FORT BRAGG – 50001 READY FACILITY

Background

The U.S. Army Garrison Fort Bragg in North Carolina hosts over 50,000 active-duty personnel and has a total population of around 270,000 including military families, retirees, Department of Defense civilians, and contractors. Some of the Army's most elite forces are stationed within the 54 million square feet of facilities, ready to deploy at a moment's notice. Fort Bragg handles critical missions, often on tight schedules, and so requires resilient, reliable, and sustainable energy delivery. Assessing and improving all aspects of the Garrison's energy system are crucial to mission success, not only to ensure reliability but also contribute to the U.S. Army's climate strategy.

Leadership recognized the need for a dedicated decarbonization strategy that encompassed projects and workforce development. In 2021, Fort Bragg deployed a 1.1 MW floating solar array and battery storage system at Camp Mackall. The array has the added benefit of supporting site resiliency, as Camp Mackall is at the end of a single electrical feeder and suffers from frequent power outages. The floating panels provide approximately half the site's power and provide more time for utility repair crews to respond to an outage, which greatly improves power reliability and resilience.

The second initiative was in partnering with the US Department of Energy and Lawrence Berkeley National Lab (LBNL) in implementing the DOE 50001 Ready program to deploy an energy management system compliant with ISO 50001, the global best practice standard around energy management systems, across the entire installation. LBNL partnered with Advanced Energy to provide 50001 Ready coaching and related energy management expertise. Although Fort Bragg had established energy management best practices and policies, there was no structured and cohesive approach across facilities. The Garrison's Directorate of Public Works (DPW) saw an opportunity institute a more comprehensive energy management system through the 50001 Ready pathway.

Fort Bragg received official recognition from the U.S. Department of Energy following implementation of its energy management system. The Garrison is the first U.S. Army Installation Management Command to achieve this distinction.

MW floating solar array with battery storage at Camp Mackall provides approximately half the site's power and provides more time for utility repair crews to respond in the event of an outage, helping to improve power reliability and resilience.

Photo credit: US Army Garrison Fort Bragg, Directorate of Public Works – Fort Bragg, NC

Solutions

The DPW adopted the ISO 50001 structure to increase both energy and water efficiency, in part by identifying and mitigating obstacles to these goals, and to improve energy project coordination and collaboration between divisions within the Directorate. The DPW Director and Garrison Commander both provided support by approving the concept and championing a new policy to promote energy and water conservation. Top management commitment is essential for implementing an energy management system successfully, especially in the military, so the high-level advocacy was a significant factor in system implementation.

On the 50001 Ready pathway, the DPW created a documented energy management system using the 25 50001 Ready task playbooks as the foundation. In parallel, the team put systems in place to document energy planning, conduct energy reviews, measure energy use and improvement and document results, develop and improve operational controls for key energy users, and identify training needs. The 50001 Ready structure helped standardize the development process. The team was able to quantify goals and progress, allowing for monitoring and adjusting the approach, as needed.

"I highly recommend 50001 Ready. It helps bring a structure to the chaos of managing several million square feet of energy-consuming facilities and large energy systems."

– Ray Throop, DPW Energy Engineer

The process to attain 50001 Ready recognition has also enhanced communication across Fort Bragg. The DPW initiated monthly energy meetings, called the "Common Operating Picture," and invited all DPW divisions and shops to attend. These events facilitate broad awareness of new projects, and attendees learn about energy-related challenges, solutions, and best practices. Preparation exercises also helped the DPW to identify its resources, including existing technologies and expertise, and to maximize the effectiveness of those resources in energy management.

The Fort Bragg team also benefited from the support of Lawrence Berkeley National Laboratory and Advanced Energy, who provided training on energy management systems and the 50001 Ready Navigator tool.

"I do think the 50001 Ready energy management system has helped us realize how everyone plays a part, from the maintenance techs to system designers to occupants (and how they use the equipment). All of that, together with the operational controls for each aspect, will help us save more energy in the coming years."

– Audrey Oxendine, Chief, Energy and Utilities Branch, DPW, Fort Bragg

Implementing a 50001 Ready Energy Management System

- **Developing playbooks.** Reviewing playbook templates and customizing them helped the DPW put together a dynamic calendar of tasks and directives, formalizing and documenting processes and procedures. Periodic reviews of the playbooks reveal potential focus areas for improvements.
- **Working through the 25 tasks.** The Fort Bragg energy management system benefitted from every task; the DPW saw each as necessary and impactful. Of particular note were Task 8 (Energy Data Collection and Analysis), which helped the team better understand the data—and quality of data—being gathered; Task 10 (Improvement Opportunities), which helped identify effective projects; Task 13 (Action Plans for Continual Improvement), which streamlined project management; and Task 17 (Operational Controls), which guided implementation of operational controls.
- **Enhancing inter-divisional collaboration.** The DPW emphasized the importance of collaborating with sister departments and divisions. Preparing for 50001 Ready provided opportunities to strengthen relationships with internal partners (e.g., the engineering department and HVAC mechanics)—relationships that were already positive but that are now even more constructive. The groups established patterns—almost a rhythm—for energy monitoring and continuous improvement. The widespread knowledge and thorough documentation have also fostered quick recovery in the event of personnel turnover.
- **Leveraging external partnerships.** The DPW recognized that outside support lends deep technical expertise that bolstered the team's efforts and the resulting energy management system. This included support from Duke Energy and Sandhills Utility Services, as well as from Honeywell and Johnson Controls, which provide and maintain the monitoring and control systems.
- **Identifying significant energy users:** The DPW developed diagrams that showed all energy use, revealing the significant energy uses (SEUs) and helping the team determine where to focus. Some SEUs were obvious (e.g., building heating and cooling and central energy plants), and the exercise confirmed the opportunities and showed the impacts that various projects could have on energy consumption. For example, Fort Bragg is replacing 4 million square feet of lighting and 11 million square feet of water fixtures, upgrading numerous administration and barracks buildings.

"Implementing 50001 Ready opens communication lines between parties to support energy management goals."

– Dan Lewis, DPW Resource Efficiency Manager, BayWest

Other Benefits

Although Fort Bragg recently added 114,000 square feet of facilities, the Garrison's overall electricity use has declined 0.34% from 2020 levels. Other DoD sites have also seen substantial benefits. For example, the Oklahoma City Air Logistics Complex (OC-ALC) at Tinker Air Force Base found significant energy savings through adopting an energy management system - reducing annual energy costs by around $7 million/year in 2018 compared with 2014 through including energy management system implementation as a part of an energy savings performance contract (ESPC). Additional details on energy management at OC-ALC can be found in this article from the Defense Standardization Journal - https://www.dsp.dla.mil/Portals/26/Documents/Publications/Journal/190417-DSPJ-03.pdf.

However, the benefits of 50001 Ready go beyond energy use and costs at Fort Bragg. For example, the recent lighting upgrades have not only reduced energy use but also improved working conditions. The facilities are brighter, making some work easier to perform, and are more attractive.

The energy management system has also furthered Fort Bragg's resilience efforts. The increased energy efficiency provides significant value and increased reliability by allowing the Directorate to downsize backup power generation at sites with significantly reduced electric or gas usage. The downsizing will lead to financial savings beyond the utility bill, and those funds can be directed to resilience-focused projects. Furthermore, the improvements to project execution and the use of metrics have driven efficiency across the board, not simply in energy-related efforts.

Other improvements have also had impacts beyond the immediate energy projects. Enhanced collaboration between departments and divisions, as well as more thorough understanding of available resources, is benefiting Fort Bragg universally.

"50001 Ready aids in organizing and coordinating all stakeholders' efforts around energy management, not just energy managers. The resulting gains in efficiency snowball into funding further conservation measures as well as investment in resilient solutions like on-site renewable energy and microgrids. Ultimately Fort Bragg's 50001 Ready-ness is heightened through improved energy management."

– Audrey Oxendine, DPW Energy and Utilities Chief