Start Right Up in Rochester

Rochester, home to Rochester Institute of Technology, is the place to be when it comes to technological innovation, entrepreneurship, and business development.

By Jodi Ackerman Frank

Ed McCarthy was a Marine Corps officer when he received an unusual request from researchers at Rochester Institute of Technology (RIT). The researchers were testing a device they built to predict when mechanical breakdowns would occur in vehicles. Did the Marines have a combat truck they could borrow?

"That's when I started interacting with RIT and began thinking, 'Wow, this is a really interesting project,'" McCarthy said. In 2004, McCarthy retired from the military and joined the RIT research team as a program manager for the Center for Integrated Manufacturing Studies. He helped to vet out initial kinks in the system, update the prototype, and test it on vehicles.

"Then we moved into RIT's incubator, and we grew our company from there. It's really a great success story," added McCarthy, who is now vice president of Vnomics, a cleantech company whose system not only predicts the health of a vehicle, but also helps the military and the commercial trucking industry reduce fuel consumption significantly.

"It's in Our DNA"

"Entrepreneurship — the whole process from concept to commercialization — is in our DNA here at RIT. It's what we do," said Bill Jones, executive director of RIT's Venture Creations incubator.

Jones also heads the university's Clean Energy Incubator (CEI), housed in the Venture Creations building just off campus. CEI is one of six clean-energy incubators, each funded through a $1.5 million grant awarded by the New York State Energy Research and Development Authority (NYSERDA) as a way to elevate a cleantech economy that is already making an impact around the State, across the country, and throughout the world.

In 2009, NYSERDA launched its innovative Clean Energy Business Incubator Program, a network of six cleantech incubators across New York State, including CEI. NYSERDA has committed $9 million over five years to support its incubator program. Already the program is producing results and receiving national attention. The Brookings Institution specifically highlighted this initiative as "critical in helping New York create and retain the types of companies that form the bedrock of a clean energy economy."

"In his bold agenda for 2013, Governor Andrew Cuomo continues to build on the State's progress of accelerating the commercialization of the latest clean energy technologies, proposing additional steps to increase incentives to help entrepreneurs grow their companies and stay in New York State," said Francis J. Murray, Jr., former President and CEO, NYSERDA.

Rochester, NY.

"Innovation is imperative to economic vitality, and NYSERDA's incubator program has proven to be a huge success in promoting the growth of promising and innovative clean energy startups around the State. The result has been new products and jobs as well as attracting significant private-sector investment," Murray added. "This success is rooted in the type of public-private partnerships that we have established with organizations such as RIT."

In Rochester, 14 companies entered the program since the CEI was established in 2009. Currently, not including the companies that have already graduated, there are nine startups that occupy space at the CEI as well as take advantage of resources and support that Jones and his staff offer. This web of tools includes assistance with evaluating business opportunities and developing business plans, mentoring and guidance, and access to RIT's faculty and facility resources.

Cleaner, More Efficient Trucking

One of the most successful companies to date that has grown out of the Clean Energy Incubator is Vnomics. The company has developed a next-generation vehicle monitoring system that is already having an impact in notably reducing fuel consumption in the trucking industry. **nyserda.ny.gov/cleaner-more-efficient-trucking**

"These startups are in a variety of cleantech fields, ranging from wind and solar-power generation, to biofuels, to remote-monitoring platforms, and they are igniting the clean-energy market," Jones said.

Vnomics was one of the first incubator tenants to "graduate" from the CEI. Last year, the company moved into a bigger office space in Bushnell's Basin, a suburb of Rochester, to accommodate its increasing technology needs and more than 30 employees.

It's All About Connections

Jones is an unassuming individual. He is amiable and accessible, which contribute to what he does best: bringing together business partners and other like-minded people, something he clearly enjoys doing.

"I tell everybody I have the best job in Rochester," said Jones, who has played an integral role from the beginning in establishing the CEI and recruiting entrepreneurs focused on the clean-energy industry.

Jones, who founded and ran a facilities management business for a number of years before it was acquired by another company, has served as a consultant for a variety of universities and Fortune 500 companies. For more than a decade before he accepted his current position in 2010, Jones provided expertise in the economic development of Western New York, which included mentoring RIT startups.

Jones' biggest role as the head of RIT's incubator program is to connect the dots in a variety of ways to help fledgling startups begin to plant their roots. Through his extensive collective network and business relationships in the community, Jones works tirelessly to join entrepreneurs, business executives, innovators, inventors, and others to create a hotbed of entrepreneurial activity.

"Team building is the most important aspect of successful entrepreneurship. If you want to start a company, you have to ask, 'Where am I going to get my team?'" Jones said.

And, not just any team will do. A balanced team of people with similar goals and aspirations, but who have different talents and skill sets, is critical. For example, Jones may connect an innovator who needs help developing a robust business plan to advance a product with a serial entrepreneur who has a business, marketing, or manufacturing background and is looking for the next opportunity.

Jerry Horton, a process engineer and part-time farmer who founded Sweetwater Energy, for instance, was looking for a way to bump up his startup a notch. The local startup uses a decentralized system to make low-cost nonfood sugar for biofuels. The materials used to produce the sugar are what most of us would consider part of the waste stream: cornstalks and husks and throwaway wood pieces from sawmills, to name a few.

"I was very familiar with Jerry's startup, and we were looking for ways to really get it off and running," Jones said.

Jones eventually found a way to make that happen. He introduced Horton to Jack Baron, a founder of PAETEC, the successful business telecommunications provider. Jones met Baron at a local meeting of entrepreneurs at the Rochester Open Coffee Club.

"Jack Baron introduced himself to the group and said that he was leaving PAETEC and was interested in getting involved in the alternative-energy business," Jones remembered. "After hearing that, I wanted to immediately claw my way across the table and say, 'I've got just the guy for you to work with!'"

Baron joined Sweetwater as chairman and CEO in 2009, and now serves as the company's president and COO, having convinced his former boss and serial entrepreneur Arunas Chesonis, also cofounder of PAETEC, to join him at Sweetwater. Chesonis is the largest investor in Sweetwater and now serves as the company's CEO and chairman of the board.

"The support of Bill Jones and RIT researchers, as well as access to lab space, has been invaluable," said Horton, who is on the company's board of directors. "They helped to refine the product, which significantly reduced the capital I thought I was going to need to get the company going."

Over the past year, the success of Sweetwater has skyrocketed. The company, which raised $9 million in early-stage funding last year, announced in January that it had secured two $100 million contracts. The deals, with Ace Ethanol (16-year contract) and Front Range Energy (15-year contract), are expected to trigger revenue generation of $14 million annually within the next three years, and grow significantly from there.

Sweetwater, which now has 24 full-time employees, will build and operate small decentralized plants on or near the companies' sites to produce its cellulosic sugar. The sugar will then be sold to Ace Ethanol and Front Range Energy for less than what they pay for the corn they now use to make ethanol. These contracts, and several more in the works, are expected to increase the number of Sweetwater's employees from its current staff of 25 to more than 600, which will include about 100 in Rochester.

The deal also unleashes Sweetwater's ambition to advance the biofuel industry on a scale not seen before. Through its patented technology, the company believes that it provides the most efficient process worldwide at the commercial level in manufacturing cellulosic sugar for biofuel and biochemical production. "Sweetwater's low-cost biofuel sugar will augment corn-based ethanol use and may eventually replace a substantial portion of the corn-based product as a greener alternative fuel," Chesonis said.

Cooling off the Load

As computing continues to accommodate our ever-increasing need to collect and store information, a pressing challenge has emerged: How do we prevent our electronic data systems, which we've come to completely depend on, from overheating and burning up?
nyserda.ny.gov/cooling-off-the-load

"Arunas and I firmly believe that people with high-level skills should be focused on the largest problems facing mankind, and that's what we wanted to do in our focus on clean energy," Baron said. "We did really well in business. We know how to start a company from scratch and grow it into a billion dollar business. We have done this several times, and we have enough money to retire. But, we don't want to retire. We want to do something that will help make clean, low-cost energy readily available worldwide."

Sweetwater plans on using its product line not only for biofuels, but also for replacing oil-based chemicals that are in everything from wood stain and polyurethane to plastics for any number of products.

"We believe that sugar will be the new oil," Baron said.

"What makes Sweetwater a great success story is that its roots were firmly planted through a collaborative support system that funds and focuses on clean-energy technologies," Jones said. "Sweetwater was an anchor tenant in the Clean Energy Incubator, which was a result of winning a NYSERDA grant that was then used at RIT to help develop the first part of the company's biofuel sugar process."

A Trend in Cleantech Innovation and Entrepreneurship

The business community, trade associations, and utility companies are taking note of the region's startups like Vnomics and Sweetwater Energy, which are fusing two key elements in their bottom line: building a profitable business and environmental sustainability.

Vnomics was one of two CEI-supported cleantech companies that recently won a GREAT (Greater Rochester Excellence and Achievements in Technology) Award. Presented annually by Digital Rochester, a regional trade group whose aim is to strengthen and grow the region's technology community, the awards fall into a number of categories. Vnomics won in the Rising Star category.

The other company, OptiCool Technologies, won the Going Green Award for its data-center cooling system, which reduces the energy consumed for cooling by up to 95 percent. The company's product by the same name, is based on a nontoxic, noncorrosive, and energy-saving refrigerant solution.

"Data centers offer us a definite quality-of-life improvement. However, energy use – particularly in traditional cooling methods – and the corresponding impact on our environment must be curbed," said OptiCool President Jeff Burke whose company transitioned from the CEI to a new facility this past summer in Webster, a Rochester suburb.

These and other startups are helping to lift Rochester into the limelight as a place to be when it comes to innovation, technology, and business development. Brookings Institution, the nonprofit public-policy organization based in Washington, D.C., has ranked Rochester as the 46th best metro economy in the world this year and 3rd best in the United States. Rankings were based on 2010-11 growth rates for employment, income, and output of goods and services.

This summer, Fast Company, a web-based and print magazine that focuses on technological innovation, ethical economics, leadership, and design, named Rochester one of 10 underrated hotbeds of American innovation. In addition, TheStreet.com, a digital financial media company based in New York City, named Rochester one of "10 cities poised for greatness in 2012" due in large part to the city's diversified economy.

"The transition and growth I've seen with our tenant companies over the past year have been phenomenal," said Jones, who added that many of the startups have come directly from the Rochester community or RIT alumni. "The increase in our cleantech company tenants has mushroomed, and they're producing better things, faster, sooner."

Jones also noted that RIT student startups in the cleantech fields are also growing. "They're surprising us, and I think we're going to see very profitable and burgeoning high-tech companies coming out of our student startups," he said.

To continue to foster innovation and put commercialization on the fast track in New York State, Governor Cuomo in his 2013 State of the State address has proposed a number of new initiatives, including an Innovation New York Network, which would build collaboration among academics, entrepreneurs, venture capitalists, business leaders, patent lawyers and other professionals. Innovation Hot Spots is another proposed initiative in which 10 higher education or private-sector technology incubators would be selected as "hot spots," offering entrepreneurs support to grow their businesses and to be part of a tax-free zone. The Governor also has proposed a $50 million Innovation Venture Capital Fund that would provide incentives for successful startups to stay in the State.

A Recognized Pipeline

The Simone Center for Student Innovation and Entrepreneurship has contributed in large part to this student company trend. This year, the center was ranked as the top student incubator program in country by Bestcollegesonline, a website that helps individuals in their college search and offers the latest trends in higher education.

As part of RIT's entrepreneurship program that's infused across campus, the Simone Center provides students the opportunity to test out business ideas and create commercialization plans under the guidance of faculty mentors and through access to facilities, researchers, and other resources.

"After years of working with these students, we see their products and business concepts evolve in the commercialization process, and they go on to become client companies at either the CEI or Venture Creations," said Simone Center Director Richard DeMartino. "The Simone Center is an essential part of the ecosystem that RIT has created to build entrepreneurs and innovators from the ground up."

One student startup that recently grew out of the Simone Center and is now in the CEI is Local Energy Technology (LET). The company was formed when Kosovo Wind Gardens, which accelerated through Simone Center's 11-week Summer Startup program, merged with Arxterra, another venture working with developing markets. Kosovo Wind Gardens was founded as a small-scale, decentralized wind-energy company. Arxterra was a housing venture in Haiti.
The intense summer program helped Kosovo Wind Gardens secure seed funding through the Dell Social Innovation Competition, where RIT students Adam Walker and Josh Turner first met the Arxterra team and began the journey that resulted in LET.

"Summer Startup gave us the skills and experience we needed to take our ideas to the next level," said Josh Turner, chief technology officer of LET and a 2012 RIT graduate.

LET has developed a product that incorporates cloud-based software to allow energy suppliers to directly monitor, control, and monetize the flow of energy within existing and new power infrastructure.

The device, which looks like a typical electricity meter that can be connected to a small network of wind turbines or solar panels, allows an energy provider to remotely access meter readings and bill the customer through a mobile phone or SMS (short message service) infrastructure.

"Our device allows energy developers to provide power in rural areas without the exorbitant expense and inconvenience of building a heavy grid infrastructure, especially for small customer bases," said cofounder and LET product designer Ben Stukenborg. "They can set up small renewable energy power stations and then monitor and manage these power sources remotely from a web-based platform."

For customers, payment can be made anywhere in the world through a cell phone. For someone in the U.S. who wants to buy electricity for family members in an African country, for example, he or she would buy the power via a cell phone and then the power is delivered to the family's home.

LET is already working with the Haitian and Kosovo governments to set up pilot programs in remote areas of the countryside. The startup also has received $40,000 from the Chilean government to explore further market opportunities in Latin America. Closer to home, LET is exploring ways in New York City to integrate its devices into electric vehicle charging stations, which are part of a statewide initiative to install a total of 325 stations.

"RIT is really important to us," said Stukenborg, whose team spent countless hours in the Simone Center assembly labs over the past year. "It's great having a community around to support us when we come across those really tough technical or business questions, and RIT has provided that without fail."

Pillars of Support for a Solid Ecosystem

Over the last two decades, RIT has invested in world-class industrial and research facilities that largely reflect the university's commitment to a sustainable environment as well as support an innovative ecosystem for cleantech-focused entrepreneurship. The backbone of this commitment is the Golisano Institute for Sustainability (GIS). Formed in 2007 as a multidisciplinary academic and research institute, GIS focuses on sustainable production, environmental policy, sustainable business development, and alternative energy. GIS, which developed the first-of-its-kind doctoral program in sustainability, collaborates with industry, government, and other organizations locally, nationally, and internationally on a variety of initiatives.

Six large manufacturing bays and more than 20 labs with state-of-the-art testing equipment serve the GIS's five research centers and institutes. To increase its capacity for the burgeoning number of innovative research projects across campus, GIS broke ground for a new 75,000 square-foot state-of-the-art building. The facility, which will be a showcase for green construction and design, will house seven integration test beds and eight support labs that will serve to heighten research and technology transfer in areas of alternative energy and environmentally sustainable products and production systems.

A Cornerstone of GIS is the Center for Integrated Manufacturing Studies (CIMS).

"This is the research and technology arm of our Clean Energy Incubator," said Mark Coleman, CEI manager of technical development and the CIMS senior program manager. "We use our facilities and the capabilities of the staff here in a leveraged way to provide technical services. We have research scientists, technicians, and senior staff engineers – they're problem solvers."

Many of the university's cleantech startups have jumpstarted their businesses with the help of CIMS, including Sweetwater.

"We've done a lot of work with Sweetwater," Coleman said.

Using a small pressure tank, a cooker, and some other equipment, CIMS researchers were able to complete Sweetwater's Proof-of-Concept work through demonstrating that breaking down a hodgepodge of cellulose materials in a more compact system was technically possible. The research team started out experimenting with five-gallon batches and eventually moved up to a 50-gallon processing unit.

"The project allowed us to win some NYSERDA awards for Sweetwater, which helped it to scale up its system," Coleman added.

"With our close proximity and connections to the resources, programs, and infrastructure, as well as to the intellectual and diverse expertise that we have access to across the RIT campus, startups in our incubator program can hit the ground running," said Jones. "And, we continue to build on and nurture this tightly knit entrepreneurial ecosystem to help cleantech companies succeed."

This, along with RIT's longtime connections with industry, government, and area businesses, will allow the CEI to continue to push entrepreneurship toward the frontiers of business, technology, and society to accelerate a cleantech economy for a bright and sustainable future.

NYSERDA Business Development Efforts

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