

In Business To Save the World



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Area companies nurture the environment while making a buck, too

By Melissa Nicefaro

We try to teach our children to aim high and never let anything stand in their way. They become lawyers and doctors, executives and entrepreneurs. Now there is a new breed of kids creeping in to the workforce and shooting right to the top of their game. They are ready to save the world in a different way — they're capitalizing on the green movement.

When Weston native Michael Sesko enrolled in grad school at Yale, he wanted to look for ways to raise capital through environmental services. He graduated in May from Yale's School of Forestry & Environmental Studies and his new business — Encendia — will literally make the world a greener place.

Through the forestry program, he formed a team of five people from four different graduate schools and with support from the Yale Entrepreneurial Institute, their idea to recycle organic waste material into a natural soil amendment called biochar came to fruition.

The product is customized for specific soil types and root zones using proprietary formulations and application methods. According to Sesko, Encendia Biochar provides cost savings and better-looking grass for turf managers while also improving the long-term health of the soil. Biochar also fights global warming as it locks carbon into the soil for hundreds of years, he says.

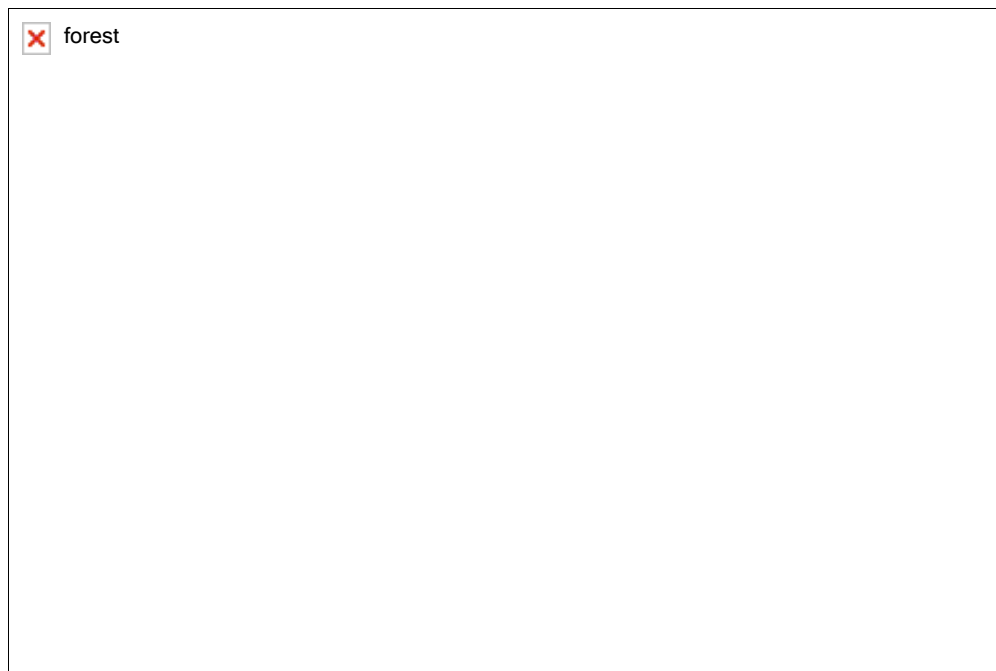
"We all came at it from a different perspective," Sesko explains. "I came at it from a corporate finance group and we were looking at biochar as a way to sequester large amounts of carbon in agricultural soil. We realized that there was no commercial biochar produced in the U.S. We started digging into that idea a little bit further and we realized there could be a private-sector approach to biochar."

Through the class at the school of forestry, the team formed and set to work drafting a business plan.

"We came up with a centralized manufacturing model, selling first to golf courses, then moving on to a larger turf market. With biochar, we're dealing with a bunch of different soil types in the U.S., so it needs to be customized," says Sesko.

In the research and development phase, the biochar is being tested on the Yale Golf Course. The goal is to have it at an outsourced validation trial by next spring.

Since the biochar has the coarse consistency of wood shavings and chips, a golf course needs a finely ground substance in order for it to absorb at ground level, but bigger pieces can be used in agriculture, since it sits right on the soil.



According to Sesko, water and fertilizer represent approximately 50 percent of annual costs for golf courses. Turfgrass managers must continue to provide superior aesthetics while facing public pressure to make their turf less environmentally harmful.

When applied to the soil, Encendia Biochar acts like a sponge, conserving water and improving the efficiency of fossil-fuel based fertilizers. Turf requires less of both. The product also acts like a soil reef, providing a habitat for beneficial microorganisms that reduce disease potentials to turf. Made from organic waste material, it is completely natural and will be applied twice a year during the aeration process. After the waste is burned, only carbon is left at the end.

“That’s where the benefits come,” Sesko explains. “You’re taking biomass and burning it and creating a usable form of carbon that when placed in the soil, can last hundreds of thousands of years.”

Encendia forged a deal with Yale Waste Management to obtain grass clippings and other proprietary ingredients.

Following the testing phase, the company looks to raise a round of \$500,000 to support its first production facility in New Haven. Since the product is costly to transport, it will be created and sold locally at first.

Encendia’s founders share expertise in soil science, finance, law, mechanical engineering and agriculture. CEO Sesko has a background in finance and environmental markets. George Collins is using his knowledge in industrial ecology and contract and intellectual property law in his job as chief counsel. Peter Kuhn, an engineer with specialization in combustion, has conceptualized Encendia’s operations and will serve as chief operating officer. Justin Freiberg has a background in sustainable agriculture and a significant network of golf course superintendents. Bidisha Banerjee has an academic background in soil science and has worked on a biochar feasibility study in India.

While Encendia’s focus is at ground level or below, another Yale startup is focusing above ground-level — and seeing the forest for the trees.

Co-founders Zack Parisa and Max Uhlenhuth formed a company called SilviaTerra and developed a patent-pending algorithm to generate forest inventories from satellite imagery and ground data. For the non-forestry types, SilviaTerra uses satellites to determine size and species of trees in a forest.

According to Uhlenhuth, a Louisville, Ky. native entering his junior year at Yale College, this is important because people need to know the size and species of the trees — known as a forest inventory — so they can value and manage their forest. He expects conservation agencies such as the Nature Conservancy will also use the technology to monitor species and habitat.

Parisa, from Huntsville, Ala., was working on his master’s degree project (he was graduated from Yale’s School of Forestry & Environmental Science last year) on community reforestation in Armenia when he was faced with the problem of needing to find forest inventory for nearly all of Armenia.

“There really is no way to do that. Today we collect forest inventory through trained forestry guys wandering around with a paper and pencil and literally counting trees,” says Uhlenhuth. “Enough long Armenian nights, just [Parisa] and his laptop, he came up with a complex statistical model to use satellites in combination with ground data points to tell you the size and species of trees.”

A self-described computer science guy, Uhlenhuth was working in the computer lab in the forestry school doing quantitative work when he met Parisa.

“The work I was doing depended on having a good forest inventory to be able to project the growth forward, and I asked Zack where the inventory came from,” Uhlenhuth recalls. “He explained the slow and expensive process of sending forestry guys to each location to inventory. Then he told me that for free, he’d just developed a way to do it remotely via satellite. With 750 million acres of forest being hand-counted for about \$20 an hour, I had my eye on a private island.”

So how do they make money?

“That’s something we’re still working on,” acknowledges Uhlenhuth. “It’s tricky, because we’re not yet sure how our costs are going to play out in the real world. On paper, it looks really nice. We have trials with real customers coming this summer. It has the potential to be a much better product than we’re using today because it’s faster, more reliable and more accurate.”

SilviaTerra recently won the \$25,000 Sabin Environmental Business Plan Prize at Yale for its ability to obtain standardized forest inventories in a scalable way that is simpler, faster, and more accurate than ever before possible. SilviaTerra is acquiring its first customers — timber investors — this summer and is refining its business model.

SilviaTerra employs Yale intellectual property since Parisa was a Yale student at the time of its development. Uhlenhuth and Parisa are in the process of obtaining the license from Yale.

“Zack just got back from a tour of the South and some of the big forestry players down there are super-excited about what we have, but they want to see demos. Anybody can say they can sell super-accurate forest inventory using a magic satellite, but there’s no reason for them to believe it until they see proof,” Uhlenhuth says. That’s the next step.

“The thing that makes this a different environmental venture is that we don’t get that warm and fuzzy feeling for saving the earth. But we are putting hard numbers on hard assets and enabling better management of environmental resources,” Uhlenhuth says. “I think we’ll have a greater impact on environmental health because it’s really hard to manage anything without someone providing the numbers.”

“The sexy pitch I give to investors is that in 2050, there’ll be 80 billion people on the planet, putting a ton of strain on the planet’s resources and we’re going to have to manage things a lot better. We can’t manage anything but numbers and we want to be the guys to give you those numbers,” he says.



He gets that indirect warm-fuzzy feeling, but Sheila Hughes, a Fairfield University graduate, has warm and fuzzy running through her veins.

Hughes graduated from FU last year with a degree in business management and a minor in environmental studies.

Now the Yonkers, N.Y. native is executive assistant to Deborah Boyd, CEO of Re3 Group (Resource Recycling and Recovery Limited) in Armagh in Northern Ireland. Re3 is an innovative waste-management company that uses a steam autoclave technology to treat household waste.

“After the treatment process we reduce the amount of waste sent to landfill, produce clean and sterile recyclables, and create a cellulose biomass fiber as a renewable energy,” explains Hughes. The facility, the first commercial size plant to be built worldwide, is located in Limerick.



While completing her undergrad at Fairfield, Hughes worked as an intern in Ireland for two summers. She moved to Ireland last August to take up a permanent position with the company and she’s decided to complete her master’s.

“I had to decide between Columbia and Queen’s University Belfast, and ended up choosing Queen’s,” she says. “I feel I have a better opportunity to learn about environmental management in Europe which is leading the way in becoming more environmentally friendly,” Hughes says. Europe is considered further advanced than the U.S. when it comes to innovative environmental technologies and tighter regulations.

“One new technology is not going to fix all the problems we are facing,” Hughes allows. “It is going to take a number of these technologies working together to finally have a positive environmental impact.

“Having the opportunity to experience a startup company grow into the establishment it is today have

been an invaluable experience in the business sense,” she adds. “The best part about getting into environmental business is the job satisfaction.”

When she was younger, Hughes says she always had the notion that she would be going into business. In 2005, after she was completing her freshman year at Fairfield, she met Boyd.

“Re3 offers a solution to environmental problems which have been increasingly causing serious harm to our environment,” says Hughes. “Knowing that I am involved with a company that provides innovative and safe solutions to environmental problems is fulfilling on many levels. The thrill of being involved in something brand new and the first of its kind has been an amazing experience. We need to be the generation of problem solvers, and getting involved with environmental business is a means to putting these ideals into action.”

She says she'll continue working with Re3 and hopes to lead the setup of Re3 in the U.S. when the time comes. As Hughes is making energy out of waste, a new New Haven company is making money on old electronics.

In November, YouRenew.com, an electronics recycling company founded by two Yale undergrads, took over 3,500 square feet of office space at 25 Science Park, part of the city's life science and technology hub. It move there from the Yale Entrepreneurial Institute (YEI) Student Venture Incubator.

YouRenew, founded during YEI's Summer Fellowship Program, has processed tens of thousands of electronic devices since its inception almost two years ago. Electronics waste is the largest, fastest-growing waste stream in the U.S. and statistics show that recycling has not slowed its growth.

“Less than ten percent of unwanted devices are recycled — so our biggest competition is the trashcan,” says co-founder Bob Casey who, like partner Rich Littlehale, took a short-term leave from Yale to launch the business.

YouRenew pays consumers for their unused electronics, including laptops, cell phones, mp3 players and other gadgets. The company's website (yourenew.com) allows consumers to determine the value of their devices, arrange for them to be shipped to the company and contract for a financial reward in many cases. The company's average transaction is around \$100, and includes three or four devices.

YouRenew recycles products to recapture their value by removing data from devices that are in good condition, then reselling them online. YouRenew sends repairable electronics to refurbishers and wholesalers who make needed repairs and resell the products. It also sends unusable devices to recyclers who dismantle the devices and sell the component parts.

“I realized there was a great deal happening in the electronics recycling space, but not a whole lot in recover and reuse,” Casey explains. “So many times, especially today, a device is turned over after just a few months or a year and still in perfect working condition. There is residual value for reuse even more so than recycling.”

An organization will turn over 50 laptops or even 500 BlackBerrys when they're upgrading, YouRenew's payment helps offset the cost of an upgrade. A BlackBerry can fetch around \$45.

Every device that comes through the facility goes through a process to ensure that proprietary data and information doesn't fall into the wrong hands. The item's serial number is logged and all data is cleared. Laptops are plugged in and completely wiped off to what Casey calls a “Department of Defense standard.”

YouRenew has 15 full-time employees and since it's a privately held company, Casey declines to discuss finances.

“I will tell you, there are a lot of businesses in New Haven sitting on a lot of unused electronics and we could use them,” he says.

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