

THE NAVY'S ENERGY & ENVIRONMENTAL MAGAZINE

# Currents

spring 2015

**LMR PROGRAM** Launches Efforts  
to Improve Marine Species Monitoring

## techniques, equipment & analyses

New Projects Range from Hardware Upgrades  
to Improved Data Collection & Analysis Methods

Additive Manufacturing Gaining Traction at Fleet Readiness Center East  
Matching Building Use, Occupancy with Energy Requirements  
Navy Region Southwest & National Marine Fisheries Service  
Salvage Rare Whale Carcass

**INSIDE:**  
2015 Navy  
Earth Day  
Poster

## Annual Marine Corps Expeditionary Energy Technology Demonstration Seeks Battlefield Solutions

2015 Camp Lejeune Gathering Seeks to Accelerate Future Energy Innovations

**THE MARINE CORPS** will host its annual Expeditionary Energy Concepts (E2C) technology demonstration (formerly known as the Experimental Forward Operating Base (ExFOB)), June 23-25, 2015 at Marine Corps Base (MCB) Camp Lejeune, North Carolina.

E2C is the Marine Corps' innovative process to identify and evaluate energy efficient technologies that can increase the self-sufficiency of expeditionary forces. By providing industry with opportunities to demonstrate new capabilities, E2C can quickly move technologies from concept to combat.

Created by the Commandant in 2009, E2C brings together energy stakeholders from across the Marine Corps requirements, acquisition, and science and technology development communities, as well as from the other military services, to leverage ideas and resources and identify energy solutions to meet warfighter needs.

Each year, the Marine Corps invites select industry participants to E2C to demonstrate commercial technologies with potential to reduce battlefield energy and water requirements and extend the operational reach of the Marine Corps.

The E2C 2015 demonstration will evaluate technologies that enable small unit distributed operations. Specifically, E2C 2015 will focus on the following three technology areas:

1. Hybrid/electric all-terrain vehicles
2. Advanced batteries and energy storage
3. Fuel cells (up to 10 kilowatts)

### Hybrid/Electric All-Terrain Vehicles

Small unit distributed operations require small, highly mobile, tactical vehicles that can travel for extended range without fuel resupply. Hybrid-electric and pure electric all-terrain vehicles offer significant fuel savings and have the potential to extend the operational reach of Marines on the move.

### Advanced Batteries & Energy Storage Technology

Marines use batteries to power a wide range of equipment and platforms in training and on the battlefield. Rechargeable batteries and energy storage solutions for specific military applications that offer greater energy density than the batteries used today can lighten the carried load, help increase infantry mobility, and extend operational reach.

### Fuel Cells

Fuel cells will play a critical role in reducing future fuel requirements and achieving the Commandant's aggressive 2025 energy goals to increase operational reach, improve readiness, and use only mobility fuel.

E2C is not a tradeshow. During the week-long demonstration, a team of engineers will collect data on system performance and Marine operators will provide qualitative feedback on what they see. 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.



The first E2C technology demonstration (then known as ExFOB) was held in March 2010 at MCB Quantico, Virginia. The E2C process helps quickly identify and evaluate commercial technologies that reduce battlefield energy and water requirements and extend the operational reach of the Marine Corps.

*U.S. Marine Corps*

## E2C Results “From Concept-to-Combat”

SINCE 2009, THE E2C team has:

- Conducted seven demonstrations at Marine Corps bases across the country.
- Reviewed over 300 technologies through the E2C RFI process.
- Assessed over 100 technologies at E2C demonstrations.
- Evaluated 26 systems in the laboratory/field following E2C.
- Transitioned five systems to Programs of Record.

Through the E2C process, the Marine Corps has conducted seven demonstrations at bases across the country, reviewed over 300 technologies through the E2C Request for Information (RFI) process, assessed over 100 technologies at E2C demonstrations, evaluated 26 systems in laboratory and field following E2C, and transitioned five systems to Programs of Record.

This June, subject matter experts from across the Marine Corps and other services will gather at MCB Camp Lejeune to once again test potential energy solutions that can help extend the operational reach of the Marine Corps, and ultimately, help to achieve the Commandant’s energy goals.

The following five renewable energy systems, first introduced by industry at past E2C technology demonstrations (formerly ExFOB), are currently Programs of Record:

1. **Solar Portable Alternative Communications Energy System (SPACES)**  
SPACES is a lightweight, portable, renewable energy system designed to provide power for platoon and squad size units operating in remote locations. Marines use SPACES to recharge batteries that power communications equipment like satellite communication radios, reducing the number of batteries carried on extended patrol.
2. **Ground Renewable Expeditionary Energy Network System (GREENS)**  
GREENS is a portable power generation system that incorporates solar panels, energy storage, and AC/DC

power sources. GREENS provides an average continuous output of 300 watts or 1,000 watts peak—enough to power a battalion combat operations center.

### 3. Radiant Barrier

This shelter liner, designed for a Base-X 305 medium soft shelter, doubles the R-value (thermal resistance) of the tent. Marines use radiant barriers to keep cool air in and hot air out, reducing the number of environmental control units required in a combat environment.

### 4. Light Emitting Diode (LED) Lights

LED light sets for medium soft shelters and general purpose use are more efficient than traditional fluorescent lights. Marines light their tents with these systems to keep power requirements at a minimum.

### 5. Mobile Electric Hybrid Power Sources (MEHPS)

MEHPS power generation—combining batteries, solar, and smart controls with traditional diesel generators—has demonstrated up to 50 percent fuel savings and up to 80 percent reduced generator run time. The Marine Corps is working closely with the Army to develop joint requirements for and field hybrid power systems that will increase the combat effectiveness of both services.



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).

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