Baseline and Additionality Assessment

The baseline and additionality assessment is a requirement for eligibility under the Puro Standard. The assessment is made by the CO_2 Removal Supplier and verified by the independent 3rd party auditor. The assessment made in this document will be publicly available in the Puro Registry.

The Puro Standard only certifies durable carbon removals from the atmosphere that are net-negative and does not certify emissions reductions or avoidance. The CORCs (Carbon dioxide removal certificates), issued therefore represent a net carbon removal (1 tCO2eq. net) from the atmosphere to a durable storage of minimum 100 years, from which are subtracted any supply-chain emissions from the project, any re-emissions over the guaranteed storage time, and any baseline removals taking place in a baseline scenarios.

The CO_2 Removal Supplier must in this assessment:

- **Define** and quantify all reasonable **baseline alternatives** to the proposed project activity to remove carbon with carbon financing. A baseline is a scenario that reasonably represents the natural and anthropogenic carbon removals to a permanent storage (storage durability over 100 years) in the absence of the carbon removal activity proposed by the CO_2 Removal Supplier. Although anthropogenic emissions may take place in the baseline scenarios, these emissions do not constitute a reference point for the quantification of CORCs (only the baseline removals do).
- Demonstrate **carbon additionality to the baseline**, meaning that the project must convincingly demonstrate that it is resulting to higher volumes of carbon removals than the likely baseline alternatives (question A1.).
- Demonstrate **regulatory additionality,** meaning that the project is not required by existing laws, regulations, or other binding obligations (question A2.).
- Demonstrate **financial additionality**, meaning that the CO_2 removals achieved are a result of carbon finance and that the project activity would not be economically viable without the carbon finance. The project activity can have substantial other non-carbon income sources, if the carbon finance through CORCs is significant for the economic viability of the project. To demonstrate financial additionality, CO_2 removal Supplier must provide the responses in this form and must be able to provide full project financials for verification.

Reference documents: Puro Standard general Rules v3.0, rule 2.1.3 and Additionality Assessment requirements

Activity name	Activity description	Removals to storage (100+ yr) due to project activity (human activity)	Natural removals to storage (100+ yr), not man-made
Baseline: *two types of biomass feedstock involved:* 1) municipal green waste with final disposition in either formal or informal landfill (Fig. 1), and 2) coffee parchment processed by Inkan Negro (Fig. 2) would be combusted or sent to landfill in the baseline	*Municipal green waste with final disposition in landfill will either be buried and therefore decompose in an anoxic environment liberating methane or will be burnt in an open fire with other waste (batteries, nail polish etc), also missing the opportunity to sequester the carbon stored within.* *A percentage of the coffee parchment is sent to artisanal brick makers to be used as fuel, but as large gas projects are developed offshore the larger brick makers are moving to gas because using gas allows for high levels of control, lowers labour costs, etc. So, more and more parchment is destined for land fill as time passes.*	None	None
Project activity: *Inkan Negro Biochar*	Both streams of waste biomass are being pyrolyzed to produce a soil amendment that: 1) increases the use efficiency of conventional fertilizers. 2) decreases the uptake of heavy metal contaminants (remediation) 3) reduces the requirement for water in crop plants. 4) Sequesters carbon.	100+ tonnes of CO_2 eq per annum with potential to increase as the market for biochar grows.	*none*
Alternative scenarios	*Composting is another potential waste management solution for these streams of waste biomass however due to the high lignin content of both compost production would require a significant amount of time, increasing costs and also increasing the probability of methane emissions. A percentage of green waste in Lima is now being gasified to produce electricity, this however produces no negative emissions.*	None	None

Figure 1: informal landfill on the southern fringe of the capital Lima:

Figure 2: coffee parchment being delivered to Inkan Negro:

A1. Does the project lead to higher volumes of carbon removal than the baseline?	Yes / No
Before the project started both waste streams were a source of greenhouse gas emissions, see: https://link.springer.com/article/10.1007/s11104-021-05159-6	Yes

A2. Is the project required by existing laws, regulations, or other binding obligations?	Yes / No
Biochar is not required by law. However, during the UN funded Biochar 4 Sustainable Soils (B4SS) Project, we successfully lobbied the Peruvian Government to include biochar in its then new law for management of solid waste, which was Gazetted in 2016.	No

A3. Is the project first-of-its-kind?	Yes / No
Particularly in Latin America.	Yes

A4. Is the project dependent on carbon finance?	Yes / No
In Latin America, biochar remains a fringe activity, mostly small scale and research orientated. With the exception of a small number of early adopters, there have been few farmers willing to transition away from the chemical fertilisers. Certification of biochar carbon credits is also new. Our growth and survival as a nascent enterprise has been heavily reliant on the fact that the	Yes

Director, Ladd, also works as a distinguished researcher at a local University which has allowed him to raise over 560K US in biochar research funding which has gone into product development, i.e. testing biochar formulations, developing production technology etc (Fig. 3) Figure 3: Biochar research funding granted (2013-2023).	

A5. Does the project need a large investment to achieve carbon removal ?	Yes / No
The project did need large investment, achieved via the grants depicted in Fig. 3 above to survive in the early stages, also we reinvested the utility from sales revenue. However, at this moment, the business is well capitalised in terms of plant and equipment, able to maintain current levels of biochar production, and even grow a little. Carbon Removal Finance is needed so that we can subsidize the cost of biochar to the farmer. In Latin America, convincing farmers to transition from chemical fertiliser to biochar will require a clear price signal. Carbon Removal Finance could also help us to up-scale production, both because it would provide us with financial resources and also because it would send a clear signal to investors and/or money lenders.	no

A6. If investment is needed, is/was carbon finance considered when the investment decision is/was made?	Yes / No
Yes, it was, however this wasn't the only potential pathway that we explored for inflating the biochar vision in Latin America. For example, with the UN-funded B4SS Project, we experimented extensively with different biochar production technologies and formulations, the latter so that we could potentially reduce required application rates in turn increasing the economic feasibility of farmers transitioning away from chemical fertiliser to biochar. Another research focus has been the development of biochar formulations that limit crop uptake of heavy metals. Due to new EU (and Californian) regulation which place stricter limits on cadmium content in agricultural products, exports of Peruvian crops (e.g., cacao and avocado) have been heavily affected. Therefore, a key focus for us has been to demonstrate the potential for biochar to mitigate this problem: Thomas, E., Atkinson, R., Zavaleta, D., Rodriguez, C., Lastra, S., Yovera, F., ... & Ladd, B. (2023). The distribution of cadmium in soil and cacao beans in Peru. Science of the Total Environment, 881, 163372. Thomas E., Borchard, N., Sarmiento, C., Atkinson, R., & Ladd, B. (2020) Key factors determining biochar sorption capacity for metal contaminants: a literature synthesis. Biochar, 2:151–163,	Yes

https://doi.org/10.1007/s42773-020-00053-3.	

Some projects may demonstrate additionality through simple cost analysis: this is applicable for projects where ex-ante investment analysis is not applicable, because a large investment is not needed. Example of such project could be charcoal producers starting to produce biochar for soil applications using existing equipment with minor adaptations.

Financial Additionality – large investment is not needed (Answer to A5 is "no")	Project response
Please describe adaptations needed and the related cost items and include evidence in attachment.	The biochar production technology was purpose built to produce biochar from municipal green waste. As the LCA we commissioned demonstrates, every tonne of biochar produced with the oven generates around 2 tonnes of negative emissions of CO_2, depending on the transport distance to the point of application. There are however further innovations that we would like to continue developing to further improve the performance of the oven, increase the efficiency with which heat energy can be extracted, modifications to optimise for feedstocks with different physical and chemical characteristics.
Please summarize the simple cost analysis here and provide additional calculation spreadsheet in attachment. All formulas used in the spreadsheet shall be readable to the verifier and all relevant cells shall be viewable and unprotected. Mark confidential when needed.	As detailed above and in the attached xcel our intention is to use CORC revenue to subsidise biochar to make it competitive with NPK on price. We prefer that the attached xcel is treated as confidential.

I hereby declare that all information provided is truthful and precise to the best of my knowledge.

Recoverable Signature

X

Date, Place: 30/1/24 Signed by: ada648fa-ea9b-4dda-a098-c66f46426318

Representative name, title, organization: Brenton Ladd, Director, Inkan Negro SAC