

## At a Glance

### What is it?

■ The Renewable Sustainable Expeditionary Power (RSEP) Future Naval Capability is a multiplatform, transportable, renewable hybrid power system developed for Marine Corps expeditionary forces.

### How does it work?

■ Heat from concentrated solar thermal energy and a multifuel burner drives a thermal-to-electric converter, producing electric power.

### What will it accomplish?

■ The RSEP program aims to achieve 40 percent fuel savings over current military power systems with increased noise reduction; continuous electrical power 3-5kW single light tactical trailer deployability with a per-unit cost no more than 110 percent of the current system, and MIL-STD-1332, Class 2B power quality.

■ A renewable power subsystem has a conversion efficiency of 30 percent automated or two-Marine deployability and stowability within 15 minutes.

■ A sustainable power subsystem has fuel-to-electric efficiency of 35 percent, power density of 30W/kg and the ability to utilize biofuels, logistics fuels and other available fuels

### Point of Contact

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The Office of Naval Research is working with the Marine Corps and other services to advance tactical energy independence for expeditionary power needs.

The Renewable Sustainable Expeditionary Power enabling capability, or EC, responds to a joint urgent operational need statement to support forward-operating bases, combat outposts and observation posts with renewable and self-sustainable energy solutions. It addresses the Navy expeditionary maneuver warfare capability gap logistics support to distributed operations by providing increased self-sufficiency in powering small units and development of alternative tactical mobile electric power sources necessary to support an increasing number of critical electrically powered devices.

RSEP will deliver a tactically deployable TRL 6 system employing both renewable and sustainable power, targeted for forward-deployed enhanced company operation needs. It will enable short-term silent operations and sustained low-noise missions.

The warfighting payoff includes support of forward-deployed enhanced company operation needs; reduced logistics tail; improved force protection; increased tactical energy independence, and; the enabling of staggered fuel resupply, short-term silent operations, sustained low noise missions and longer missions

The EC transition sponsor is the program manager for Expeditionary Power Systems, Quantico, Va. It supports 2010 Marine Corps critical strategic priorities which highlight operational energy reduction to reduce expeditionary energy consumption and increase naval warfighter energy independence. The EC is also aligned with the 2009 Department of the Navy energy strategy, which calls for aggressive reduction of our reliance on fossil fuels.

### Research Challenges and Opportunities:

- Tactical, stowable and redeployable solar concentrator
- Properties of thermal storage medium
- Concentrator surface fouling due to battlefield environment
- Successful development of tactical concentrator could also enable tactical concentrated solar photovoltaics
- Thermal and system controls
- Tactical, multifuel burner

