organic waste (assumed sorted before pyrolysis).	Biomass types and origins list.xlsx	Required to be passed	Technical eligibility
C1.2	*Biomass feedstock sustainability and chain-of-custody can be demonstrated, if applicable*	Passed	Plans to demonstrate the sustainability of the feedstock sourced from forest and tree plantations are made in accordance with the methodology, relying on forest management regulations and other land and biodiversity conservation regulations, as applicable in Western Australia.	Biomass types and origins list.xlsx	Required to be passed	Technical eligibility
C1.3	*Bioenergy leakage related to feedstock use is minimal*	Assessed	The wood residues can also be used as a fuel or input into compost, but the pyrolysis process is also generating useful co-products.	Biomass as a feedstock - Puro additionality questions to suppliers v1.8.pdf	Required to be assessed	Technical eligibility

ID	Criteria / Sub-criteria	Outcome	Comment	Evidence reviewed	Requirement for listing	Purpose of criteria
c1.4	*Land use change related to feedstock use is minimal*	Assessed	The wood residues and organic waste are not primary drivers of land use, hence, land use change is deemed minimal.	Biomass types and origins list.xlsx	Required to be assessed	Technical eligibility
c1.5	*Sourcing of biomass is secured (e.g. letters of intent, contracts)*	Assessed	For woody biomass, a draft contract (dated 2024) between a prospective biomass provider and the CO_2 Removal supplier was shared, illustrating plans of contractual arrangements to ensure the quality and quantity of biomass delivered. For waste, a signed contract (dated 2021) ensuring sourcing of waste for commissioning and testing of the facility was provided. Biomass sourcing is however not yet secured per se for commercial operations, but some providers are identified.	c1.5-1 Stridem-Renergi Biomass Waste Supply Agreement.pdf c1.5-2 Shire-Renergi Agreement on Interim Waste Processing Fee.pdf	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	This is the first commercial deployment of Renergi's custom designed pyrolysis plant and has been built using its own proprietary grinding pyrolysis technology integrated with its own proprietary drying technology.	Plant description (Environmental Compliance Report).pdf Biochar production equipment questionnaire.xlsx	Required to be passed	Technical eligibility
c2.2	*Reactor design has been decided, contracted, or purchased*	Assessed	Reactor has already been manufactured since 2023.and is being commissioned.	Plant description (Environmental Compliance Report).pdf 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	No laboratory results were provided; however, based on the declared pyrolysis temperature (400-500°C) and the feedstocks considered (wood, organic municipal waste), it is deemed feasible to achieve H/C ratio below 0.7.	Plant description (Environmental Compliance Report).pdf Biochar production equipment questionnaire.xlsx	Required to be passed	Technical eligibility
c2.4	*Reactor design is vetted, regarding risk for CH_4 emissions*	Passed	The reactor is designed to only combust non-condensable syngas. The combustion system passed Puro's vetting, based on a technical questionnaire supported by evidence.	Plant description (Environmental Compliance Report).pdf Biochar production equipment questionnaire.xlsx	Required to be passed	Technical eligibility
c2.5	*Reactor design is vetted, regarding air pollutant emissions in line with local regulation*	Passed	The reactor is designed to only combust non-condensable syngas. The condensation systems contribute to cleaning the syngas prior to combustion. NOx reducing equipment is installed and used if necessary. Local authority (Western Australia) has placed emission limits for this type of facility, and the facility will need to monitor SO_2, NOx, CO, Total Organic Carbon (TOC), Particulates, HCl, HF, Cd, Tl, Hg, Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Dioxins and Furans, either continuously or regularly sampled for analysis. Results are not yet available.	Plant description (Environmental Compliance Report).pdf Biochar production equipment questionnaire.xlsx Environmental Evaluation Report.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	Liquid by-products (bio-oil and wood vinegar) will be generated. Bio-oil is planned to be sold as a renewable fuel. Wood vinegar is planned to be sold for use in agriculture or for environmental purposes. In case those co-products are not possible to sell, the project may not have yet planned other	Biochar production equipment questionnaire.xlsx Environmental Evaluation Report.pdf	Required to be passed	Technical eligibility

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			disposal options. Other waste streams are deemed minimal, but remain unquantified.			
c2.7	*Facility is co-producing bioenergy (e.g. heat, power) for internal use*	Assessed	Non-condensable gases will be burned to generate the heat for pyrolysis and drying.	Biochar production equipment questionnaire.xlsx	Required to be assessed	Maturity & Quality
c2.8	*Facility is co-producing bioenergy (e.g. heat, power, fuel) for external use*	Assessed	The facility will not produce directly bioenergy for external use, but bio-oil and wood vinegar are planned to be sold in bioenergy and biomaterial applications.	Biochar production equipment questionnaire.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	Planned end-uses include retail and corporate garden markets and broadscale agricultural soil improvement. All are eligible.	Evidence for planned use of biochar - Partial list of contacts.xlsx Summary answer on biochar end use.pdf	Required to be passed	Technical eligibility
c3.2	*Plans of biochar end-uses are tangible*	Assessed	Partial list of contacts indicates contact has been made and there are options for the sale of biochar	Evidence for planned use of biochar - Partial list of contacts.xlsx	Required to be assessed	Maturity & Quality
c3.3	*Biochar environmental quality thresholds are known for the identified end-uses*	Assessed	No information available		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	The alternative scenarios presented would not lead to permanent carbon storage	Biomass as a feedstock - Puro additionality questions to suppliers v1.8.pdf Municipal Organic Waste as a feedstock - Puro additionality questions to suppliers v1.8.pdf	Required to be passed	Technical eligibility
c4.2	*Financial additionality of facility*	Passed	Financial additionality seems to be achievable, with CORC revenues necessary to get a positive IRR, despite government funding received in the past. However, certain elements of the financial model need to be clarified (additional costs).	Collie Project Financial Model.xlsx	Required to be passed	Technical eligibility
c4.3	*Regulatory additionality*	Passed	No requirement to produce biochar from the identified feedstocks.	Biomass as a feedstock - Puro additionality questions to suppliers v1.8.pdf Municipal Organic Waste as a feedstock - Puro additionality questions to suppliers v1.8.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 facility has been constructed but is waiting to be commissioned	Plant description (Environmental Compliance Report).pdf	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 preliminary plan was provided, including most necessary aspects. It could be refined with procedures to keep records of biomass sustainability evidence, for woody feedstocks. The plan still needs to be converted into actual operating procedures.	Summary answer on MRV Procedures.pdf	Required to be assessed	Maturity & Quality

ID	Criteria / Sub-criteria	Outcome	Comment	Evidence reviewed	Requirement for listing	Purpose of criteria
c5.2	*Protocol for dry mass determination of biochar is prepared*	Assessed	A preliminary plan was provided, including all necessary aspects. The plan still needs to be converted into actual operating procedures.	Summary answer on MRV Procedures.pdf	Required to be assessed	Maturity & Quality
c5.3	*Protocol for biochar sampling and laboratory analysis is prepared (permanence and environmental quality)*	Assessed	A preliminary plan was provided, including all necessary aspects. The plan still needs to be converted into actual operating procedures.	Summary answer on MRV Procedures.pdf	Required to be assessed	Maturity & Quality
c5.4	*Monitoring and reporting plan of facility emissions is prepared*	Assessed	A preliminary plan was provided, including all necessary aspects. The plan still needs to be converted into actual operating procedures.	Summary answer on MRV Procedures.pdf Table 3 Summary Answers to Questions for Preliminary Assessment	Required to be assessed	Maturity & Quality
c5.5	*An LCA model specific to the facility's operation is prepared*	Assessed	LCA Reports and Calculation files were provided, using the Puro template, with adequate type of emission factors, and a mostly complete inventory modelling.	Revised Renergi - Biochar LCA - Using Biomass as Feedstock.zip Revised Renergi Puro Report - using MOW as Feedstock	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 has identified positive impacts in promoting sustainable agricultural practices, especially in Australia's carbon-deficient soils.	c6.1 Facility-specific co-benefits.pdf	Required to be assessed	Maturity & Quality
c6.2	*Facility-specific SDG targets or indicators have been identified*	Assessed	Multiple relevant SDG targets were identified, and specifically linked to the project activity, within SDG 7, SDG 9, SDG 11, SDG 12, SDG 15, and SDG 13.	c6.2 Facility-specific SDG targets.pdf	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	Via partners supplying the biomass.	Table 3 Summary Answers to Questions for Preliminary Assessment.pdf	Not required	Maturity & Quality
c7.2	*Relating to thermochemical processes*	assessed	Supplier team has academic and industrial experience in the field.	CV - Chun-Zhu Li.pdf CV-Richard Gunawan.pdf Table 3 Summary Answers to Questions for Preliminary Assessment.pdf	Not required	Maturity & Quality
c7.3	*Relating to biochar use*	Assessed	Supplier team has academic experience in the field.		Not required	Maturity & Quality
c7.4	*Relating to monitoring and carbon accounting*	Assessed	Supplier team has academic experience and demonstrated capacity to produce LCA model and monitoring plans for this facility.		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 have been conducted in 2021. They may need to be updated prior to audit.	Community Consultation.pdf Stakeholder Engagement Report.pdf	Required to be assessed	Maturity & Quality
c8.2	*Regulation applicable to facility has been identified*	Assessed	Applicable regulations are known by the supplier.	W6620 Renergi Collie Pyrolysis Plant amend_Conditions.pdf	Required to be assessed	Maturity & Quality
c8.3	*Procedures to acquire relevant permits have been identified, started, or completed*	Assessed	Permitting procedures are known. Some procedures have been completed, other remain to be completed during commissioning.	W6620 Renergi Collie Pyrolysis Plant amend_Conditions.pdf	Required to be assessed	Maturity & Quality