Terms of Reference (ToR)

Independent External Technical Review

Methodology: BCR0011 – Sustainable Biochar Production, Carbon Removal and Long-Term Storage

Version 2.0 – Public Consultation Draft

1. Background

BioCarbon has developed the methodology BCR0011 – Sustainable Biochar Production, Carbon Removal and Long-Term Storage (Version 2.0), currently under public consultation.

This methodology establishes a project-level framework for quantifying greenhouse gas (GHG) emission reductions, carbon dioxide removals, methane avoidance, and durable carbon storage resulting from the sustainable production and application of biochar.

The methodology applies to projects that utilize eligible biomass feedstocks and approved thermochemical conversion technologies to produce biochar for long-term carbon storage in soil and non-soil applications.

The methodology includes requirements related to:

Feedstock sustainability;

(a) Renewable biomass eligibility;
(b) Additionality;
(c) Baseline determination;
(d) Leakage assessment and management;
(e) Permanence and reversal risk management;
(f) Uncertainty management;
(g) Monitoring, reporting and verification;
(h) Durable carbon storage and eligible end-use applications.

In accordance with the BioCarbon methodological governance framework and international best practices, the methodology is subject to an independent external technical review.

The review aims to ensure methodological robustness, environmental integrity, scientific credibility, transparency, and alignment with high-integrity carbon market principles.

2. Objective of the Review

The objective of the independent external review is to assess whether the methodology:

(a) Ensures environmental integrity and conservative estimation of emission reductions and removals;
(b) Avoids systematic over-crediting of mitigation outcomes;
(c) Provides scientifically robust and auditable procedures for quantifying durable carbon removals through biochar;
(d) Adequately addresses baseline determination, additionality, leakage, uncertainty, permanence, and reversal risks;
(e) Applies appropriate requirements for sustainable biomass sourcing and feedstock eligibility;
(f) Is consistent with relevant IPCC guidance, biochar science, and internationally recognized best practices;
(g) Aligns with high-integrity frameworks, including the ICVCM Core Carbon Principles (CCPs), Article 6 of the Paris Agreement, and emerging Carbon Dioxide Removal (CDR) integrity frameworks.

3. Scope of Work

The external reviewer shall assess at a minimum:

(a) Applicability and Eligibility

(i) Clarity and enforceability of applicability conditions;

(ii) Adequacy of feedstock eligibility requirements;

(iii) Adequacy of renewable biomass provisions;

(iv) Adequacy of exclusions related to non-sustainable biomass sources;

(v) Adequacy of eligible and non-eligible production technologies;

(vi) Adequacy of end-use application requirements.

(b) Baseline and Additionality

(i) Robustness of baseline determination procedures;

(ii) Conservativeness of baseline assumptions;

(iii) Treatment of avoided methane emissions and baseline waste management scenarios;

(iv) Application of the BioCarbon Additionality Tool;

(v) Consistency between baseline determination and additionality demonstration;

(vi) Treatment of retrofitted facilities;

(vii) Adequacy of safeguards against non-additional crediting.

(c) Quantification Approach

(i) Scientific validity of carbon removal quantification;

(ii) Scientific validity of methane avoidance quantification;

(iii) Adequacy of life-cycle emissions accounting;

(iv) Treatment of associated project emissions;

(v) Consistency between baseline and project scenario quantification;

(vi) Adequacy of net GHG accounting;

(vii) Application of conservative assumptions.

(d) Feedstock Sustainability

(i) Sustainability criteria for biomass sourcing;

(ii) Treatment of competing biomass uses;

(iii) Adequacy of feedstock traceability requirements;

(iv) Treatment of deforestation, ecosystem conversion, peatlands, and wetlands;

(v) Alignment with sustainable biomass sourcing principles.

(e) Leakage

(i) Identification of leakage sources relevant to biochar systems;

(ii) Treatment of competing biomass uses;

(iii) Treatment of market leakage;

(iv) Application of the BioCarbon Leakage Management Tool;

(v) Adequacy of leakage deductions and conservative assumptions;

(vi) Integration of leakage into net GHG accounting.

(f) Permanence and Carbon Storage Integrity

(i) Scientific robustness of permanence requirements;

(ii) Adequacy of biochar stability criteria;

(iii) Adequacy of H and carbon content requirements;

(iv) Adequacy of Stable Carbon Content (SCC) provisions;

(v) Scientific justification for permanence assumptions;

(vi) Adequacy of end-use application restrictions;

(vii) Application of the BioCarbon Permanence and Risk Management Tool;

(viii) Adequacy of reversal risk assessment and buffer mechanisms.

(g) Monitoring, Sampling and Verification

(i) Adequacy of monitoring requirements;

(ii) Adequacy of sampling procedures;

(iii) Statistical representativeness of sampling approaches;

(iv) Laboratory testing requirements;

(v) Consistency between monitoring parameters and quantification equations;

(vi) Suitability of QA/QC requirements;

(vii) Adequacy of validation and verification provisions.

(h) Uncertainty and Conservativeness

(i) Treatment of uncertainty associated with biochar production and carbon storage;

(ii) Treatment of SCC uncertainty;

(iii) Application of the BioCarbon Uncertainty Tool;

(iv) Adequacy of conservative deductions and adjustments;

(v) Safeguards against over-crediting.

(i) Avoidance of Double Counting

(i) Consistency with national accounting frameworks;

(ii) Alignment with Article 6 requirements;

(iii) Application of traceability and exclusive claim principles;

(iv) Consistency with the BioCarbon Avoiding Double Counting Tool.

(j) Transparency and Replicability

(i) Clarity and completeness of methodological procedures;

(ii) Transparency of assumptions and parameters;

(iii) Internal consistency across sections;

(iv) Replicability across different feedstocks, technologies, and end-use applications.

4. Deliverables

The external reviewer shall provide:

(i) A written independent technical review report;

(ii) Identification of material methodological risks, if any;

(iii) Structured recommendations for improvement;

(iv) An overall conclusion regarding:

- methodological robustness;
- environmental integrity;
- scientific credibility;
- suitability for application in high-integrity carbon markets.

The report shall clearly distinguish between:

(i) Critical issues affecting methodological integrity or credibility;

(ii) Advisory recommendations intended to strengthen the methodology.

5. Eligibility Requirements for Applicants

Applicants shall demonstrate:

(a) Advanced academic qualifications in one or more relevant disciplines, including biochar science, soil science, environmental engineering, carbon removal technologies, biomass systems, climate science, carbon accounting, or related fields;

(b) Demonstrated experience in biochar systems, carbon dioxide removal methodologies, greenhouse gas accounting, or carbon market methodologies;

(c) Expertise in one or more of the following areas:

(i) biochar production systems;

(ii) biomass sustainability and feedstock sourcing;

(iii) carbon removal quantification;

(iv) permanence and carbon storage science;

(v) leakage assessment;

(vi) uncertainty and sampling methodologies;

(vii) IPCC guidance and project-level GHG accounting;

(viii) ICVCM CCPs, Article 6, CORSIA, CRCF, or other high-integrity frameworks;

(ix) absence of conflicts of interest.

Applicants shall disclose any past or present involvement in the development of this methodology.

6. Selection Process

BioCarbon shall evaluate proposals through a documented, merit-based process, applying criteria related to:

(a) Technical competence;
(b) Relevant scientific and sectoral expertise;
(c) Independence and conflict-of-interest screening;
(d) Capacity to complete the review within the specified timeline.

7. Independence and Financial Arrangements

To safeguard independence:

(a) The external reviewer shall not have participated in the development of the methodology;
(b) The reviewer shall sign a conflict-of-interest declaration;
(c) All costs associated with the review shall be borne exclusively by BioCarbon.

8. Timeline

The external review is expected to be completed within two (2) weeks from contract signature.