

A Simple Biochar Solution Increases Farmers' Production by up to 95 Percent

When he was looking for his next role in 2021, WasteX CEO Pawel Kuznicki said, "I didn't want to start just another business purely focused on financial outcomes, like a social media app. I wanted to make an impact." And that led him to turn agricultural waste into biochar.

Biochar is the residue remaining after the pyrolysis - burning - of biomass such as agricultural waste. Very importantly, Pawel noted, biochar is a solution for both climate mitigation and climate adaptation. "For mitigation, you remove carbon. For adaptation, you're making agriculture much more resilient, improving soil health, increasing yields, and reducing fertiliser usage. Given the climate crisis and how agriculture is affected by it, and how fertiliser prices affect farmers, we are actually creating mind-blowing value for them." Farmers get higher yields and more income, and rice, corn or sawmill operators turn their waste into cash.

The Machine is Affordable in Developing Markets

Pawel assembled a team that includes engineers, an agronomist and technologists to design equipment to produce biochar. The equipment is especially innovative, Pawel said, because it is small and targeted at developing markets. "We delivered a solution for biochar production without difficult logistics or large infrastructure." Whereas comparable biochar equipment from US or European firms can easily cost US\$50,000, WasteX sells its machine for \$11,000.

While the team did not plan to develop software, they found that no one had developed a Monitoring, Reporting and Verification (MRV) tool for biochar production and developed an app themselves. "If you work with certification bodies," Pawel explained, "you need a proper digital MRV to document the whole process, collect the right data and verify it. The key steps are feedstock preparation, biochar production and biochar application. The operator puts in all the required data, takes a few pictures of the process, and submits everything. Then you validate if everything is correct."

WasteX works with subcontractors to produce the equipment and also operates its own manufacturing facility. "We have operations in the Philippines and Indonesia," Pawel said. "In the Philippines, we recently opened our own workshop to have more control over quality. The next step is to make it commercially scalable. We are also going to continue working with contract manufacturers."

Another key step is enabling carbon credit certification. To validate the carbon credits, WasteX will submit the data to a carbon credit registry, Carbon Standards International (CSI). CSI approves the project developer, who manages and oversees a network of biochar producers. WasteX is also working with CSI for the endorsement of its proprietary equipment and MRV tool. "Once we are certified and audited, we can manage a large network of producers utilizing our small-scale equipment." Other biochar project managers can also use equipment and the app from WasteX, so the company is creating a solution for other developers too.

The next six months is thus focused on certification, scaling and value creation.

Customers Want the Solution

Whereas some other biochar equipment companies target farmers, WasteX decided to start by focusing on rice and corn mills as well as poultry farms. "Mills have more centralised operations. If it's biomass in the field, we have to collect it and it's wet," he explained.

WasteX is currently doing partnerships with the mills. "They provide space and feedstock. We develop, build and operate the facility."

They expect to sell biochar to farmers before long. Even though farmers can be resistant to change, Pawel has found that they are receptive to the WasteX solution. "We are not telling them they should change their current farming practice," he explained. "We show them how it

could complement fertiliser. And often, communities have already been using biochar. There are now hundreds of farmers waiting for us to produce enough biochar so they can start applying it.”

To increase market awareness, WasteX primarily uses online marketing and social media. “Biochar project developers are reaching out to us. They follow the news, so they know about us. We started getting orders.”

While the primary focus is on Southeast Asia, he said “we got interest from everywhere - Africa, South America, North America, Europe. We're going to focus primarily on Southeast Asia. We are likely to venture out to other places as long as the client is willing to pay for the shipment.”

Pawel believes other firms producing biochar may be interested in using the WasteX solution. “We ventured into the equipment and MRV software development because we couldn't find the tools in the market,” he said. After implementing projects in Indonesia and Philippines, “people started asking us to provide to them with our full stack solution. No one else is offering something comparable in terms of price, performance and scope. There is a growing interest in biochar and all the benefits.”

The Impact is Massive

Creating biochar has positive impacts for both people and the planet.

For farmers, research by WasteX has shown that crop yields can increase by as much as 95 percent and fertiliser usage can drop by 50 percent. While those results are higher than the increases shown by other researchers, Pawel noted that the biochar is put in the fertiliser and tilled into the ground rather than being spread on the top of the field, where it can be blown or washed away. The biochar is also created at a temperature of 550°-650° Celsius, which is best for agriculture.

Producing biochar also reduces carbon emissions, and WasteX has seen positive results. Each ton of biochar can remove 1-2 tons of CO₂e, depending on the feedstock type.

A Passion for Impact

Spending his time on meaningful work is important, Pawel said. “What I devote my time and actually my life to, I want to do something that's going to matter.”

He came up with the idea for biochar when he joined Wavemaker as the first founder in their newly established climate tech venture building programme in late 2021. “We didn't just want to be a carbon removal company. If you look at Asia, the largest share of emissions comes from agricultural land use, especially from agri-processing waste. We were looking for this commercial angle where we create value for others, as well removing carbon. That's how we decided to go after biochar and then help with its application in agriculture. We see a tremendous agricultural, financial and climate opportunity in our solution.”