

# 2015 Expeditionary Energy Concepts Demonstration Accelerates Innovation

## Annual Marine Corps Event Evaluates Energy Technologies to Give Warfighters Tactical Advantage

**THE MARINE CORPS** held its annual Expeditionary Energy Concepts (E2C) technology demonstration at Marine Corps Base Camp Lejeune, North Carolina on June 23–25, 2015.

E2C (or the Experimental Forward Operating Base (ExFOB), as it was originally known) is the Marine Corps' innovative process to identify, evaluate, and accelerate the fielding of energy efficient technologies that have the potential to reduce battlefield energy and water requirements and extend the operational reach of the Marine Corps.

E2C brings together energy stakeholders from across the Marine Corps, government laboratories, industry, and other military services to leverage ideas and resources and identify innovative energy solutions to meet warfighter needs.

Once a year, the Marine Corps invites selected vendors to E2C to demonstrate commercial energy technologies that can increase the self-sufficiency of expeditionary forces.

“This event is about a partnership with industry and other government organizations to try to get the best solutions for our tactical energy problems,” said Col. Jim Caley, director of the Marine Corps Expeditionary Energy Office (E2O). “This is us asking the companies ‘how do I fix this?’”

Companies participating in E2C develop their products based on the warfighter's energy needs and travel to E2C at their own expense. The cost effectiveness of E2C helps make the overall goal a reality.

“E2C is a great deal, not only for the Marine Corps, but for the Department of Defense (DoD),” said Caley.

“We haven't spent a dime. These companies have spent their money to build prototypes for the Corps. We are getting the best ideas from industry with their initial investment.”

The 2015 E2C focused on technologies that enable small unit distributed operations—giving Marines more mobility and the ability to stay out longer without being resupplied constantly.

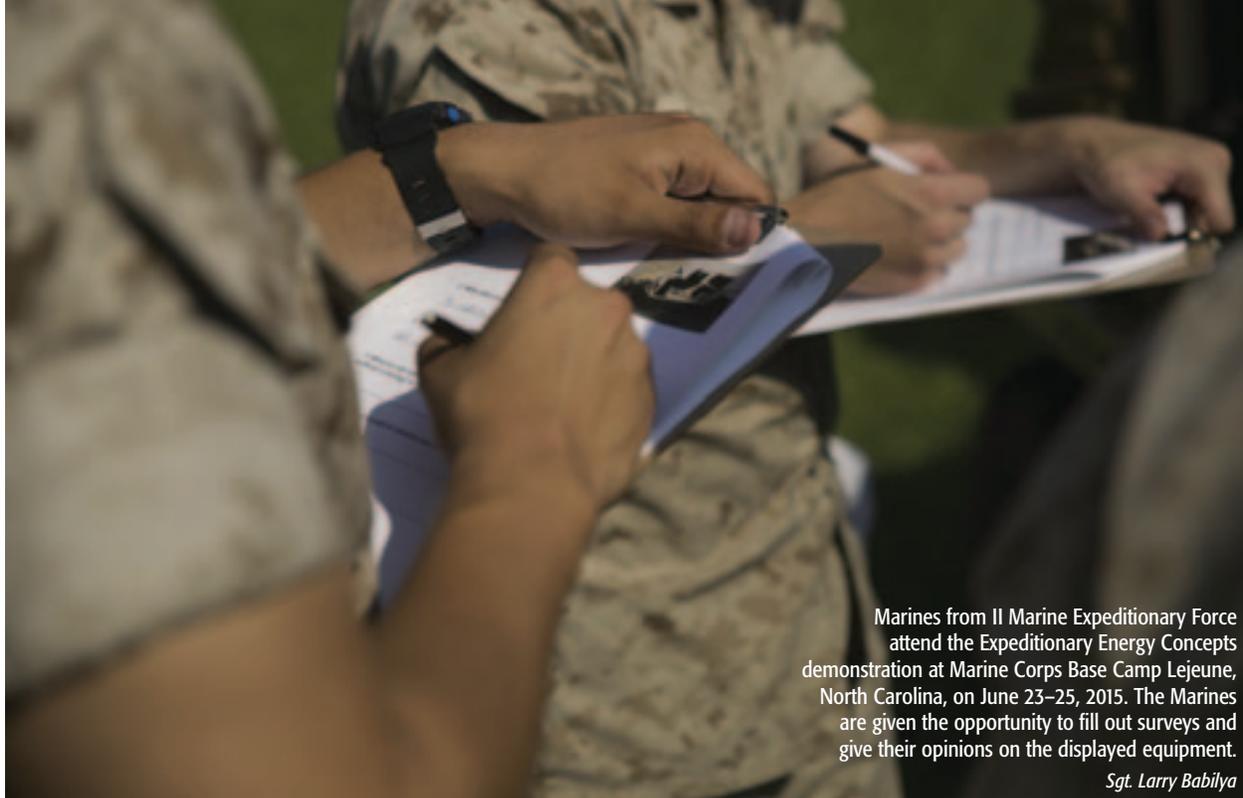
This year's demonstration featured 32 systems (22 industry technologies and 10 government systems) with the potential to reduce fuel and battery resupply requirements for small unit distributed operations.

Technologies evaluated during the 2015 E2C included:

- **Hybrid/Electric All-Terrain Vehicles**  
These vehicles offer significant fuel savings and have the potential to

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Marines from II Marine Expeditionary Force attend the Expeditionary Energy Concepts demonstration at Marine Corps Base Camp Lejeune, North Carolina, on June 23–25, 2015. The Marines are given the opportunity to fill out surveys and give their opinions on the displayed equipment.

*Sgt. Larry Babilya*

extend the operational reach of Marines on the move.

- **Advanced Batteries and Energy Storage Technology**

These technologies can lighten the carried load, help increase infantry mobility, and extend operational reach.

- **Fuel Cells (up to 10 kilowatts)**

These fuel cells play a critical role in reducing future fuel requirements.

There were also a number of government-sponsored energy systems on display, including:

- **The Unit Energy Manager Program**

This is an energy command and control planning tool for Commanders which guides Marines in developing awareness and acceptance of energy efficiency efforts.

- **The Joint Infantry Company Prototype (JIC-P)**

The JIC-P is a suite of systems (e.g., backpacks, knee braces) that harvest energy from Marines on patrol.

During the multi-day demonstration, 200 Marines from II Marine Expeditionary Force (from a range of ranks



Assistant Secretary of the Navy for Energy, Installations and Environment Dennis McGinn (left), speaks to a representative from one of the civilian companies responsible for developing new, more energy efficient batteries for the Marine Corps at the 2015 E2C. The demonstration drew senior personnel from the Marine Corps, DoD and civilian organizations, as well as members of other military services and from other countries.

*Cpl. Sullivan Laramie*

and military occupational specialties) evaluated each of the systems to learn about technologies and equipment they might use in the future. After evaluating the systems, Marines completed surveys describing what they liked and what they didn't like for each of the systems on display.



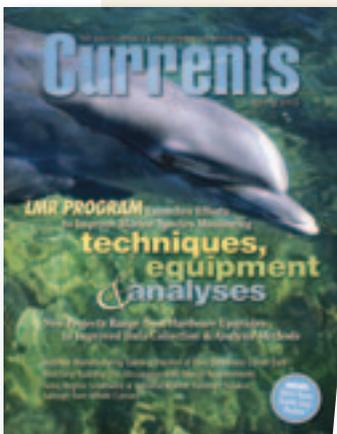
Capt. Nathan Daniel, an E2O operational analyst, leads a group of Marines with II Marine Expeditionary Force at the 2015 E2C demonstration aboard Camp Lejeune. E2C gives Marines an opportunity to learn about new technologies and provide feedback directly to the developers.

*Cpl. Sullivan Laramie*

### For More Information

FOR MORE INFORMATION about E2C and other expeditionary energy efforts underway, visit the Marine Corps Expeditionary Energy Office's web site at [www.hqmc.marines.mil/e2o](http://www.hqmc.marines.mil/e2o).

For more insights into the 2015 E2C and information about the technology focus areas of the demonstration, read our article "Annual Marine Corps Expeditionary Energy Technology Demonstration Seeks Battlefield Solutions" in the spring 2015 issue of *Currents*.



"I enjoyed coming here," said Cpl. Kyle Murdoch, a refrigeration mechanic with the 2nd Marine Logistics Group. "I am the 'hands on' of the Marine Corps so it is nice for them to come to me and get my opinion."

Inputs from Marines help inform Marine Corps' requirements and ensure the gear is as practical as it is tactical.

"The last thing that I want to do is procure something for Marines on the battlefield that they think is useless," said Caley. "I want to procure something that makes sense to them. This is our attempt to put the Marine in front of the gear and give a lance corporal, a sergeant, or a staff sergeant a say in the billions of dollars of gear we buy for Marines."

Staff Sgt. Tyler Grogg, an explosive ordnance technician, said it is extremely valuable that the Marine Corps asks the junior Marines for feedback since, in the end, they are the ones who have to perform with the equipment.

"You need to have the guys on the ground," Grogg said. "You need those guys who have that combat experience to say, 'Would this have helped me when I was alone and in the middle of nowhere?'"

Marines' evaluations are considered alongside system performance data collected by engineers to determine the products that will be selected for future testing and development.

Industry and government vendors also benefit from the ability to interact with the future end-users of their technology. Vendors receive valu-

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Representatives from Naval Research Laboratory and Naval Postgraduate School speak to Marines with II Marine Expeditionary Force about a solar-powered autonomous unmanned aircraft system at the 2015 E2C. Technology such as solar and kinetic energy-harvesting equipment was on display to give Marines an idea of gear they may receive in the future, and presented an opportunity for Marines to give feedback to the developers.

*Cpl. Sullivan Laramie*



Master Sgt. Shawn Workman, an operational analyst with II Marine Expeditionary Force, speaks to a representative of one of the civilian companies responsible for designing an energy efficient, all-terrain utility vehicle for the Marine Corps at the 2015 E2C. E2C gives civilian and DoD developers the opportunity to demonstrate technologies with potential to address gaps in Marines Corps energy, water, and waste capabilities.

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able feedback from Marines who use the technology in an operational relevant environment. After reviewing feedback from Marines, companies can improve their equipment to better serve the DoD.

Following the demonstration, promising technologies may be evaluated in a controlled laboratory environment and then put into the hands of Marines for field testing in combat conditions. Laboratory and field evaluation results will inform Marine Corps requirements development and may lead to future fielding. Systems that make it through the five phases of E2C—from demonstration to fielding—can enable a more self-sufficient, combat-effective future force.

To date, through the E2C process, the Marine Corps has:

- Conducted eight demonstrations at bases across the country.
- Reviewed over 300 technologies through the E2C Request for Information process.
- Assessed over 100 technologies at E2C demonstrations.
- Evaluated 26 systems in laboratory and field following E2C demonstrations.
- Transitioned five systems to Programs of Record. [📌](#)

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