

**Environmental Security Technology Certification Program (ESTCP)**

**MICROGRID DEVELOPMENT FOR MILITARY INSTALLATIONS**

**OBJECTIVE**

The Department of Defense (DoD) Installation Energy Test Bed seeks demonstration projects of innovative solutions to reduce the time and cost of designing and implementing microgrids on military installations. ESTCP intends to fund multiple projects to demonstrate and validate technologies and solutions that expedite the design, simplify component and system integration, and accommodate expansion while considering the conditions found on military installations and the expected business and financial constraints of developing and building a microgrid.

As described in the background section, there is a need to demonstrate technologies that will allow for cost-effective and agile development of future microgrid solutions. Technologies and approaches are needed that can allow for development of microgrid capabilities that can be cost effectively expanded, networked, or modified as requirements and opportunity arise over time. Technologies that allow for the following capabilities are of interest:

- The ability to network multiple microgrids. Advanced monitoring, control, and communication technologies are needed to enable the operation of multiple microgrids. Networking multiple microgrids on an installation to the grid is of interest.
- The ability to cost-effectively implement a scalable microgrid from ground up or facilitate integration of additional critical loads, generation, and storage assets into an existing microgrid. Approaches that facilitate low-cost incremental expansion of networked distributed energy resources (DER) and critical loads over time are of interest.
- The ability to cost-effectively exploit legacy generation assets and modify building load configuration in response to changing missions. Approaches that facilitate exploiting and or modifying legacy generation and load assets that reduce the cost of microgrid development are of interest.
- The ability to simplify the design process. Application of standard interfaces and configurations where possible, or other approaches to streamlining design, are of interest.

Demonstrations can be conducted on military installation, but most are expected to be conducted in a hardware-in-the loop test facility and may lead to follow-on field demonstrations. Testing in these facilities will allow for comprehensive and more cost-effective evaluation of proposed technologies. Information on the available test facilities will be provided to those proposers for which full proposals are requested.

**BACKGROUND**

The starting conditions for military microgrids are neither clean slates nor are they monolithic. Military installations have significant existing energy infrastructure investments in multiple legacy systems (generation assets, distribution systems, substations, load configurations, storage, metering etc.). These assets, and their energy security uses, also vary widely spatially and

temporally. For example, critical loads are often dispersed across a base. They may be several critical loads grouped on one part of the base while others are a significant distance away and can be on a different portion of the base's distribution system. In addition, the criticality of loads on a base can change over time as buildings host different missions as during a long duration outage when missions evolve and may move on or off a base.

It is anticipated that many microgrids will not be designed and built for an entire installation at one time due to financial and regulatory constraints, business processes, and the needs of different installation tenants as well as partnerships outside the fence line. The cost of a microgrid can be significant and current business processes make it difficult to fully fund large comprehensive microgrid development. Microgrids are likely to be developed incrementally over time and modified once built to respond to changing conditions and requirements.

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For pre-proposal submission due dates, instructions, and additional solicitation information, visit the [ESTCP website](#).