

Future is bright for ONR's lightweight, sun-powered generator

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A 300-watt photovoltaic battery system, developed by the Office of Naval Research, can provide continuous power to Marines in the field. The solar-powered battery, called the Ground Renewable Expeditionary ENergy System (GREENS), is designed by the Advanced Power Generation Future Naval Capabilities program located at the Experimental Forward Operating Base at Marine Corps System Command Transportation Demonstration Support Area in Quantico, Va. Credit: U.S. Navy photo by John F. Williams/Released

The Department of the Navy continues its move toward renewable energy with an Office of Naval Research (ONR)-funded solar generator that recently entered full production, with several systems already in the field.

The Ground Renewable Expeditionary [ENergy System](#) (GREENS) is a portable, 300-watt, hybrid battery generator that uses the [sun](#) to produce

[electric currents](#). It was developed to provide Marines with continuous power in the field.

"This item significantly reduces the amount of fuel that has to be delivered, minimizing the number of warfighters on the roads, convoys and hazards, as well as the logistics expenses associated with distributing fuel," said Cliff Anderson, logistics program officer in ONR's Expeditionary Maneuver Warfare & Combating Terrorism Department. "That was really the objective: to get warfighters out of harm's way and reduce the cost of transporting fuel."



The Ground Renewable Expeditionary ENergy System (GREENS) was developed to provide Marines with continuous power in the field. The 300-watt hybrid battery system uses the sun to generate power. The system is currently in production with several units already in the field. Credit: U.S. Navy photo by John F. Williams

The system—which rapidly transitioned from ONR to Marine Corps Systems Command (MCSC) and then into production—provides Marines in remote locations with battery and plug-in power for charging various devices. Several small Marine Corps outposts have successfully used GREENS as their sole energy source. This is notable because

transporting fuel to these remote locations is often challenging and expensive.

"Infantry battalions that are far forward do not have immediate access to a wide range of logistics and maintenance equipment; therefore, any source of power that requires no [military-grade fuel], low maintenance and no special skills to operate becomes an instant

success," said Maj Sean Sadlier, a logistics analyst with the Marine Corps Expeditionary Energy Office, who trained users on and tested GREENS in the field with India Company, 3rd Battalion, 5th Marine Regiment. Additionally, "GREENS is modular, portable, rugged and intuitive enough to deploy in a combat environment. Units trained on GREENS as part of pre-deployment training have provided positive feedback."

GREENS supports the Marine Corps' objective of generating all power needed for sustainment and command, control, communications, computers and intelligence equipment in place in the field by 2025. This vision, as laid out in the USMC Expeditionary Energy Strategy, aligns with the [Marine Corps](#) Vision and Strategy 2025. The goal is to enable Marines to travel more lightly and quickly by reducing the amount of fuel needed.

Naval Surface Warfare Center Carderock Division developed and tested the GREENS prototypes. Naval Air Warfare Center Weapons Division at China Lake assessed the final prototype, subjecting it to continuous power testing in temperatures exceeding 116 degrees Fahrenheit. Even under these conditions, GREENS worked at 85 percent capacity. This result exceeded expectations and led to an MCSC request that the product be rapidly developed and readied for acquisition.

Provided by Office of Naval Research

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