

Harvesting tactical energy from knee braces, drones

By Hope Hodge Seck
hseck@militarytimes.com

Marines aboard Camp Pendleton, Calif., will soon test new gadgets and gear aimed at harvesting and repurposing waste energy — including a knee brace that could power battery-operated gear.

The Marine Corps' annual Expeditionary Forward Operating Base, an exposition-style event that rotates between Marine installations, demonstrates tactical energy-creating or energy-saving technologies in order to rapidly field the best ones. This year's event, to be held May 12-16, will focus on tactical energy harvesting, featuring gear ranging from wearable solar-powered devices to a solar drone that can detect thermal updrafts to prolong its flight time, officials said.

Fifteen companies are building prototypes for the event, and most of the technology is focused on increasing Marine infantry mobility, said Marine Expeditionary Energy Office director Col. Jim Caley.

Officials are particularly interested in exploring the potential around a piezoelectric knee brace prototype, which may be able to replace batteries in portable devices by harvesting vibrations caused by ordinary knee movement.

"If a Marine is able to generate

enough power from a piezoelectric knee brace to charge his radio/cell phone/GPS, he doesn't have to carry as many batteries and can stay

out longer without resupply," said Katie Hanson, an analyst with the office.

The event will also feature tech-

nology being tested by the Army and projects from the Naval Postgraduate School, Caley said. While prototypes featured at an ExFOB

are not guaranteed to make it to the field, the Corps has purchased and rapidly deployed technology tested at ExFOBs in the past. □

ENERGY From previous page

suming resources, it will change their behavior, producing a 15 percent reduction in energy use in the first year, and an additional 10 percent reduction in the second.

He acknowledged that waste is sometimes inevitable in combat — Marines need to leave their trucks running at an IED stop outside the wire, for example — but data would give commanders the ability to discern the difference between necessary energy use and waste.

"No one is telling them, 'Half your idle is done inside the base,'" Caley said. "So, they're not ... doing anything about it because they don't have a number that says, 'Wow, this is what I'm not using wisely.'"

The next phase of the Corps' energy-saving strategy will have more teeth; officials plan to hold individual units accountable for energy use over an established norm.

"I'm an operational guy, so what [holding units accountable] looks like in garrison, I'm not entirely sure," Caley said. "But I'll bet that looks like a power bill." □

PENFED AUTO LOANS

0.49
%APR



For Up To 36 Months **On New Vehicles** When
Financed Through **PenFed Car Buying Service**
Limited Time Offer.

Apply online at PenFed.org/BuyCarMT1804 or call 866-247-5626

Rate and offers are current as of April 15, 2014, and are subject to change. Promotional rate is not available to refinance existing PenFed car loans. Rate depends on model year and term. Other restrictions may apply. Call 800-247-5626 for details. Car Loan example: \$20,000 loan at 0.49% APR, 36 monthly payments of approximately \$559.76 each.