

ONR, Marine Corps show alternative energy use at forward operating bases can save dollars, lives

January 26 2011

To cut down on convoys trucking fuel to forward operating bases, as well as implement the Department of the Navy's vision for energy efficiency, the Office of Naval Research (ONR) and elements within the Marine Corps have successfully demonstrated their goal to reduce petroleum and energy usage in remote locations in Afghanistan.

"The early results from the front indicate the ability of ONR and its Marine Corps partners to make a difference in survivability and efficiency for our warfighters," said Rear Adm. Nevin Carr, chief of naval research.

"We have successfully transitioned commercial alternative [energy](#) systems to Afghanistan to reduce dependency on fossil fuels and batteries," he added. "By doing so, there is potential for the Marine Corps to cut back the number of resupply convoys to these remote locations and save lives by keeping Marines clear of IED attacks."

Marine Corps officials said at an Experimental Forward Operating Base Executive Integrated Product Team (EIPT) meeting held in January the results from Afghanistan have been remarkable.

The 3rd Battalion 5th Marines (3/5), who are forward deployed in Afghanistan, have successfully demonstrated the Ground Renewable Energy Networks (GREENS), Solar Portable Alternative

Communications Energy Systems (SPACES) LED lighting systems, Solar Shades, and Solar Light Trailers.

The ExFOB EIPT is the body that guides the demonstration effort. It meets at least once a quarter at the Marine Corps Warfighting Lab (MCWL), Quantico, Va. The ExFOB EIPT is planning to conduct an evaluation later this year.

"The demo [was] successful because the ExFOB team trained the Marines of 3/5 on the strengths and limits of renewable and energy efficient technologies that are being employed," said Col. Bob Charette, director of the USMC Expeditionary Energy Office (E2O).

"I believe our young Marines are more accepting of renewable energy technology because of all the discussion in the media and society regarding 'green' energy," he added.

By deploying SPACES, a lightweight solar panel system, which can also recharge batteries, the 3/5 was able to conduct extended patrols away from their FOB without the need for battery resupply. The 3/5 also powered two patrol bases with renewable energy.

At larger sites, fuel used to power generators was reduced to two to three gallons a day, from 25 gallons, using GREENS, a 300-watt, photovoltaic/battery system, which provides continuous power to Marines in the field. That resulted in a 90 percent reduction in fuel use, Marine Corps officials said at the ExFOB IPT briefing.

The ExFOB is now embraced by the Marines, and the MCWL, Marine Corps System Command (MARCORPSYSCOM), E2O, the Capabilities Development Directorate and ONR. They have all played a vital role to ensure the concept moves forward.

The idea for ExFOB was first raised in 2009 by ONR's George Solhan,

the deputy chief of naval research, Expeditionary Maneuver Warfare and Combating Terrorism. ONR issued a "request for information" (RFI) to help the Marine Corps rapidly assess industry's capabilities to provide off-the-shelf solutions.

About 100 vendors responded to the RFI with a variety of ideas for water purification, power generation technologies and energy-efficient shelters.

ONR, MCWL, and MARCORSSYSCOM subsequently selected vendors representing the diversity of potential technical solutions. ONR then extended invitations for those vendors to participate in an ExFOB demonstration at Marine Corps Base, Quantico, in March 2010.

"We were looking for technologies that could have immediate impact on getting Marines off the roads hauling fuel and water," Charette added. In addition to inviting industry participants, ONR has invested \$1.6 million, in both dollars and technologies, toward ExFOB. The total ExFOB cost to date is \$3.9 million, Solhan said.

ONR proposed establishing a "test bed" at Quantico in order to identify and demonstrate mature technologies. This concept was adopted as the ExFOB. ONR funded the initial effort and continues to support it through its Western Area Research, Test, and Evaluation Center facility at (Marine Corps Air Ground Combat Center) 29 Palms," Solhan said.

Early results identified several mature "green" energy technologies, as well as several water purification systems. "More importantly, it defined follow-on ExFOB efforts at 29 Palms and provided baseline information leading to the development of the USMC Energy Strategy." Solhan said.

The second ExFOB built in the Southern California desert at 29 Palms closely mimicked the characteristics of the Afghanistan environment, Solhan said. The Marines also purchased several hybrid energy

technologies for this demonstration that went beyond the initial ExFOB and will show a greater savings for Marines, Charette added.

Provided by Office of Naval Research

Citation: ONR, Marine Corps show alternative energy use at forward operating bases can save dollars, lives (2011, January 26) retrieved 23 April 2024 from <https://phys.org/news/2011-01-onr-marine-corps-alternative-energy.html>

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