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. 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	Tapovanam Organic Farming Systems Private Limited
Company address	1394, 2nd floor, 21st main, HSR Layout , Sector-1 Bangalore 560102 India
Business ID	U46209KA2023PTC176267
KYC status	Completed
CO_2 Removal Project	
Methodology	**Biochar, Edition 2022, Version 3**
Production Facility name	Tapovanam Biochar - Prakruthi
Facility registration date	03 June 2024
Production Facility ID	330469
Production Facility location	Adivi Bollaram Hamlet - Golla Gudem GP jurisdiction Nalgonda 508205 India
Host Country of removal	India
Has this facility been registered in another registry?	☒No ☐Yes, additional information:
Preliminary Assessment Details	
Date of assessment	06 November 2025
Status of assessment	Completed
Conclusion of assessment	**Passed**

2. Non-Technical Project Summary*

Tapovanam Biochar – Prakruthi is a climate-positive initiative that transforms crop residues, primarily cotton stalks, into biochar — a stable form of carbon that can be stored safely in soil for centuries. The project tackles the widespread challenge of residue burning by turning agricultural waste into a valuable product that enriches soil, enhances water retention, and improves long-term farm productivity. Our biochar is produced through a clean and energy-efficient pyrolysis process, where the gases released are reused to power the system itself, minimizing emissions. The resulting biochar is further developed into a biofertilizer that supports regenerative agriculture and reduces dependence on chemical inputs. Beyond removing carbon from the atmosphere, Prakruthi contributes to rural livelihoods by creating a new income stream for farmers and promoting circular economy practices. The project reflects Tapovanam's vision to build sustainable, low-carbon farming systems while contributing meaningfully to global carbon removal and soil restoration goals.

*Filled by the Supplier. Between 150-200 words

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.**

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	The supplier has identified cotton stalk as the biomass feedstock. It is compatible with category Ag-05 (agricultural residues) as listed in the EBC/WBC Positive List of Feedstocks.	Filled Biomass types and origins.docx	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 multiple local feedstock sources in the Nalgonda District, Telangana State, India, through a partnership with Kattangur Farmers Producers Company Limited, the biomass supplier. While certification is not required for this feedstock type, it	Filled Biomass types and origins.docx	Required to be passed	Technical eligibility

			must still be sourced using sustainable, legal, and safe working practices. Comprehensive record-keeping will be required for the audit.			
c1.3	*Bioenergy leakage related to feedstock use is minimal*	Assessed	The supplier has not identified alternative uses for cotton stalks that could entail energy production in the local context. Hence, bioenergy leakage is deemed minimal.	Filled Biomass types and origins.docx	Required to be assessed	Technical eligibility
c1.4	*Land use change related to feedstock use is minimal*	Assessed	The selected feedstock and its sourcing approach are deemed to have minimal to no effects on land use change.	Filled Biomass types and origins.docx	Required to be assessed	Technical eligibility
c1.5	*Sourcing of biomass is secured (e.g. letters of intent, contracts)*	Assessed	The sourcing of cotton stalks has been secured through a Letter of Intent from Kattangur Farmers Producers Company Limited, confirming its commitment to facilitate and coordinate the collection of cotton stalks from farmers in the vicinity of the facility.	LOI with FPO Kattangur.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	The supplier has selected a custom-designed rotary-kiln reactor to operate in continuous mode. The reactor has been engineered to process up to 12 tons of agricultural feedstock per day.	Filled Biochar production equipment questionnaire.xlsx	Required to be passed	Technical eligibility
c2.2	*Reactor design has been decided, contracted, or purchased*	Assessed	The supplier has signed a formal agreement with the manufacturer for the design, fabrication, and installation of the pyrolysis equipment.	Filled Biochar production equipment questionnaire.xlsx; Filled Puro additionality questions to suppliers v1.9.pdf	Required to be assessed	Maturity & Quality
c2.3	*Reactor design is vetted, regarding production of biochar with molar H/C_{org} ratio below 0.7*	Passed	Pyrolysis temperatures are expected to be between 600-650°C, with residence time of 20-30 minutes depending on the feedstock type and size, and intended end-use type. Laboratory analyses of biochar produced using the manufacturer's pilot reactor indicate that the selected equipment can achieve an H/C ratio below 0.7. For the audit, test results from the operational facility must be provided.	Filled Biochar production equipment questionnaire.xlsx; Test report – Biochar.pdf	Required to be passed	Technical eligibility
c2.4	*Reactor design is vetted, regarding risk for CH_4 emissions*	Passed	• The reactor is designed to combust only non-condensable syngas, which is first redirected to a shared condensation system. Approximately 50–60% of this syngas is then recirculated for combustion, at expected temperatures of 700–750 °C with a residence time of 1–3 seconds across three combustion chambers. Turbulence in the chambers is created through the use of pre-heated air and a centrifugal blower, with air injection manually controlled. When operated according to specifications, the risk of CH_4 emissions from the combustion chambers is expected to be minimal. • The remaining syngas is directed to a generator that supplies power to the facility. Information provided around the design of the generator suggests efficient fuel combustion.	Filled Biochar Production Equipment Questionnaire.xlsx; Filled Mass and energy balance of production process.xlsx; Integrated Process Summary_ Biochar Production and Syngas Utilization via Genset.pdf; Annexe-System Design.pdf; Genset Photos	Required to be passed	Technical eligibility

			• Finally, the reactor is equipped with a single safety flare, intended solely for emergency use, and therefore expected to operate for less than 1% of the reactor's total running time. • The supplier is also committed to conducting CH_4 emissions measurements prior to facility audit at all flue gas outlets.			
c2.5	*Reactor design is vetted, regarding air pollutant emissions in line with local regulation*	Passed	• The supplier is in the process of obtaining an Industry Categorization certificate for the facility, which is a prerequisite for identifying the relevant permits and emission limits under India's Central Pollution Control Board (CPCB) regulations and National Ambient Air Quality Standards (NAAQS). • This said, the supplier has identified the pollutants that will be subject to monitoring under both CPCB and NAAQS for varying industry categorization, and exemplified preliminary compliance for a subset of air pollutants (PM, SO_2, NO_x, CO), in line with CPCB limits for power plant and diesel generators. • Currently, the reactor's condensation system helps clean the syngas prior to combustion by removing particulates, tars, and condensable hydrocarbons. According to specifications, a portion of the cleaned flue gas then passes through a venturi scrubber before being released into the atmosphere. The remaining portion is filtered using sawdust and cotton filters before being supplied to the generator and is then also released into the atmosphere. • The supplier is committed to conducting the air emission tests and implementing continuous monitoring systems, prior to Facility Audit, upon receiving a categorization decision from the local authorities.	Filled Project Description v1.01.docx; Filled Environmental Evaluation Report.docx; Filled Biochar Production Equipment Questionnaire.xlsx; Integrated Process Summary_ Biochar Production and Syngas Utilization via Genset.pdf; Applicable Laws-Clarification.pdf; 1434-Tapovanam TEST 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	• The pyrolysis process produces tar/oil that is condensed and stored for sale as industrial fuel. Management measures include on-site storage, an end-use plan, and laboratory testing confirming suitability for furnace oil through blending (to be provided for the Audit). Alternative disposal methods are in place if the oil cannot be sold. • Weekly reactor cleaning generates wastewater and small amounts of tars and oils, managed through drainage control, spill containment, and collection in designated containers for transfer to authorized hazardous waste facilities. • Minor solid wastes (ash, biochar dust) are tested for use in trial plots; if unsuitable, they are disposed of via an authorized local waste management provider.	Filled Project Description v1.01.docx; Filled Environmental Evaluation Report.docx; Filled Biochar Production Equipment Questionnaire.xlsx; Integrated Process Summary_ Biochar Production and Syngas Utilization via Genset.pdf	Required to be passed	Technical eligibility

c2.7	*Facility is co-producing bioenergy (e.g. heat, power) for internal use*	Assessed	Syngas produced during pyrolysis is partially used to sustain the pyrolysis reaction, with the surplus routed to a gas engine to generate electricity for the pyrolysis unit and associated utilities. Efforts are underway to replace LNG with syngas for ignition, aiming to make the entire pyrolysis system energy self-sufficient.	Filled Biochar production equipment questionnaire.xlsx; Filled Puro additionality questions to suppliers v1.9.pdf	Required to be assessed	Maturity & Quality
c2.8	*Facility is co-producing bioenergy (e.g. heat, power, fuel) for external use*	Assessed	The condensed tar/oil is intended for use as industrial fuel or in other bioenergy applications. If the oil cannot be sold, alternative disposal methods include using it as a soil amendment under controlled conditions or upgrading it to wood vinegar, which can then be used as a bio-pesticide.	Filled Biochar production equipment questionnaire.xlsx; Filled Puro additionality questions to suppliers v1.9.pdf; Integrated Process Summary_ Biochar Production and Syngas Utilization via Genset.pdf	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 biochar will be used as a soil amendment on local agricultural land and sold as a compost mix. This intended end-use is eligible.	Filled Project Description v1.01.docx; MRV Description for Puro Customers.docx; Filled Puro additionality questions to suppliers v1.9.pdf	Required to be passed	Technical eligibility
c3.2	*Plans of biochar end-uses are tangible*	Assessed	The supplier intends on selling biochar as a compost mix. No information was provided on how the biochar-compost compound will be distributed to end-users.	Filled Project Description v1.01.docx; MRV Description for Puro Customers.docx; Filled Puro additionality questions to suppliers v1.9.pdf	Required to be assessed	Maturity & Quality
c3.3	*Biochar environmental quality thresholds are known for the identified end-uses*	Assessed	The supplier is aware of international standards such as the European Biochar Certification (EBC) and the International Biochar Initiative (IBI); however, the environmental quality thresholds for the intended end-use has not yet been provided. Biochar must meet the applicable thresholds for its intended end-use prior to the audit.	Filled Project Description v1.01.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	Without the project, biomass would be burnt in-field to clear the land for the next planting season. Therefore, the carbon storage is deemed additional to the baseline.	Filled Project Description v1.01.docx; Filled Puro additionality questions to suppliers v1.9.pdf	Required to be passed	Technical eligibility
c4.2	*Financial additionality of facility*	Passed	The supplier has demonstrated with a cash flow model (and a sensitivity analysis) that the production of biochar without CORC revenue is unviable. Despite the sale of biochar as a soil amendment and of bio-oil from the facility, the sale of CORCs is integral to the	Filled Puro additionality questions to suppliers v1.9.pdf; Tapovanam Biochar - 12 TPD.xlsx	Required to be passed	Technical eligibility

			profitable running of the project and the payback of the initial investment.			
c4.3	*Regulatory additionality*	Passed	The project is not required by any existing law, regulations, or other binding obligations in India.	Filled Puro additionality questions to suppliers v1.9.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 equipment will be newly built.	Filled Puro additionality questions to suppliers v1.9.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	The supplier plans to partner with Cula Technologies GmbH, a digital MRV provider, recognized as an official LCA partner by Puro.earth, to implement a comprehensive tracking system that covers the entire life cycle of the biochar carbon removal activity—from biomass sourcing to biochar application. A preliminary MRV plan has been developed, outlining key data points such as location, weight, moisture content, and volume.	MRV Description for Puro Customers.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 yet prepared.	MRV Description for Puro Customers.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 not been yet prepared.	MRV Description for Puro Customers.docx	Required to be assessed	Maturity & Quality
c5.4	*Monitoring and reporting plan of facility emissions is prepared*	Assessed	A preliminary MRV plan has been prepared, identifying all stages of the biochar carbon removal activity and providing a high-level outline of key monitoring parameters for tracking and quantifying emissions. Calculations will be based on actual production data, emission factors used in the life-cycle assessment or from environmental impact databases, and biochar characteristics reported in laboratory analyses.	MRV Description for Puro Customers.docx	Required to be assessed	Maturity & Quality
c5.5	*An LCA model specific to the facility's operation is prepared*	Assessed	A preliminary LCA report was prepared by Cula Technologies GmbH, a digital MRV provider recognized as an official LCA partner by Puro.earth. While project emissions have not yet been estimated, high-level activity boundaries have been defined, along with preliminary estimates of key monitoring parameters. These are expected to align with the Methodology requirements; however, further refinement is still needed.	MRV Description for Puro Customers.docx; LCA - Prakruthi - Tapovanam Biochar.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 co-benefits have been identified: enhanced soil health, fertility, microbial activity, water retention, and nutrient efficiency, resulting in increased crop yields; reduced dependence on chemical fertilizers, cutting input costs for farmers; lowers local air pollution by eliminating the need for open burning of agricultural residues; and promotion of a circular economy generating rural employment, directly benefiting farmers in Telangana.	Facility_Specific_CoBenefits_and_SDGs.docx; Filled Project Description v1.01.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 2 – Zero Hunger, SDG 7 – Affordable and Clean Energy, SDG 8 – Decent Work and Economic Growth, SDG 12 – Responsible Consumption and Production, and SDG 13 – Climate Action.	Facility_Specific_CoBenefits_and_SDGs.docx; Filled Project Description v1.01.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	No specific information was provided and therefore a formal assessment was not conducted. However, the supplier plans to partner with Cula Technologies GmbH—a digital MRV provider recognized as an official LCA partner by Puro.earth—for the development of the digital MRV and LCA model. In addition, the supplier has signed a formal agreement with a technology partner, for the design, fabrication, and installation of the pyrolysis plant.	Filled Project Description v1.01.docx; Filled Puro additionality questions to suppliers v1.9.pdf; MRV Description for Puro Customers.docx	Not required	Maturity & Quality
c7.2	*Relating to thermochemical processes*				Not required	Maturity & Quality
c7.3	*Relating to biochar use*				Not required	Maturity & Quality
c7.4	*Relating to monitoring and carbon accounting*				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	Consultations have been conducted to engage relevant stakeholders, including local farmers, community members, village leaders, and farmer producer organizations. A grievance mechanism will be established, and a community liaison officer will be appointed to ensure continuous dialogue. This will include quarterly community meetings held in villages and regular farm visits conducted by a dedicated field outreach team.	Filled Puro Stakeholder Engagement Report.docx	Required to be assessed	Maturity & Quality
c8.2	*Regulation applicable to facility has been identified*	Assessed	The supplier has identified permitting needs for its facility from the local municipality and regional authorities, as well as declared to comply with regulations related to air, water, and soil pollutant emissions. However, it remains unclear whether on-site environmental monitoring or emission testing is conducted, or if such monitoring is mandated.	Filled Project Description v1.01.docx	Required to be assessed	Maturity & Quality

c8.3	*Procedures to acquire relevant permits have been identified, started, or completed*	Assessed	The supplier has stated that, at the regional level, the Factory License, Land Use and Building Plan Approval, and Fire & Safety No Objection Certificate (NOC) have been obtained from the Telangana State Government. At the national level, the supplier has applied for industrial categorization from India's Central Pollution Control Board. Once the facility is classified, the necessary environmental permits will be obtained accordingly.	Filled Project Description v1.01.docx	Required to be assessed	Maturity & Quality