CARBONFUTURE CASE STUDY

Pacific Biochar

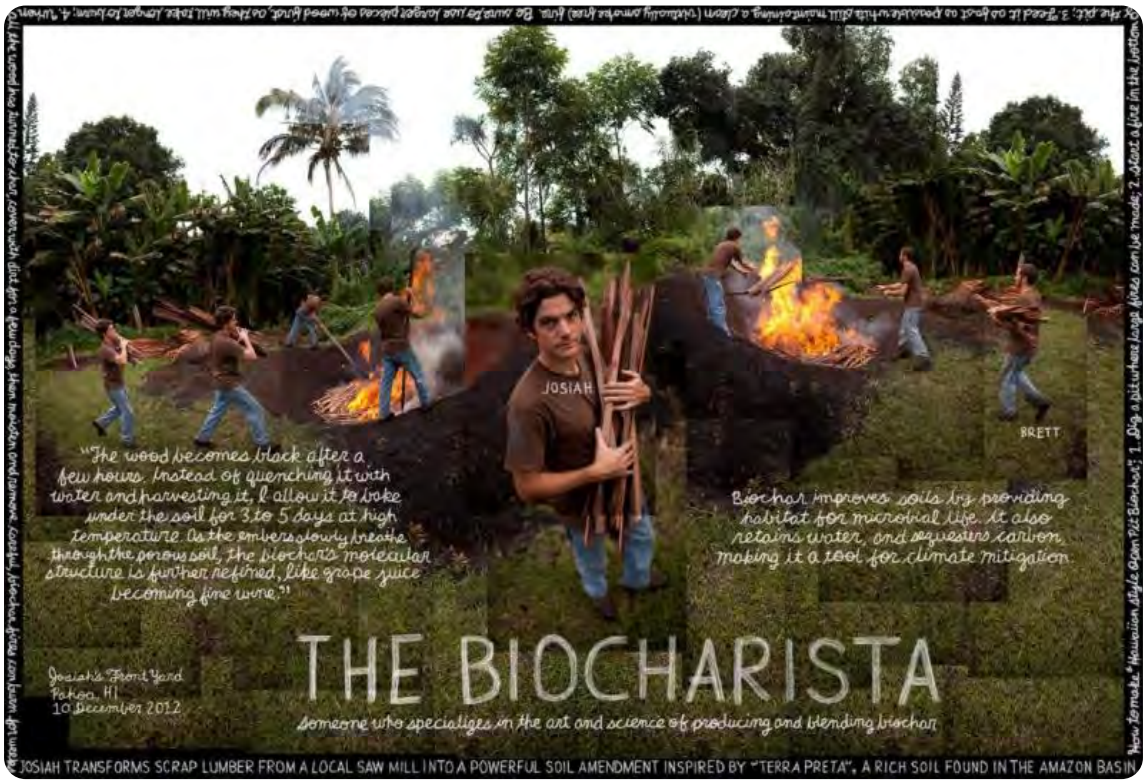
How Perseverance turned a Biochar Pioneer Into an Industry Leader

Carbonfuture

A Scrappy Survivor

“The history of biochar has two eras,” says Josiah Hunt, “BCC, before carbon credits, and ACC, after carbon credits.”

There’s no better person to tell the history of biochar as a strategy for carbon removal and storage than Hunt, the founder and CEO of Pacific Biochar in Santa Rosa, California. Starting with a fire pit in his Hawaii backyard, he mastered the process of turning surplus organic material—biomass—into a rich form of purified charcoal—biochar—that can be used as a soil amendment, improving farm productivity while keeping carbon out of the atmosphere for centuries.



The business struggled. He built a network of partnerships to finesse the difficult economics of producing and distributing biochar. He was able to convince a handful of progressive farmers that tilling biochar into their land, despite its expense, would improve the profitability of high-value crops like grapes and almonds. “For the first twelve years, we barely survived selling biochar just on its agricultural value,” Hunt says. “A lot of other companies started, blossomed, and died. And the global sales of biochar were pathetically small.”

Pacific Biochar’s fortunes changed in 2020 when it started working with Carbonfuture to sell carbon removal credits. Businesses seeking to meet their emission reduction targets had started to buy these removal credits, where each removal credit represents one metric ton of carbon dioxide or equivalent greenhouse gas removed from the atmosphere.

Carbonfuture helped the company arrange for independent certification of the carbon removed by Pacific Biochar's efforts by implementing tracking of the physical carbon removal on Carbonfuture's platform, and registering credits for sale.

> Carbonfuture really makes a difference. They've got strong relationships to sell carbon credits. And they have the expertise and financial partners to help us raise capital and develop projects.

Josiah Hunt, Pacific Biochar

Through October 2022, Pacific Biochar has delivered more than 3,000 removal credits and contracted to supply more than 25,000 removal credits to several buyers, including Microsoft. When the company found lenders unwilling to finance its new equipment purchases, Carbonfuture agreed to purchase some credits in advance, which has recently enabled Pacific Biochar to triple its production capacity, even as it cuts the cost of biochar to farmers by one-third.

Pursuing a Mission

Josiah Hunt can precisely date when he became fascinated with biochar. It was in September 2008, when he read a story in National Geographic about amazingly fertile patches in the Amazon rainforest, where most of the land is nutrient-poor. Archeologists traced the “terra preta,” Portuguese for “black earth,” to charcoal mixed by indigenous people into the soil, where it has kept its remarkable properties for more than 500 years.

The structure of terra preta keeps nutrients from washing away while creating an environment for helpful microorganisms. It also turns out to store ten to twenty times more carbon than regular tropical soil. The article described how scientists were developing a modern version of terra preta, using biochar, they could offset much of the carbon causing climate change if it was widely deployed. “I had a really big aha moment,” Hunt recalls. “We’re living in a world where piles of biomass are so large that we call it waste. With biochar, we could help with climate change mitigation, waste management, and soil fertility, all in this one process. I said I’m going to learn more about it, and that’s all I’ve done ever since.”

Hunt, who was living on a farm in Hawaii, started making charcoal in his backyard burning wood scraps from a nearby sawmill. With the assistance of a grant from the U.S. Department of Agriculture in 2009, Hunt gave biochar to local corn farmers and collected data on its effects. “Everywhere we put the stuff, we saw dramatically improved plant growth,” he says.

By 2011, Hunt's operation had become one of the country's significant biochar producers, making 100 tonnes a year. "I would have liked to be making thousands of tonnes, but I needed more machinery and more of a market," he said. "You can only produce in the backyard for so long."

Growing Production Capacity and Sales

Hunt spent several years exploring equipment that could produce biochar in high volume. Eventually, he heard about a method that can make biochar in existing facilities that generate electricity by burning biomass—often surplus wood from forestry and sawmills. Instead of completely incinerating the biomass, the process is cut short, leaving a residue of charcoal. Hunt worked for several years refining the optimal procedures to produce biochar in energy generating facilities.

In 2016, Hunt reformed the company in Santa Rosa, California, with Michael Fallon, a college friend, as co-founder and started to work with these biomass energy facilities. In 2019, Pacific Biochar reached an agreement with the Humboldt Sawmill Company to produce biochar at its cogeneration plant in Scotia, California. In addition to wood scraps from the sawmill, the plant uses logging residue from nearby forests, reducing the risk of catastrophic wildfires that have become increasingly common in California.

As the company tried to sell biochar to the area's many farmers, it found the business difficult, with thin margins and unpredictable sales.

Tapping the Carbon Credit Market

As Pacific Biochar struggled, Hunt wondered if he could tap into the rapidly growing market for carbon offset credits. It could be a significant source of revenue, but the market wasn't set up to handle credits from biochar. "You need a recognized methodology for carbon accounting of biochar projects," Hunt says. "You also need someone to assess the project based on that methodology, someone else to register the credits, and a marketplace where you can sell the credits. None of that existed."

Even worse, most of the credits being sold were based on emission reduction and sold for $10 or $15 per metric ton. Biochar actually removes carbon from the atmosphere and stores it safely, but it requires a much larger subsidy. "We had a Porsche, and the only place to sell it was a Kia dealership," Hunt said.

By 2019, standards for biochar carbon removal credits had been published, and credit buyers began to be more discerning. At a conference, Hunt heard Sampo Tukiainen, then the chief executive of Finish biochar producer Carbofex, describe registering and selling carbon credits. "I was just mind blown," Hunt recalls. "The doors are open now."

Working With Carbonfuture

Hunt looked for a partner to facilitate credit sales and decided to work with Carbonfuture. In early 2020, he connected with Hannes Junginger, CEO of the carbon removal tracking and end-to-end credit platform based in Freiburg, Germany. "We had a good rapport and quickly built a lot of trust," Hunt says. "That helped things move fast."

Pacific Biochar began working with Carbonfuture to develop the systems it needed to register credits. The first step was to have its entire process—from acquiring the biomass to deploying biochar on farms—certified by the European Biochar Certificate (EBC) and independently audited.

> We have to register each tonne [...]
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> Josiah Hunt, Pacific Biochar

Hunt was already familiar with the sort of paperwork and recordkeeping needed because the company's products were already certified as organic. The Humboldt power plant, similarly, is subject to strict state emissions monitoring. Pacific Biochar did need to work with its partners to create a new process to track each batch of biochar through the distribution channel to its final use on a farm. This carbon removal tracking is digitally recorded and auditable on Carbonfuture's platform to ensure every ton of biochar carbon is safely stored out of the atmosphere for the long term. "We have to register each tonne as it goes out, recording things like its moisture content and the location of an end client, which is needed to calculate transportation emissions," Hunt says. "Then we need an affirmation from the client that says, 'I didn't burn it. I applied it to the soil. And I'm not double counting it.'"

Selling Credits and Financing Growth

By the end of 2020, Pacific biochar had received the certification it needed and started to register credits. The first sale was an agreement to sell credits for 3,000 removal credits to Carbonfuture, who ultimately resells them to corporate buyers.

In the following two years, Carbonfuture arranged three other removal credit sales, including 1,500 credits to Microsoft, which has been an early investor in carbon removal. With standards for biochar credits still emerging, Microsoft decided to do its own due diligence, examining Pacific Biochar and its process. While this required additional work over several months, Hunt says he enjoyed the process. “I love working with Microsoft and look forward to further collaboration,” he says. “They had a very intelligent due diligence process and very thoughtful questions.”

With commitments in place to buy credits, the challenge for Pacific Biochar was to increase its production capacity to meet the new demand. Raising capital for the new equipment it needed turned out to be surprisingly difficult.

Banks wouldn’t lend money claiming the business was too immature. It had no better luck with venture capital funds devoted to climate technology. “All the impact investors want to get in on the ground floor of an unproven technology that could become a unicorn,” Hunt says. Our method of biochar production isn’t exciting. We’re kind of rusty and gritty. But we get the job done today.”

Hunt asked Carbonfuture for help, and it replied with a contract to pay in advance for some of the carbon credits it had agreed to buy. “That’s the kind of product development support that can really make a difference,” Hunt says. “That’s one of the many reasons we like working with Carbonfuture.”

Expanding to Meet the Climate Challenge

With the money from credits flowing, Pacific Biochar has been able to triple its capacity even as it lowers its prices to farmers by one-third. “Lower prices mean a lot more farmers can get a positive return over five years and dramatically increases our ability to move biochar,” Hunt says. Indeed, in August 2022, a vineyard that had long been testing the company’s biochar bought nearly 2,000 tonnes of it, the largest order in the company’s history.

Meanwhile, demand for carbon credits is surging as more companies make ambitious net zero commitments. And the biggest challenge for Pacific Biochar is to increase its production. Hunt is reaching out to more biomass power plants to strike deals to convert their process to make biochar. “Without carbon credits, it would have been impossible for us to confidently write a contract for biochar production,” Hunt says. “We couldn’t commit to how much we would purchase, so the plant would wonder if they would build all this machinery and have it sitting with nothing to do.”

Hunt says that the company already has deals to start production in three more biomass power plants by the end of 2022 that increase its capacity fivefold. And it is in discussions with a dozen more plants, hoping to find four more that will begin production in 2023.

Meeting the Global Challenge

That's just the beginning. Hunt is looking to expand beyond facilities located in biomass power plants. He wants to have operations that are close to other potential sources of biomass, including construction and demolition, municipal waste, and agricultural manure. The urgent pace, he says, is driven by the potential for biochar to remove gigatonnes of carbon annually.

> Industry-wide, we need to increase biochar production by ten thousand times over the next 13 years. How much of that we can provide is still to be determined.

Josiah Hunt, Pacific Biochar

What's clear already, he says, is that the revenue from carbon credits, facilitated by Carbonfuture, now enables Pacific Biochar to think big. "The carbon markets have given us the confidence to grow knowing that companies will spend money to put carbon in the ground," Hunt says. "We've gone from surviving to thriving."

Have We Sparked Your Interest?

If you would like to become a Carbonfuture partner and join us on our climate mission, contact us at info@carbonfuture.earth or book an appointment.

About Us

Pacific Biochar

pacificbiochar.com

With the goal of safely sequestering carbon while leaving a legacy of fertile soil, Pacific Biochar Public Benefit Corporation was founded in California in 2016. It offers carbon dioxide removal with the tangible co-benefits of aiding forest management practices that reduce risk and improve forest health. Pacific Biochar's pioneering approach uses the residue forest biomass from these efforts and turns it into a more stable form of carbon: biochar. Applying this valuable product to the abundant Californian farmlands sequesters the carbon while improving soil health - with the benefits being realized for generations to come.

Carbonfuture

carbonfuture.earth

Carbonfuture is an end-to-end platform for companies who want to participate in removing carbon from the atmosphere. The climate tech startup offers access to premium carbon removal and participation in the world's most cutting-edge carbon community. Unlike traditional marketplaces, the combination of Carbonfuture's digital platform, project financing tools, and long-term partnerships ensures a new tier of credit quality, while simultaneously reducing friction for growth across the world's most promising carbon removal technologies.

Companies like **Microsoft, Swiss Re, Klarna**, and **South Pole** trust Carbonfuture to help them meet their climate commitments in a transparent, verifiable, and scientifically robust way.

Carbonfuture operates globally with offices in Freiburg, Germany and San Francisco, USA. See the latest at carbonfuture.earth.