

Tackling New York's Rising Power Demand With an Affordable Housing Microgrid



The solar-plus-storage-plus-fuel-cell project showcases what utilities can do when they have the right incentives.

by [Julian Spector](#)
December 13, 2016

Consolidated Edison has a problem. By the summer of 2018, the utility's Brownsville substation serving customers Brooklyn and Queens will be overburdened, to the tune of approximately 69 megawatts.

But rather than invest \$1.2 billion in conventional grid upgrades, Con Ed is investing \$200 million in non-wires alternatives to meet its needs -- including a new microgrid project going up in a low-income housing complex.

Turnkey energy storage developer Demand Energy is in the midst of completing the microgrid at the 625-unit Marcus Garvey Apartments in Brooklyn. The project includes 400 kilowatts of rooftop solar, a 400-kilowatt fuel cell from Bloom Energy, and 300 kilowatts/1,200 kilowatt-hours of LG Chem batteries, all managed by Demand Energy's Distributed Energy Network Operating System. Once the entire system is up and running in April, it will leverage 1.1 megawatts of power for an apartment complex that hits a peak of 1.5 megawatts in the summer and 3 megawatts in the winter.

The project is designed to cut power expenses, help keep the grid reliable, and provide off-grid backup power for emergencies. As part of Con Ed's broader [Brooklyn-Queens Neighborhood Program](#) (formerly known as the Brooklyn-Queens Demand Management program), benefits of the microgrid will also be felt beyond the property's perimeter -- by easing strain on the grid and saving the utility money at the same time.

“The regulatory model is changing, and now [with] these sorts of programs, these non-wires alternatives, Con Ed can earn on these programs,” said Doug Staker, vice president for global sales at Demand Energy. “That’s huge. That breaks the spell of building to meet the peak through capital deployment. They can earn now through doing better grid optimization.”

The Marcus Garvey project is the first in the city to integrate a battery storage microgrid at a low-income property, Staker said. The site came with several features that made it amenable to an upgrade. It was built in the 1970s as low- and middle-income housing, and needed new wiring and transformers. The site already featured a master meter, so it had a single point of contact with the outside grid.

Utility costs for residents are already built into their housing payments, so it was in the interest of owner L+M Development Partners to add distributed generation to keep its operational costs down. This will, presumably, avoid future rate increases for the tenants as well, and free up funds for the owner to invest in amenities rather than utility bills.

The company faced certain obstacles pulling off the Marcus Garvey solar project. Peak demand for the residences runs from 8 p.m. to midnight, when most tenants are home from work. That means rooftop solar would risk overproduction during the midday hours, especially in shoulder months. The site cannot export power, however, because the network design that feeds electricity to the campus is not built to handle backflow.

Need to shift daytime generation to nighttime load and avoid solar overproduction? Sounds like a job for energy storage.

Demand Energy spent a year working with New York City’s Fire Department and Department of Buildings to clear permitting for the 40-foot container unit of lithium-ion batteries. Those departments have been cautious about signing off on such systems in the dense urban environment. They want to be sure that battery siting, fire suppression and accessibility will enable a safe response in the event of a fire.

The project is designed to enhance safety in the event of a grid outage, at which point the microgrid will automatically island itself and keep the central office running as a resilient hub for the community.

Like in many early-stage storage projects, this one combines several funding streams to become financially feasible. L+M and Demand Energy secured a 10-year project loan from the nonprofit New York City Energy Efficiency Corporation based on a shared savings model where the

owner and developer will pay off the financing using energy bill savings once the system is up and running.

The two companies will also share revenue from BQNP demand response events. Participants receive a capacity payment each year for enrolling, and performance payments for each event they participate in.

This model would be hard to replicate without the broader regulatory framework at play in New York under the Reforming the Energy Vision initiative. In much of the country, utilities have an incentive to pursue expensive capital improvements, which they earn profit on through the rate base. New York added a few other requirements to shift the incentive structure.

“There are special milestones in the REV rate order that say, 'Thou shalt reduce greenhouse gases, thou shalt improve utilization factors of the grid,’” Staker said. “If you build a distribution system to the peak and it only carries that peak for 24 hours out of the year, that's not good utilization.”

With benchmarks for decarbonization and grid optimization in place, it's up to Con Ed to maximize efficiency rather than capital costs. It will likely need more projects like the Marcus Garvey microgrid to meet New York state's target of 50 percent renewable electricity by 2030, not to mention the city's goal of 100 megawatt-hours of storage by 2020.