

Baseline and Additionality Assessment

The baseline and additionality assessment is a requirement for eligibility under the Puro Standard. The assessment is made by the CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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, CO₂ 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)
Baseline: <i>NutShell</i>	<i>Pecan nutshell is a by product of nut kernal production, the nutshell component represents 55% of the total nut production. Nutshell when not diverted as a feedstock for biochar production is used for use as mulch in orchards and/or amenity areas and to the best of our knowledge the primary use is as a feedstock for drying through combustion to generate heat air/water or electricity generation. Nutshell feedstock for combustion is estimated to release 1,119 kg CO2 eq, Nutshell produced Biochar stores 701kg CO2 a benefit of 701kg diverted to carbon storage.</i>	None	Insignificant
Project activity: <i>Pyrocal CCT Biochar Production</i>	Pyrocal CCT core business is the research and development of continuous Biochar production systems for rapid deployment across a range of industries. The core business objective is to provide equipment that efficiently converts waste material to biochar for the removal of carbon. The project in question is an extension of the research and marketing of Pyrocal to have a fully functioning biochar production operation to demonstrate to markets, regulators, customers and the broader industry the capabilities of Pyrocal CCT and be able to test and research alternate feedstocks and refine biochar production systems. The existing project utilises primarily pecan nutshell as a feedstock post kernal removal for the production of biochar, biochar is subsequently used in agricultural and horticultural production systems with a view to expanding the use to land rehabilitation with increasing supply of biochar with the sale and commissioning of additional Pyrocal CCT systems across the world.	Majority – LCA analysis completed in 2021 by Edge Environment estimated that the Net CDR in Biochar of 782-841kg of CO2 per MT of feedstock. Gasification and other CO2 emissions as estimated at 393kg CO2 eq.	None
Alternative scenarios	None to our knowledge.	None	None

A1. Does the project lead to higher volumes of carbon removal than the baseline?	Yes / No
Diversion of nutshell to biochar production results in net CDR of 782-841kg CO2 eq for every tonne of nutshell diverted to biochar production.	Yes

A2. Is the project required by existing laws, regulations, or other binding obligations ?	Yes / No

There are no local regulations that require nutshell to be used as a feedstock for biochar production.	No
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A3. Is the project first-of-its-kind?	Yes / No
Biochar production is not a new technology or process. Production of biochar requires ongoing development of uses for biochar to ensure a viable biochar production operation.	No

A4. Is the project dependent on carbon finance?	Yes / No
<p>Based on the provided financial analysis carbon financing through the trading of CORC's is a key component of biochar production, the investment required to produce biochar would not be supported by sales of biochar only.</p> <p>CORC revenue accounts for approximately 50% of revenue generated based on current values, without this income source the biochar business would not sustain the capital investment and operating costs to produce biochar.</p> <p>A transparent and organised carbon finance market is fundamental to biochar production systems financial sustainability.</p>	Yes

A5. Does the project need a large investment to achieve carbon removal ?	Yes / No
The capital cost to manufacture and set up a Pyrocal CCT production system is a minimum investment of AUD 3M (Commercially Sensitive). The current facility was completed in late 2021. The capacity of such a production line is limited and envisaged that in a large number of waste streams would require multiple production lines would be required to achieve the required volumes to process waste streams to biochar. It is for this reason Pyrocal believes significant investment is required.	Yes

A6. If investment is needed, is/was carbon finance considered when the investment decision is/was made?	Yes / No
Investment in biochar production is reliant on carbon financing, continued operations is subject to continued carbon financing. If carbon financing was not available operations would cease and would revert to a research plant if it was deemed there was a viable business for design and manufacturing of biochar systems. It is the view of the business this would be unlikely as the financial sustainability of any biochar production business would require carbon financing to support capital investment in biochar production.	Yes

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.	
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.	

If large investment is needed, CO2 Removal Suppliers can be guided by the CDM Methodological Tool 27 of the UNFCCC Clean Development Mechanism [“Investment Analysis”](#) to demonstrate financial additionality.

Financial Additionality – large investment is needed (Answer to A5 is “yes”)	Project response																				
Please show your calculations to determine the benchmark rate for either equity IRR or WACC, whichever you are using. Please include documentation of how the rate is suitable for the technology and region.	Based on an initial investment of AUD3M, discount rate of 8%, residual value of 20% the NPV is AUD -0.4M . Full details in the provided worksheet.																				
Please state how CORC revenues change the expected IRR or NPV of the project.	Without CORC revenues based on the same assumptions the NPV is AUD -5.6M .																				
Please conduct a sensitivity analysis in relation to the investment analysis and summarize the results here.	<table border="1"> <thead> <tr> <th>Variable</th> <th>Lower</th> <th>Base</th> <th>Upper</th> </tr> </thead> <tbody> <tr> <td>Biochar</td> <td>600.00</td> <td style="background-color: #d9ead3;">800</td> <td>1000</td> </tr> <tr> <td>CORC</td> <td>150.00</td> <td style="background-color: #d9ead3;">170</td> <td>190</td> </tr> <tr> <td>Input MT/Hr</td> <td>0.75</td> <td style="background-color: #d9ead3;">0.9</td> <td>1.05</td> </tr> </tbody> </table>	Variable	Lower	Base	Upper	Biochar	600.00	800	1000	CORC	150.00	170	190	Input MT/Hr	0.75	0.9	1.05				
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I hereby declare that all information provided is truthful and precise to the best of my knowledge.

X

Date, Place:

Representative name, title, organization