

Biochar Market to Reach USD 1625.7 Million by 2035, Growing at 11.8% CAGR from USD 474.3 Million in 2024 | TMR

Biochar Market to reach US\$ 1.63 Bn by 2035, expanding at 11.8% CAGR, driven by sustainable agriculture demand, soil enhancement, and carbon sequestration.

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EINPresswire.com/ -- The conversation around sustainability, climate change mitigation, and regenerative agriculture has grown louder in recent years. In this context, biochar—a carbon-rich product derived from thermochemical conversion of biomass—has shifted from being a niche soil amendment to a mainstream sustainability solution with enormous growth potential.

The global [biochar market](#), valued at US\$ 474.3 million in 2024, is projected to grow at a CAGR of 11.8% between 2025 and 2035, reaching an impressive US\$ 1625.7 million by the end of 2035. This exponential rise is being fueled by biochar's dual ability to enhance agricultural productivity and sequester carbon in a durable form, thus directly contributing to global net-zero targets.

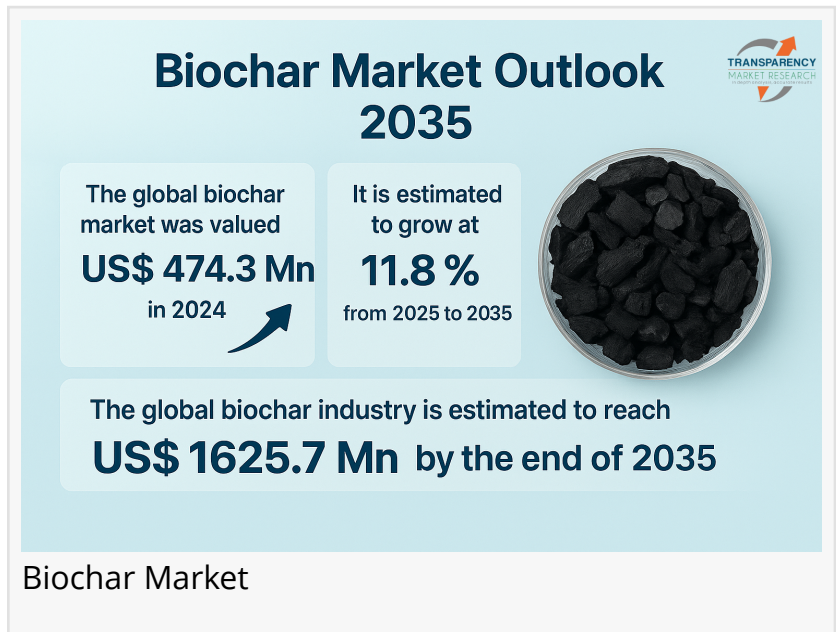
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Analysts' Viewpoint on Biochar Market

Industry analysts emphasize that the biochar market is undergoing a major transition:

From niche agricultural usage to mainstream sustainability applications.
From regional pilot projects to commercial-scale production facilities.



From being viewed solely as a soil amendment to being acknowledged as a carbon-negative technology with economic value through carbon credits.

The next decade will see biochar's integration across agriculture, waste management, construction, and renewable energy sectors, supported by favorable policies, international climate agreements, and rising investor interest in carbon sequestration projects.

Global Biochar Market Overview

Biochar is produced through pyrolysis or gasification of organic biomass such as agricultural residues, animal manure, or forestry by-products under limited oxygen. The process yields biochar, bio-oil, and syngas, providing multiple revenue streams.

Key attributes of biochar include:

Carbon sequestration – locking carbon into a stable form for centuries.

Soil enhancement – improving fertility, nutrient retention, and water-holding capacity.

Circular economy contribution – converting agricultural and forestry waste into value-added products.

Versatility – applications in agriculture, water treatment, construction, livestock feed, and more. Its multifunctional benefits make biochar one of the most promising sustainable materials for the 21st century.

Market Drivers

Rising Demand for Sustainable Agriculture Practices

The agriculture sector is under immense pressure to increase productivity while minimizing reliance on chemical fertilizers that harm soils and water bodies. Biochar directly addresses this challenge.

Field trials in North America and Asia show biochar can increase crop yields by 10–25% while reducing nitrogen fertilizer needs by 15%.

By enhancing soil pH, nutrient availability, and moisture retention, biochar improves crop resilience, especially in regions facing droughts or soil degradation.

As the world faces the challenge of producing 50% more food by 2050, biochar is gaining recognition as a cost-effective and sustainable soil management solution.

Growing Focus on Carbon Sequestration and Climate Change Mitigation

Biochar is one of the very few carbon-negative technologies available at scale. Instead of releasing CO₂ during biomass decomposition, pyrolysis locks carbon into biochar for centuries.

The IPCC estimates that global adoption of biochar could sequester 2.6 gigatons of CO₂-equivalent annually.

Carbon markets offer immediate revenue opportunities, with one ton of biochar sequestration credits valued at US\$ 20–30 under voluntary carbon credit schemes.

Governments in Europe and North America are offering subsidies, grants, and regulatory support for biochar projects under net-zero strategies.

Expanding Applications Beyond Agriculture

While agriculture remains the largest biochar application, new uses are emerging:

Livestock feed additive – improving digestion and reducing methane emissions.

Water and wastewater treatment – biochar's porous structure makes it effective for filtration.

Construction – lightweight, insulating, and durable, biochar is used in concrete admixtures and insulation materials.

Energy sector – syngas and bio-oil byproducts of pyrolysis provide renewable energy options.

This diversification is creating new revenue streams for producers and expanding the market beyond farming.

Technology Insights: Pyrolysis Leads the Way

Among all conversion methods, pyrolysis dominates the biochar market, accounting for over 62% of global production facilities.

Pyrolysis offers 25–35% carbon yield from biomass, higher than gasification or hydrothermal carbonization.

It produces bio-oil and syngas as valuable byproducts, improving project economics.

Systems can be modular for rural use or industrial-scale for commercial projects.

European projects often integrate pyrolysis units with agricultural systems to produce soil amendments while utilizing syngas for local heating, reinforcing circular economy benefits.

Regional Outlook

Asia Pacific (Leading Region – 44% Share in 2024)

Driven by China and India, with abundant biomass availability and high agricultural demand.

Governments actively promote biochar to address soil degradation and stubble burning.

Pilot projects in Chinese rice systems and Indian crop residue management show yield improvements of 10–15% with reduced fertilizer use.

North America

A hub for technological innovation and carbon credit-linked commercialization.

Companies like Cool Planet, Wakefield Biochar, and Biochar Now are scaling production.

Biochar adoption is supported by USDA carbon-smart farming initiatives.

Europe

Strong adoption in Germany, Switzerland, and the UK, focusing on agriculture and climate action.

Favorable subsidies and participation in voluntary carbon markets drive adoption.

Latin America, Middle East, and Africa

Emerging markets with abundant biomass and agricultural potential.

Governments are beginning to explore biochar for waste-to-resource projects and rural development.

Competitive Landscape

The biochar market is highly competitive, with a mix of established companies and emerging startups focusing on different applications and technologies.

Key Players

Airex Energy – pioneer in CarbonFX pyrolysis technology, with strong involvement in carbon credit markets.

Biochar Now – operates one of North America's largest biochar facilities, USDA-certified, serving agriculture and environmental remediation.

Carbon Gold – focuses on premium agricultural biochar.

Pacific Biochar, Swiss Biochar, PYREG, Wakefield Biochar, ARIES Clean Technologies, Earth Systems Bioenergy, among others.

Recent Developments

Google (2025): Purchased carbon credits from Indian company Varaha, which converts crop residues into biochar, marking one of the largest-ever transactions in India's carbon dioxide removal (CDR) sector.

Carbonfuture & Swiss Re (2024): Signed a 7-year agreement to supply 70,000 tonnes of Biochar Carbon Removal credits from Bolivia's Exomad Green facility.

Future Outlook and Opportunities

Looking ahead, the biochar market presents immense opportunities across multiple domains:

Agriculture – Scaling adoption among smallholder farmers through subsidies, education, and carbon credit integration.

Carbon Markets – Expanding role of biochar in voluntary and compliance carbon markets as net-zero deadlines approach.

Technology Innovation – Advancements in modular pyrolysis units and integration with renewable energy projects.

Construction & Materials – Growing potential for biochar in concrete admixtures, insulation, and composites.

Waste Management – Conversion of municipal and agricultural waste into biochar to address pollution and generate revenue.

The combination of economic, environmental, and social benefits positions biochar as a cornerstone of the circular economy and climate mitigation strategies.

The global biochar market outlook to 2035 highlights a sector transitioning from niche soil amendment to a multi-industry sustainability solution. With a forecasted value of US\$ 1625.7 million by 2035, the market reflects surging demand for sustainable agriculture practices, carbon sequestration, and diversified applications.

Asia Pacific will remain the largest regional market, while North America and Europe will drive innovation and carbon-credit-linked adoption. Pyrolysis will continue to dominate as the preferred technology due to its scalability and revenue potential.

As governments, corporations, and farmers increasingly recognize biochar's role in addressing climate change and food security, the next decade will be transformative for the industry. Companies that can integrate technology, scalability, and carbon credit opportunities will lead the way in shaping the biochar market's future.

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