



## Title: Commanding Energy Needs Statement

### **Background**

Across the Department of Defense (DOD) enterprise, energy affects capabilities, operations, and strategy. This is especially true in expeditionary or disaggregated environments, such as the Indo-Pacific region, where energy can be a limiting factor in operations. The DOD [Operational Energy – Innovation \(OE-I\)](#) office is seeking solutions for addressing energy knowledge gaps and improving the understanding of how energy functions as an underlying enabler or constraint to critical missions and activities.

The goal of this ‘Commanding Energy Needs Statement’ is to identify novel capabilities that increase energy situational awareness and enable smart, energy-informed decisions across all levels of the Department (squad to service). The DOD’s energy use varies considerably, ranging from liquid fuel to batteries; local, unreliable and ‘dirty’ power grids to modernized green energy plants; and permanent base power to mobile and austere power generation. This needs statement is seeking solutions that can look across multiple military use cases and inform better decision making as it relates to energy enabled operations.

Selected solutions will focus on rapidly maturing capabilities that could be leveraged by deployed forces in the Indo-Pacific region and other military areas of responsibility. Further, solutions must fill these needs within broader policy and strategic context including achieving goals for positive climate impact and green technologies. The DOD needs technologies that adapt to, and maximize the impact of, energy resources; methods to ensure energy availability in contested environments; and decision support tools to improve situational awareness, understanding, and trust around said energy resources.

Proposed solutions for resolving Commanding Energy needs should ensure that associated data, information, technologies, and services are **understandable and visualized** in a way that is appropriate for the anticipated user (e.g., by a policy planner, base commander, or operator). Whenever possible, assets should be **interoperable** with existing DOD resources and operations to ensure a smooth transition into a fielded capability. Developers should ensure their solution is **trusted** by taking necessary measures, such as providing data traceability, so that users are confident in their use of the solution. Finally, the technology should comply with all applicable information assurance and **cyber security** policies. Through this combination, Commanding Energy solutions can provide impactful decision support throughout all phases of a potential future conflict.

The Office of the Undersecretary of Defense for Research and Engineering (OUSD R&E) Capability Prototypes (CP) is facilitating the ‘Commanding Energy Needs Statement’ to support OE-I in discovering innovative technologies. Selected companies will have an opportunity to make short technical presentations to government representatives about their potential solutions in May 2023, with the exact date to be determined. Results of this effort inform decision-makers

about emerging and available technology solutions that enhance or improve operational capabilities. The technology areas of primary interest include:

**Energy Situational Awareness:** Capabilities to collect, aggregate, and understand energy data (e.g., remaining fuel supplies, required kilowatts per hour of operation, tracking disruptions to power distribution), then communicate and display this data at the appropriate levels (e.g., individual soldier to integrated coalition forces). Energy situational awareness addresses all aspects of the energy ecosystem including availability (supply, quality, and storage), use (power networks and load), and threats (vulnerabilities and adversary capabilities) in both permissive and contested environments. Further, it covers the full life cycle of systems (e.g., battery disposal and tracking). Situational awareness is a precursor to planning and decision support tools. Example needs include:

- Individual plug-in sensors to retrofit existing systems for collecting and communicating energy data
- Methods to standardize and fuse energy data
- Secure methods of sharing energy situational awareness, and aggregate disparate energy data to enhance operational planning
- Capabilities to accurately characterize and track energy availability, use, and current priorities

**Energy Informed Planning:** Tools and techniques to understand and incorporate the impact of energy data into plans and courses of action. These solutions use energy data to inform the full range of decisions from prepositioning and logistics, to maneuver and engagement. Example needs include:

- Informed decision support tools for DOD users across various levels of command, location (e.g., theater command, operating base, expeditionary forces) and operations
- Solutions (e.g., common operating picture, modeling and simulation) tailored toward the appropriate user that enable near real-time situational understanding by reducing data overload and resolving current data deficiencies
- Energy informed control systems and dynamic route planning for individual or multiple remote platforms (e.g., air, land, or sea vehicles)
- Analytical tools and modeling/simulations that integrate existent systems and simulated/virtual systems

**Identifying Efficiencies:** Capabilities to identify and realize opportunities that reduce energy consumption. Relevant solutions include tools and techniques to identify trends in energy use and potential methods to reduce use or demand. Example needs include:

- Verifiable ML/AI enabled monitoring and trend analysis
- Plug-in upgrades that do not increase manual effort or reduce performance
- Reporting tools that feed into energy awareness to assess efficiency impact
- Demand reduction technologies

**Interoperable Energy Networks:** Investments in commanding energy that anticipate and prepare for evolving standards and capabilities. Relevant solutions consider interoperability and open-source standards for hardware, software, and networks. Further solutions should consider

current and potential future threats, including appropriate cybersecurity, to ensure resilient future networks. Example needs include:

- Modular open systems architectures that enable upgrades and new capabilities
- Flexible techniques and tools to bridge disparate standards
- Smart interfaces that increase interoperability and modularity
- Tools and analytics to identify weak or vulnerable interfaces in energy networks

**Training and Education:** Tools, processes, and techniques to support intelligent decision-making and energy literacy that incorporate DOD training doctrines and best practices. Solutions should be adaptive and tailorable to inform the appropriate audience, whether it be policymakers, analysts, or tactical operators. This need area includes education and curriculums to improve understanding of energy's impact on potential actions and help to identify and reinforce informed and effective energy decisions. Example needs include:

- Virtual or augmented reality training solutions to educate either an individual or class
- Tools, processes, and techniques for providing energy understanding at the policy, operational or tactical level
- Use of AI assisted human-in-the-loop (HITL) training solutions and products
- Solutions for integrating operational energy into leadership and policy training

**Novel Energy Technologies:** In addition to the specific need areas, the DOD is interested in hearing of any novel energy technology that may positively affect the joint force.

### **Application Process**

Companies interested in participating in the Innovation Outreach Solutions Meeting should submit one (1) application to the Innovation and Modernization Office (formerly the Rapid Reaction Technology Office) via email to [osd.pentagon.ousd-atl.mbx.rcto-innovation@mail.mil](mailto:osd.pentagon.ousd-atl.mbx.rcto-innovation@mail.mil). Only one application per company is permitted, NOT one application per topic area or company business unit.

The following information is required in the application. All application information must be contained in the body of the email. No attachments are allowed.

1. Email subject line: IO Commanding Energy Solutions Meeting
2. Company name
3. Website address
4. Point of Contact (POC), email, and phone number, and alternate POC (if desired)
5. One succinct single paragraph description (100 words or less in length and no bullets) of the technology that the company plans to discuss if they are selected to present at the Innovation Outreach Solutions Meeting. This description must focus on the technology and the envisioned use of that technology and must not be a description of the company.
6. Select the one technology area of the six technology areas above (Energy Situational Awareness, Energy Informed Planning, Identifying Efficiencies, Interoperable Energy Networks, Training and Education, and Novel Energy Technologies) that BEST fits your technology solution. Do not apply for multiple technology areas.

All applications must be received on or before 5:00 PM EDT, 24 March 2023. Submission of an application does not guarantee an invitation to the Innovation Outreach Solutions Meeting.

Selected companies are responsible for their travel and all other expenses associated with participation in the Innovation Outreach Solutions Meeting. The DoD does not guarantee funding or follow-up work to selected and/or participating technology developers but may provide developers additional follow-on opportunities for pilot projects based on applicability and other factors.