First Person—The "Matchmaker" for Launching Energy Technologies

The Story in Brief

"There's a buzz in the air" at Greentown Labs, says Emily Reichert, CEO of the Massachusetts-based incubator for energy technology startups. Drawing from her experience with dozens of startups, Reichert speaks about the key to successful utility partnerships, technology trends in electric power, and the importance of grid infrastructure upgrades.

EJ: Greentown Labs has a co-working space, machine shop, prototyping lab, event space, and more than 50 hardware-focused startup companies employing more than 500 people. What's a typical day like?

Reichert: Every day is completely different and filled with surprises and new things happening. On any given day, one thing you will notice immediately—and people comment on it when they walk in the front door—is that there's a buzz in the air. This buzz is generated by people developing, testing, and presenting about their technologies. They are passionate about turning their ideas into commercial reality.

Emily Reichert

More than half of our companies have an active project in our 20,000-square-foot lab and spend some portion of their days testing and learning about how a technology works. They may be getting ready for field trials to demonstrate that the technology can be a winner in the market.

In our office spaces, meetings are buzzing away all day. Startups are meeting with utilities and other large corporations, government officials, potential talent, universities, and more. In our event space, we do more than 200 energy industry networking events a year.

EJ: How are Greentown Labs and its member companies collaborating with electric utilities?

Reichert: Investment in clean energy technology is not what it was 10 years ago when traditional venture capital was available for early-stage companies. So we have taken an alternative approach by creating an environment where we connect startups with corporate partners. Our utility partners include National Grid and ENGIE, a French gas and electric company. They sponsor Greentown Labs, interact with our companies in a variety of capacities including mentorship, technology validation, and testing, and sit on our advisory board.

It's difficult for a young startup to penetrate corporate partners and particularly utilities, because their entry point is often a technology scout who is not a decision maker. That person may have to report two or three levels up to get a decision maker interested, and that can take time and sustained effort.

We have a 6-month accelerator program called *Greentown Launch*, which provides startups with mentoring, milestone planning, technical feedback, and support with prototype refinement to prepare them for successful corporate partnerships. This program has helped spark several partnerships.

One example is between Tagup, a Greentown Labs startup, and Veolia, a water and energy company. Tagup has developed a cloud-based system for continuous monitoring and analysis of industrial equipment data, with power transformers as one early application. Monitoring of transformers is typically done today by a technician who manually samples transformer oil. This happens infrequently, and there is no data the rest of the time. Tagup and Veolia have deployed the sensors at a cogeneration plant in Cambridge to validate the technology.

> **"It's difficult for a young startup to penetrate corporate partners and particularly utilities, because their entry point is often a technology scout who is not a decision maker. That person may have to report two or three levels up to get a decision maker interested, and that can take time and sustained effort."**

Another partnership involves Sparkplug Power, a Greentown Labs member company, Massachusetts Clean Energy Center, and Holyoke Gas and Electric, a utility in western Massachusetts. They are doing a pilot project to integrate Sparkplug's energy storage system into the grid. A third example is from one of our recent graduate companies, NBD Nano, which has developed an external condenser tube coating that improves steam condensation in power plants. Tennessee Valley Authority is testing the technology at the Shawnee Plant in Kentucky.

EJ: What makes successful partnerships between startups and utilities?

Reichert: The number-one key to a successful partnership between startups and utilities is that the utility has a technology scouting group as well as decision maker in asset management—someone at a senior level that will support and authorize testing and evaluation of new equipment or technology. The utility needs to have an openness to take some risk within the confines of the regulatory world in which it operates.

It's important that the partners understand each other's world views. Utilities need to understand how quickly startups work and their tight timelines, and startups need to understand that utilities must comply with various regulations when testing or evaluating technologies.

The startup needs to be able to make the business case that its technology will offer cost savings or increased revenues or profits for the utility, without adding unnecessary risk. For example, Tagup's monitoring platform can save millions of dollars in maintenance costs if it identifies a failing transformer, and the utility can address that degradation before a catastrophic failure occurs.

Greentown Labs and other organizations like us across the United States are in a position to help guide partners and facilitate mutually beneficial introductions. We're matchmakers for startups and utilities. We make sure that the startup is ready for a partnership with a utility and that the utility is ready for a partnership with the startup.

> "The number-one key to a successful partnership between startups and utilities is that the utility has a technology scouting group as well as decision maker in asset management—someone at a senior level that will support and authorize testing and evaluation of new equipment or technology."

EJ: What technology trends are you seeing with potential to transform the electric power sector?

Reichert: Based on the startups we've received applications from over the past year or so, along with current applications, we've noticed a clear trend related to energy storage. Ten years ago there was a lot of innovation in battery materials and chemistries. Today, many of those companies still exist, but energy storage companies are more focused on systems. For example, they are developing hardware and software to control, monitor, and collect data from energy storage systems; our member Sparkplug Power is developing systems to optimize grid energy storage.

We're seeing many companies developing software, algorithms, and data analytics to support grid operations. One Greentown Labs company, NewGrid, has software to help operators route power around congested areas of the grid by switching high-voltage circuit breakers.

> "Utilities need to understand how quickly startups work and their tight timelines, and startups need to understand that utilities must comply with various regulations when testing or evaluating technologies."

There's also a lot of work happening to develop control technology for microgrids, but the challenge is that we don't have demonstration facilities where we can easily test new products. I'm hoping that the utility industry will step in to help with that.

EJ: Given your exposure to technologies in diverse aspects of power generation, delivery, and use, what might the electric power system look like in 10 years?

Reichert: Based on my experience, what the grid looks like 10 years from now will depend on how the federal government prioritizes infrastructure upgrades. Investing nationally in grid infrastructure could be a great opportunity for a much smarter grid that enables more renewable and distributed energy at a larger scale. In addition to more infrastructure such as transmission and distribution, updating grid security is an important part of this. This needs to be a federal priority because so many interconnected states are involved. A national-scale grid upgrade is the best outcome and would not only enhance security, reliability, and resiliency, but also create many jobs and stimulate economic development.

Texas is an interesting case study of what could happen nationally if we put a lot of eggs in the infrastructure basket. Over the last 15 years, the state has built a great deal of infrastructure to enable significant wind power.

A less ideal scenario would be to continue limping along with the grid we have. It may support a certain amount of renewables but was not designed to interact effectively with small-scale, distributed energy resources.

> "Based on my experience, what the grid looks like 10 years from now will depend on how the federal government prioritizes infrastructure upgrades."

EJ: You have a plan to double the size of Greentown Labs. Discuss the vision for this expansion and its implications for technology innovation.

Reichert: In just five years, we've grown from four startups to nearly 60, and we see the need to accommodate even more companies, many of which are developing innovative technologies applicable to the electric power sector. We're viewing our expansion with a global perspective, understanding that not all the technology being deployed in the United States needs to be developed in the United States, and not all the technology developed in the United States needs to stay in the United States. With our new center, we want to facilitate interactions and sharing of ideas among innovators from around the world, so that technology can move as freely as possible between countries. For example, we might host startups from different countries for six months or send domestic startups to India, China, or Brazil to test and deploy technologies that can promote broader access to energy in emerging markets.

Around the world, there's a huge need for more incubator organizations to connect startups with industry expertise. By hosting startups from different countries, we want them to take the idea of a strong startup community back to where they came from and let that be a seed for new startup communities.