

A CLIMATE RESILIENT ARMY

Huntsville Center is focusing on climate change impacts in acquisition strategies, planning and infrastructure upgrades.

by Holly DeCarlo-White

Public concern in America to “do something” about the deteriorating conditions of our water, air and land led to the creation of the U.S. Environmental Protection Agency during the 1970s. Since its beginning, U.S. Army Engineering and Support Center – Huntsville, an entity of the U.S. Army Corps of Engineers, has been invaluable in managing environmental projects and programs nationally—without any geographical constraints that state and regional offices hold. To ensure its support to the Army is most efficient, Huntsville Center in Alabama is also focused on improving the acquisition process.

“The Huntsville Center helps the Army to find paths of execution to implement resiliency requirements,” said Jonathan Winkler, chief of the Energy Division at U.S. Army Engineering and Support Center – Huntsville.

Huntsville Center’s main focuses are environmental cleanup including ordnance and chemical warfare materiel removal; installation support to facilities and medical facilities for repair, maintenance and acquisition; energy conservation, reduction and contracting; systems engineering and construction for ballistic missile defense, munitions production and chemical demilitarization.

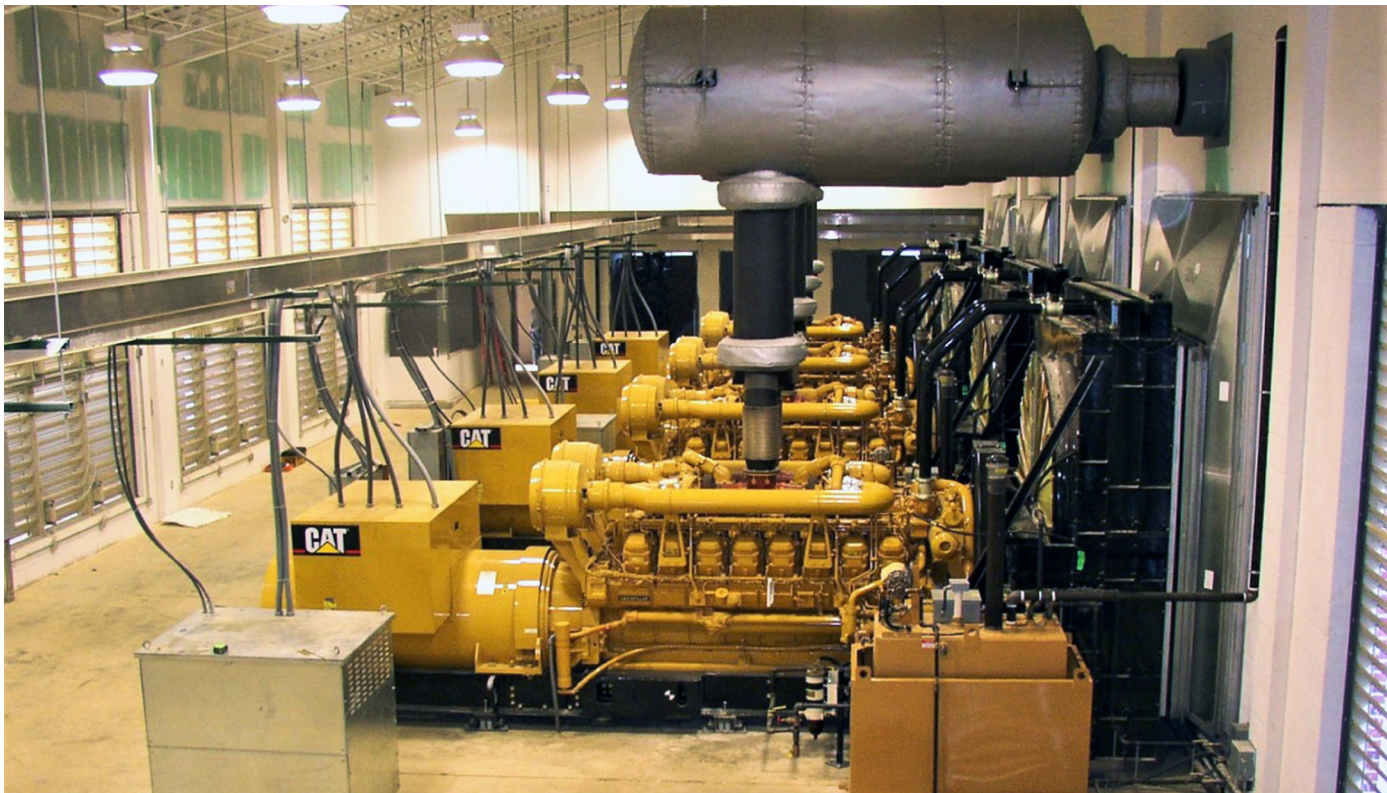
“We support a multitude of programs such as the planning and design for the Energy Resilience and Conservation Investment Program (ERCIP). The Army’s focus has been the implementation of microgrids for installation resilience,” Winkler said. Microgrids



SUN ENERGY

An Energy Resilience and Conservation Investment Program solar microgrid project at Fort Hunter Liggett, California, is managed by the Sacramento District. A fiscal 2016 ERCIP project added additional rooftop solar panels and a second battery energy storage system. (Photo by John Prettyman, USACE)





FUEL CELL ENERGY

The Department of Energy awarded grants to Fort Knox for the next phase of energy resilience. The new fuel cell technology, which has yet to be designed or developed by engineers in the Directorate of Public Works' Energy Program, will connect to existing energy systems and increase Fort Knox's energy resilience. (Photo courtesy of Fort Knox News)

use controls to manage multiple local electrical system generation sources. They can provide power in the event of an emergency, operating independently from the main grid, and provide grid services, like frequency regulation, to the local utility provider, which saves on cost.

ENERGY SAVINGS PERFORMANCE CONTRACTS

With a history of pioneering capabilities, serving as a testing ground for new programs, technology, new contracting vehicles and process improvement, Huntsville Center is recognized as the Army's expert in energy savings performance contracts (ESPCs). ESPCs are unique in that they enable the direct partnership between federal agencies and energy service companies so that agencies can procure energy savings and make facility improvements via alternative financing from the private sector. This is important because without the need to tap into funds from the capital budget or obtain special appropriations from Congress,

infrastructure improvements and new efficiencies that support the warfighter and meet energy and environmental mandates can be executed faster.

"Energy Savings Performance Contracting is a contract vehicle that leverages private sector capital investment to implement energy conservation measures (ECM). The energy service company that implements the ESPC is paid back for their capital investment through the funds that are saved resulting from the implemented ECMs," Winkler said, adding that the contract period may be up to 25 years.

In support of the Army Climate Strategy, ESPC assists installations in reducing energy and water use, as well as carbon and greenhouse gas emissions. The ESPC program encompasses 114 active projects and \$2 billion in capital investments. In fiscal year 2022, ESPC verified savings were \$127 million, with a 305 million total kilogram CO₂e (carbon dioxide equivalent)



WORKING TOWARD COST REDUCTION

Workers install portions of an 8.5 megawatt-per-hour battery system at Fort Carson, Colorado. Huntsville Center's Energy Savings Performance Contracting program coordinated the project, designed to reduce peak electricity use costs, especially during the summer cooling season. (Photo courtesy of U.S. Army Engineering and Support Center – Huntsville)

reduction. The average ESPC project capital investment amount is approximately \$20 million worth of infrastructure improvements, and Winkler said that amount has been increasing over the years.

The energy service company performs operations and maintenance on major systems, allowing the limited resources of the Department of Public Works to be spent on other activities, and garrisons can appropriate funds on mission critical requirements. While energy conservation measures per installation may vary, they typically include energy management systems; lighting; steam distribution system repair; heating, ventilation and air conditioning (HVAC) systems; boiler repair, replacement or efficiency controller; and water and wastewater treatment plant pumps and motors.

ESPC project savings are cumulative, creating savings for the installation throughout the project contract period and often

replacing equipment near the end of its service life with higher efficiency energy solutions. Cost savings are calculated by the measurement and verification activities under the Federal Energy Management Program.

INSTALLATION IMPACTS

In 2023, the ESPC program awarded Fort Knox in Kentucky with Phase 2 and a capital investment of \$13.1 million. Energy conservation measures included HVAC controls and mechanical upgrades, plant operation, lighting improvements, building envelope upgrades (air sealing measures such as windows and doors) and refrigeration upgrades. A guaranteed savings of \$29.3 million over the 22-year performance period. Fort Knox was one of 19 federal agencies to receive a portion of a \$28.1 million grant awarded by the Department of Energy's Federal Energy Management Program to fund two new resilience energy conservation measures: the 800-kilowatt natural gas fuel cells and a 1,750-kilowatt-hour battery energy storage system to store excess

energy from renewable sources for backup power and energy demand management. According to the Federal Energy Management Program website, the expansion will lead to electricity savings growing to 9% and energy cost savings to 11%. Expected greenhouse gas emission reductions will rise to 5.25%.

The Department of Energy's Office of Energy Efficiency and Renewable Energy determined in 2020 that Fort Bliss, which encompasses more than 1 million acres of land across Texas and New Mexico and houses approximately 80,000 military and family members, needed upgrades. Its determination paper proposed work in three areas: lighting improvements, water resilience and energy storage. The post has over 43,000 light fixtures, and 102 of its buildings are designated as critical or uninterruptible for power. An ESPC task order was awarded in 2023 with a capital investment of \$7.3 million. Energy conservation measures include interior and exterior lighting with guaranteed savings in the first year of \$625,000.

ESPCs are unique in that they enable the direct partnership between federal agencies and energy service companies.

"The program is working with other garrisons in the Army to develop projects to improve efficiency and improve resiliency," Winkler said. "Some critical areas include utilizing third party financing to support its organic industrial bases, which supports DOD and our allies across the globe."

The ESPC program also supports outreach and training events for the Army by holding an annual ESPC and Utility Energy Service Contract (UESC) workshop. Last year's workshop, in August 2023, focused on industry trends and innovations in ESPCs and UESCs. Around 300 attendees included leadership from the Council on

Environmental Quality within the Executive Office of the President, Deputy Chief of Staff of Army (G-9), Deputy Assistant Secretary of the Army for Energy and Sustainment, Army Materiel Command, Installation Management Command and executives from energy service and utility companies to name a few. During the forum attendees shared information, experiences and lessons learned on past and ongoing ESPC projects.

A Utility Energy Service Contract is a limited-source acquisition between a federal agency and serving utility for energy management services, including



MAJOR UPGRADES

The solar array at the alternative energy corridor at Tooele Army Depot in Utah is an Army Energy Conservation Investment Program project. The 429 solar dishes provide 1.5 megawatts of electricity, approximately 30% of the depot's annual electric energy need. (Photo by Kathy Anderson, Tooele Army Depot)

energy and water efficiency improvements and energy demand reduction.

The UESC program awarded two task orders for Fort Irwin, California, in fiscal year 2022 and 2023, which, Winkler said, will not only create more than \$7.8 million in annual energy savings but will also ensure Fort Irwin's energy resiliency and security.

"Fort Irwin is currently fed from one single 115 kV electric distribution line and relies on truck delivery of liquefied petroleum gas (or propane) for its heating and operational requirements. This has created substantial energy vulnerabilities, exacerbated by its remote desert location, which ultimately jeopardizes the Army's training mission," Winkler said.

This project, valued at almost \$188 million, provided for the implementation of about 22 miles of natural gas pipeline and 16 megawatts of natural gas generation, solar photovoltaic, microgrid, a battery energy storage system, lighting, HVAC, boiler and chiller upgrades and a utility monitoring and control system.



POWER THROUGH WIND

One of two wind turbines stands next to one of its many solar installations on Fort Buchanan, Puerto Rico. The two wind turbines will produce an estimated 5% of the energy consumed by the installation. A total of 21,824 solar photovoltaic panels will produce about 5.5 megawatts of power, which is at least 60% of the installation's current power demand at its peak production. (Photo courtesy of U.S. Army Engineering and Support Center – Huntsville)

"These energy conservation measures will give Fort Irwin the capability to produce up to 85% of all electrical demand onsite without dependency on the local utility," Winkler said.

CONCLUSION

The long-term strategy and goals for the Army are outlined in the 2022 Army Climate Strategy. Federal Acquisition Regulation 23.205 states that agencies should make maximum use of the authority provided in the National Energy Conservation Policy Act to use energy savings performance contracts to reduce energy use and cost in facilities and operations.

"The Army in 2024 has an added focus regarding Deep Energy Retrofits [DER], and Huntsville Center is working with the Army to integrate DER into ESPC and UESC projects," Winkler said. DERs are energy conservation measures that lead to overall emissions performance in a building to achieve net-zero or near net-zero emissions, defined in the Energy Independence and Security Act of 2007, by 2030.

Stakeholders should reach out to Huntsville Center to discuss the possibilities to improve efficiency in energy, munitions or any other program service the Huntsville Center supports, Winkler said. "Huntsville Center is a key strategic partner for the Army and all of DOD serving as an execution agent to assist in the implementation of climate change goals and requirements," he said.

For more information, go to <https://www.hnc.usace.army.mil>.

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AN ECO-FRIENDLY HOME

The new Lower Stilwell housing development at the Presidio of Monterey, California, features ENERGY STAR appliances, LED lighting and water-efficient fixtures. Army offices and installations are working to meet the goals of the Army Climate Strategy, and federal agencies are required to procure ENERGY STAR-qualified and Federal Energy Management Program-designated energy- and water-efficient products. (Photo by Winifred Brown, U.S. Army Garrison Presidio of Monterey)

