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Chautauqua



Plugging the Micro into the Macro: Rethinking Your ENERGY Needs

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Extreme weather has become a reality for New York as the state endures severe storm events every few years. With aging infrastructure continuing to cause costly complications for municipalities (and the push for renewable energy becoming more prevalent), self-contained electricity distribution systems – or microgrids – are gaining recognition in commercial markets as part of the storm preparedness solution. So much so that states up and down the East Coast have not only invested in discovering how to viably deploy microgrids, the government in New York State has offered incentives.

At the start of 2014, Gov. Andrew Cuomo's \$17 billion "Reimagining New York for a New Reality" storm preparedness strategy included a \$40 million competition to kickstart 10 microgrids in communities of approximately 40,000 residents. However, despite these rewards, municipalities need more justification to allocate resources for installation.

As defined by the Department of Energy (DOE) and the Lawrence Berkeley National Laboratory, "A microgrid is a localized grouping of electricity sources and loads that normally operates connected to and synchronous with the traditional centralized grid (macrogrid), but can disconnect and function autonomously as physical and/or economic conditions dictate." It has the capability to distribute energy supplied from one or more sources to a network of users in a spatially defined area.

One of the key challenges with microgrids is providing municipalities with a worthwhile commodity even in non-emergency situations. Depending upon its complexity, a microgrid can become a source of revenue as it moves a municipality toward self-sufficiency. Whether they are intended to be used year-round as a primary energy source to help offset peak energy times or to sustain electrical power for essential municipal and emergency services

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during severe weather events, microgrids offer many financial and environmental benefits. With the demand for lower-cost energy growing, microgrids produce local power generation, reducing the distance energy travels and passing on fewer costs from transmission losses, congestion pricing and customer service overhead. Microgrid operators have an opportunity to produce income by bidding excess energy into the wholesale market.

Modern microgrids are meant to work in tandem with other clean, renewable energy resources like solar, hydro and wind power to lower greenhouse gas emissions, reduce reliance on fossil fuels and cut overall consumption of energy. This utilization of various energy sources means microgrids do not require a large open space, proving its ability to accommodate varying municipalities. But more than its inherent adaptability, a microgrid's critical value lies in the resiliency to ensure reliable power and heat supply, as microgrids can reuse the energy that is produced during electricity generation for heat, sterilization, cooling and even absorption refrigeration.

After significant flooding from Superstorm Sandy damaged underground infrastructure and coastal communities, it became all too clear the special challenges New York has in protecting its critical systems. The concept of installing a microgrid may

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seem implausible when maintenance of existing systems takes precedence, but it is more cost-effective to install the framework for a microgrid at the same time other repairs and upgrades are going on. With severe weather becoming a common occurrence, it's the responsibility of municipalities to make every effort to fortify resources and infrastructure in order to build a more resilient community. Rather than just being utilized as emergency backup power, microgrids could serve as models for integrating a range of grid-edge technologies into the macrogrid.

Despite the overwhelming benefits, there are some challenges for microgrids that have hampered widespread development. Microgrids' alternative revenue streams conflict with existing regulations and threaten utility business models that sell power to consumers. It can also prove to be a pricey investment if developed as a singular project rather than part of an infrastructure renovation.

Some municipalities may be hesitant to employ this type of initiative because they don't know where to begin. They have to plan for the future while taking care of more immediate infrastructure issues. Since Sandy, many grants that enable infrastructure to be reconstructed and promote storm preparedness have become available. Recently, the U.S. Environmental Protection Agency (EPA) announced a \$340 million grant to New York for the rebuilding of water and wastewater infrastructure. Such funding enables municipalities to address the severity of aging infrastructure and prepare for the future with the most advanced technology. Rather than be an intimidating undertaking, each microgrid is meant to meet the exact needs of the consumers it serves, but all microgrids share the ability to optimize energy usage and generation to provide customers with resilience, reliability and sustainability.

It's no secret that New York has tough regulatory policies, especially as other states in the northeast are cutting through the red tape and gaining ground. Yet making headway in New York is not an impossible task. Over the past several years, policies in New York have been promoting and supporting change, albeit slowly and despite broad challenges. Legislatures and municipal leaders need to consider the big picture rather than a single component in realizing solutions for the future sustainability of their communities and begin to reimagine New York for a new reality!



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