

## The Life and Death Value of Energy Storage in Military Microgrids

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At military microgrids in hostile territory, reducing fuel use is more than a green effort; it's a life-saving endeavor.

Afghanistan offered an eye-opener. Vulnerable to attack, one in 24 U.S. fuel supply convoys resulted in a casualty there, according to an [Army study](#).

“Lives are lost. The fewer tanker trucks they have to take out, the better,” said Bill Sproull, vice president for business development & sales at [ESS](#), a flow battery manufacturer in Portland, Oregon.

To reduce need for fuel at remote military bases, the U.S. Army Corp of Engineers is demonstrating use of energy storage — flow batteries — as a baseload power source in military microgrids.

Installed at Fort Leonard Wood in Missouri, the test project is a precursor to possible use of flow batteries at the military's forward operating bases, or FOBs. Removed from main bases, these tactical facilities allow for quick military action in what are sometimes remote regions.

The Fort Leonard Wood demonstration uses two 30kW/110kWh ESS' all-iron flow batteries with ARDA Power battery DC-DC converters.



The battery saves fuel by replacing jet fuel generators as baseload power. Jet fuel generators, often used for remote military microgrids, are inefficient as baseload power. This is because they are built to meet the base peak load requirements, yet typically run at only 25 to 30 percent of that capacity, Sproull said. Instead of acting as baseload power, the generators will charge the long duration batteries when needed.

With the battery serving “a constantly fluctuating load at the FOB, the generator will only be called upon to recharge the energy storage, allowing it to operate at peak fuel efficiency and dramatically reducing refueling logistics requirements,” said Tom Decker, program manager, U.S. Army Corps of Engineers.

Decker also sees the flow battery as a pathway to more renewable energy in military microgrids. The batteries could act as the power source when the wind isn't blowing or sun isn't shining. And when the renewables are generating power, any excess energy they create could charge the batteries, reducing use of the fossil fuel generators even more.

[The life and death value of energy storage for the military in hostile territory.](#) [Click To Tweet](#)

In addition to saving fuel, the battery makes equipment hauling easier. The ESS flow battery uses iron, salt, and water for its electrolyte, but can be shipped dry. Local water is added when it arrives at the base. This lightens shipping weight 60 percent below conventional or other flow batteries, according to ESS.

If the military operation moves to a new location, it can just dump the water, since it is non-toxic. Lighter, the batteries then can be transported via truck or helicopter in standard military containers.

*For more information on long duration flow batteries, see the white paper, [“Beyond Four Hours,”](#) in the [Microgrid Knowledge white paper library](#).*



ESS flow battery interior-shot-  
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