



*December 21, 2023
Climate Action Reserve
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Comments and clarifications related to the U.S. and Canada Biochar Protocol Version 1.0 for Public Comment

First, Grain Ecosystem greatly appreciates the opportunity to submit comments regarding the Climate Action Reserve's U.S. and Canada Biochar Protocol, Version 1.0 draft. This protocol has been anxiously awaited and we truly value the dedication within the Reserve to put forth comprehensive, accurate, and practical carbon removal protocols.

Grain Ecosystem is a pioneering company addressing the climate crisis, specializing in accelerating decarbonization through innovative waste-to-value solutions like biochar. Our unique platform simplifies the process for carbon removal initiatives resulting in certified carbon credits from specific Standards bodies. We offer impactful and verified investment opportunities through a transparent and accessible platform with tools for risk management and profitability calculation. Our mission is to enhance the availability of carbon removal credits by optimizing the development process. Grain Ecosystem streamlines the Voluntary Carbon Market, offering a simplified journey towards decarbonization.

Section 2.2.2 Biochar Production

Please clarify text on page 4 that states biochar "...contains eligible levels of stable carbon." We believe the intent of this statement is that the "eligibility level" is based on the stability of the carbon (i.e. H:C ratio and permanence factor) but could be misinterpreted as there being a minimum amount of carbon required to be eligible.

Section 2.2.3 Biochar Application

We understand from the methodology that there is no timing requirement or limitation for when the biochar can be applied based on its date of production (for instance, biochar produced in 2024 could be stockpiled and then applied in 2027 and the project could still be verified with sufficient evidence and CRTs generated in 2027). In the absence of data that demonstrates that biochar does not decay when stockpiled for extended periods of time (whether in containers or left in the open), we would urge the Reserve to implement a time limit for biochar application (such as, biochar needs to be applied within 18 months after production to remain eligible for crediting) that ensures the carbon within the biochar is sequestered and the permanence factors given in the Protocol are accurate.

Section 2.3 The Project Developer

The Protocol states: "the project developer is assumed to be the end user of the biochar" (page

6). Based on what has been seen in the market to date, we strongly recommend that the Reserve change this statement to be “the project developer is assumed to be the producer of the biochar.” First, the carbon can be assumed to be sequestered at the time of pyrolysis/thermochemical conversion, assuming there is no release of the carbon such as burning. Although the end user of the biochar may be the last entity in custody of the carbon, the biochar producer usually has far greater stake in the project given the high cost of most biochar production facilities. Additionally, not only will it be exceptionally difficult to gather signed contracts from all end users under the current language, but it may undermine development of biochar projects when the biochar producer is not guaranteed or assumed to be the project developer as there is a risk that they will not receive the revenue/ownership of the carbon credits.

Pages 6 and 7 Footnote

As a general comment, it also appears that the link in the footnotes at the end of pages 6 and 7 appears to be incorrect (<https://www.climateactionreserve.org/how/program/documents/>).

Section 3.2 Project Start Date

Regarding the start-up testing described on page 8, we believe it would be beneficial to clarify that biochar produced within the potential 9 months of project initiation is not eligible for credits (crediting only beginning on the project start date), assuming that is the intent. Furthermore, we would like to recommend this period be lengthened to 12 months, given the long construction timelines for equipment (5-7 months, generally) as well as the current unknowns in the industry with how best to scale and make equipment more efficient/effective since few facilities have been producing at scale or for continuous extended periods of time to date. We also believe it would be worth clarifying if there is a limit or threshold on the percentage of total production or production rates referenced as support for being able to claim a start-up period specifically when the business was “not functioning at scale” (page 8).

We would also like to clarify what the start date is for mobile equipment (i.e. pyrolysis or gasification equipment that can be loaded onto a truck and transported to a new location for biochar production) since this date could technically be defined for the equipment itself (first usage after manufacturing) or based on location (first date of biochar production in a new location, after the equipment has been transported).

Section 3.4.1.1 Biomass Acquisition

We would like to clarify if there is any specific requirement or guidance regarding the statement under Waste and By-Product Biomass, point 2: “The project developer must be able to characterize the typical fate of the project feedstocks” (page 9). Does “characterizing” the fate require any supplementary evidence?

Under Purpose-Grown Biomass, point 2: “have minimal or no negative impacts on soil organic carbon over a time scale of several years” we recommend that “several years” be defined with a quantitative value in order for this parameter to be implemented effectively.

Section 3.4.1.2 Biochar Production

First, there appears to be grammatical error on page 10: “...to foster the production and use biochar in ways...” We recommend adding “of” to this sentence (use of biochar).

We would also appreciate if clarification were added to the section on pre-existing facilities spe-

cifically for mobile equipment. For instance, if mobile equipment has been used to create biochar in the past, is it considered a pre-existing facility? What if the owner of the equipment sells or transfers ownership to another buyer, but the original owner did not collect any records of production and the new owner cannot establish production levels prior to their own project start date? If the same piece of mobile equipment is transported to multiple locations, can each location be considered as part of the same project or do they need to be aggregated into a grouped project? Mobile equipment is of increasing interest in locations that have large wildfire risk, where they can transport the equipment to multiple locations with large fuel loads rather than transporting the fuel loads to a singular location.

Section 3.4.3 Ecosystem Services Payment Stacking

The reference on page 12 is incomplete: ".. or "payment stacking," respectively (4)."

Section 3.4.3.2 Payment Stacking

Regarding the mandatory reporting of EQIP payments (Page 13), what if the project is using an intermediary entity and EQIP program payments are not reported directly to the project? Similarly, what if buyers are using the EQIP program but don't report it at the time of purchase of the biochar?

Section 3.4.3.1 Credit Stacking

We would like to ask for explicit clarification if projects are eligible to generate credits if they are generating electricity from their biochar production heat output and selling it back to the grid.

Section 3.5 Permanence

First, we believe there is a grammatical error on page 13: "...based under this protocol..."

Second, we would appreciate clarification if an H:C value of exactly 0.7 is eligible or not.

Section 3.7 Environmental and Social Safeguards

In Table 3.1, please Please clarify "Lack of separation between biochar and pyrolysis gases in reactor and discharge" and how this would be determined (page 15).

Section 4 The GHG Assessment Boundary

We would like to suggest that mobile equipment transportation be included as an SSR within the Project GHG boundary, as transport of large equipment can result in significant fuel emissions.

Section 5.2.1 Calculating Project Emissions

For Equation 5.3 regarding the adjustment factor, there are scenarios where electricity is being generated but it is only used on-site so it is not metered. In this case can it still be estimated and included in the calculation?

Generally, would this approach still apply when the project is producing other by-products that

don't have great BTU value but still have monetary value, such as wood vinegar?

Section 5.2.1.2 Feedstock Transportation Emissions

We would like the Reserve to consider that there are scenarios where feedstock transport doesn't need to be included in project quantification, since it will be the same between baseline and project. For instance, if the biomass is already being transported to another location to be stockpiled, or if it would have been transported to the landfill anyway, then could emissions in the project scenario be excluded?

Additionally, we would appreciate clarification as to why Feedstock Production and Feedstock Transport NOT include AF (adjustment factor for proportional allocation of emissions in co-production settings) but Feedstock processing does? It would seem that these categories would be treated similarly in regards to co-production.

Section 5.2.1.4 Auxiliary Energy Emissions

We suggest adding clarification that if the project is generating its own electricity for use on-site/ for the production equipment, it does not need to be metered or accounted for. Such as, the first sentence of the section could state: "use of grid electricity" (page 26).

Section 5.2.1.5 Thermochemical Conversion Emissions

First, can you clarify when proof is required for Thermochemical Conversion processes that do not recover or combust methane, and what proof is sufficient? For instance, the theory of using air curtain technology is that all gases are recombusted. Is that theory sufficient on its own or is emissions testing data required? If emissions testing data is required, is that based on the specific equipment make/model, or can the testing be completed on that process type generally?

Furthermore, for some technologies this may be considered proprietary information, is there a scenario where a project/technology specific emission factor can be used when it is not published in the tool?

We would also suggest that in Equation 5.8, methane should not be pro-rated based on AF. Since methane has a higher GWP than carbon dioxide, it may not be beneficial in the short term for projects to be sequestering carbon if they are also producing methane at high rates. This would also disincentivize projects from generating electricity with greater emission factors than typical grid processes, and ensure the quantification of the methane associated with biochar is conservative.

Lastly, please clarify in Equation 5.8 if $M_{b,TC}$ is the mass of biochar on a dry or wet weight basis.

Section 5.2.1.6 Biochar Processing Emissions

Does biochar mixing or bagging need to be included in biochar processing emissions?

Section 5.2.2 Calculating Project Removals

We believe it should be clarified that $M_{hist,EU}$ in Equation 5.11 and the term A math problem with numbers

Description automatically generated with medium confidence is only for projects that have been

historically operating prior to start date and the term definition should not say “for the reporting period” (as the historical portion did not have a reporting period).

Section 6.2 Chain of Custody Tracking

Regarding tracking the mass of biochar, we would encourage the Reserve to add guidance regarding the variation in moisture content of the biochar. The mass of biochar will change based on the moisture content and will be adjusted for safe handling. Although sometimes moisture is added directly by the equipment at the end of biochar production, in other cases it may be weighed first and then moisture added manually before being bagged. If biochar is being stored outdoors and rained upon this could also change the moisture content, similarly with open air transportation which would cause the starting mass not to match the final mass at its destination.

Section 6.3 Biochar Sampling and Testing Guidance

We are concerned that the retention sampling requirements are onerous and could create significant barriers to implementation, in service of minimal improvements in accuracy. 6 subsamples per day will add a very large administrative and procedural burden to facilities, especially considering they will have to retain a minimum of 30 samples at a time. Additionally, if sites are operating on a “batch” basis (vs continuously) they would need to gather 6 subsamples in a short period of time, adding complication while not necessarily capturing more of the temporal variability.

We would appreciate if the Reserve could add additional guidance for cases where the project is using a heterogeneous feedstock. For instance, municipal solid waste can have a wide variety within its composition, plus food service or expired food may contain varying individual components. Is additional mixing required in these scenarios? Similarly, is less mixing required in cases where the feedstock is homogenous?

Can initial sampling occur during the 9-month set up period, or only after the start date?

Regarding mixing for sampling, does biochar need to be mixed mechanically (with emissions potentially included) or does hand mixing or tumbling suffice?

Table 6.3 – Sampling approach – please clarify that daily samples for 10 samples means 10 days worth of samples. Is there a max amount of samples that can be considered for the initial parameter (the Protocol mentions 30 as well)?

Table 6.3 – Timing of sampling – “Sampling must be performed from the first day of biochar production under the project and during the reporting period for which the associated laboratory analysis results are applicable.” Please clarify if the intent of this statement is just that the first initial sample needs to be taken at the start date of the project and at each first date of a reporting period.

Table 6.4 –How long do samples need to be kept for after the monthly dates are chosen?

Table 6.4 – Sample handling - if list is given at the end of the month than samples cannot be sent within 5 days of collection, so the Initial Parameter Sampling guidelines are not applicable.

Eligible Biochar Feedstocks List

Forestry – what about waste invasive species (woody biomass or not) that are not normally cleared/collected, would they be eligible? If yes, would they need to be considered as purpose-grown since the harvest emissions would need to be included?

Urban waste – biomass component of municipal solid waste is eligible, but what if the MSW feedstock has a non-biomass/biogenic component (such as plastic), is it still eligible?

Eligible Biochar End Uses List

Animal feed additive – is this eligible for any type of animals? For ruminants, is there data that demonstrates that there is no change to the carbon structure of the biochar in the rumen?

Construction/engineered materials – transport is “Included?” please clarify under what conditions it needs to be included.

Thank you for the opportunity to submit comments on this protocol.



Sincerely,
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