

Operational Energy Capabilities Improvement Fund Program Highlights

Innovative Cooling Equipment (ICE) Development/Demonstration Program: FY12 - \$2.5M

Led by Army Communications Electronics Research, Development, and Engineering Center (Aberdeen, MD) with partnership from the Office of Naval Research, Army Research Laboratory, U.S. Marine Corps Program Manager – Expeditionary Power Systems and Program Manager – Mobile Electric Power.

Heating and air conditioning systems are often the most significant electrical loads on the battlefield. By implementing state-of-the-art advancements in thermodynamic cycles, electronics/digital controls, components, and waste heat recovery, the program team seeks to reduce fuel consumption for heating and cooling by 10% – 30% which in turn, will translate to fewer fuel convoys on the battlefield and increased safety for DoD personnel.

Navy Expeditionary Technology Transition Program: FY12 - \$3.19M

Led by the Naval Facilities Engineering Command Expeditionary Programs Office (Washington, DC), with partnership from the Department of Energy Advanced Research Projects Agency–Energy and the Chief of Naval Operations Navy Energy Coordination Office.

Advanced technology research aimed at air conditioning for the commercial marketplace has recently made significant advances in heating and cooling technologies, particularly with thermal energy based air conditioners, solid state cooling, membrane based dehumidification, and water based vapor compression. By adapting these or other technologies to the rigors and constraints of the expeditionary environment, the program team seeks to reduce fuel consumption for heating and cooling by 20–50%, reducing the number of fuel convoys on the battlefield, and increasing the safety of DoD personnel.

Advanced, Energy Efficient Shelter Systems for Contingency Basing and Other Applications: FY12 - \$5.997M

Led by U.S. Army Natick Soldier Research, Development, and Engineering Center (Natick, MA) with partnership from Air Force Research Laboratory – Airbase Engineering Development Branch, Air Force Base Expeditionary Airfield Resources Global Management Office, Air Force Civil Engineer Support Agency, Army Corps of Engineers, Engineer Research, and Development Center – Construction Engineering Research Laboratory, and Army Materiel Command – Product Manager Force Sustainment Systems

Current battlefield shelter systems, including tents, are not energy efficient, often requiring very powerful, energy intense heating and air conditioning units to compensate for air leakage. The program team will demonstrate the current state of the art in energy efficient shelters, develop new energy efficient technologies, and then develop and demonstrate a next generation of energy efficient shelters. The goal for this program is to demonstrate and transition shelter systems that will reduce the heating and cooling required by 50% while providing improved capabilities and quality of life.

Super Energy Efficient Containerized Living Unit (SuperCLU) Design and Development: FY12 - \$1.0M

Led by Naval Facilities Engineering Command (Port Hueneme, CA) with partnership from Camp Lemonnier, Djibouti Public Works Department, and U.S. Marine Corps Forces Pacific Experimentation – Western Area Research, Testing and Evaluation Center.

In expeditionary bases around the world, many DoD personnel live in converted metal shipping containers called Containerized Living Units (CLUs), which do not incorporate energy efficient HVAC systems, high R-value insulation, reflective insulated exterior coatings, or well balanced interior air

distribution. The program team will incorporate these features into the redesign of an existing CLU and to develop a new highly efficient SuperCLU. In addition, the team will also incorporate light weight building materials, better mobility, and aim to maximum interior space. The team will initially focus on Camp Lemonneir, Djibouti where they seek to reduce energy use in renovated CLUs by 54% and 82% for the Super CLU, thus reducing the fuel demand and associated costs at the camp and providing valuable lessons for other expeditionary sites.

Transformative Reductions in Operational Energy Consumption (TROPEC): FY12-\$3.85M

Led by U.S. Pacific Command (Camp Smith, HI) with partnership from the Department of Energy's Oak Ridge National Laboratory and Lawrence Berkeley National Laboratory and the Marine Forces Pacific Experimentation Center (MEC).

Many of today's defense energy technologies are suited for the arid climate U.S. forces have been operating in over the past decade. The TROPEC program will identify and assess new and existing technologies that would reduce the energy demand of expeditionary outposts in tropical environments. The program team seeks to demonstrate technologies that could reduce the total energy use of forward operating bases in these environments by 50% in 2016.

Operation Enduring Freedom Energy Initiative Proving Ground: FY12 – \$1.425M

Led by U.S. Army Research, Development and Engineering Command - Field Assistance in Science and Technology Center (RFAST-C) (Bagram Air Base, Afghanistan) with partnership with U.S. Army Materiel Analysis Activity and Program Manager – Mobile Electric Power

This program will establish a baseline for energy and fuel use in expeditionary operations in Afghanistan and systematically evaluate the quantitative operational benefit of a broad spectrum of energy-related technologies such as improved efficiency heating and air conditioning units, insulating tent liners, solar tent shades, and hybrid solar-electrical power technology. The program will take place at RDECOM's Field Assistance in Science and Technology Center at Bagram Air Base, Afghanistan and seeks to rapidly analyze the effect of these technologies on fuel consumption and determine which provide the highest operational impact and the best return on investment for deployment in Operation Enduring Freedom.