PROGRAM PROFILE

National Grid Community Resilience Demonstration Project

Program Description

Launched in 2014, Reforming the Energy Vision (REV) is Governor Andrew Cuomo's comprehensive energy strategy for the state of New York. REV represents a multifaceted strategy encompassing initiatives in the areas of renewable energy, building and energy efficiency, clean energy financing, sustainable and resilient communities, energy infrastructure modernization, innovation and R&D, and transportation. REV helps consumers make more informed energy choices, develop new energy products and services, and protect the environment, while creating new jobs and economic opportunity throughout the state. Combined heat and power (CHP) is identified as a Building and Energy Efficiency initiative to achieve REV goals.

Quick Facts

LOCATION: New York
MARKET SECTOR: All
PROGRAM TYPE: Microgrid pilot
GEOGRAPHY: Potsdam
PROGRAM START: 2015

In February 2015, the New York Public Service Commission issued an official order directing the state's six electric investor-owned utilities to develop and file initial demonstration projects that were consistent with REV guidelines. These projects are intended to demonstrate new business models, create new revenue streams for the state's electric utilities and third parties, and determine the most effective approaches to implementing distributed energy resources (DER).

National Grid proposed a project to test a series of new services that would facilitate establishing a community resilience microgrid in Potsdam, New York. The primary objective was to design and test utility services that would permit development of a microgrid that could deliver electricity to connected customers for up to two weeks during an extended grid outage. The Village and Town of Potsdam had experienced multi-day power outages due to microbursts and ice storms, most notably an ice storm in 1998 that left more than 100,000 customers in the region without power for as long as three weeks.

Program Development

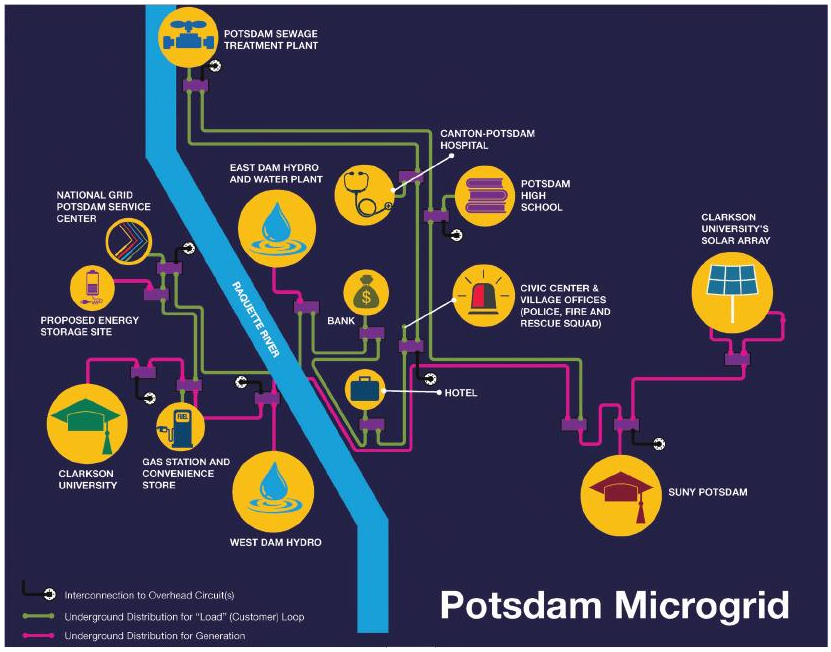
Potsdam has a considerable number of generation sources, including CHP (at State University of New York [SUNY] Potsdam), solar PV, and two hydroelectric plants. This diversity makes Potsdam an ideal prospect for a community microgrid project. While the typical microgrid business model is a single owner and/or operator approach, usually on a single campus, a community microgrid connects multiple owners and customers across various locations or campuses. Developing community microgrids requires a higher degree of coordination to aggregate and optimize loads and distributed energy assets, as well as identifying mechanisms for sharing the costs and benefits of the microgrid investment.

The proposed community microgrid comprised several customers, including universities (Clarkson and SUNY Potsdam), various municipal services (police and fire departments), a civic center, water and wastewater treatment plants, a hospital, a hotel, a grocery store, two pharmacies, and fuel stations. While no actual microgrid assets progressed to the construction phase, they were designed and engineered with the intent of construction if the community was amenable. To test customer acceptance of, and willingness to pay for, the required coordination and aggregation services provided by the utility, National Grid conducted several rounds of focus groups and surveys with both major microgrid clients and the surrounding community entities that would derive different tiers of benefits from the microgrid. The services tested for customer acceptance included a tiered recovery for storm-hardened underground wires, a central procurement for DER, microgrid control and operations, and billing and financial transaction services.

Program Outcomes and Lessons Learned

The project found that customers were willing to accept utility-provided DER procurement and billing services; however, customers were not prepared to accept the incremental monthly bills to help recover the utility's investment in the storm-hardened underground distribution system.

Another important lesson was the necessity of communicating a longer-term perspective on reliability and resilience. The study found that customers were unwilling to pay an increased monthly electric bill for microgrid connection or services unless they perceived a significant business or operational value for the increased resilience. Potsdam experienced just one power outage lasting more than four hours over the last eight years, so customers lacked interest in paying an additional microgrid fee. National Grid staff determined that the historic outage analysis should span a larger timeframe so that short-term thinking would not overwhelm an understanding of the larger overall issue of potential risk.



National Grid's Proposed Community Microgrid in Potsdam

IMAGE COURTESY OF NATIONAL GRID

The demonstration project concluded with a final report delivered to the New York State Public Service Commission on January 31, 2019.[1] Although no capital assets were constructed, National Grid asserted that several successes were achieved. The National Grid team explored the design and operation of a hybrid ownership model, whereby the utility owns the distribution system and the microgrid controller and a third party own the distributed generation assets that power the microgrid. The project team also developed a method for determining appropriate tiered tariffs for cost recovery from microgrid customers based on the benefits they receive. National Grid is still pursuing other potential models that share microgrid costs and revenues between the utility, customers, and third parties as appropriate.

Key lessons learned include the need to compensate for fluctuating customer interest in microgrid participation with flexible underground designs that accommodate adding and removing customers. The project also uncovered the potential adverse impacts of including the cost of burying overhead lines in the microgrid capital costs recovered solely from the costomers connected; these costs are likely to be lower and less of a project barrier in areas with electric lines already underground. While the study found customers amenable to billing and DER procurement from the utility, some customers did not find increased utilty bill costs for increased reliability reasonable, as they held the utility already responsible for minimizing outages. Customers may be more amenable to third-party microgrid ownership models, as they avoid the perception of double payment to the utility for services rendered.

For More Information

U.S. DOE NEW YORK–NEW JERSEY CHP TECHNICAL ASSISTANCE PARTNERSHIP (CHP TAP)
www.nynjchptap.org

Date produced: 2020

[1] Final Report for the Community Resilience REV Demonstration Project: https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B2E895524-DE22-4C13-876B-46B7C41AD378%7D