

From: Kiki Tidwell <ktinsv@cox.net>
Sent: Tuesday, September 04, 2018 10:33 AM
To: pzcounter
Subject: Otis Microgrid to Achieve Several Firsts in Microgrid Development

RECEIVED

SEP - 4 2018

BLAINE COUNTY
LAND USE & BUILDING SERVICES

Please share with p and z and commissioners- Kiki Tidwell
<https://microgridknowledge.com/otis-microgrid-development/>

Otis Microgrid Nearly Ready and Poised to Make Some Energy History in Massachusetts

[Andrew Burger](#)

The Air National Guard is putting the finishing touches on the Otis microgrid on Cape Cod, Mass., a project that is expected to achieve several firsts in microgrid development for the military and New England.

Located at Otis Air National Guard Base, the project will be unveiled [August 29](#) by the 102nd Intelligence Wing and project partners.

[Video explains importance of Otis microgrid to military](#)

The grid-connected microgrid may serve as a model for similar Air National Guard and Department of Defense (DoD) projects, according to Air Force National Guard Major and Civil Engineer Shawn Doyle, the project's manager. Marking several milestones in microgrid development, it will be:

- The first microgrid in the eastern Massachusetts territory of local utility Eversource and within ISO New England to provide ancillary services
- The first time a microgrid integrates enough wind power and batteries to meet 100 percent of the electricity needs, 24x7, at a military base or defense facility
- The first time a US military facility connects to an independent system operator
- The first microgrid to leverage a battery-based energy storage system to form a base-wide microgrid completely independent from any utility grid or other external power provider

The Otis microgrid packs enough power to meet all of the base's electricity needs while islanded. It includes a 1.5-MW wind turbine and a 1.6-MW diesel back-up generator. An intelligent, 1.6-MW/1.2-MWh lead-acid battery energy storage and management system from East Penn Manufacturing subsidiary Ecoult will demonstrate the economics of stacking multiple, battery-based energy storage services.

Managing it all is a microgrid controller developed and installed by Raytheon, the lead contractor for the project. The controller will optimize on-site energy for maximum efficiency.

Revenue streams from grid & demand response

In addition to enhancing base energy security, reliability and resilience, the Otis microgrid offers economic benefits to both the base and the regional grid. It will do so by participating in a utility demand-response program and ISO New England's frequency services market.

The Otis microgrid project team is in the final stages of installing, testing and commissioning the various aspects of the battery energy storage system, according to Doyle. Next it will do the same for the wind turbine and remaining microgrid platform components.

If all goes well, the project will enter testing in October, including frequency regulation testing with ISO New England. Full commissioning is slated for December, Doyle told Microgrid Knowledge.

Otis microgrid projects five-year payback

The team designed the microgrid so that it will pay for itself in five years or less, and result in an estimated savings-to-investment ratio of 2:1 over its 20-year life cycle.

Project partners expect the microgrid to net the Air National Guard \$500,000-\$1 million a year, achieved through energy savings and new revenue.

A projected \$100,000-\$200,000 of that will come from reductions in so-called 'capacity tag' savings — the amount utility customers are charged for electricity consumption during peak periods of demand. Savings from participating in an Eversource demand response program should amount to about the same.

In addition, the Air National Guard expects the microgrid to generate from \$300,000-\$500,000 in annual revenues by participating in ISO New England's frequency regulation services market.

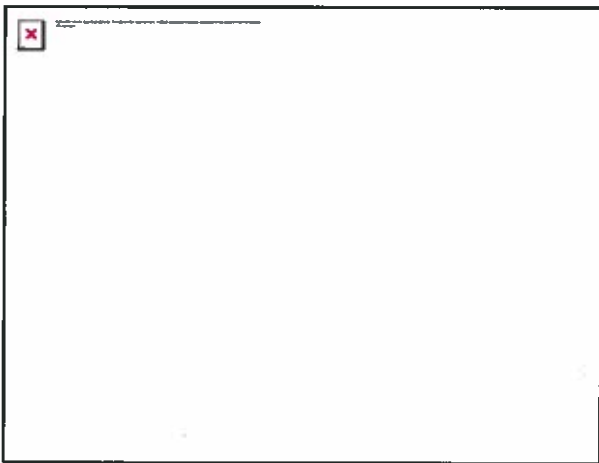
Free Resource from *Microgrid Knowledge White Paper Library*

[Download](#)

The Otis microgrid was funded by a \$5.7 million grant from the DoD's Environmental Security Technology Certification Program (ESTCP), established for leading-edge, environmentally friendly energy technology for the military. The state of Massachusetts contributed another \$1 million.

The Air National Guard will own and operate the microgrid. Raytheon, the project's lead private contractor, developed the microgrid control system and saw to all cybersecurity, as well as microgrid design, procurement and engineering. Customized Energy Solutions is responsible for overall microgrid system optimization and participation in ISO New England's frequency regulation market. C-Power serves as the intermediary for the microgrid to participate in the utility demand response program.

Making use of the military's own labor force shaved some \$3 million to \$4 million from the project's total \$8.5 million budget, Doyle said.



Air National Guard soldiers. By Dave Weaver/[Shutterstock.com](#)

Civil engineer and communications airmen from the 102nd Intelligence Wing Civil Engineering Squadron and soldiers from the US Army Corps of Engineers' 249th Engineering Battalion worked closely with Raytheon and other contractors to prepare site locations and saw to installation of the microgrid's information and communications network. Their efforts included installation of 3.5 miles of overhead, three-phase AC power lines and 4.5 miles of dedicated fiber-optic network cabling.

In total, some 300 individuals from more than 30 military and private-sector organizations are contributing to the project, according to Doyle. The units gained valuable training time

and experience as a result, which may be put to good use as the Air National Guard and DoD look to carry out similar projects at other facilities, he added.

Cybersecurity was a project focal point. Defense installations such as the 102nd Intelligence Wing typically have no external ICT network connections, Doyle pointed out. A dedicated, digital fiber-optic provides the data and communications the microgrid requires. The microgrid network isn't connected to any Air Force information or communications network or the public Internet, but it does provide a highly secure, dedicated connection to ISO New England. That's essential for the Otis microgrid to participate in the regional grid manager's frequency regulation market.

Other microgrid development on Cape Cod

The Otis microgrid is latest among several [military microgrids](#) underway. It also marks something of a trend for microgrid development on Cape Cod. A microgrid is in the works for a [Native American tribe](#) in the region and another for a [community](#) in the town of Sandwich that won funding from the Massachusetts Clean Energy Center earlier this year.

Track news about microgrid development by the military. Subscribe to the free [Microgrid Knowledge newsletter](#).

Sent from my iPhone