

Transforming Entrepreneurial Innovation Into Business Success

By Jodi Ackerman Frank

David Hessler remembers the day in 2011 when he had to stand in front of a panel of investors and pitch a promising clean-energy product based on an advanced technology that few are familiar with — piezoelectric microelectromechanical systems (piezo-MEMS).

“It was one of the hardest things I’ve ever done,” said Hessler, who served as interim CEO for MicroGen Systems Inc. The cleantech startup has developed the BOLT™ micropower generator, a family of energy-harvesting devices that replaces the need for batteries in wireless sensor network systems. The micropower generator scavenges energy from ambient vibration to enable individual wireless sensor nodes or “motest.”

Working with an experienced management team, Hessler served as CEO for a short time before company founder Robert Andosca took the reins in 2011 as the current CEO. Hessler helped guide the company by leveraging both the startup’s existing industry contacts and his own extensive contacts along with marketing savvy and business know-how.

Although he is a seasoned entrepreneur, business executive and investor who is a founding member of the Rochester Angel Network, he still knows how hard it can be for a startup to make a convincing pitch and reach a level of stability. And, perhaps this is a success factor of his work in helping companies in the earliest stages of development get a leg up.

A Successful Program

Hessler initially served as MicroGen’s entrepreneur-in-residence (EIR). He is one of about 60 serial entrepreneurs or high-level business executives who participate in the New York State Energy Research and Development Authority Entrepreneurs-In-Residence (NEIR) Program.

Hessler eventually went on to become MicroGen’s CEO when his NEIR project with the company ended so he could have more hands-on access to a company he continues to believe and invest in.

NEIR provides a broad range of high-level strategic advice and assistance to early-stage companies associated with any of the six NYSERDA-funded incubators around the State or through NYSERDA research and development programs and grant awards.

“Governor Cuomo has made it a priority to promote the cleantech industry around the State, and the Entrepreneurs-In-Residence Program complements his efforts. This program is part of a suite of initiatives that NYSERDA offers to help promote New York’s clean-energy businesses in all stages of development,” said Francis J. Murray Jr., former President and CEO, NYSERDA.

“By building upon the knowledge and skills of proven, successful business leaders, the cleantech industry will continue to be a driving force in stimulating economic activity and creating jobs across the State.”

NEIR is administered by High Tech Rochester (HTR), a nonprofit business incubator that aids early-stage technology-based startups in Rochester and the Finger Lakes region. In 2010, HTR was recognized by the National Business Incubation Association for incubator best practices.

“We have a unique partnership with NYSERDA to help accelerate the growth of cleantech startups across the State by connecting serial entrepreneur mentors with new startups in short-term, highly focused strategic engagements,” said Doreen Kula, who oversees the program at HTR.



Doreen Kula, director of the NEIR Program, stands next to Bob Kot, a former Entrepreneur-in-Residence, who now oversees High Tech Rochester's (HTR) efforts in accelerating the growth of regional startups. HTR administers the NEIR Program

The term “entrepreneur-in-residence” is a concept that grew out of the venture capitalist world. “What venture capitalists found, particularly those with large portfolios of invested companies, was that whenever they paired newly formed companies with a mentor who was a serial entrepreneur or a C-level start-up executive, these companies had much higher rates of success,” Kula said.

The EIR concept then began to expand, most notably in the 1980s and 1990s, to business schools and universities, incubators and other business organizations. NYSERDA explored the idea a few years ago to see how such an EIR program might assist the cleantech startups that NYSERDA funds across the State.



The NEIR Program initially was launched as a two-year pilot program in 2010, with funding tied to a specific time period for each NEIR project and a projection that a certain number of early startups would apply. Because of early success stories and its popularity, NYSERDA has continued to fund the program for up to five more years. For the State and individual startups, the program has paid off. The statewide impact from the roughly 50 projects from March 2010 through October 2012 includes \$4.1 million in revenues, \$7.33 million in capital raised, and \$3.78 million in grants. As a result of NEIR, 86 jobs were created or retained. In addition, 14 strategic partnerships were negotiated and one company was acquired.

"This combined program impact is nearly \$16.5 million, which leverages NYSERDA's investment 30:1," Kula added. Because the terms of acquisitions and strategic partnerships are confidential, this amount does not include the economic impact of the company acquired or the negotiated strategic partnerships, which would make it significantly higher, Kula noted.

A Technological Focus



MicroGen CFO and COO Mike Perrotta (far right) discusses a new MEMS-based energy harvester with David Trauernicht, MicroGen's principal scientist in their office at High Tech Rochester.

One main focus of the NEIR Program is to pair early-stage companies with EIRs who not only have a business-approach mentality, but who are also familiar with the technological arena. "Our common thread is that we know how to build businesses, and we often have one or more areas of technical expertise," said Hessler, who bought his first electronics business in the 1980s. Hessler became MicroGen's EIR in 2010.

With Hessler's guidance, the company revamped its business plan, which later helped catch the attention of investors and NYSERDA.

"David brought credibility to the management aspect of our company and was instrumental in helping us network for investment opportunities," Andosca said. "David serves on MicroGen's advisory board, provides insight for strategic issues, and we highly value his continuing contributions."

MicroGen is a tenant at the NYSERDA-funded business incubator, The Center for Clean Tech Entrepreneurship (Clean Tech Center), in Syracuse. It also has offices at HTR and Cornell Business and Technology Park.

In summer 2012, MicroGen secured about \$2.6 million, which included \$700,000 from NYSERDA and \$1.3 million from XTRION, N.V., a Belgian company that designs and markets semiconductor

devices worldwide. The funds also included \$100,000 in licensing revenue from a leading semiconductor/sensor company that sells primarily in the automotive industry. The NYSERDA contract was one of the largest technology commercialization grants awarded by the agency at the time. The production of the piezo-MEMS-based generator is currently being transferred to X-FAB Silicon Foundries in Germany. The overall BOLT micro-power electronics module's assembly, packaging and testing will be conducted in New York State. Andosca said he expects up to 30 employees working for the company by 2016.

Taking a Startup to the Next Level

Battery Energy Storage Systems (BESS) Technologies LLC was founded in 2010 by five doctoral students from the College of Nanoscale Science and Engineering (CNSE) at the University at Albany.

The company has developed a "hyperbranched," three-dimensional nanostructure from a metal-silicon composite to improve the performance of anodes in lithium-ion batteries for increased storage capacity, charging rate and lifetime. BESS is a tenant company in the NYSERDA-funded incubator program, Incubators for Collaborating and Leveraging Energy and Nanotechnology (iCLEAN), also located at the University at Albany. In spring 2012, with the help of its EIR, Mark Austin, the company secured the first-ever license agreement for a spin-off technology from the CNSE.

"The NEIR Program really provided — in a very structured way — the leverage we needed to take our company to the next level. In less than a year, we went from having very little to show to proving that we had a sound plan, a sound structure, and the relationships we needed to move forward," said Fernando Gomez-Baquero, company cofounder and CEO. "Without Mark Austin, we wouldn't be a company today."

Austin is the managing director of Chandler Reed LLC in Larchmont, NY, where he advises companies in the emerging technology sector in business strategy and planning, investment, technology development, marketing and strategic alliances. He is a member of the iCLEAN Board of Advisors and is also a long-standing member of the International Licensing Executives Society. "The process of negotiating a technology license from academic institutions is a specialized field," Austin said. "Universities increasingly want to capitalize on their intellectual property rights not only as a way to build partnerships, but also and ultimately they're looking for some additional return on the investments they have spent in building their faculty and state-of-the-art research facilities."

"University technology transfer departments are growing more sophisticated and also reflect some institutional prestige," Austin added. "However, universities also want to foster entrepreneurship, so they are open to working with developing startups, which often involves trade-offs and judgment calls. This can add a bit more challenge and complexity to the negotiations."

Preparing for the licensing agreement also allowed BESS to achieve several other milestones, including a more comprehensive business plan that ultimately secured the \$1.5 million offered by investment firms. This year, BESS partnered with Ceres Technologies, a solar-cell equipment manufacturer in Saugerties, NY.

“The process to make our anodes is the same process that is used to make solar cells and computer chips,” Gomez-Baquero said. “Manufacturing the equipment to make our anodes can be another line of business for Ceres, so we both benefit.”

The Right Match

The most notable part of NEIR, Gomez-Baquero said, is how selective it is in pairing a company with an EIR.

“The match between the company and the EIR is key, and that’s why the program works,” said Gomez-Baquero, who hired Austin to stay on as strategic advisor. “The choice is not random. We explored the qualities and backgrounds of a number of EIRs with NYSERDA staff and found that Mark was a perfect fit.”

The EIRs also serve as an important link in helping the state-funded incubators prevent new startups from falling through the cracks. NYSERDA supports six cleantech incubators: iCLEAN in Albany; New York City Accelerator for a Clean and Renewable Economy (NYC ACRE); Long Island High Technology Incubator (LIHTI); Clean Energy Incubator (CEI) in Rochester, Directed Energy in Buffalo; and the Clean Tech Center in Syracuse.

Since EIR applicants are either located in one of the six incubators or are working directly with a NYSERDA project manager, incubator directors and the NYSERDA project managers develop a close working relationship with these startups. But time and resources, and even knowledge on some of the most advanced clean-energy technologies, can be tight.

As a way to bridge these gaps, EIR was developed to work closely with the NYSERDA project managers and incubators. EIRs are hired to spend the additional time needed and have the expertise to help guide inexperienced entrepreneurs in making decisions that can bring their startups closer to viability.

Because NEIR is a statewide program, it is able to draw on a larger talent pool to more appropriately match the right expertise with company needs. As the program has evolved, it has also drawn on EIR candidates from California, Connecticut, Florida, Massachusetts, New Hampshire and New Jersey. To help EIRs and startups connect even before participating in a NEIR-sponsored project, networking events are held in various locations across the State every year. Based on the concept of speed dating, companies and EIRs present a one-minute elevator pitch, explaining who they are and what they specialize in. A reception follows, allowing participants to conduct follow-ups.

A Business Approach

Many cleantech startups are launched by technology leaders in their fields. However, these technologists often have little experience developing a business plan, raising money and convincing investors that their emerging technology will pay dividends and be fruitful in the marketplace. Terry Moag, who founded The Radiant Store Inc. in 2005, can attest to this. The Radiant Store, based at the Rensselaer Technology Park in Troy, specializes in solar-thermal systems, which provide heat and hot water for a variety of customers. One of the company’s main markets is agriculture. Dairy and other farms use solar-thermal power for equipment such as milking machines and chillers and for warm-water use in greenhouses in winter.

Unlike photovoltaic cells, which generate electricity directly from sunlight, solar-thermal panels produce heat by collecting energy from the infrared light spectrum. The heat is then distributed to a building to help offset energy costs. The technique is about seven times more efficient than photovoltaic generation, and globally the solar-thermal industry is thriving. The technology has not developed as fast in the United States as it has in Europe, although that may be changing soon.

Over the last two years, The Radiant Store has executed a research and development project, partially funded by NYSERDA, to study the performance of the technology and help develop a bigger market for it. In addition, the company has created several new skilled-labor positions in utilizing the NYSERDA on-the-job training program, which helps small businesses train new employees.

In 2012, The Radiant Store earned the Outstanding Achievement award from NYSERDA for completing the most solar-thermal installations and displacing the largest number of kilowatt hours of electricity for water heating.

But Moag said his company’s achievements largely would not have been possible without Paul Burton, an EIR who helped Moag reorganize the company in 2010. As a result, The Radiant Store raised revenues from \$650,000 to \$2 million in 18 months.

“Paul was instrumental in consolidating and organizing our business in a way that gave us opportunity,” said Moag, whose company has eight employees and is a participating contractor in the NYSERDA Home Performance with ENERGY STAR® program.

Most notably, Burton helped reorganize the company into three revenue streams: building consulting that includes conducting energy audits; solar-thermal systems installations; and heating, ventilation, and air conditioning (HVAC) installations. In the latter, the company’s specialty is low-temperature radiant heating. Taking Burton’s advice, Moag was also able to negotiate a long-term capital structure to allow the company to position itself for continued growth.

“Being an independent-minded entrepreneur, I felt I knew exactly what I needed. But when Paul came in, the realization hit that I needed someone with business experience who could teach me how to step away from the operational details and translate my ideas into a meaningful business strategy,” Moag said.

“NYSERDA’s EIR Program has been the best use of public money to help small businesses break through the inflection point they face in growing their companies,” said Burton, CEO and president of Remmele Engineering. “Most new entrepreneurs know their products and even their market, but many times they don’t have the business acumen to break through the glass ceiling, and this program addresses that.”

“We definitely would have been a statistic in the scrap heap of failed businesses had I not run into Paul and STEP,” Moag said. STEP® is the NYSERDA-owned Saratoga Technology + Energy Park®, where Moag’s company was located when he was sponsored in the NEIR Program.

Opening the Market Pipeline

Stefan Doering is founder of BEST Coaches, a New York City company that focuses on helping entrepreneurs worldwide launch and scale up green companies. At the heart of his coaching strategy is a commitment to “achieve the unreasonable.”

“What ‘unreasonable goals’ means is going outside your comfort zone and opening yourself up to new opportunities,” said Doering, a serial entrepreneur who in the early 1990s started one of the first green retail companies in the U.S. The retail store became the largest of its kind in the country at that time.

Doering served as the EIR for Jeff Perlman, who founded the New York City company Bright Power Inc. in 2004. The company is a leader in providing energy efficiency, solar energy and energy management solutions to apartment buildings. Bright Power’s goal is to help multiunit residential building owners save energy, money and time through more sustainable energy practices.

Shortly after establishing Bright Power, Perlman realized that one barrier to clean energy and energy sustainability in buildings was that most people don’t know how much energy they use.

“If they own multiple buildings and they don’t know how much energy is being used, then they don’t know which ones are the most or least energy efficient and, therefore, which ones to make the biggest investments in,” Perlman said.

To address this issue, Perlman and a software development partner launched EnergyScoreCards in 2010. The Bright Power subsidiary created a new software tracking tool that integrates and automates energy benchmarking and management for multi-apartment complexes.

Doering helped Perlman create a plan for EnergyScoreCards. He also challenged Perlman to commit to the “unreasonable” goal of securing 1,000 buildings benchmarked under New York City’s Local Law 84 (LL84). The mandate, established in 2009, requires private owners of buildings over 50,000 square feet to report energy and water consumption every year.

Perlman managed to obtain commitments for close to 700 LL84 benchmarks. These benchmarking clients represent additional revenue opportunities for Bright Power, since they are prime candidates for Bright Power’s energy auditing, installation and other services. The EnergyScoreCards software has grown from containing a database of 1,000 buildings owned by a consortium of nonprofit housing organizations to over 300,000 apartments on more than 4,000 properties across 49 States.

“It was important for us to establish dominance in the New York City market – our home turf,” Perlman said. “So, while we did fall short of the goal, we have still become a leading benchmarking provider in the city and are well known for our work around the country.”

In addition to encouraging startups to reach the next level of opportunity by thinking “big,” EIRs in the NYSERDA program also have shown new entrepreneurs how to expand their vision to explore new markets. Kathy and John Olenick, along with four former coworkers, started their Buffalo-based company, ENrG Inc., in 2003. The company produces an ultrathin flexible ceramic substrate.

The zirconium-oxide-based ceramic that ENrG produces can survive high temperatures (exceeding 800 degrees Celsius) and are more durable and flexible than typical ceramics. The thin membrane is dense and self-supporting at 20 micrometers thick — qualities that benefit the solid-oxide fuel-cell (SOFC) industry.

For five years, ENrG served as the manufacturing arm of Corning Incorporated’s SOFC research program, conducting research and producing fuel cells to specification in its cleanroom facility in Buffalo. Corning eventually licensed the thin-ceramic technology to ENrG, when it decided to pursue other research avenues.

“We really saw ourselves as a solid-oxide fuel-cell company before the NEIR program,” said Kathy Olenick, who earned her degree in ceramics engineering at Alfred University in Alfred, NY. “We weren’t even thinking of using the product for other applications because it was Corning’s product. We were looking to be its manufacturing arm. That was our goal.”

To Dan Connors, the company’s EIR, the opportunities for marketing such a unique product was limitless, now that ENrG licensed the technology.

“When I learned what this product could do, I saw the potential for a very broad list of applications. The research we did to find potential markets for ENrG’s ceramic membrane revealed new opportunities in applications that ranged from under the ocean to outer space, the most promising being as a new substrate for thin-film solar photovoltaics,” said Connors, president of Renewable Energy Strategies. He also serves as an advisor to Rentricity Inc., another New York clean-energy technology company that previously used his NYSERDA EIR services.

Potential applications for ENrG’s ceramic substrate, which the company markets as Thin E-Strate®, range from temperature and chemical sensors, to fuel cells and batteries, to flexible electronics, to abrasion-resistant materials, among others. Currently, ENrG’s thin-ceramic foil product is attracting strong interest from the thin-film solar industry, a key market segment identified in the NYSERDA EIR project.

“Working with Dan on the EIR project has changed the way we do business. In the last 12 months, we have sold or provided samples of our Thin E-Strate® to 30 companies in 15 different markets,” Olenick said. We are particularly encouraged by the potential opportunities in the thin-film photovoltaic market.”

“I don’t know of a better program that helps entrepreneurs grow their companies into sustainable businesses,” Moag said. “Pulling it all together so that your company can turn a profit, that’s what the NEIR Program is for.”

NYSERDA Business Development Efforts

Visit nyserdera.ny.gov/Business-Development to learn about how New York State and NYSERDA are helping inventors, innovators, and investors bring clean energy technology to market. To receive Clean Energy technology information from NYSERDA, sign up for our Clean Energy ListServ. nyserdera.ny.gov/clean-energy-listserv

