Biochar Carbon Credit Class

[redacted]

Ecosystem focus: Forests, Croplands, Grasslands

Kulshan Carbon Trust

Building Alliances for Natural Climate Solutions

Table of Contents

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Commented [1]: Do we need to state how changes impact existing projects?

Commented [2R1]: yes great point Ned

This document is intended to be used in combination with:

- *Approved Methodology:* Methodology for Biochar Utilization in Soil and Non-Soil Applications
- *Methodology Appendix*: In-Stand Surface Application of Biochar in Forestlands
- Regen Registry Program Guide

Definitions

1. Approved Activities: the set of land management or conservation activities that are eligible activities for a given Credit Class.
2. Crediting Term: the finite length of time for which a Project Plan is valid, and during which a project can generate credits.
3. Biochar Producer: the person or entity that creates biochar through pyrolysis of waste biomass feedstock.
4. Biochar Processor: the person or entity that further processes the biochar. This includes composting, grinding, mixing, or otherwise processing the biochar.
5. Land Steward: the individual or organization that is applying the biochar. This can be a farmer, rancher, conservationist, forester, fisherman, etc.
6. Land Owner: the individual or organization that holds title to the land where the project is occurring. This can be the Land Steward or a third party that rents the land to the Land Steward.
7. Monitor: an individual or organization that is contracted to measure the benefits / indicators defined in a given Credit Class based on the requirements in the Approved Methodology.
8. Project Proponent: the project developer or land steward that is applying to register a project on the registry.
9. Project Developer: the individual or organization that is in charge of managing the project and is the main point of contact with Regen Registry. The Project Developer can be the land steward or a third party.
10. Project Plan: the template that each project proponent fills out in order to register a project on the registry.
11. Project Registration Date: the official date when a project commences.
12. Project Activity: the applied management or conservation practice that a project
13. proponent is undertaking in order to improve the benefits tracked in a given Credit Class.
14. Project Initial Monitoring Date: the date when the baseline measurement was performed.
15. Program Guide: the main document specifying the rules and procedures of Regen Registry.
16. Supply Chain Participants: those directly involved in the production of biochar and its application in soil.
17. Verification : a systematic, independent, and documented assessment by a qualified and impartial third party of the benefits' assertions for a specific reporting period.
18. Verifier: an individual or organization that is contracted to execute the verification requirements stipulated in a given Credit Class.

1. Introduction

Biochar is a carbon-rich, highly stable soil amendment produced when biomass is burned, or "pyrolyzed", under low-oxygen conditions. Unlike other natural climate solutions, biochar does not replace a current practice, but is instead an alternative to other uses of biomass, such as open burning or decomposition. If applied at scale, Project Drawdown[1] estimates that biochar can reduce carbon dioxide emissions by 1.36-3.00 gigatons by 2050. In addition to its carbon sequestration potential, biochar provides many ecosystem service co-benefits including water conservation and improved soil health.

The intent of this Credit Class is to provide an incentive structure that significantly increases the production and application of biochar by providing biochar producers and land stewards with the necessary incentives to make this important work possible.

For buyers of this certificate, the aim is to provide a high-quality certificate that ensures that contributions are maximizing conservation values including the avoidance of emissions within the project, optimizing the flow of funds to the biochar producer and land stewards that are implementing the activities, and ensuring the product delivers the quality it promises.

For land stewards and biochar producers, the aim is to provide payment to incentivize adoption, and to simplify the data collection process and monitor in an appropriate manner. By creating a high-quality credit, the aim is to increase trust in the market to ensure stability and longevity of the market.

This Credit Class follows the requirements in the Program Guide. Each section below includes specific adaptations for this Credit Class.

2. Credit Class Overview

The Biochar Carbon credit focuses on soil carbon sequestration and emission reductions resulting from the production and application of biochar to soils. In the case of this credit, the approved benefit that is monitored, quantified and used to determine the quantity of credits issued is Carbon Sequestration.

2.1. Approved Indicator

The approved indicator defined in this credit class is soil organic carbon. The units of this credit are: one crediting unit equals 1 metric tons of CO_2e sequestered.

[1] https://drawdown.org/solutions/biochar-production

Commented [3]: And storage? From my perspective, the primary benefit is carbon storage.

Commented [4R3]: +++

Commented [5]: It's not clear to me what the difference is between an indicator and a unit. Can they be the same? This also has me thinking about the inorganic component of biochar that would be incorporated into the soil. That might be important for C sequestration but would be missed in soil organic carbon measurements.

The approved benefit of atmospheric regulation through carbon sequestration is driven by carbon removals and reductions through the production and application of biochar to soils. To ensure a net positive effect, aside from CO2 removals from the atmosphere, it is also important to take into account significant greenhouse gas (GHG) emissions directly resulting from the *project activity*. These should be accounted for each year to accurately calculate creditable carbon change. Emissions sources attributable to the *project activity* might include emissions from sourcing, production, or application of biochar as defined by the approved methodology.[2]

2.2. Ecosystem Service Classification

This Credit Class applies to the ecosystem services of atmospheric regulation as defined in the RND Taxonomy.[3]

3. Project Eligibility

3.1. Ecosystem Type Classification

This Credit Class applies to temperate forests and woodlands, croplands, and grasslands as defined in the RND Taxonomy.[4] Biochar must be utilized in soil applications as outlined in the Approved Methodology[5] or the accompanying appendix, "In-stand surface application of biochar in forestlands",[6] for forest application.

Table 1. Highlights the appropriate application types and criteria suitable for each land type.

Ecosystem Type	Application Type	Other Criteria
Forest or Woodland	Surface level	Biochar should be applied as a unique soil amendment.[7]
	Subsurface level	Not recommended
Cropland	Surface level	Biochar should be mixed with other substrates.

[2] approved Methodology. Section 5, pg. 12-14. Available at: https://verra.org/wp-content/uploads/2022/10/VM0044-Methodology-for-Biochar-v1.00.pdff
[3] RND Taxonomy Document
[4] RND Taxonomy Document
[5] Approved Methodology. Section 4. Eligible biochar end-use application criteria. Available at: https://verra.org/wp-content/uploads/2022/10/VM0044-Methodology-for-Biochar-v1.00.pdff
[6] Will add a link to the Appendix once published.
[7] Appendix, Biochar Application in Forestlands. This document outlines the criteria and justification for producing and applying biochar to the soil surface in forestlands.

	Subsurface level	Biochar can be mixed with other substrates or applied as a unique soil amendment
Grassland	Surface level Subsurface level	Biochar should be mixed with other substrates. Biochar can be mixed with other substrates or applied as a unique soil amendment

3.2. Project Activity

The project activity approved by this credit class is the production and application of biochar to soils as defined in the approved Methodology.[8] For forest applications, appropriate activities are defined in the Methodology Appendix.[9]

3.3. Land Ownership Type

This credit class accepts projects under the following ownership types: public, private, tribal. In addition to individual ownership, these types may include collective or community based initiatives.

3.4. Adoption Date

Adoption Date: Projects run under this credit class will accept an adoption date that goes back up to 1 year prior to Project Registration Date. In order to claim an Adoption Date before the Project Registration Date, the Project Proponent must provide sufficient historical records as outlined in the approved Methodology.[10]

3.5. Crediting Term

The crediting term for this credit class is 1 year. The logic for this is that it only takes a few hours to produce biochar from biomass feedstock. Once the biochar is produced, we expect that most of it will enter the supply chain and be applied to soil within a 1-year period. Since the biochar is in a stable form, even if some of it was not applied within a year, the carbon would remain sequestered.

[8] Approved Methodology. Section 4, pg. 8-11. Available at: https://verra.org/wp-content/uploads/2022/10/VM0044-Methodology-for-Biochar-v1.00.pdff

[9] Will add a link to the Appendix once published.

[10] Approved Methodology. Section 6. Baseline Scenario: Step 2; providing evidence of the fate of waste biomass. Available at: https://verra.org/wp-content/uploads/2022/10/VM0044-Methodology-for-Biochar-v1.00.pdff

The Crediting Term does not include the permanence obligation defined in Section 5.3.

4. Project Rules and Regulations

4.1. Approved Methodology

The approved methodologies for this Credit Class are:

a. Methodology for the Utilization of Biochar in Soil and Non-Soil Applications[11]
b. Appendix: In-Stand Surface Application of Biochar in Forestlands[12]

4.2. Aggregate Projects

Aggregated projects are permitted in this credit class. The intention behind aggregating projects is to overcome the high transaction costs that inhibit small carbon sequestration projects from accessing carbon markets. Aggregated projects:

a. May include separate ecosystem types and/or biomass feedstocks, provided that appropriate carbon yield calculations are used for each individual project.
b. May include various biochar production methods (i.e. kilns, conservation burns, pit burns, etc.), provided that appropriate carbon yield calculations are used for each individual project.
c. Must include an in-soil application type.
d. Must be approved by the Project Developer.

For each group of Aggregated Projects the following points shall be summarized in the Aggregated Project Documentation:

a. Standardized baseline scenarios and emission calculations for each project within the application.

This document shall be made available on the Project Page on the Regen Network website.

Commented [6]: Anything related to geospatial max distance between the project areas? same bioregion? not sure its relevant. Same country maybe?

Commented [7]: Where is this document? The context for the bullet point ("a") isn't clear. I was expecting something like a list of unique requirements for aggregated projects.

Commented [8]: Which document?

4.3. Project Plan

Any project run using this Credit Class must have an aligned Project Plan.

[11] Approved Methodology. Available at: https://verra.org/wp-content/uploads/2022/10/VM0044-Methodology-for-Biochar-v1.00.pdff
[12] Will add a link to the Appendix once published.

4.4. Monitoring Plan

As specified in the primary methodology,[13] a monitoring plan is required for each project or aggregated projects. The relevant format of data collection is provided to the biochar producer, biochar processor, and land steward at the beginning of the reporting period and shall be completed by either the biochar producer, biochar processor, land steward or project proponent, or a combination thereof. Initial data collection shall be returned completed within one month of application.

Monitoring will be in the form of collecting attestations that the biochar application continues without disruption.

4.5. Monitoring Report

A monitoring report will be made available at the end of the crediting term. This will include the following:

a. Activities implemented during the crediting term
b. Total CO2eq removed and avoided, including all carbon sequestrations calculations, during the crediting term.

The values documented in this report will be used as the basis for issuing credits.

Commented [9]: Does this include the data and formulas to calculate CO2 removed? Will those data be open-licensed?

5. GHG Removal and Emission Reduction Requirements

The credit class follows the GHG accounting requirements defined in the Program Guide.

5.1. Additionality

Proof of additionality is required for this credit class.
Additionaltiy is required to be accounted for and specified in the approved Methodology in this credit class.

The approved Methodology specifies how the baseline and the additional carbon emission and/or removal is calculated.[14] Baselines can be calculated or assumed to be zero. Additionality must be calculated following the approved Methodology.

[13] Approved Methodology. Section 9, pg. 35-49. Available at: https://verra.org/wp-content/uploads/2022/10/VM0044-Methodology-for-Biochar-v1.00.pdff
[14] Approved Methodology. Section 8, pg. 16-34. Available at: https://verra.org/wp-content/uploads/2022/10/VM0044-Methodology-for-Biochar-v1.00.pdf

5.2. Leakage

Leakage is required to be accounted for in this credit class as defined in the approved Methodology.[15]

5.3. Permanence Period

The permanence period required by this credit class is 100 years. 100 years is the timeframe used to incorporate permanence risk in the approved methodology calculations. The actual permanence of biochar in soil applications reported in the literature is between 1,000-10,000 years.[16,17]

5.4. Permanence Approach

This credit class does not allocate additional credits to cover risks associated with permanence because these risks are already accounted for in the methodology. Specifically, the fraction of carbon in the biochar remaining after 100 years is included in the final carbon calculations associated with this credit class.[18]

5.5. Buffer Pool

A buffer pool is required for this credit class. The buffer pool amounts are based on information from the program guide[19] as well as the best available science regarding the permanence and the risks of biochar loss in soil applications.[20,21]

For all projects registered using this credit, the credit issuer will apply a contribution of 10% of each credit issuance (as quantified by the latest monitoring report) to the Buffer Pool.

The project buffer pool is intended to smooth fluctuations that can occur during the project period. These include but are not limited to:

a. Changes in model accuracy due to verifications
b. Deviation by the land steward from planned activities

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[15] Approved Methodology. Section 8.3, pg. 30-32. Available at: https://verra.org/wp-content/uploads/2022/10/VM0044-Methodology-for-Biochar-v1.00.pdf

[16] Rawat, J., Saxena, J., Sanwal, P., Rawat, J., Saxena, J., & Sanwal, P. (2019). Biochar: A Sustainable Approach for Improving Plant Growth and Soil Properties. In *Biochar—An Imperative Amendment for Soil and the Environment*. IntechOpen. https://doi.org/10.5772/intechopen.82151

[17] Jennifer Weiss. Keeping it 100 – Permanence in Carbon Offset Programs. https://www.climateactionreserve.org/blog/2022/07/26/keeping-it-100-permanence-in-carbon-offset-programs/

[18] Approved methodology. Section 8.2, pg. 25.

[19] Regen Registry Program Guide

[20] Biochar: A Sustainable Approach for Improving Plant Growth and Soil Properties. https://doi.org/10.5772/intechopen.82151

[21] Appendix

c. Reversals in emission removals over the course of the project
d. Unexpected weather and major climate events

In the case that there is an unexpected reversal of the project, credits in the buffer pool will be used to mitigate losses. In the event that the reversal outweighs the credits in the buffer pool, credits from the future Regen Registry communal buffer pool could be used to cover the difference.

5.6. Verification

Verification is required for this credit class. Verification requirements for the measurement of the approved indicator is outlined in the approved Methodology.[22,23] Project proponents will provide a monitoring report to approved third party verifiers. Verifiers will then create a separate verification report to be included in project documentation.

5.7. Fungibility

The buffer pool credit issuances are considered fungible over time based on the quantity of carbon dioxide they represent. They can be used to cover losses within projects developed by the project proponent.

6. Issuing and Selling Credits

1.1. Credit Allocation

The carbon credits created in year one from biochar production (minus the credits dedicated to the buffer pool) will be issued to supply chain participants on a case by case basis, after the project developer has received attestation from the land steward that the biochar has been appropriately applied to soil. After the final year of the project, remaining credits in the project buffer will be distributed to supply chain participants as deemed appropriate and may be retired or sold at current market value.

1.2. Credit Distribution and Schedule

Credits shall be sold after issuance ex-post as per the schedule defined below.

Prior to project start:

[22] Approved Methodology. Section 9.3, pg. 47-49. Available at: https://verra.org/wp-content/uploads/2022/10/VM0044-Methodology-for-Biochar-v1.00.pdff
[23] Program Guide.*Verification*, pg. 35-41. Available at: Regen Registry Program Guide.

Commented [10]: I'm not sure when or how this communal pool will be created, and might be good to have a reference. Would reversals that occur before the community pool is established be retroactive? When tapping into the community pool is the unit of fungibility simply CO2e?

Commented [11]: Equivalent (CO2e)?

Commented [12]: It's not clear what the intent of this sentence is. Are buffer pools tied to a project, a project proponent, or a credit class? This isn't a fungibility question but should be clarified, perhaps in the Registry Guide.

Commented [13R12]: I agree is a question for RND Registry. @tica.lubin@regen.network

a. Calculate the baseline CO_{2eq} emissions from the data provided by the landowner in the project start year as specified in the Approved Methodology.[24] In lieu of documentation, the default baseline emission scenario for the project activity feedstock is zero, a conservative assumption.

After each year:

a. Calculate the actual volume of carbon dioxide sequestered and greenhouse gas benefits of minus production and utilization from the previous year.
b. Issue 5% of the credits to the permanence buffer
c. Issue 15% of the credits to the project buffer.
d. Issue the remainder of the credits as decided between supply chain participants.

End of Project

a. After the final year of the project, calculate actual volume of carbon dioxide sequestered and greenhouse gas benefits of production and utilization from the previous year.
b. If there are credits available in the project buffer, these credits will be issued to supply chain participants and may be sold at the current market value.

[24] Approved Methodology. Section 6, pg.15. Available at: https://verra.org/wp-content/uploads/2022/10/VM0044-Methodology-for-Biochar-v1.00.pdff