

Renewable Energy for MCLBA

Marine Corps Logistics Base Albany pursues renewable energy as part of “net zero” plan



Challenge

How can the Marine Corps build energy networks that will keep the power on in critical locations during a grid outage and simultaneously maximize the use of renewable energy? After catastrophic events, such as hurricanes and tornadoes, the Marine Corps has been at the forefront of developing plans to address resilient energy delivery. At the same time, the Department of the Navy has set goals to increase renewable energy production, improve energy efficiency, and reduce costs.

Located near Albany, GA, Marine Corps Logistics Base Albany (MCLBA), has been on a mission to not only build cost-effective and resilient energy delivery, but also become the first “net zero” Marine Corps installation, producing more renewable electrons on base than it purchases from the grid. Over the past decade, the base has installed systems using landfill gas, solar, geothermal energy and solar hot water heating, and the base currently has efforts underway for additional large-scale landfill gas generation and geothermal energy, but it still needed to secure a portion of its power from renewable sources to achieve “net zero” status.

At a property adjacent to the base, Constellation has constructed a woody biomass cogeneration plant (known as Albany Green Energy) that supplies steam to a Procter & Gamble (P&G) manufacturing facility. Due to the plant’s proximity to MCLBA, the Marine Corps identified it as a potential source of renewable energy that could help the Marine Corps achieve “net zero” status.

Solution

MCLBA collaborated with Constellation to develop and implement a plan to leverage steam from the woody biomass plant located on P&G’s property and convert it to electricity. Steam generated from the plant will be sent to a steam turbine located on land leased to MCLBA by P&G. There, the steam will be converted to electricity and then distributed to the base via a 1.5-mile electrical line. Constellation will construct, operate, and maintain the 8.5 MW steam turbine during the 23-year term under a Department of Energy (DOE) Energy Savings Performance Contract (ESPC), while MCLBA will own it.

In addition to woody biomass, MCLBA is using another nearby renewable energy source: landfill gas. Methane is a by-product of the decomposition of landfills. Instead of releasing this greenhouse gas into the atmosphere, it is captured and used as a power source. MCLBA is adding capacity to its existing combined heat and power plant that uses landfill gas as its fuel source for which Constellation will provide operations, maintenance, repair and replace services. The plant will increase generation capacity of the current 1.9 MW plant by adding another 2.1 MW of electric generation, and its excess heat will be harnessed to preheat boilers.

To provide back-up power during a grid outage, Constellation is interconnecting the critical power generators at the base to create a cyber-secure microgrid, an independent electricity network that has its own power source and is capable of separating from the grid during emergencies. All together, these enhancements



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Highlights

Project

- First “Net Zero” Marine Corps Base
- \$47 million in ECMs
- \$178 million in total expected energy cost savings over a 23-year period
- \$5 million in annual energy cost savings in the first year, which then escalates annually
- Microgrid for energy resiliency

Technical

- 8.5 MW steam turbine that is expected to generate 44 MWh in the first year of operation, operated by Constellation
- 100,000 fixtures will be upgraded with Tubular LED bulbs
- 2.1 MW Combined Heat and Power landfill generator operated by Constellation
- Smart Grid Control System (SGCS) to enhance transparency and control of the microgrid
- Enhancements to the existing Supervisory Control and Data Acquisition (SCADA)
- Upgrades to Direct Digital Control (DDC) environmental control systems

will increase reliability, stability, and security of the electrical generation and distribution system.

Other energy conservation measures include replacing 60 transformers with more efficient models, installing approximately 100,000 indoor LED bulbs, installing more efficient air compressors, and optimizing the number of compressors needed to meet air flow requirements.

MCLBA is working with Constellation under the \$170 million ESPC to implement these energy conservation measures. Under the terms of the ESPC, the water and energy efficiency improvements provided by Constellation require no upfront capital and are guaranteed to provide more than \$178 million in total expected energy cost savings over the 23-year period.

Due to the implementation of the energy conservation measures, the base is projected to not only reduce its electric consumption by 15 percent, but also to become “net zero.”

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