Biochar

IETA Carbon Management Business Brief Series

EXECUTIVE SUMMARY

Biochar is a scalable, near-term CDR method with a growing market. Its credibility depends on sustainable biomass sourcing, additionality, conservative and robust carbon accounting, demonstrated durable storage, verified material quality, robust MRV, and defined and authorized claims usage.

WHAT IS BIOCHAR?

DEFINITION

Biochar is a carbon-rich material produced when biomass, such as wood residues, crop waste, or manure, is thermochemically converted under oxygen-limited conditions, typically through processes such as pyrolysis. Instead of fully decomposing or oxidizing to CO_2, a fraction of the biogenic carbon is transformed into a stable, carbonized solid that can persist for long periods. Biochar can be applied to soils, incorporated into construction materials, or used in other approved applications. The method may qualify as a carbon removal when the biomass is sustainably sourced and the carbon is stored under conditions that prevent rapid re-release (e.g. combustion, as is the case with charcoal used for energy).

USES AND BENEFITS

Biochar is commonly used as a soil amendment with the potential to improve soil functions such as water retention and nutrient efficiency. It can also be used in animal bedding, construction materials, filtration, and various industrial products. Its effectiveness in removing carbon removal depends on feedstock type, production conditions, intended end use. Robustness of monitoring impacts climate utility.

COMMON FORMS OF PRODUCTION SYSTEMS

INDUSTRIAL BIOCHAR

Produced in engineered, large-scale, tightly controlled systems with energy recovery and emission control systems.

ARTISANAL BIOCHAR

Produced using smaller-scale pyrolysis tech or simple open kilns. Control systems can be limited, impacting quality.

COMMON BIOCHAR END-USES

SOIL AMENDMENT AND AGRICULTURAL BLENDS

Biochar is applied to soil directly or in manure, compost or fertilizer. It can improve soil function (e.g. nutrient uptake, water retention).

CONSTRUCTION, BUILDING MATERIAL, AND INDUSTRIAL PRODUCT BLENDS

Biochar can be incorporated into concrete, asphalt, and other durable materials, contributing to long-lived carbon storage.

POLICY & REGULATORY OUTLOOK

A6.4/PACM: *Building a framework for carbon removals.*
EU: *The CRCF is adopting methodologies for permanent carbon removals, one of which is Biochar Carbon Removal (BCR).*
UK: *Advancing GGR support mechanisms.*
Japan: *GX-ETS is creating regulated demand for eligible credits.*
Future market access *depends on robust MRV, sust. biomass sourcing, demonstrated durability, and defined & authorized claims.*

THE CARBON CREDITING PROCESS

HOW BIOCHAR CREDITS ARE GENERATED

Biochar credits are generated when a project demonstrates that sustainably sourced biomass has been converted into stable biochar and stored in an approved end use. Crediting methodologies quantify the durable carbon stored, account for lifecycle emissions, require chemical composition testing and chain-of-custody documentation, and issue credits only after independent third-party verification.

TYPICAL CREDITING STEPS:

1. *Eligible biomass is sourced and converted into biochar*
2. *Biochar is characterized to confirm carbon content, stability, durability, contaminant levels, and product quality.*
3. *Biochar is applied and stored in an approved end-use*
4. *Net removals are quantified: the project accounts for carbon stored, lifecycle emissions, and any required buffers/discounts.*
5. *Monitoring and reporting are conducted*
6. *Independent third-party verification*
7. *Credits are issued*

MARKETS ALLOWING BIOCHAR CREDITING

VOLUNTARY CARBON MARKETS

Issuing bodies include Puro.earth, Verra, Isometric, Climate Action Reserve, Rainbow, and Global C-Sink/Carbon Standards. Some methodologies received CORSIA eligibility or ICVCM CCP-labels.

COMPLIANCE / REGULATORY MARKETS

Eligibility in compliance markets remains limited but is most advanced in Japan, where biochar is covered by J-Credit methodology AG-004, and J-Credits can be used in the GX-ETS, subject to limits. Forthcoming provisions for CDR under the EU ETS or UK ETS are unlikely to include biochar.

APPLICABLE STANDARDS & METHODOLOGIES

STANDARDS [CORSIA-eligible and/or CCP-labelled]

Isometric: *Biochar Production & Storage protocol* **[CORSIA+ CCP]**
Puro.earth: *Biochar Methodology for CO_2 Removal*
Verra: *VCS VM0044 – Biochar Utilization in soil and non-soil applications* **[CCP]**
Climate Action Reserve: *U.S. & Canada Biochar Protocol* **[CCP]**
Carbon Standards: *Global Biochar C-Sink*
Rainbow: *Biomass carbon removal and storage*
Gold Standard: *Production and Application for the Removal of Carbon via Biochar [under consultation]*.

MARKET SNAPSHOT — KEY STATS

+1 MILLION tCO_2
CREDITS ISSUED TO DATE [1]

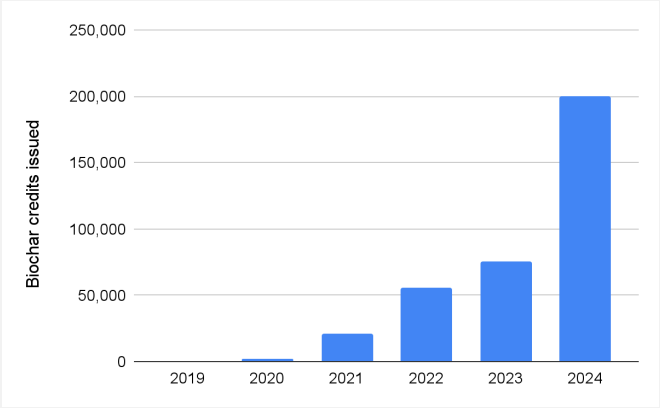
128 - CDR.fyi
ACTIVE PROJECTS GLOBALLY [1]

$100–$300
PRICE RANGE PER TCO_2E [2]

166% - Puro.earth
2023-2024 YOY VOLUME GROWTH [3]

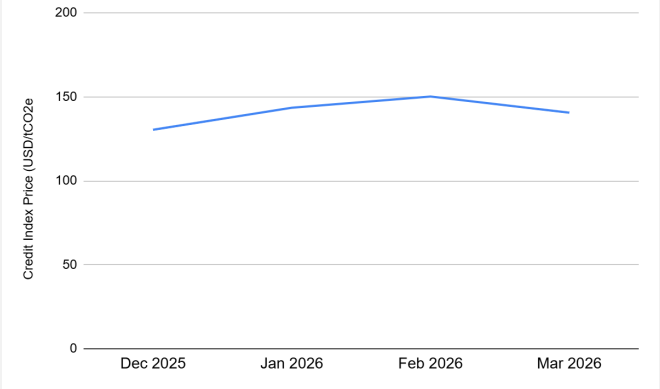
CREDIT ISSUANCE OVER TIME

ANNUAL BIOCHAR CREDIT ISSUANCE BY PURO.EARTH [3]



PRICE TREND

PURO'S CORC BIOCHAR PRICE INDEX (1 EUR = 1.08 USD) [5]



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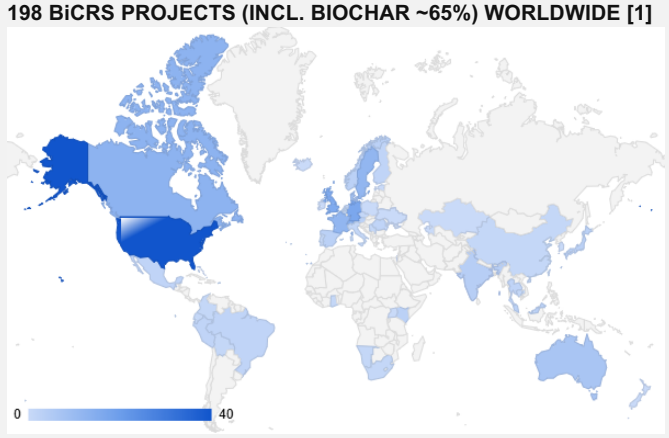
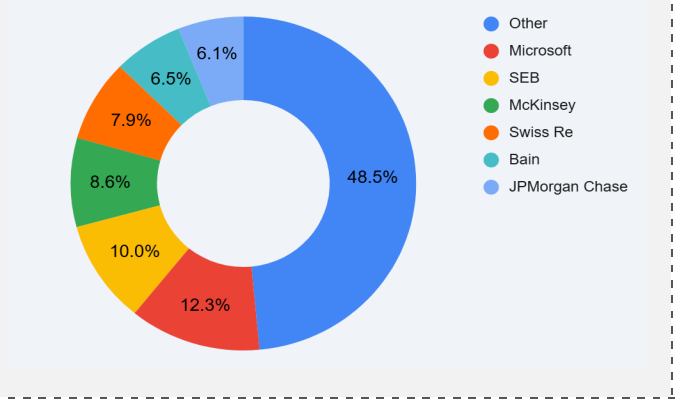
GEOGRAPHIC DISTRIBUTION OF PROJECTS

198 BiCRS PROJECTS (INCL. BIOCHAR ~65%) WORLDWIDE [1]



BUYER BREAKDOWN

BIOCHAR CREDITS RETIRED BY BUYER - MAY 2026 [4]



IETA CARBON MANAGEMENT BUSINESS BRIEF SERIES

PURPOSE & OVERVIEW
This IETA Carbon Management Business Brief Series aims to provide market clarity on CCUS and engineered CDR pathways from market participants and stakeholders. IETA's suite of business briefs, covering nearly all compliance carbon markets, is publicly available.

REFERENCES
[1] CDR.fyi, accessed May 2026.
[2] CDR.fyi/OPIS Durable CDR Pricing Survey (2025).
[3] Puro.earth Biochar's Market Momentum: Leading the Carbon Removal Revolution (2025).
[4] BeZero Carbon Corporate Retirements, accessed May 2026.
[5] CORC Carbon Removal Indexes, Puro.earth, accessed May 2026.