

## DEFENSE INNOVATION UNIT ENERGY PROJECTS

### INSTALLATION RESILIENCE

#### CONSTRUCTION SCALE ADDITIVE MANUFACTURING

**PROBLEM:** Battlefield construction is extremely time consuming, expensive, and dangerous.



**SOLUTION:** Newly developed additive manufacturing techniques are making it possible to “print” buildings for a fraction of the cost in time, money, and manpower.

**DEFENSE PARTNERS:** USMC SYSCOM, USA IMCOM

**COMMERCIAL VENDORS:** ICON Technology, Inc.

#### EXTENDED DURATION STORAGE FOR INSTALLATIONS (EDSI)

**PROBLEM:** The DoD needs access to secure, cost-effective, and reliable energy that’s resilient to natural and man-made disruptions to support critical loads for days or weeks.

**SOLUTION:** Leverage emerging breakthroughs within long-duration energy storage (technology, chemistry agnostic).

**COMMERCIAL VENDORS:** 100+ companies responded to initial solicitation



#### REMOTE INSTALLATION GRID OPTIMIZATION & RESILIENCE (RIGOR)

**PROBLEM:** The DoD operates remote radar installations across the globe that require electricity via diesel generators and are vulnerable to logistical and cyber disruptions as well as power outages.



**SOLUTION:** An integrated solution that provides power stabilization, data capture, cybersecurity and energy management/storage, and resource monitoring.

**COMMERCIAL VENDORS:** 31 companies responded to initial solicitation

#### ELECTRIC VEHICLE SUPPORT EQUIPMENT (EVSE)

**PROBLEM:** With the number of EVs increasing rapidly for both the government fleet and personal vehicles, there is a growing need to proliferate fast charging services within DoD and on military installations.



**SOLUTION:** Install a mixture of Level 2 and Level 3 chargers initially at a number of Navy, Army Reserve, Marine Corps, and Air Force bases.

**DEFENSE PARTNERS:** Energy / Facilities / Transportation Offices at Marine Corps Installations WEST-MCB Camp Pendleton

**COMMERCIAL VENDORS:** One vendor is undergoing contract negotiations and six other vendors are in portal.

#### SHADOW MONITORING

**PROBLEM:** DoD does not have timely and comprehensive installation-level data for electricity, natural gas, and water consumption for effective decision making to execute EO 14057 sustainability requirements.



**SOLUTION:** Install inline parallel meters, or “shadow meters,” at the fenceline at installations that can reflect total installation usage.

**COMMERCIAL VENDORS:** TBD

#### FINANCE FIRST

**PROBLEM:** Installations are facing a challenging landscape from rapidly increasing energy demand, inconsistent grids, and threats from environmental change. To respond, bases will need TW of power, and traditional funding mechanisms will not meet the continuously growing needs for renewable, resilient local power.

**SOLUTION:** Utilize proven structured finance methods to more quickly install renewable generation, storage, and microgrids at little to no up-front cost.

**COMMERCIAL VENDORS:** TBD



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### OPERATIONAL ENERGY

#### TACTICAL VEHICLE HYBRIDIZATION

**PROBLEM:** Liquid fuels create battlefield logistics challenges and do not inherently support future operational requirements.



**SOLUTION:** Retrofit tactical vehicles fleets with hybrid energy-capture systems. On-board power storage to support EW & C2 systems, HVAC, DE weapons and V2G / V2V energy sharing.

**DEFENSE PARTNERS:** Army PM Transportation Systems, Army PD Light Tactical Vehicles, Army Ground Vehicle Systems Center, USMC Combat Development Directorate, USMC Systems Command.

**COMMERCIAL VENDORS:** XL Fleet, Volta Power Systems, Stealth Power, Blackburn Energy

#### SYNTHETIC FUELS FOR CONTESTED ENVIRONMENTS (SynCE)

**PROBLEM:** Defense fuel operational energy logistics are reliant on the global energy supply chain, which is easily disruptible.

**SOLUTION:** Creation of a highly agile, rapidly deployable synthetic fuel production system (leave-behind or onboard) that could be dispersed throughout any AOR to produce just-in-time fuel at the edge.



**COMMERCIAL VENDORS:** Air Company (for Synthetic Fuel Creation); Company TBD (for Direct Air/Ocean Capture for feedstock procurement)

#### ELECTRIC SEARCH AND RESCUE (eSAR)

**PROBLEM:** Military small watercraft are powered by internal combustion engines creating logistic, storage, detection, and environmental challenges.

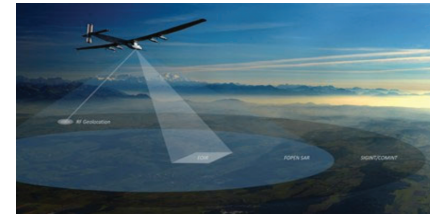


**SOLUTION:** Leverage Congressionally directed funds, commercial electric personal watercraft, and small boat market offerings. Demonstrate the utility of a fully electric personal watercraft-sized vehicle, capable of performing search and rescue (SAR) / Maritime Reconnaissance (MR) operations and embarkation on naval ships

**COMMERCIAL VENDORS:** Pure Watercraft, T3mp3st

#### PERSISTENT INTELLIGENCE, SURVEILLANCE, & RECONNAISSANCE (ISR)

**PROBLEM:** Traditional Intelligence, Surveillance, and Reconnaissance assets that provide long-range, broad area, and persistent ISR are limited by onboard liquid fuel capacity and operational expense, limiting the ability to support deployed forces executing missions.



**SOLUTION:** Modify Skydweller's solar-powered unmanned, mid-altitude, heavy payload aircraft with advanced energy technologies to increase operational endurance.

**DEFENSE PARTNERS:** SOUTHCOM, NAWCAD

**COMMERCIAL VENDORS:** Skydweller Aero, Inc.

#### JUMPSTART FOR ADVANCED BATTERY STANDARDIZATION (JABS)

**PROBLEM:** DoD's low-demand signal and complex specifications make it nearly impossible to engage with high-volume automotive battery suppliers.



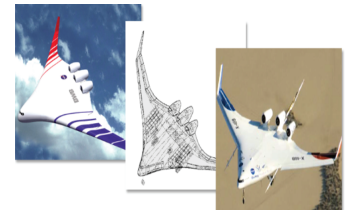
**SOLUTION:** Engage EV companies to develop standard battery modules that leverage state-of-the-art commercial technologies for defense applications.

**DEFENSE PARTNERS:** SecNav Operational Energy, OSD (A&D) Ind Pol, Ground Vehicle Systems Center, Naval Surface Warfare Crane & Carderock, DE Community

**COMMERCIAL VENDORS:** Vendors undergoing contract negotiations

#### BLENDED WING BODY (BWB)

**PROBLEM:** The USAF identified an operational problem of conducting contested fuel logistics and supply chain management over longer range while maximizing efficient utilization of fuel use as well as addressing environmental concerns.



**SOLUTION:** Significantly lower fuel burn (25% threshold, 30% objective).

**DEFENSE PARTNERS:** SAF/IEN, AFRL/RQV, NASA LaRC, AFTC

**COMMERCIAL VENDORS:** Seven companies responded to initial solicitation