

Deploying State-of-the-Art Energy Innovations Across the Department of Defense

ESTCP Simplifying Procurement of Proven Technologies

THE ENERGY SECURITY Technology Certification Program (ESTCP) is developing a transition process to make it easier for installation energy managers to implement innovative energy conservation technologies.

The Department of Defense (DoD) manages more than 275,000 buildings on approximately 500 installations throughout the United States. These facilities account for about one-third of DoD's energy demand or close to \$4 billion every year. DoD has implemented an installation energy strategy that is designed to reduce energy costs and improve the energy resilience of DoD fixed installations to contribute to energy security and mission assurance. The strategy requires energy and facility managers to seek out state-of-the-art technologies. It is very important that they be technically sound and reliable to meet mission requirements; however, new technologies have a limited track record which requires managers to weigh the risk.

DoD established ESTCP to help consolidate the risk posed by innovative technologies. The program's mission is to harness science and technology to enhance mission capabilities, improve environmental performance as well as energy resiliency and reduce costs. ESTCP annually solicits the Federal government, academia and industry to propose innovative technology projects that address high-priority energy security and environmental requirements.

The Challenge with Transition

The program funds the most promising technologies to be demonstrated at DoD operational sites, with independent investigators validating performance and cost savings. Upon successful demonstration, ESTCP promotes the transfer of technologies throughout DoD.

The last step can be the most challenging. No matter how well a tech-



nology performs, it cannot have an impact if no one knows about it or is able to procure it. Recognizing this challenge, ESTCP is developing a transition process to make it easier for installation energy managers to implement innovative, proven technologies. The resources created by this process will help managers streamline discovery, validation, presentation, specification and procurement.

Aiding the Transition Process

ESTCP established a special project to aid in the development of a new transition process. The project first identified potential end users, including DoD procurement specialists, installation energy managers and installation commanders and other staff in the approval chain. Based on these target audiences, it then developed high

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level descriptions of data and products that would potentially assist these end users in implementing a new technology. The end result was a suite of tools to be developed for each technology:

1. Fact Sheets

A one-page overview of the project and technology that includes general technical and economic facts, ESTCP test results and resources.

2. Specifications

A “cut sheet” containing an in-depth outline of key technical details.

3. Briefing

A slide deck to brief decision makers on the technology, which can be tailored to an individual installation’s situation.

4. DD Form 1391 Processing

“Technology specific model language” to include in the DD Form 1391 for initial procurement processing.

5. Building Life Cycle Cost (BLCC) Program Input

An Excel™ tool to help installations populate and run the BLCC program.

6. Specifications and Evaluation Criteria

Performance-based specifications that inform Federal Acquisition Regulation-compliant performance work statements for competitive solicitations. Evaluation criteria reflect the attributes of the technology and are not vendor-specific.

7. Webinar

An overview of key information for each specific technology in less than 10 minutes.

This effort piloted the transition process on the most promising energy conservation and efficiency technologies demonstrated by ESTCP. From over 100 completed demonstrations, the following 12 technologies were selected for the pilot based on successful demonstration and commercial availability:

1. Variable Dew Point Evaporative Comfort Cooling Equipment (project no. EW-200821)
2. Advanced Lighting Controls for Reducing Energy Use and Cost in DOD Installations (project no. EW-201012)
3. Daylight Redirecting Window Film (project no. EW-201014)



4. Bi-level Demand Sensitive LED Street Lighting Systems (project no. EW-201017)
5. Dynamic Exterior Lighting for Energy and Cost Savings on DOD Installations (project no. EW-201141)
6. Improving Direct Expansion Unitary Air Conditioning Efficiency (project no. EW-201144)
7. Dining Facility & Kitchen Exhaust Hood and Makeup Air monitoring and Control (project no. EW-201151)
8. Mobile Kinetic Super-Resolution Long-Wave Infrared Thermography for Building Envelope Diagnostics (project no. EW-201241)
9. Low Cost, High Energy-Saving Dynamic Windows (project no. EW-201252)
10. Rapid Energy Modeling for Building Auditing and Diagnostics (project no. EW-201259)
11. Electronic Auditing Tool with Geometry Capture for Automating Building Energy Audits (project no. EW-201260)
12. Rapid Building Assessment to Identify and Profile the Energy Savings Potential of Individual Buildings (project no. EW-201261)

Of the projects listed above, four were selected for an early prototype stage that allowed stakeholders from across DoD to review an early version of the new transition process. A group of over 25 stakeholders were invited to review and comment on the overall concept and the prototype tools for the first four technologies. After incorporating feedback from the prototype stage, the remaining eleven technologies were added to pilot the revised process.

For More Information

FOR MORE INFORMATION about this project including a downloadable fact sheet, visit www.serdp-estcp.org/Program-Areas/Energy-and-Water/Energy/Conservation-and-Efficiency/EW-201252..

Case Study: Dynamic Windows

One pilot technology was a dynamic window demonstrated at Marine Corps Air Station Miramar in San Diego, California (EW-201252, “Low-Cost, High-Energy-Saving Dynamic Windows”). The windows use an electrochromic effect that automatically tints to optimize heat gain and maximize interior daylighting. The demonstration found a 29 percent reduction in heating, ventilation and air conditioning (HVAC) energy consumption and a 62 percent reduction in lighting energy compared to the previous windows, with both savings over double that offered by state-of-the-art low-emissivity windows. An economic assessment estimated a payback of less than three years compared to current low-emissivity windows and a lifetime savings-to-investment ratio of 4.3. The demonstration also found a significant increase in occupant comfort and satisfaction based on before and after surveys.

If you are interested in the transition tools for this or other ESTCP demonstrations, the transition project was on schedule to be completed sometime in the summer of 2017. After a review of the pilot tools is completed, they will be made available to energy managers through the ESTCP website.

The Basics About ESTCP

ESTCP is the DoD’s environmental technology demonstration and validation program. The program was established



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in 1995 to promote the transfer of innovative technologies that have successfully established proof of concept to field or production use. ESTCP demonstrations collect cost and performance data to overcome the barriers to employ an innovative technology because of concerns regarding technical or programmatic risk.

The program's goal is to identify and demonstrate the most promising innovative and cost-effective technologies and methods that address DoD's high-priority environmental requirements. Projects conduct formal demonstrations at DoD facilities and sites in operational settings to document and validate improved performance and cost savings.

ESTCP issues an annual solicitation for proposals from the Federal government, academia and industry and employs

a competitive selection process to ensure that ESTCP funds high-quality demonstrations. ESTCP requires each project to develop a formal test and evaluation plan. Demonstration results are subject to rigorous technical reviews to ensure that the conclusions are accurate and well supported by data.

ESTCP is managed by a Director and Deputy Director, five Program Managers, and a Financial Officer. The ESTCP office is co-located with the Strategic Environmental Research and Development Program (SERDP) in Alexandria, Virginia. In this joint program structure, the management staff has insight into the entire range of scientific and technical issues associated with an environmental problem, from basic research questions through implementation. ESTCP relies on the technical skills offered by the participating Services serving on its technical committees to assist in the technical aspects of program development, project selection, program monitoring and technology transfer.

ESTCP projects are managed within the following five program areas:

1. Energy and Water
2. Environmental Restoration
3. Munitions Response
4. Resource Conservation and Climate Change
5. Weapons Systems and Platforms

For more information, visit the program's web site at www.serdp-estcp.org. 



SERDP and ESTCP Symposium

The SERDP and ESTCP Symposium will be held November 28–30, 2017 in Washington, D.C. For additional information or to register for the Symposium, visit www.symposium.serdp-estcp.org.

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