

Blue Sky Innovation

ComEd gets \$4 million to build microgrid in Bronzeville



Microgrids can incorporate multiple renewable energy sources. This Method soap factory in Chicago's Pullman neighborhood uses a 230-foot-tall wind turbine and computer-driven solar panels that shift position with the sun. (Zbigniew Bzdak, Chicago Tribune / 2015)

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ComEd is building a microgrid in Bronzeville and just received federal funding for its next step: solar power and battery storage that could eventually keep the Chicago Police Department headquarters and other key buildings running during a mass power outage.

Illinois' largest electricity utility received a \$4 million grant from the U.S. Department of Energy's SunShot Initiative last week that will be used to design and deploy the technology.

A microgrid is a grouping of electricity sources and buildings — in this case, most of Bronzeville — that has the ability to disconnect from the larger grid and function independently. It offers stability in the case of a mass power outage and provides cyber security.

Bronzeville was chosen as a starting point because it houses infrastructure that would be vital to keep running during a mass power outage, like medical centers and police headquarters.

The battery developed with the grant money will have a footprint about the size of a couple of boxcars, said Joe Svachula, vice president of Smart Grid and Technology at ComEd.

Microgrids can incorporate multiple renewable energy sources. They often use technology that learns how buildings in the microgrid use energy, then use that data to deploy more efficient energy-use strategies.

ComEd's microgrid will start with solar power and storage that will serve about 800 customers and potentially build upon that, said Michelle Blaise, senior vice president of Technical Services at ComEd.

Legislation introduced in the Illinois General Assembly last year would allow ComEd to spend \$300 million on the creation of six microgrids. If the pending legislation passes, ComEd would increase Bronzeville's microgrid to 10 megawatts, which would be able to provide power to 1,200 customers.

Neighboring Illinois Institute of Technology, which already has a fully functional microgrid, is helping ComEd with the project.

Illinois Tech began developing its microgrid in 2008 and completed it in 2013. It saves the university about \$1 million a year, and cuts back on 7 percent of the school's carbon-dioxide emissions, said Mohammad Shahidehpour, director of the Robert W. Galvin Center for Electricity Innovation at Illinois Tech.

"We keep adding to it," Shahidehpour said. "You build the house, but you keep decorating."

Illinois Tech's microgrid averages nine megawatts and has everything it needs to operate campus' more than 50 buildings independently from the grid. It has a battery, natural gas unit, solar and wind generators, a control unit that studies the best time to use certain kinds of energy and moderates the power loads in buildings. "If ever there was a major catastrophe in the metro area in Chicago, we'll be able to run it," Shahidehpour said.

ComEd will partner with Illinois Tech on its project in Bronzeville, creating the first microgrid cluster in the country. A \$1.2 million grant ComEd received in 2014 allowed them to work with the university and [Argonne National Laboratory](#) to develop a master control system that will let the two microgrids share power.

"Then it goes a step further," said Svachula of ComEd. "The controller ... can look at weather forecasts and look at what the sunshine might be for the next couple of days. It can make decisions — do I need

to keep the battery charged?”

It will help ComEd understand customer behavior and energy use patterns. Some infrastructure to do that is already in place in Bronzeville, such as smart meters, which send customers' energy data to ComEd, eliminating the need for meter readers or personal calls to report outages. ComEd is halfway to its goal of installing 4 million smart meters in homes and businesses across northern Illinois by 2018.

Illinois Tech has spent about \$15 million on its microgrid — \$8 million of that from federal grants and the rest from the school, Shahidehpour said. ComEd will have spent about \$10.4 million on Bronzeville, since it matches federal grants, Blaise said.

ComEd is receiving this money at a time when the federal government is devoting increasing resources to microgrid research.

The Department of Energy announced plans earlier this month to funnel \$220 million to its national laboratories and partners over three years for more research on storage systems and clean energy integrations. Argonne received \$19 million of that, aimed specifically at grid modernization.

With federal support and the costs of solar energy and energy storage dropping, this is the right time for Illinois Tech and ComEd to embark on a project like this, said Jeff Chamberlain, director of the Argonne Collaborative Center for Energy Storage Science at Argonne National Laboratory.

“If they can understand how the technology behaves inside the energy system and understand how to maintain that, and the technology improves, they are ready,” he said. “They can understand and own the disruption.”

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