

SFCC, biofuels company partner to develop renewable, energy-efficient farming

Posted: Saturday, April 23, 2016 10:30 pm | Updated: 9:54 am, Tue Apr 26, 2016.

By Staci Matlock
The New Mexican



A rendering of the planned greenhouses.
Courtesy photo

Santa Fe Community College and a private company plan to launch a unique project this summer that will use renewable energy, leftover food and fish waste to grow more fresh food with less water.

Ecoponex Systems President Benjamin J. Brant needed a place and a skilled workforce to test-run the project, which he says is the world's first integrated closed-loop urban agriculture system. The community college, with a nationally recognized sustainable technologies program, can provide both a trained workforce and space to build out such a facility. It has agreed to lease about 2 acres of campus land to the company, which will own the project but also will provide training and internships to college students.

The Colorado-based company and the college said the \$6.5 million project is expected to generate new jobs and become a model for local food production.

“We’re doing a lot of convergent technologies,” SFCC President Randy Grissom said of the programs already offered to students, such as solar installation, green building, biofuels and greenhouse management. “I looked at the business plan and model for Ecoponex and saw it takes a lot of what we teach and combines it in one project,” he said.

Brant said the individual components of the Ecoponex project are already proven technologies and techniques. Generating power and heat from the sun? Check. Growing fish in tanks and using their waste as nutrients for growing plants? Check. Recycling organic plant and food waste to generate biogas fuel? Check. Growing veggies and herbs in greenhouses using less water than needed in fields? Check.

But how do you combine all those components to work together in a closed-loop system that provides all of its own energy and wastes nothing, akin to the way nature does things? That's what Brant and the community college are aiming for through Ecoponex. Brant calls the planned facility a micro-REEF — or renewable energy efficient farming.

In a nutshell, here's how the Ecoponex micro-REEF works: Food waste from the college and other schools or restaurants is turned into biofuel, along with waste from fish grown in the REEF. The biogas, along with solar thermal energy, will power the facility. Even the waste heat from the system will be captured and recycled into more energy. Filters and algae will clean the water in the fish tanks and then recycle the water back through to the fish, the algae and the crops grown in a greenhouse. Fish will eat the algae. Nutrients generated by algae and fish, along with the heat and carbon dioxide generated, will help grow veggies, herbs and berries in a greenhouse.

Those foods will go back to the restaurants and schools where the original food waste came from.

“This really is the first of its kind to integrate proven technologies together in this manner,” said Brant, a landscape architect and environmental planner who has worked on energy and water projects with the National Park Service and the Solar Energy Research Institute, along with projects in other countries, where he's worked with technologies that he plans to weave into the REEF system at SFCC.

The project still needs additional investors and final approval by the New Mexico Board of Finance. But the partners hope to get it underway by summer — and if they do, they estimate it will create 34 construction jobs and 14 direct jobs, and produce ample amounts of fish, vegetables and fruit.

Ecoponex is one of two dozen companies with some financial backing from LACI, a Los Angeles-based clean-tech company that invests in “disruptive technologies” — those that vary from traditional methods and have the potential to shake up industries. Its portfolio also includes California Lithium Battery, Chai Energy,

Grid Logistics and Pick My Solar, an online hub designed to help homeowners switch to solar power.

Brant is also CEO of Agregy Renewables and an adviser to Global Water Technologies. He's founded several biofuels, renewable energy and water conservation companies, including Planetec, which helped Santa Fe with a water conservation program and energy audits in the 1990s.

Brant is a cheerleader for closed-loop systems, where little to nothing is thrown away and all the components work together. The challenges for Ecoponex are big, but the promise is immense. "Santa Fe will be the first community to close the food-water-waste-energy loop from an institutional stand point," Brant said. "We could create a circular economy."

Grissom said the Ecoponex project fits in with the college's long-range goals to foster economic development and teach students skills that can transfer into a variety of jobs. "The world is changing so fast," Grissom said. "The jobs of tomorrow don't even exist yet. We need to teach transferable skills and flexible knowledge."

Students also will work alongside innovators, learning the process of experimenting, sometimes failing, and trying again until a system or a product is perfected.

"In New Mexico and the United States, we need more innovators," Grissom said. "We need people who are willing to take risks."

Luke Spagenburg, who directs the biofuels center at the community college, also is excited about the opportunities the Ecoponex project presents. "The college is the perfect place because we focus on community needs, skills training and jobs," Spagenburg said. "Beyond just education, we need to have a skilled workforce to build a resilient community."

"This project encompasses food management, water management and resource management," he added. "These are jobs that are right in line with what we're training people to do."

Growing algae goes way beyond biofuels now, Spagenburg said. His program and students are now working with the U.S. Department of Energy and the National Renewable Energy Lab on research projects and developing curriculum. He thinks that — along with the college’s sustainable technologies program — attracted Brant.

Adam Cohen, who runs the college’s new greenhouse management program, is writing a federal agriculture grant now with Brant to also develop a sustainable feed for farmed fish. The micro-REEF offers a perfect lab for such experimentation.

“I am super excited about him coming in because his ideas on integration of energy generation and algalculture and aquaponics are amazing and novel. That’s the type of thing my students will gain immensely from,” Cohen said.

The partners believe that once the system is perfected, it will offer a possibility of creating jobs and year-round local food sources. And it can be scaled to fit the needs of a community of any size.

“You could custom-design systems to serve a pueblo or a Navajo community or small communities like Las Cruces or Roswell,” Brant said. “Or it can be scaled up for cities such as Albuquerque or Denver.”

Designed as part of a larger food production system, the micro-REEF would complement, not compete with, local farmers.

“We don’t want to create a system that would overwhelm the local market,” Brant said. “If rural farms are producing certain crops in the summer, we can adjust and produce a different crop or scale back so we aren’t competing with those farms.”

Since 90 percent or more of fruits and vegetables available in Santa Fe currently come from out of state or out of country, Brant and Grissom think there’s plenty of room for more growers.

Revitalizing the local food economy and helping to build a self-sufficient region is at the heart of this project for the partners, along with providing students with more job skills.

“In New Mexico, we were once self-sufficient. Why can’t we be again?” Spagenburg asked. “We’re number one in food insecurity. What if we could solve that here in our own backyard?”

*Contact Staci Matlock at 505-986-3055 or smatlock@sfnewmexican.com.
Follow her on Twitter @StaciMatlock.*