



January 2016

DEFENSE INFRASTRUCTURE

Energy Conservation Investment Program Needs Improved Reporting, Measurement, and Guidance

Accessible Version

GAO Highlights

Highlights of [GAO-16-162](#), a report to congressional committees

Why GAO Did This Study

DOD established ECIP, which funds projects at military installations that are designed to conserve energy or water, generate electricity from renewable sources, promote energy security, or accomplish a combination of these goals. Senate Report 113-174 included a provision that GAO review energy savings from ECIP-funded projects. This report assesses the extent to which DOD has (1) reported anticipated returns on investment or reduced energy use from ECIP-funded projects; (2) found that completed ECIP projects have resulted in cost savings or lower energy use; and (3) developed and implemented a strategic vision for ECIP.

GAO obtained and analyzed the annual congressional notifications of the 441 proposed ECIP projects from fiscal years 2009 to 2015; analyzed applicable guidance, including DOD guidance from fiscal year 2011 for preparing ECIP proposals; developed, circulated, and analyzed a questionnaire to project managers; and analyzed project documentation to determine which contained attributes that formed part of DOD's strategic vision.

What GAO Recommends

GAO recommends that DOD improve its reporting on anticipated ECIP savings; measure actual savings from ECIP projects; and review its goals and update guidance to best align projects with DOD's strategic vision. DOD concurred or partially concurred with all of the recommendations.

View [GAO-16-162](#). For more information, contact Brian J. Lepore at (202) 512-4523 or leporeb@gao.gov, or Frank Rusco at (202) 512-3841 or ruscof@gao.gov.

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Energy Conservation Investment Program Needs Improved Reporting, Measurement, and Guidance

What GAO Found

The Department of Defense (DOD) collects information on how Energy Conservation Investment Program (ECIP) projects are expected to perform when operational, including anticipated returns on investment and energy or water savings. While DOD annually notifies congressional committees of proposed ECIP projects and includes some of this performance information with the notification, it does not do so consistently. In particular, for fiscal years 2009 through 2015, DOD reported anticipated returns on investment for 79 percent of projects. However, it did not consistently update these data as projects were added and revised or report any information on expected energy or water savings. While DOD is not required by law or its own guidance to report this information, federal internal control standards provide guidance for communicating with external stakeholders information that may have a significant effect on an agency achieving its goals. However, DOD has not developed guidance to require reporting the additional performance information and thus congressional committees may not be able to assess the extent to which DOD expects to achieve ECIP program objectives.

Since fiscal year 2011, DOD has required the services to measure and verify the extent to which ECIP projects have realized their projected savings and energy efficiencies. However, of the 35 domestic projects that the services have started and reported as completed since that requirement was adopted, only 8 projects have resulted in documented savings or reduced energy use. Managers of the remaining projects either did not complete projects according to their original scope, or did not measure or verify cost savings or reduced energy use. Managers, with few exceptions, did not specifically budget for postcompletion measurement and verification costs in their project proposals. If the military services do not include these costs in project proposals, managers will be less likely to set aside resources needed for the measurement and verification actions necessary to determine whether projects realized anticipated benefits.

DOD developed guidance in fiscal year 2011 describing a strategic vision for the program where projects meet at least one of six attributes, such as fundamental performance improvements, that it described as "game-changing" (i.e., significant) benefits. However, about 80 percent of the ECIP-funded projects that GAO reviewed only anticipate benefits that DOD considers traditional rather than significant. DOD has not clarified how the military services and defense agencies should choose ECIP projects to best achieve DOD's strategic vision. According to DOD officials, it is challenging to identify projects that align with DOD's strategic vision and deliver the return on investment that DOD expects of \$2 for every \$1 invested. This challenge exists because significant projects also tend to be more expensive and therefore have a lower return on investment. If DOD does not review its strategic goals for ECIP and update guidance to clarify how its components should balance their portfolios among traditional and other projects, the department will be unable to meet its strategic vision for the program.

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Abbreviations

AT&L	Acquisition, Technology and Logistics
DOD	Department of Defense
ECIP	Energy Conservation Investment Program
FEMP	Federal Energy Management Program
M&V	measurement and verification
OSD	Office of the Secretary of Defense
Recovery Act	American Recovery and Reinvestment Act of 2009
SPIDERS	smart power infrastructure demonstration for energy reliability and security

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January 29, 2016

The Honorable Mark Kirk
Chairman
The Honorable Jon Tester
Ranking Member
Subcommittee on Military Construction, Veterans Affairs, and Related
Agencies
Committee on Appropriations
United States Senate

The Honorable Charlie Dent
Chairman
The Honorable Sanford Bishop
Ranking Member
Subcommittee on Military Construction, Veterans Affairs, and Related
Agencies
Committee on Appropriations
House of Representatives

The Department of Defense (DOD) is the largest energy consumer in the federal government, spending about \$4 billion per year on energy for more than 500 installations and 500,000 buildings and structures. To help conserve energy at its installations, DOD, in fiscal year 1976, established the Energy Conservation Investment Program (ECIP), which funds projects every year through the defense-wide military construction appropriation. ECIP projects are designed to conserve electricity or water, generate electricity from renewable sources, promote energy security,¹ or accomplish a combination of these goals. In fiscal year 2015, \$160 million was provided for ECIP—\$150 million for projects and \$10 million for planning and

¹ Section 2924 of Title 10 of the United States Code defines a renewable energy source as electric energy generated from renewable sources, such as solar (including electricity), wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal (including electricity and heat pumps), municipal solid waste, new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project, or thermal energy generated by any of the above. Section 2924 also defines energy security as having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet mission-essential requirements.

design—out of a total military construction budget authority of about \$6.5 billion.

The Office of the Secretary of Defense—through the Under Secretary of Defense for Acquisition, Technology and Logistics (AT&L) and the Assistant Secretary of Defense for Energy, Installations, and Environment—centrally manages ECIP and annually allocates project funding to the military services and defense agencies, collectively referred to as the “components.” The components submit project proposals to AT&L, which bases its funding decisions on factors such as projected cost savings, whether the project ranks as a high priority to a component, and the degree to which the project is expected to contribute to installations’ overall energy goals.

In Senate Report 113-174 to accompany a proposed bill for the Military Construction and Veterans Affairs, and Related Agencies Appropriations Act, 2015, the Appropriations Committee stated that it encouraged the transition of ECIP from funding small, rapid-payback projects, such as isolated heating, cooling and lighting efficiencies, to playing a central role in leveraging larger energy security and renewable energy projects. The committee urged DOD and the services to complete projects that would produce significant “game-changing” improvements to reduce carbon emissions, energy consumption, and energy costs, as well as projects to enhance installations’ energy security.

The committee report also included a provision for GAO to review realized energy savings associated with ECIP-funded projects. This report assesses the extent to which DOD has (1) reported anticipated returns on investment or reduced energy or water use from ECIP-funded projects; (2) found that completed ECIP projects have resulted in cost savings or lower energy use; and (3) developed and implemented a strategic vision for ECIP.

To determine the extent to which DOD has reported anticipated returns on investment or reduced energy use from ECIP-funded projects, we obtained and analyzed the annual notifications of the 441 proposed ECIP projects that DOD provided to congressional committees for fiscal years 2009 through 2015, including projects funded by the American Recovery and Reinvestment Act of 2009, referred to hereafter as the Recovery Act.²

² Pub. L. No. 111-5 (2009).

These notifications included updates to projects included in prior year notifications. To verify the completeness and accuracy of these data, we compared them with a preliminary list of proposed ECIP projects in budget justification materials provided in support of the President's annual budget request for fiscal years 2009 through 2015. We also performed logic checks and other analyses to identify, and in some cases correct, inconsistencies and other errors in the data. We verified our corrections and our compilation of projects with DOD. After making the corrections, we determined that the data were sufficiently reliable for the purpose of determining the extent that DOD reported returns on investment and reduced energy use from ECIP projects. We also obtained and reviewed DOD guidance on the criteria the department uses for funding ECIP projects and compared that to DOD data and other information on proposed projects. We also compared the level of information that DOD reports to Congress to the information and communications standard in the Standards for Internal Control in the Federal Government.³ Also, we interviewed AT&L officials and energy officials in the services' headquarters.

To determine the extent to which DOD has found that completed ECIP projects have resulted in cost savings or lower energy use, we identified applicable guidance, including AT&L guidance for preparing ECIP project proposals issued for fiscal year 2011 and later. We began with fiscal year 2011 because the annual ECIP guidance for fiscal year 2011 states that all projects should include a measurement and verification (M&V) plan to determine cost and energy savings. We then determined the 35 domestic ECIP projects that the military services had begun since AT&L issued its fiscal year 2011 guidance⁴ and reported complete as of June 2015. We developed and circulated a uniform questionnaire to each of the project managers—all of whom responded—and we analyzed the results; we then followed up with respondents as needed. We reviewed documents, such as the projects' military construction proposals, meter data, and records of incurred costs. Based on these documents, as well as project managers' responses, we categorized the projects according to whether installations had realized cost or energy savings by (1) constructing

³ GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

⁴ We excluded overseas projects from our scope because varying national regulations may have affected the time required for project completion, and we excluded defense agencies' projects because the military services had most of the projects.

projects to the original scope and (2) developing and implementing measurement and verification plans, and documenting results.

To determine the extent to which DOD has developed and implemented a strategic vision for ECIP, we used the data that we compiled from DOD's notifications to Congress to identify and review the military services' 102 domestic ECIP projects funded since fiscal year 2011, when DOD issued guidance to articulate its strategic vision. At the time of our review, DOD had not funded fiscal year 2015 projects. We analyzed documentation for each of these projects to determine which proposals contained any of the six attributes that DOD had identified as part of its strategic vision.⁵ We recorded the project document analysis into three categories: (1) projects that appeared to contain at least one of these attributes, (2) projects that did not appear to contain any of these attributes but were conventional military construction projects such as the installation of energy-efficient equipment, and (3) projects that received military construction funding but that we observed during the course of our review could potentially have been funded with operation and maintenance funds. Appendix I provides further information on our scope and methodology.

We conducted this performance audit from February 2015 to January 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

⁵These attributes include, for example: integrating multiple energy savings and technologies together in a creative, innovative, and productive manner; and dramatically changing the energy consumption at an individual or joint installation.

DOD Guidance, Federal Laws, and an Executive Order Related to Energy and Water Conservation and Renewable Energy

DOD Instruction 4170.11 provides that it is DOD policy⁶ that installation energy management shall satisfy all goals and policies established by several provisions in statute related to conservation and renewable energy production, as well as a 2007 executive order. These goals and policies are as follows:

- The Energy Independence and Security Act of 2007,⁷ which amended a previous statutory goal to reduce energy usage in federal buildings. The new goal is to reduce energy usage by 30 percent by fiscal year 2015, relative to the fiscal year 2003 baseline.
- The Energy Policy Act of 2005,⁸ which directs the President, acting through the Secretary of Energy, to seek to ensure that, to the extent economically feasible and technically practicable, of the total amount of electric energy the federal government consumes during any fiscal year, the following amounts shall be renewable energy: (1) not less than 3 percent in fiscal years 2007 through 2009, (2) not less than 5 percent in fiscal years 2010 through 2012, and (3) not less than 7.5 percent in fiscal year 2013 and each fiscal year thereafter.
- Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (Jan. 24, 2007), which directs the head of each agency to meet specific goals to boost energy efficiency and the use of renewable energy and to reduce

⁶Department of Defense Instruction 4170.11, *Installation Energy Management*, (Dec. 11, 2009).

⁷Pub. L. No. 110-140, § 431 (codified at 42 U.S.C. § 8253).

⁸Pub. L. No. 109-58, § 203 (codified at 42 U.S.C. § 15852).

greenhouse gas emissions and water consumption intensity, among other things.⁹

Additionally, the statutory provision that authorizes DOD to carry out ECIP projects also requires that the Secretary of Defense notify the appropriate committees of Congress prior to beginning an ECIP project, and DOD typically provides its ECIP notifications annually to Congress.¹⁰

ECIP Project Selection and Notification Process

ECIP project proposals undergo a multistep selection process. AT&L initiates the process every year by issuing guidance that outlines its priorities; the components may provide supplementary guidance. The components then develop military construction proposals and life-cycle cost analyses based on this annual guidance. A military construction project is generally defined as including all military construction work necessary to produce a complete and usable facility or a complete and usable improvement to an existing facility.¹¹ Among other things, an ECIP military construction proposal must estimate

⁹The goals are: (a) to improve energy efficiency and reduce greenhouse gas emissions of the agency, through reduction of energy intensity by (i) 3 percent annually through the end of fiscal year 2015, or (ii) 30 percent by the end of fiscal year 2015, relative to the baseline of the agency's energy use in fiscal year 2003; (b) ensure that (i) at least half of the statutorily required renewable energy consumed by the agency in a fiscal year comes from new renewable sources, and (ii) to the extent feasible, the agency implements renewable energy generation projects on agency property for agency use; (c) beginning in fiscal year 2008, reduce water consumption intensity, relative to the baseline of the agency's water consumption in fiscal year 2007, through life-cycle cost-effective measures by 2 percent annually through the end of fiscal year 2015 or 16 percent by the end of fiscal year 2015. The executive order defines energy intensity as energy consumption per square foot of building space, including industrial or laboratory facilities, but does not separately define water intensity.

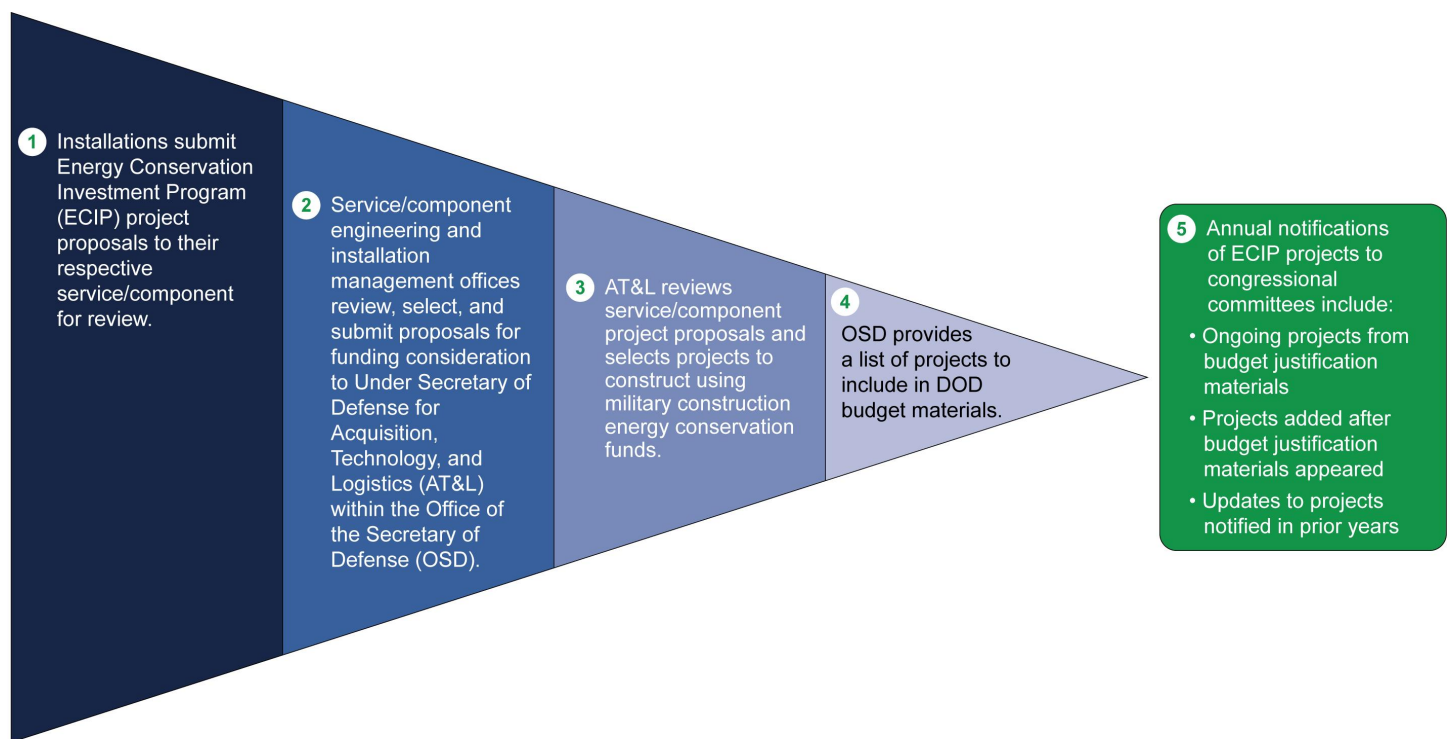
¹⁰Section 2914 of Title 10 of the United States Code authorizes the Secretary of Defense to carry out military construction projects for energy conservation, not previously authorized, using funds appropriated or otherwise made available for that purpose.

¹¹See 10 U.S.C. § 2801 (b). Additionally 10 U.S.C. § 2801 (a) defines, military construction as any construction development, conversion, or extension of any kind carried out with respect to a military installation, whether to satisfy temporary or permanent requirements, or any acquisition of land or construction of a defense access road, and most military construction projects must be specifically authorized and funded by military construction appropriations, subject to certain exceptions. One exception is that minor military construction projects as defined in 10 U.S.C. § 2805 may be funded with operation and maintenance appropriations. Additionally, repairs or sustainment of facilities are also appropriately funded by operation and maintenance appropriations subject to limitations outlined in 10 U.S.C. § 2811.

- cost;
- payback, or number of years until the project recoups its costs; and
- savings-to-investment ratio, or return on investment. A return on investment of 2.0, for example, means that the completed project eventually realizes \$2 in savings for every dollar spent.

Figure 1, below, depicts some major elements of the selection and notification process that begins once installation managers submit their proposals to their component headquarters (step 1).

Figure 1: Project Selection and Notification Process



Source: GAO analysis of Department of Defense information. | GAO-16-162

Engineering and installation management offices then further evaluate these proposals (step 2) and forward their choices to AT&L. AT&L selects as many of these proposals as DOD anticipates having budget authority to fund, according to criteria that may vary from year to year (step 3). For example, until fiscal year 2012, AT&L allocated project funding in

proportion to the share of energy that each component consumed during the previous year.

AT&L then notifies Congress about the selected projects. Some projects first appear in the budget-justification materials that support the annual President's budget request (step 4). Project design begins after DOD provides ECIP funding to the components, during which time DOD may determine that some projects are not feasible. Therefore, AT&L may cancel these projects and add others to replace them; these first appear in the formal ECIP notification to Congress (step 5). Since DOD sometimes cancels projects and adds others to replace them, the notification to Congress may not contain the same number of projects as appeared in budget-justification materials provided in support of the President's annual budget request. Additionally, DOD may add or cancel projects, or modify the scope or cost of existing projects after the year in which the department first notifies Congress. These changes appear in annual updates that accompany initial notifications.

ECIP and Other Energy Conservation Programs

DOD and the services use several programs to accomplish energy conservation goals. ECIP is DOD's primary source of directly appropriated military construction funding for energy conservation projects, but energy conservation features may be incorporated in other military construction projects, and the military services may also spend operation and maintenance¹² funds on certain energy projects. For example, according to DOD, the department's fiscal year 2015 budget request included approximately \$500 million for direct investments in conservation and energy efficiency. Of this, the majority (\$350 million) was funded in the military components' operation and maintenance accounts, for sustainment and recapitalization projects. Such projects typically involve retrofits to incorporate improved lighting; high-efficiency heating, ventilation, and air conditioning systems; energy-efficient windows; energy management control systems; and new roofs. The remaining \$150 million was for ECIP projects.

DOD also uses alternative financing mechanisms to accomplish its energy conservation goals, for example, Energy Savings Performance

¹²Operation and maintenance refers to a type of appropriation that funds a wide variety of costs, including maintenance, repair, minor construction projects, fuel, utility costs, and civilian compensation, among other things.

Contracts and Utility Energy Services Contracts. Under Energy Savings Performance Contracts, agencies use private funds to finance energy conservation measures. As part of these contracts, the agency and the contractor estimate the annual energy and cost savings expected from the energy conservation measures outlined in the contract and develop a plan to measure and verify that the savings are achieved over the life of the contract. Payments may be made only when the project is determined to be life-cycle cost-effective and when actual savings generated from the financed project exceed the payment amount in the same year. In a typical Utilities Energy Services Contract, a utility arranges funding to cover the capital costs of the project, which are repaid over the contract term from cost savings generated by the energy efficiency measures. In fiscal year 2014, DOD awarded about \$336 million in Energy Savings Performance Contracts and about \$37.8 million in Utilities Energy Services Contracts.

Prior GAO work

In June 2015, we reported on Energy Savings Performance Contracts.¹³ We reviewed selected agencies, including the Army, Navy, and Air Force, and found that the agencies awarded approximately \$12.1 billion in fiscal years 1995 through 2014 and plan to continue using these contracts to help meet federal energy directives and initiatives. We found that cost and energy savings that contractors reported to agencies for most of these contracts met or exceeded expectations, but some of these savings may have been overstated. The seven agencies in our review had conducted limited oversight and evaluation of their Energy Savings Performance Contracts projects. We also provided information on the Department of Energy's Federal Energy Management Program guidance, which outlines a range of options that contractors may select to measure and verify cost and energy savings. We made recommendations, with which DOD concurred or partially concurred, to improve oversight of projects funded through these contracts by means such as clearer reporting of savings, improved training, and systematic evaluations of portfolios. As of November 2015, DOD had not implemented our recommendations. A list of related GAO products is provided at the end of this report.

¹³ GAO, *Energy Savings Performance Contracts: Additional Actions Needed to Improve Federal Oversight*, [GAO-15-432](#) (Washington, D.C.: June 17, 2015).

DOD Has Not Always Provided Congressional Committees with Information about ECIP Projects' Anticipated Return on Investment or Reduced Energy and Water Use

DOD is statutorily required to notify appropriate congressional committees of proposed ECIP projects prior to beginning the projects. DOD does this annually and includes information about the project, such as the cost and location of the project. Additionally, DOD sometimes modifies the scope or cost of projects, or cancels projects and replaces them with other projects, after it has notified the committees. DOD provides these updates about prior years' projects with its annual notifications to the committees. While DOD has collected information on how projects are expected to perform, the department has not always reported to Congress relevant information about all ECIP projects, such as the anticipated return on investment or anticipated reduced energy and water use.¹⁴ Specifically, for fiscal years 2009 through 2015, DOD notified congressional committees of 441 proposed ECIP projects, reporting anticipated returns on investment for 79 percent of the projects, but not for the remaining projects. Also, none of the notifications included information on the projects' anticipated energy or water savings, or the anticipated renewable energy production.

DOD Requires the Collection of Information on Anticipated Project Performance

As part of its project selection process, DOD collects information on how projects are expected to perform when they become operational. Specifically, DOD's annual guidance for proposing ECIP projects requires installations to calculate the projected return on investment. This is important in assessing the cost-effectiveness of individual projects in contributing to the program's conservation and renewable energy goals and in assessing the long-term cost of the program. The guidance also requires installations to estimate projected energy or water savings, or renewable energy production. This information is important to assessing individual projects' contribution to meeting ECIP's conservation and renewable energy goals. Additionally, DOD has taken steps to require more detailed information on project modifications. According to annual guidance for proposing ECIP projects (effective for fiscal year 2015 projects), installations are to recalculate the return on investment and re-estimate energy or water savings or renewable energy production, as applicable, should there be a significant change in the cost, scope or

¹⁴The anticipated return on investment is an estimate of the long-term cost-effectiveness of a proposed project developed by calculating the extent to which reduced future costs may offset initial costs.

other aspect of the project.¹⁵ Installations report updates to service headquarters, which in turn provide this information to AT&L.

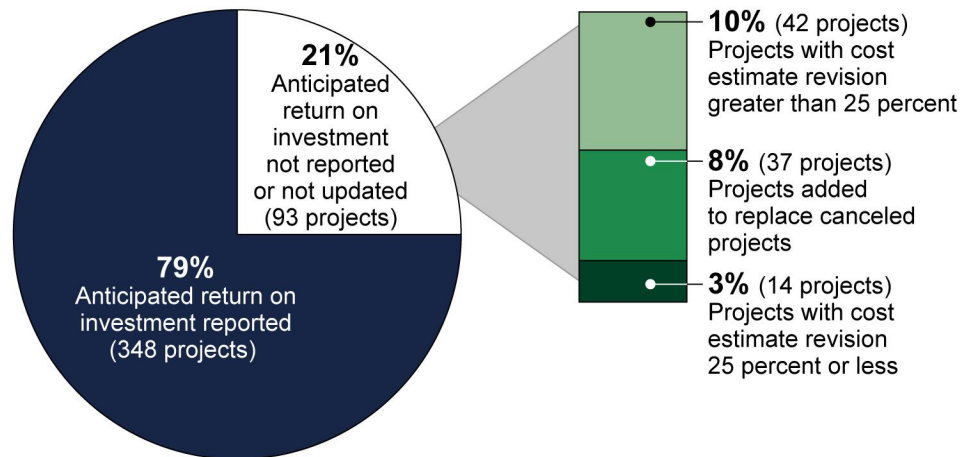
DOD Has Not Consistently Reported Anticipated Project Performance

Return on Investment—We found that for a majority of, but not all, projects, the department included information on anticipated return on investment in its congressional notifications. However, DOD did not report the anticipated return on investment or did not provide updates in subsequent notifications on the anticipated return on investment following scope or cost changes for about 21 percent (93 projects) of the 441 proposed projects for which it notified the congressional committees from fiscal years 2009 through 2015. Of the 93 projects for which DOD omitted or did not update the return on investment, DOD omitted the return on investment when it initially notified congressional committees of 37 of these projects. These projects were added to replace canceled projects. DOD did not update the return on investment for 56 projects when it notified congressional committees of a cost revision. Of these 56 projects, 42 projects had a cost revision greater than 25 percent and 14 projects had a cost revision of 25 percent or less, according to DOD.¹⁶ Figure 2 illustrates the reporting status of ECIP projects, including detail on projects where anticipated return on investment was either not reported or not updated.

¹⁵The guidance does not specify what constitutes a significant change to the cost, scope or other aspect of the project. However, previous annual guidance required installations to notify the Office of the Deputy Under Secretary of Defense (Installations and Environment) if the cost estimate of an ECIP project changed by more than 25 percent or the scope decreased by 25 percent.

¹⁶The size of the cost revision is an absolute value—thus, a cost revision of greater than 25 percent could be an increase or a decrease to the cost of the project.

Figure 2: Total DOD Energy Conservation Investment Projects (ECIP) and Projects with Return on Investment Omitted or not Updated for Congressional Committees, Fiscal years 2009 through 2015



Source: GAO analysis of Department of Defense (DOD) data. | GAO-16-162

Energy or Water Savings—In its annual notifications to congressional committees for fiscal years 2009–2015, DOD did not include information on the anticipated reduction in energy or water use for conservation projects or anticipated energy production for renewable energy projects for any of the 441 projects it proposed to carry out.¹⁷

DOD does not consistently report to Congress the ECIP projects' anticipated return on investment or energy or water conservation because neither statute nor DOD guidance requires reporting this information. Specifically, DOD has not issued guidance to require reporting to congressional committees

- the anticipated return on investment of a project added to replace a canceled project;
- an update to the anticipated return on investment of a project when DOD notifies the committees of a significant change to the project's cost or scope;

¹⁷Not all ECIP projects are designed to conserve energy or water or produce renewable energy; a small number are classified as energy security and are designed to mitigate electrical grid vulnerability.

-
- the anticipated energy or water savings, or renewable energy production, of a project; and
 - an update to the anticipated energy or water savings, or anticipated renewable energy production, of a project when DOD notifies the committees of a significant change to the project's cost or scope.

Although DOD is not required by law or its own guidance to provide congressional committees with information on the anticipated performance of ECIP projects, the Standards for Internal Control in the Federal Government provide guidance for communicating with external stakeholders information that may have a significant effect on an agency achieving its goals.¹⁸ For ECIP, including performance information such as the anticipated energy or water savings, or renewable energy production about proposed ECIP projects as part of DOD's notifications to congressional committees would constitute an effective practice. DOD officials also acknowledged that they collect and circulate within the department performance information on ECIP projects including the return on investment and energy and water savings. However, the officials told us that they were concerned that reporting this information to congressional committees risked stimulating unnecessarily detailed questions about individual projects, but stated that the information is available to congressional committees if they ask for it.

Without consistent information on the anticipated return on investment, and information on the anticipated energy or water savings, or renewable energy production, from proposed ECIP projects, congressional committees may not be able to assess the extent to which DOD expects to cost-effectively achieve ECIP program objectives. Moreover, DOD guidance provides that each component's annual portfolio of proposed ECIP projects must have a return on investment of at least 1.25 and the components should strive to achieve an annual portfolio average of 2.0.¹⁹ Without consistent and current information on the anticipated return on investment for every project, DOD and congressional committees will not know whether DOD components expect their overall portfolios to meet the minimum return on investment established by DOD.

¹⁸[GAO/AIMD-00-21.3.1](#).

¹⁹A return on investment of 2.0, for example, means that the completed project eventually realizes \$2 in savings for every dollar spent.

DOD Has Not Consistently Verified Whether Completed ECIP Projects Have Resulted in Actual Cost Savings or Reduced Energy Use

Our review of the 35 domestic ECIP projects that the military services had begun—and reported as completed—since AT&L issued its fiscal year 2011 guidance to plan for measurement and verification found that DOD installation managers have measured and verified data demonstrating actual cost savings or reduced energy use for 8 of these projects. However, of the remaining 27 projects, 2 were not operational, and managers of 25 of the remaining completed projects did not verify cost savings or reduced energy use. Moreover, 12 of these 25 projects underwent a reduction in scope but 8 did not demonstrate a reduction in cost, and in 6 of these cases costs increased.

DOD's Instruction 4170.11 states that ECIP funding should generally be applied only to projects that directly produce energy savings or cost reduction and that realized savings should not only be auditable, but the initial submission of proposed projects shall identify the method planned for savings verification.²⁰ Additionally, AT&L guidance for fiscal year 2011 for preparing ECIP project proposals directed the defense components to identify an M&V plan and maintain consistent and current M&V reports.²¹ Finally, federal standards for internal control state that activities need to be established to monitor performance measures and indicators.²²

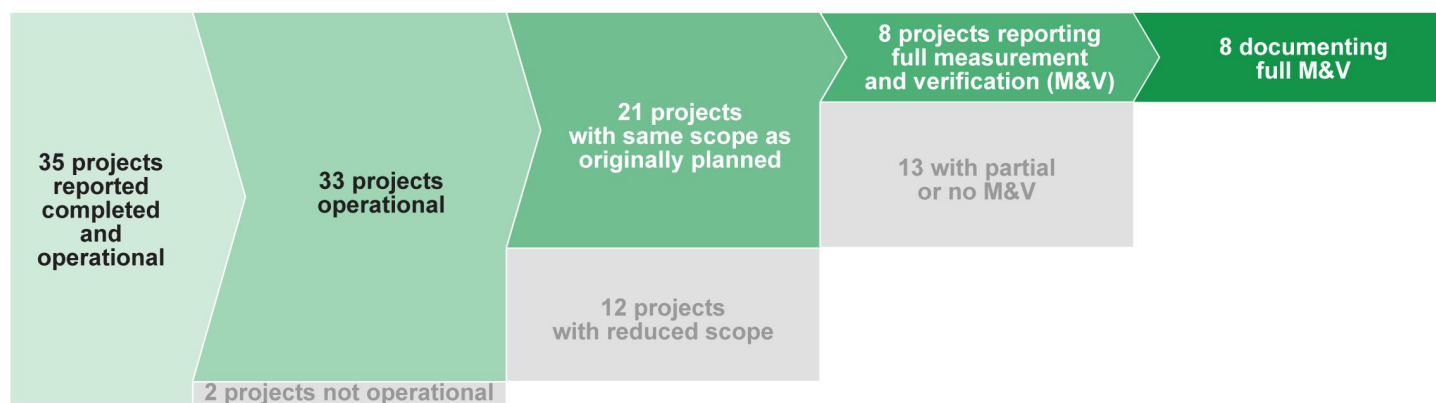
We found that 8 of the 35 ECIP projects that we reviewed documented full M&V. Of the initial 35, 2 projects were not operational and 12 had a reduced scope compared to their original proposal, and the military services reported that they either did not perform M&V or collect complete data for 13, leaving 8 for which the services reported and documented full M&V. Figure 3 below depicts the progression of projects according to completion and M&V status.

²⁰Department of Defense Instruction 4170.11, *Installation Energy Management* (Dec. 11, 2009).

²¹Under Secretary of Defense for Acquisition, Technology and Logistics, "Submission of Projects for the FY 2011 Energy Conservation Investment Program Congressional Notification and FY2012 Budget Exhibit" (Dec. 23, 2010).

²²[GAO/AIMD-00-21.3.1](#).

Figure 3: Progression of Energy Conservation Investment Program Projects from 35 Reported Completed/Operational to 8 Documenting Full Measurement and Verification



Source: GAO analysis of Department of Defense (DOD) information. | GAO-16-162

Of the 33 operational projects, the services constructed 12 at a reduced scope compared to the project proposals. For example, one proposal included a photovoltaic array²³ as well as digital heating, ventilation, and air conditioning controls for three buildings. According to installation energy staff, the completed project included the digital controls but not the array because contractors returned bids with higher than expected costs. When contractors bid higher than expected, installation energy staff may reduce a project's scope to keep costs within the proposed budget. According to the installation's records, the final cost of this project was more than originally proposed when it included the array. Officials on another project installed upgrades to the heating, ventilation, and air conditioning systems in seven buildings at an installation. Installation managers provided documentation showing that six of the seven proposed buildings received upgrades but that the six-building project cost more than the seven-building proposal. We did not classify these projects according to M&V status because the M&V plans were not all revised to reflect reduced scope and therefore might no longer accurately reflect the project as constructed.

²³Photovoltaic arrays convert sunlight (solar energy) directly into electricity. This allows an installation to generate electricity to supplement purchases from an external provider.

Further, we found that installation energy staff for 13 of the 21 operational projects that were completed as proposed either partially documented that they had achieved cost savings or lower energy use (6 projects) or did not document savings at all (7 projects). For example:

- Partial M&V—Energy staff at one installation planned two ECIP projects with “daylighting” systems²⁴ and photovoltaic arrays. Installation energy staff stated that they read meters installed with the arrays to measure the energy produced, but said that they did not perform M&V to confirm the effect of the daylighting systems because they did not have sufficient resources. Another project included energy efficiency upgrades for five buildings. Officials stated that two of the five buildings have electricity meters that installation staff used to measure cost savings and lower energy use. For the other three buildings, installation staff hired a contractor to create baseline and after-project energy models to estimate the project’s savings. However, installation staff did not update the after-project portion of the model and, therefore, cannot determine the savings for those three buildings.
- No M&V—One project included installing energy efficient lights, solar daylighting tubes, and a solar wall²⁵ at an installation. However, the buildings are part of sensitive mission activities and access to them is restricted. Installation energy staff stated that they did not have access to the buildings so they did not collect baseline data or after-project-completion data, and cannot verify the project cost savings or lower energy use. Another project included energy-efficient lights throughout a government-owned, contractor-operated installation. Although installation energy staff reported that they completed the project without issue, the staff did not include an M&V plan in the proposal, and have not performed M&V activities because the installation contract does not cover such activities.

Installation energy managers for 8 of the 21 operational projects that were completed as proposed reported that they measured and verified data to show that the projects achieved expected savings, and they provided

²⁴The installation describes the daylighting system as including skylights, replacement of high intensity discharge lights with fluorescent fixtures, and a smart lighting control system that adjusts lighting levels based on ambient sunlight in the space.

²⁵ The solar wall system preheats colder outside air above 70 degrees and feeds it into a building, which reduces the amount of energy needed to heat the building. The solar walls are installed on the south-facing walls to maximize solar heat exposure.

documentation that the projects achieved anticipated savings. For example, one project installed a photovoltaic array and energy-efficient lighting on the exterior of 14 buildings, interior of one building, and the perimeter of the installation. Installation energy staff collected data and documented that the project achieved the proposed savings. In a second example, project officials installed a ground-source heat pump to provide temperature control in a building. The installation energy staff documented that the project achieved the anticipated savings and return on investment.

The military services have not ensured that installation managers include M&V costs in project proposals. Installation managers cited various reasons why they could not execute their M&V plans, such as overly ambitious M&V plans, inaccessible meters to measure energy consumption or insufficient funds to replace broken meters, inadequate staffing, and failure to measure baseline performance. These reasons generally reflected a view that installation managers could not perform M&V within available installation resources. While we did not review the resources available to installation managers because it was outside the scope of our work, we noted that military construction proposals and life-cycle cost estimates for these projects, with five exceptions, did not account for post-completion M&V costs. As of October 2015, only the Navy has issued specific guidance to require installations to determine the costs of M&V.²⁶ AT&L took a step toward such a requirement by directing in its fiscal year 2017 guidance²⁷ that M&V plans shall propose M&V activities that have the most likelihood of being performed in the current budget and resource constrained environment, but did not provide examples of a range of options for M&V plans that are appropriate for ECIP projects of different sizes and types. As we have previously reported,²⁸ the Department of Energy has published guidance for Energy Savings Performance Contracts that outlines a range of options that vary in their rigor and costs that contractors may select to measure and verify cost and energy savings. While this guidance does not apply to ECIP projects,

²⁶Naval Installations Command Instruction 4101.2, *Evaluation of Energy Project Investment Performance*, (Mar. 16, 2015).

²⁷Assistant Secretary of Defense for Energy, Installations, and Environment, *Submissions of Projects for the Fiscal Year 2017 Energy Conservation Investment Program (ECIP) and Plans for the Remainder of the Future Years Defense Program* (Oct. 14, 2015).

²⁸[GAO-15-432](#).

such guidance might serve as a model for ECIP, a smaller but similar program.

If the military services do not specifically budget for M&V costs as they develop project proposals, installation managers will be less likely to set aside resources needed for M&V. Officials from the services' headquarters energy offices said that installation managers would be unlikely to devote any installation operation and maintenance funding to M&V, because they deem other tasks to have higher priority in a declining budget environment. Without performing M&V on all projects, neither installation energy managers nor component headquarters officials who evaluate subsequent proposals will know which projects realized anticipated benefits. Moreover, they may consequently miss opportunities to gather information that could improve future projects, such as project types that generated high returns on investment or factors that reduced (or increased) savings compared to estimates. Also, installation energy personnel may need to reduce the scope of projects to conform to available funding, but if they do so without recalculating return on investment based on the new scope, the original M&V plan will be obsolete. For example, projects that include plans to conserve energy and generate electricity from renewable sources would likely have a different return on investment and cost or energy savings without one element. Thus, even if installation energy staff performed M&V on such projects, they would already know that such projects are unlikely to achieve their anticipated return on investment.

DOD Has Developed a Strategic Vision for Energy Conservation, but Most of the Funded Projects Have Not Achieved Intended Benefits

DOD has developed guidance describing a strategic vision²⁹ for funding construction projects that can achieve significant benefits—described by DOD as “game-changing”—in energy conservation, cost reduction, and energy security; however, the majority of the ECIP-funded projects that we reviewed have achieved traditional rather than significant benefits.³⁰

We reviewed the 102 projects funded by the military services since DOD’s guidance was issued in fiscal year 2011, and found that about 10 percent of ECIP project proposals anticipated significant benefits in energy consumption, costs or security, while about 80 percent of projects anticipated traditional benefits such as the installation of energy-efficient equipment. We also found examples of projects approved to receive ECIP construction funds that could likely have been funded with operation and maintenance funds, which can be used for repairs or minor construction, among other things. Using construction funds for repairs reduces funding to meet the ECIP vision of achieving significant benefits. Figure 4 illustrates the three categories of ECIP projects, and depicts how many we placed in each category.

Figure 4: Profile of Funded Energy Conservation Investment Program (ECIP) Projects



Source: GAO analysis of Department of Defense (DOD) data. | GAO-16-162

Note: Significant, which DOD refers to as game-changing, refers to projects that include at least one of six attributes that produce significant improvements in energy consumption, costs, or security. Traditional refers to conventional military construction projects, such as replacement of equipment with more energy-efficient technology. Potential operation and maintenance projects are those that likely could have been funded with operation and maintenance, rather than military construction, funds. AT&L agreed that 7 of 8 service projects and two similar projects at the Pentagon that we provided for its review could have been funded with operation and maintenance funds

²⁹Under Secretary of Defense for Acquisition, Technology, and Logistics, “Submission of Projects for the FY 2011 Energy Conservation Investment Program Congressional Notification and FY 2012 Budget Exhibit” (Dec. 23, 2010).

³⁰DOD’s fiscal year 2011 guidance, which includes a strategic vision, uses the term “game-changing” to describe major benefits from the integration of multiple energy savings and technologies in a creative, innovative, and productive manner.

Few ECIP-Funded Projects Aligned with DOD Strategic Vision for Energy Conservation, Costs, and Energy Security

DOD developed guidance that described a strategic vision for ECIP projects funded in fiscal year 2011 and thereafter. The guidance stated that project proposals should ideally include one or more of six attributes to produce significant, or what DOD called game-changing, improvements in energy consumption, costs, or security. These relate, in general, to performance improvement, implementation of new technologies, integration of multiple technologies, incorporation of renewable energy with storage, implementation of an energy security plan, and meeting energy goals. Appendix II provides detailed information on the six attributes as well as examples, where applicable.

We reviewed the military services' 102 domestic ECIP projects funded since DOD issued guidance to articulate its strategic vision, and found 10 projects that were aligned with DOD's guidance of a strategic vision for producing significant improvements in energy consumption, costs, or security. These 10 projects included an energy grid at Marine Corps Air Station Miramar, California; a wind turbine at Tooele Army Depot, Utah; and a smart power infrastructure project at Joint Base Pearl Harbor-Hickam, Hawaii. Specifically:

- The Marine Corps project is designed to transmit power from a landfill methane gas turbine to the installation's electrical distribution station, which is designed to enhance energy security by providing back-up, on-site power in the event of a commercial power failure.
- The Army project plans to construct a 1,500-kilowatt wind turbine to provide renewable energy, achieve energy security, and achieve net zero energy³¹ status. According to DOD documents, this is the second wind turbine at the depot, and once it is operational, the two wind turbines together will produce about 60 percent of the depot's energy.

³¹The Army developed a Net Zero strategy as part of its efforts to address its energy security and sustainability needs. The strategy strives to bring the overall consumption of resources at installations down to an effective rate of zero. The Net Zero concept encompasses management of energy, water and waste resources. A Net Zero Energy Installation produces as much energy on-site as it uses over the course of a year. A Net Zero Water installation limits the consumption of freshwater resources and returns water back to the same watershed so as not to deplete the groundwater and surface water resources of that region in quantity and quality over the course of a year. A Net Zero Waste installation reduces, reuses, and recovers waste streams, converting them to resource values with zero solid waste to landfill over the course of a year.

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- The Navy smart power infrastructure³² project is designed to bolster energy security. The Navy project connects a cyber-secure micro-grid to a wastewater treatment plant, existing power generation, existing renewable power resources, and a hydrogen fuel cell. The project is designed to assure that the base's wastewater treatment plant is able to operate independently of the main power grid for long periods of time in cases of commercial power outages and with assurance that cyber security is uncompromised.

As shown in figure 4 above, we found that 85 of the 102 ECIP projects that we compared with DOD's fiscal year 2011 strategic vision provide traditional benefits such as replacement of equipment with more energy-efficient technology, small-scale renewable energy projects,³³ or water conservation projects. For example, the military services have installed solar wall projects at installations since 1997, including 11 that we reviewed. The solar wall system, as noted earlier, reduces the amount of energy needed to heat a building by preheating colder outside air and feeding the heated air into a building. According to an official at Letterkenny Army Depot, Pennsylvania, the solar wall heating system project at that location provides energy savings during the winter. Figure 5 illustrates the solar wall on one of these buildings.

³²The smart power infrastructure demonstration for energy reliability and security (SPIDERS) is a technology demonstration to enable a facility to operate independently from the main power grid for extended periods, with maximum assurance that cyber security is uncompromised.

³³Small scale refers to renewable energy projects designed to produce less than 1,000 megawatt-hours of energy annually. See GAO, *Renewable Energy Project Financing: Improved Guidance and Information Sharing Needed for DOD Project-Level Officials*, [GAO-12-401](#) (Washington, D.C.: Apr. 4, 2012).

Figure 5: Solar Wall at Letterkenny Army Depot



Source: Department of Defense (DOD). | GAO-16-162

Other examples of ECIP projects with traditional benefits are: a daylighting and photovoltaic system and a new heating system. The first project included lights to increase illumination in the work area and a ground-mounted 25-kilowatt photovoltaic system to generate renewable energy for the administrative area of the air station. The second project consisted of a new heating system that was expected to save energy by removing portions of existing steam lines and replacing obsolete steam unit heaters with electric heaters.

AT&L officials told us that they mostly funded projects with traditional benefits because it is difficult to identify and fund projects that align with DOD's strategic vision and also achieve departmental goals for return on investment. These goals, according to a DOD Instruction, direct components to strive to attain an overall annual ECIP program return on investment of 2.0—that is, to realize \$2 in return for every dollar of investment. Moreover, most individual projects must achieve a minimum return of 1.25; exceptions must generally contribute toward the

department's renewable energy goals.³⁴ However, projects that meet DOD's criteria for significant, or "game-changing," tend to be more expensive than average and anticipate a lower return on investment. For example, of the 102 projects we reviewed, the 10 potentially "game-changing" projects were expected to cost an average of \$7.3 million and to realize a return on investment of 1.1; the remaining 92 projects were expected to cost an average of \$3.5 million and realize a return on investment of 2.4. Therefore, for every project with a low return, the components would need to propose enough projects with higher returns to balance the total portfolio.

AT&L officials also said they funded few projects with anticipated significant benefits because the fiscal year 2011 guidance was supported by previous leadership and is now outdated. However, subsequent guidance continued to call for such projects, even though it did not clarify how the services should choose construction projects that can use new, validated technologies for achieving significant improvements while also greatly reducing energy costs. If DOD does not review its strategic goals for ECIP and update guidance accordingly so the components—military services and defense agencies—clearly understand how to balance their portfolios among traditional and "game-changing" projects, the components will be unable to consistently meet DOD's strategic vision. For example, if DOD's current priority is to achieve a substantial return on investment, or energy and water savings, or both, then its vision for "game-changers" may be in conflict with the program's emphasis on traditional construction projects. Conversely, if DOD's emphasis is to use ECIP to fund potential "game-changing" improvements, then DOD may not be able to achieve returns on investment of 2.0 or greater on specific projects or even its total portfolio.

³⁴DOD Instruction 4170.11, *Installation Energy Management* (Dec. 11, 2009). This instruction states that, with certain exceptions, ECIP funding should be applied only to construction projects that directly produce energy savings or cost reduction.

DOD Has Used ECIP Construction Funds Rather than Operation and Maintenance Funds or Alternative Financing for Certain Projects

We also found examples of projects approved to receive ECIP military construction funds when the projects likely could have been funded with operation and maintenance funds—which may be used for repairs or minor construction—leaving less funding available to apply to energy conservation construction projects.³⁵ For example, DOD used ECIP at two installations to retrofit and replace high-pressure sodium and metal halide light fixtures with energy-efficient light fixtures. At another installation, DOD used ECIP funds to replace old, damaged, or poorly-insulated siding of production facilities with new insulated panels. While these three projects replaced lights and insulation with more energy-efficient substitutes, major repairs or replacement of facility components that are expected to occur periodically throughout the life-cycle of a facility, such as roof replacement, replacement of tile or carpet, or replacement of heating and cooling systems, are classified as sustainment, and are generally funded with operation and maintenance funds.³⁶ Such “repairs by replacement” may replace older facility components with components that are up to current standards or codes, and may, subject to certain conditions, replace energy-inefficient or obsolete facility components with more efficient or modern components.³⁷ Also, AT&L’s annual ECIP guidance since fiscal year 2011 directed the DOD components to avoid seeking funding from ECIP for projects that would be candidates for operation and maintenance funding.

We found that DOD has funded at least 9 repair-type projects with ECIP military construction funding—rather than seeking to fund those projects with operation and maintenance funding—because AT&L has not ensured that managers proposing repair and minor construction seek operation and maintenance funds. An AT&L official acknowledged that 9 of 10 funded ECIP projects about which we inquired³⁸ could have been funded with operation and maintenance rather than construction funds.

³⁵Appendix I, Scope and Methodology, provides further details on DOD’s funded ECIP projects from fiscal year 2011 through 2014 and how we identified projects that could have been funded with operation and maintenance funds.

³⁶See Department of Defense Financial Management Regulation 7000.14-R, Vol. 2B, Chap. 8, *Facilities Sustainment and Restoration/Modernization* (June 2013).

³⁷See, for example, Department of the Army Pamphlet 420-11, *Project Definition and Work Classification*, § 1-6 (Mar. 18, 2010).

³⁸We provided AT&L with a list of 8 service projects and 2 similar projects at the Pentagon.

The AT&L official also stated that the Budget Control Act³⁹ and the funding reductions that followed the act overtook DOD's strategic direction for the ECIP program, and some DOD installations may have submitted projects to ECIP that were focused on maintaining and repairing buildings.

The official also stated that DOD does not clearly delineate which energy projects should be funded with operation and maintenance funds, ECIP construction funds, and third-party (alternative) financing. DOD's installation energy management instruction calls partnerships with the private sector through alternative financing a crucial tool for financing energy efficiency measures and allowing installations to improve their infrastructure.⁴⁰ The instruction also states that energy efficiency projects with higher return on investment components should first be pursued for alternative financing before consideration for ECIP funding. However, the instruction does not clarify what constitutes a higher return on investment for which components should pursue alternative financing.

If AT&L does not ensure that managers planning repairs and minor construction seek operation and maintenance rather than ECIP funding as appropriate, ECIP will have less funding available to apply to energy-conservation construction projects and potentially less funding to realize DOD's strategic vision. Moreover, if DOD does not revise its guidance to clarify an appropriate return on investment for projects for which the components should pursue alternative financing, managers at the component level may find it more difficult to develop a portfolio of ECIP projects that can meet the program's strategic vision and also meet return on investment requirements. DOD and service officials with whom we discussed these points expressed reservations about how they could

³⁹Pub. L. No. 112-25 (2011). The Budget Control Act of 2011 established spending caps and an accompanying sequestration procedure through 2021, but the Bipartisan Budget Act of 2013 extended the budget caps and sequestration through 2023. As a result of funding reductions from the Budget Control Act, the Bipartisan Budget Act of 2013, and related actions, DOD estimates that reductions in planned defense spending from fiscal years 2012 through 2021 will exceed \$1 trillion. Department of Defense, *Estimated Impacts of Sequestration-Level Funding* (Apr. 3, 2014).

⁴⁰DOD Instruction 4170.11 describes alternative financing through Utility Energy Services Contracts and Energy Savings Performance Contracts. These contracts include infrastructure upgrades (e.g., new cogeneration, renewable systems, and ancillary structures) and new equipment (e.g., heating, ventilation, and air conditioning; lighting; motors; fixtures; and controls) to help the installations reduce energy and water consumption.

assemble portfolios of projects while excluding projects that also qualified for other funding sources.

Conclusions

While DOD and the services make use of several different programs to accomplish their energy goals, ECIP is DOD's primary source of directly appropriated military construction funding for energy conservation projects. DOD is required to notify congressional committees of the ECIP projects that it plans to construct, although it is not required by either law or its own guidance to include in its notifications information on the anticipated performance of those projects, including the anticipated returns on investment, estimates of the energy or water savings, or renewable energy production. However, providing project notifications without including performance information reduces the committees' ability to review in a single source what they can expect from the ECIP program, such as whether DOD components expect their overall portfolios to meet the minimum return on investment. Further, anticipated performance information would provide a baseline from which DOD and the committees could later evaluate the program's implementation.

Although DOD installation managers have measured and verified data for some ECIP projects, they cannot verify that most of the projects begun since fiscal year 2011 and completed as of June 2015 achieved their anticipated cost savings or lower energy use, mainly because most projects did not budget for M&V activities. Because managers—the Navy's excepted—are not required to do so, ECIP projects may not have information on whether the projects realized anticipated savings and other benefits, or which types of projects generate the greatest savings and return on investment. Additionally, given the large percentage of operational projects that were completed with a reduced scope since 2011, without further guidance on how to scope ECIP projects to conform to available funding, future projects may continue to be constructed at a reduced scope compared to the project proposals.

Since fiscal year 2011, few of the funded ECIP projects have delivered what DOD refers to as game-changing improvements (e.g., integration of multiple technologies or incorporation of renewable energy with storage), but instead most projects have anticipated traditional benefits such as the installation of energy-efficient equipment. This situation is the result of components trying to achieve ECIP's somewhat contradictory goals. Without reviewing its strategic goals and updating its guidance, DOD components will continue to lack clarity on how they should seek to balance their portfolios among different types of projects, and what return

on investment may qualify a project for alternative financing. Additionally, allowing components to use ECIP military construction funds to finance projects that could have been funded with operation and maintenance funds may continue to leave less funding available to accomplish the department's strategic vision to make game-changing improvements in energy conservation, cost reduction, and energy security.

Recommendations for Executive Action

To help improve DOD's ability to report on and measure anticipated and actual savings from ECIP projects, and to provide guidance to inform further project selection, we are making the following five recommendations to DOD:

1. The Secretary of Defense should direct the Under Secretary of Defense for AT&L to develop and implement guidance requiring that statutory notifications to congressional committees include
 - the anticipated return on investment for all projects, including new projects added to replace canceled projects and existing projects for which there is a significant change to the cost or scope of the project; and
 - information on the estimated energy or water savings, or renewable energy production, anticipated from proposed ECIP projects.
2. The Secretary of Defense should also direct the Under Secretary of Defense for AT&L to
 - direct the components to include projected M&V costs—in the military construction proposal or another appropriate document—as they develop projects; in so doing, the Under Secretary might build on existing Navy guidance, as appropriate.
3. provide the components with additional guidance on the range of options available when developing M&V plans that are appropriate for different project sizes and types; and how to scope ECIP projects to conform to available funding;
4. review the strategic goals for the ECIP program and make any needed adjustments to reflect current DOD priorities; and
5. after reviewing strategic goals and adjusting as needed, update installation energy management guidance and, as appropriate, annual ECIP guidance, to clarify:

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- how the components—military services and defense agencies—should balance their ECIP portfolios among what DOD describes as traditional and game-changing projects to best achieve DOD’s strategic vision for ECIP,
 - what constitutes a higher-return project that should be proposed under alternative financing rather than ECIP, and
 - that managers proposing repair and minor construction projects should seek operation and maintenance rather than ECIP funds.

Agency Comments and Our Evaluation

We provided a draft of this report to DOD for review and comment. DOD provided written comments, which are summarized below and reprinted in appendix III. DOD concurred with one of our recommendations and partially concurred with four recommendations. DOD also provided additional comments, which we have incorporated as appropriate.

DOD partially concurred with our first recommendation, which states that the Secretary of Defense should direct the Under Secretary of Defense for AT&L to develop and implement guidance requiring that statutory notifications to congressional committees include (1) the anticipated return on investment for all projects, including new projects added to replace canceled projects and existing projects for which there is a significant change to the cost or scope of the project; and (2) information on the estimated energy or water savings, or renewable energy production, anticipated from proposed ECIP projects. DOD stated that it provides Congress with information on the anticipated return on investment (i.e., savings to investment ratio) for projects as part of its notification to Congress and that current reporting is pursuant to Title 10. However, as we state in our report, DOD has not consistently provided information on the return of investment for projects that were added or revised since the original notification or report any information on expected energy or water savings. We do acknowledge in our report that DOD is not required by either law or its own guidance to include this information in its congressional notifications. Still, given that DOD already collects and internally circulates performance information on ECIP projects including the return on investment and energy and water savings, we believe reporting it to Congress should impose little additional burden and that it would provide more comprehensive information to congressional decision makers in evaluating ECIP. In addition, DOD stated that ECIP project selection is based primarily on proposed projects’ return on investment. DOD added that requiring submission on the

estimated energy or water savings, or renewable energy production, anticipated from proposed ECIP projects would not provide a meaningful difference from what is already being submitted. However, as stated earlier, DOD does not report energy and water savings under its current practice. We continue to believe that providing project notifications without including performance information reduces the congressional committees' ability to review in a single source what they can expect from the ECIP program. Further, anticipated performance information would provide a baseline from which DOD and the committees could later evaluate the program's implementation.

DOD partially concurred with our second recommendation, which states that the Secretary of Defense should direct the Under Secretary of Defense for AT&L to direct the components to include projected M&V costs—in the military construction proposal or another appropriate document—as they develop projects; and that in so doing, the Under Secretary might build on existing Navy guidance, as appropriate. DOD stated that current DOD guidance, in general, requires all ECIP projects to have an M&V plan, and that identifying the costs associated with M&V will assist the services in the budgeting process. However, even with projects having an M&V plan, without a requirement to include projected M&V costs, ECIP projects may not collect the information that DOD needs to determine whether the projects realized anticipated savings and other benefits, or which types of projects generate the greatest savings and return on investment. Further, DOD disagreed with the second part of our recommendation: that the Under Secretary might build on existing Navy guidance in directing the components to include projected M&V costs as they develop projects, as appropriate since each service does things in a way to meet its own mission. We agree with DOD's comment that each service budgets and executes its own operations and maintenance funding in such a way that best meets its mission requirements. However, our recommendation that the Under Secretary might build on existing Navy guidance is to suggest an example of leveraging existing guidance. ECIP is a centrally-managed program, and we believe that the other services may be able to build on the Navy's example, and potentially save time, effort, and resources.

DOD partially concurred with our third recommendation, which states that the Secretary of Defense should direct the Under Secretary of Defense for AT&L to provide the components with additional guidance on the range of options available when developing M&V plans that are appropriate for different project sizes and types; and provide guidance on how to scope ECIP projects to conform to available funding. DOD agreed

with the first part of the recommendation but suggested deleting the second part of our recommendation: for the Under Secretary of Defense for AT&L to provide the components with additional guidance on how to scope ECIP projects to conform to available funding. DOD stated that the department holds periodic working groups with DOD components and agencies that include discussions on best practices utilized to develop ECIP projects; the best practices include how to scope project requirements. While periodic working groups may be helpful, we continue to believe that DOD needs further guidance on how to scope ECIP projects to conform to available funding, given the large percentage of operational projects that were completed with a reduced scope since 2011.

DOD concurred with our fourth recommendation, which states that the Secretary of Defense should direct the Under Secretary of Defense for AT&L to review the strategic goals for the ECIP program and make any needed adjustments to reflect current DOD priorities. However, DOD did not identify any actions that it plans to take nor the time frames to implement our recommendation.

DOD partially concurred with our fifth recommendation, that DOD should update guidance to provide clarification in three areas: (1) how the components—military services and defense agencies—should balance their ECIP portfolios among what DOD describes as traditional and game-changing projects to best achieve DOD’s strategic vision for ECIP, (2) what constitutes a higher-return project that should be proposed under alternative financing rather than ECIP, and (3) that managers proposing repair and minor construction projects should seek operation and maintenance rather than ECIP funds. DOD agreed with the second and third parts of our recommendation, stating that it intended to review and revise guidance as necessary to clarify the portions of the guidance dealing with projects that should be pursued using alternative (third-party) financing or operation and maintenance funds. We believe that by reviewing their strategic goals and updating their guidance, DOD components will obtain better clarity on how they should seek to balance their portfolios among different types of projects, and when to seek alternative financing for a project based on its return on investment. Additionally, by clarifying its guidance, DOD may reduce the chances of components using ECIP military construction funds to finance projects that could have been funded with operation and maintenance funds. However, DOD did not agree with the first portion of our recommendation: that the Under Secretary of Defense for AT&L update installation energy management guidance and, as appropriate, annual ECIP guidance, to

clarify how the components should balance their ECIP portfolios among what DOD describes as traditional and game-changing projects to best achieve DOD's strategic vision for ECIP. DOD stated that recent ECIP guidance, covering fiscal years 2016 and 2017, did not include the use of "game-changing" language. Instead, DOD's strategic vision for ECIP looks to fund more holistic projects, leveraging the services' investments in energy efficiency and energy cost reduction. While ECIP guidance for fiscal years 2016 and 2017 does not use the phrase "game-changing," the stated goals continue to call for projects with the attributes that were described in earlier guidance as game changing. Therefore, we continue to believe that DOD needs to review its strategic goals for ECIP and update guidance accordingly so the components will clearly understand how to balance their portfolios with various projects to consistently meet DOD's strategic vision.

We are providing copies of this report to appropriate congressional committees; the Secretary of Defense; the Secretaries of the Army, the Navy, and the Air Force; the Commandant of the Marine Corps; and the Director, Office of Management and Budget. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact Brian Lepore at (202) 512-4523 or leporeb@gao.gov, or Frank Rusco at (202) 512-3841 or ruscof@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff members who made key contributions to this report are listed in appendix IV.



Brian J. Lepore
Director, Defense Capabilities and Management



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Director, Natural Resources and Environment

Appendix I: Scope and Methodology

To determine the extent to which the Department of Defense (DOD) has reported anticipated returns on investment or reduced energy use from Energy Conservation Investment Program (ECIP)-funded projects, we obtained the annual notifications of proposed ECIP projects that DOD provided to congressional committees for fiscal years 2009 through 2015, including projects funded by the American Recovery and Reinvestment Act (hereafter, the “Recovery Act”) of 2009.¹ We chose these years because the notification to congressional committees of fiscal year 2015 ECIP projects was the most recent available at the time we were doing our work and because fiscal year 2009 was the first year for which the military services could consistently provide us with records. These notifications included updates to projects included in prior-year notifications. We compiled all of the information into one database, and counted the number of unique projects.

To verify completeness and accuracy of this database, we performed logic checks and other analyses to identify, and in some cases correct, inconsistencies and other errors in the data. For example, we noted cases where two apparently different projects had nearly identical project numbers with transposed digits, and determined that these were one project. We also compared the notification data to the preliminary list of proposed ECIP projects provided in the budget justification materials provided in support of the President’s annual budget requests for fiscal years 2009–2015. Based on this comparison, we made additional corrections to the notification database that we constructed. We verified our corrections and our compilation of projects with the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (AT&L). At the end of this process, there were three projects for which neither we nor AT&L could identify an adequate correction. We excluded these projects from our list of projects included in the notification database that we constructed. Based on this database, we determined that DOD notified congressional committees of 441 proposed ECIP projects for fiscal years 2009 through 2015, including projects under the Recovery Act. We reached this number by combining (1) the number of projects that first appeared in the annual notifications to congressional committees from 2009 through 2015, including Recovery Act projects, with (2) the number of projects added to replace cancelled projects that first appeared in the notifications during that time frame.

¹Pub. L. No. 111-5 (2009).

After making the corrections and verifying them with AT&L, we determined that the data were sufficiently reliable for the purpose of determining the extent that DOD reported anticipated returns on investment and reduced energy use from ECIP projects. We did not attempt to analyze the data to determine whether DOD had correctly calculated projects' anticipated return on investment because the data are prospective and examining each project to the necessary level of detail would have been beyond the scope of this review. We also obtained and reviewed DOD guidance on the criteria the department uses for selecting ECIP projects and compared that to DOD data and other information on proposed projects. We also compared the level of information that DOD reports to Congress to the information and communications standard in the Standards for Internal Control in the Federal Government.² Also, we interviewed AT&L officials and energy officials in the services' headquarters.

To determine the extent to which DOD found that completed ECIP projects resulted in cost savings or lower energy use, we identified and reviewed applicable guidance, including AT&L guidance, for preparing ECIP project proposals issued for fiscal year 2011 and later. We then searched the services' ECIP databases to identify all of the projects begun since fiscal year 2011 that met certain criteria: domestic, developed by a service, and that the service listed as complete as of June 2015. We began with fiscal year 2011 because the annual ECIP guidance for fiscal year 2011 uses language that emphasizes that all projects include a measurement and verification (M&V) plan to determine the cost and energy savings. We restricted our list to domestic projects due to the possibility of unique circumstances for construction at bases in other countries (for example, regulations in other countries that make military construction or ECIP projects more difficult to execute) and to the services—Army, Navy, Marine Corps, and Air Force—because most ECIP projects are executed by the services.

We compiled a list of 37 projects, which we sent to the services for review. Staff at the Army Corps of Engineers related that one of the Army projects listed was not executed. In addition, staff at Navy Installations Command related that three of the Navy projects listed in the Navy

²GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

database were not ECIP projects and identified two additional ECIP projects not listed in the database. Thus, we identified 35 projects, as of the services' responses in June 2015, that fulfilled our criteria.³

We then developed a questionnaire, which we sent to installation project managers for the 35 domestic, service ECIP projects. The questionnaire focused on the projects' scopes and M&V plans, and whether the projects achieved anticipated cost and energy savings. The questionnaires also included instructions for installation staff to provide us with copies of the projects' most recent military construction proposals, also called DD-1391s, which describe projects' proposed scopes, M&V plans (which describe how installation managers plan to measure the cost savings or lower energy use from a project), and savings documentation, if available. We pretested the questionnaire with an installation energy staff member during a site visit to Letterkenny Army Depot, Pennsylvania. The staff member provided suggestions on how to clarify and improve the questionnaire. We also observed the technology installed as part of the ECIP project at that installation.

After we reviewed the completed questionnaires and the documentation provided by the installation managers, we followed up with the managers by e-mail or telephone to confirm our understanding of the projects' scope and M&V activities. Specifically, we confirmed whether or not the completed projects matched the projects' proposed scopes, as identified in their DD-1391s, and what M&V data installation managers collected or were in the process of collecting.

We used the completed questionnaires, follow-up e-mails and calls, and documentation to categorize the projects based on their scope and M&V activities. We categorized the projects according to whether installations had realized cost or energy savings by (1) constructing them to the original scope and (2) developing and implementing M&V plans. We determined that two projects at two installations were not operational. At one installation, a geothermal loop was constructed to improve the efficiency of water-source heat pumps for several buildings. The loop returned temperatures higher than expected and that are potentially damaging to the buildings' heating systems, so the geothermal loop is

³After consulting with installation energy staff, we found that two of the projects identified were not operational.

currently deactivated. At another site, solar water heaters were installed in several buildings, but the project has had several construction issues that staff said they plan to address under warranty.

We assigned projects to one of two categories for scope: “same” or “changed.” We classified projects as “same” scope when the completed project reflected the construction identified in the project proposal. We classified projects as “changed” if the completed project reflected construction less than that identified in the proposal. The projects classified as “changed” did not reflect commensurate reductions in cost.⁴ We did not classify these projects according to M&V status because the M&V plans were not all revised to reflect reduced scope and therefore might no longer accurately reflect the project as constructed.

For M&V, we assigned projects to one of four categories: “full (evidence provided),” “full,” “partial,” or “none.” We classified projects as “full (evidence provided)” M&V if installation energy staff reported that the project had achieved the cost savings or lower energy use anticipated in the project proposal and provided documentation to support their statements.⁵ We classified projects as “full” M&V if installation energy staff reported that the project had achieved the savings anticipated in the project proposal, but did not provide documentation of these savings.

We classified projects as “partial” M&V if M&V data are either incomplete⁶ or project managers could not fully document that they had achieved cost savings or lower energy use.⁷ We classified projects as “none” for M&V if

⁴Each completed military construction project includes a document, *Transfer and Acceptance of DOD Real Property* (known as a DD-1354), which formally transfers ownership from the constructing agency, such as the Army Corps of Engineers, to the installation. The DD-1354, in final form, provides the final cost of the project.

⁵We did not independently evaluate the evidence provided by the installations.

⁶For example, installation staff are still in the process of collecting M&V data on a project. In such a case, a project may be reclassified as “full (evidence proved)” or “full” M&V after collecting M&V data.

⁷For example, installation staff only collected M&V data for a portion of a project.

installation energy staff could not perform M&V⁸ or had no plans to perform it.

To inform our review of installations' M&V activities, we referred to the Department of Energy's Federal Energy Management Program (FEMP) guidance on M&V. FEMP guidance outlines a range of options that contractors may select to measure and verify the cost and energy savings achieved by each energy conservation measure. The M&V options that FEMP guidance outlines vary in their rigor and costs. The option that is generally the least rigorous and costly involves measuring the key factors affecting energy use—such as the number of lighting fixtures or efficiency of a heating unit—before and after installation, but typically does not involve measuring such factors over the life of the project. In contrast, other options outlined in FEMP guidance generally involve ongoing measurements of energy use, or proxies of energy use, over the life of the project. FEMP guidance helps identify when each option should be used and states that the selection of a measurement and verification method is based on project costs and savings, complexity of the energy conservation measure, and the uncertainty or risk of savings being achieved, among others. According to FEMP guidance, costs for measurement and verification generally increase with the level of accuracy required in energy savings analyses and the number and complexity of variables that are analyzed, among other factors. Moreover, the incremental value of additional M&V will at some point be less than its cost.

To determine the extent to which DOD implemented its fiscal year 2011 ECIP strategic vision,⁹ we identified the number of domestic ECIP projects funded from fiscal year 2011 through fiscal year 2014 by the military services;¹⁰ reviewed project information for the military services' domestic ECIP projects; categorized the military services' domestic ECIP projects into three categories: 1) ECIP projects that incorporated at least one of DOD's "game-changing" attributes, 2) ECIP project with traditional

⁸For example, installation energy staff failed to collect baseline data for a project, making M&V impossible.

⁹Under Secretary of Defense for Acquisition, Technology and Logistics, "Submission of Projects for the FY2011 Energy Conservation Investment Program Congressional Notification and FY2012 Budget Exhibit," Dec. 23, 2010.

¹⁰For this review, the military services include the Army, Navy, Marine Corps, and Air Force.

benefits, and 3) repair projects that could potentially have been funded with operation and maintenance funds.

We utilized a subset of data, based on annual notifications of proposed ECIP projects that DOD provided to congressional committees for fiscal years 2009 through 2015, that were collected to answer the first research objective as described above. We excluded foreign projects from our scope because varying national regulations may have affected the time required for project completion, and we excluded defense agencies' projects because the military services had developed the bulk of the projects. We excluded from our scope DOD's fiscal 2015 ECIP projects, because at the time of our review DOD had not funded projects from that year. Based on data from DOD congressional notifications for fiscal year 2011 through fiscal year 2014, we determined that DOD funded 102 domestic military service ECIP projects.

We collected military construction project data¹¹ for the 102 domestic military service ECIP projects. We reviewed relevant statutes¹² and DOD guidance to determine work classification and fund type for ECIP military construction projects and repair projects. We reviewed DOD's 2011 ECIP strategic vision to identify the six potentially game-changing ECIP project attributes. Two analysts independently reviewed and assessed military construction project data for the 102 domestic ECIP projects. The two analysts independently placed the ECIP projects into three categories—ECIP projects with game-changing attributes, ECIP project with traditional benefits, and repair projects that could be potentially be funded by operation and maintenance funds. To categorize an ECIP project as a game-changing improvement, the analysts reviewed the project's military construction project data scope of work and determined that the project was a military construction project, based on work-classification criteria, and had one or more of the six attributes found in the DOD fiscal year 2011 ECIP strategic vision. To characterize an ECIP project with traditional benefits, the analysts reviewed the project's military construction project data scope of work and determined that the project was a military construction project, based on work classification criteria,

¹¹DD Form 1391, Military Construction Project Data, is used by the Department of Defense to submit requirements and justifications in support of funding requests for military construction to Congress.

¹²See 10 U.S.C. § 2801-2811, and 10 U.S.C. § 2914.

and that the ECIP project does not provide any of the six desirable attributes found in the DOD fiscal 2011 ECIP strategic vision. To characterize an ECIP project as a potential operation and maintenance project, the analysts reviewed the project's military construction project data scope of work and determined that the project could potentially be funded with operation and maintenance funding, based on work-classification criteria. The analysts then compared their results to identify any disagreements and reached agreement on all items through discussion. We tentatively identified 10 projects as examples of potential operation and maintenance projects.

We provided AT&L with the list of projects that we had classified as eligible for operations and maintenance funding, and asked officials to corroborate our preliminary findings as well as to identify what elements or factors contributed to the classification of the projects as military construction rather than operation and maintenance repair or sustainment projects.

We conducted this performance audit from February 2015 to January 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Key Attributes of DOD’s “Game-Changing” Energy Conservation and Investment Program (ECIP) Projects

Table 1 lists the key attributes of what the Department of Defense (DOD) terms “game-changing” projects, and provides examples of their use in recently funded ECIP projects, where these exist.

Table 1: Key Attributes and Examples in Funded Projects

Department of Defense’s (DOD) key attributes for Energy Conservation and Investment Program (ECIP) projects from the fiscal year 2011 guidance		Examples of funded projects (fiscal years 2011 through 2014)
1.	Dramatically change the energy consumption at an individual or joint installation, for example, by fundamentally improving the performance of the power or steam plant. ^a	<ul style="list-style-type: none"> Tooele Army Depot, Utah funded in fiscal year 2014 an Energy Management and Control System project with an anticipated energy reduction of 30 percent to 40 percent.
2.	Implement across multiple installations a technology validated in a demonstration program sponsored by DOD (e.g., the Installation Energy Test Bed Initiative) or by the Department of Energy. ^b	<ul style="list-style-type: none"> No funded project identified
3.	Integrate multiple energy savings, monitoring, and renewable energy technologies to realize synergistic benefits.	<ul style="list-style-type: none"> Dugway Proving Ground, Utah plans to install a 2-megawatt solar photovoltaic array to be integrated with energy storage, microgrid control systems, advanced building controls and metering, and energy management control systems.
4.	Integrate distributed generation and storage to improve supply resiliency for critical loads.	<ul style="list-style-type: none"> Fort Bliss, Texas installed a 500 kilowatt photovoltaic array, a microgrid, and a 1 megawatt storage battery bank to supply emergency power for two mission critical buildings in case of a long term power outage.
5.	Implement an energy security plan, especially at an installation where such an investment would leverage a partnership with the Department of Energy. ^c	<ul style="list-style-type: none"> No funded project identified
6.	Maximize performance towards meeting the energy conservation and renewable energy goals of the department’s Strategic Sustainability Performance Plan.	<ul style="list-style-type: none"> Tooele Army Depot, Utah awarded a contract to build a 1,500-kilowatt wind turbine. According to military construction project data, this turbine will help the depot meet its renewable energy requirements mandated by the Energy Policy Act of 2005.

Source: GAO analysis of DOD data. | GAO-16-162

^aA DOD official stated that an ECIP project’s contribution towards reduction of energy consumption can be measured based on the installation’s total energy footprint as reported in the Annual Energy Management Report. 10 U.S.C. § 2925 requires DOD to submit to Congress an Annual Energy Management Report describing its facility energy activities.

^bDOD established the Installation Energy Test Bed in 2009 to fund the demonstration of new energy technologies in a real-world environment to reduce risk, overcome deployment barriers, and to facilitate wide-scale commercialization.

^cU.S. Department of Energy, Federal Energy Management Program, Performing Energy Security Assessments—A How-To Guide for Federal Facility Managers (January 2006), provides further information.

Appendix III: Comments from the Department of Defense



ENERGY,
INSTALLATIONS
AND ENVIRONMENT

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

3400 DEFENSE PENTAGON
WASHINGTON, DC 20301-3400

JAN 15 2016

Mr. Brian J. Lepore
Director, Defense Capabilities and Management
U.S. Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Lepore:

Enclosed is the Department of Defense (DoD) response to the Government Accountability Office (GAO) Draft Report, GAO-16-162, "DEFENSE INFRASTRUCTURE: Energy Conservation Investment Program Needs Improved Reporting, Measurement and Guidance," dated December 7, 2015 (GAO Code 352015).

Sincerely,

A handwritten signature in blue ink, reading "Peter J. Potoczney", is written over the typed name.

Peter J. Potoczney
Deputy Assistant Secretary of Defense (Basing)
Performing the Duties of the Assistant Secretary of Defense
(Energy, Installations and Environment)

Enclosure:
As stated

GAO DRAFT REPORT DATED DECEMBER 7, 2015
GAO-16-62 (GAO CODE 352015)

“DEFENSE INFRASTRUCTURE: ENERGY CONSERVATION INVESTMENT
PROGRAM NEEDS IMPROVED REPORTING, MEASUREMENT, AND
GUIDANCE”

DEPARTMENT OF DEFENSE COMMENTS
TO THE GAO RECOMMENDATION

RECOMMENDATIONS: To help improve DOD’s ability to report on and measure anticipated and actual savings from ECIP projects, and to provide guidance to inform further project selection, the GAO made the following five recommendations:

- (1) The Secretary of Defense should direct the Under Secretary of Defense for AT&L to develop and implement guidance requiring that statutory notifications to congressional committees include:
 - the anticipated return on investment for all projects, including new projects added to replace canceled projects and existing projects for which there is a significant change to the cost or scope of the project, and
 - information on the estimated energy or water savings, or renewable energy production, anticipated from proposed ECIP projects.

DoD RESPONSE: The DoD partially concurs. DoD provides Congress project Savings to Investment Ratio (SIR) (estimated discounted lifetime savings (\$) divided by investment (\$)) and Simple Payback in years as part of notification to Congress pursuant to Title 10, U.S.C., section 2914(b) and DoD guidance. However, the current authority for ECIP projects provided by Title 10 allows the use of the current method of reporting changes in past fiscal years’ programs to Congress. Also, ECIP project selection is primarily based upon the SIR which currently provides savings to investment ratio information. Thus, requiring submission on the estimated energy or water savings, or renewable energy production, anticipated from proposed ECIP projects will not provide a meaningful difference from what is already being submitted.

RECOMMENDATIONS cont.: The Secretary of Defense also direct the Under Secretary of Defense for AT&L to:

- (2) direct the components to include projected measurement and verification (M&V) costs – in the military construction proposal or another appropriate document – as they develop projects. In so doing, the Under Secretary might build on existing Navy guidance, as appropriate.

DoD RESPONSE: The DoD partially concurs. Current DoD guidance, in general, requires all ECIP projects to have a measurement and verification (M&V) plan. Identifying the costs associated with M&V will assist the Services in the budgeting process.

DoD suggests deleting the second sentence, “In so doing, the Under Secretary might build on existing Navy guidance, as appropriate.” Each Service budgets and executes their operations and maintenance (O&M) funding in such a way that best meets their mission requirements. For example, the Army has an established process to address M&V.

- (3) provide the components with additional guidance on the range of options available when developing M&V plans that are appropriate for different project sizes and types; and how to scope ECIP projects to conform to available funding.

DoD RESPONSE: The DoD partially-concurs. DOD suggests re-wording to, “provide the components with guidance on the range of options available when developing M&V plans that are appropriate for different project sizes and types;” and deleting “...and how to scope ECIP projects to conform to available funding.” The current DoD ECIP guidance provides requirements that must be included in a project’s M&V plan, and provides the Department of Energy / Federal Energy Management Program, FEMP M&V Guidelines: *Measurement and Verification for Federal Energy Projects*. The guidelines provide a range of options available when developing M&V plans that are appropriate for different project sizes and types. Additionally, DoD holds periodic working groups with DoD Components and Agencies which include discussions on best practices utilized to develop ECIP projects which includes how to scope project requirements.

- (4) review the strategic goals for the ECIP program and make any needed adjustments to reflect current DOD priorities.

DoD RESPONSE: The DoD concurs with this recommendation.

- (5) after reviewing strategic goals and adjusting as needed, update installation energy management guidance and, as appropriate, annual ECIP guidance, to clarify:

- how the components – military services and defense agencies – should balance their ECIP portfolios among what DOD describes as traditional and game-changing projects to best achieve DOD’s strategic vision for ECIP,
- what constitutes a higher-return project that should be proposed under alternative financing rather than ECIP, and
- that managers proposing repair and minor construction projects should seek operation and maintenance rather than ECIP funds.

DoD RESPONSE: The DoD partially concurs with this recommendation. DoD suggests removing the first bullet, “how the components - military services and defense agencies - should balance their ECIP portfolios among what DOD describes as traditional and game-changing projects to best achieve DOD’s strategic vision for ECIP.” Historically, the Services, in their efforts to meet mandated goals, funded energy efficiency projects with O&M funding. Due to sequestration in FY13 and the budget constraints that followed, the Services no longer had O&M funds available to accomplish energy efficiency projects. Thus, other methods of funding were needed to assist the Services in their efforts to meet mandated goals. To address this need the FY16 ECIP program guidance of September 2, 2014, did not include the use of “game-changing” language; this is also the case for the FY17 ECIP guidance of October 14, 2015. Instead, DoD Strategic Vision for ECIP looks to fund more holistic projects, leveraging the Services’ investments in energy efficiency and energy cost reduction. Also, current DoD guidance already provides language which directs the focus of the Services on proposed projects that would not necessarily be candidates for third party financing or O&M funds. DoD intends to review and revise guidance as necessary to make this portion of the guidance more clear.

ADDITIONAL DoD COMMENTS ON DRAFT REPORT:

1. Recommended revision on page 8, after “Energy Savings Performance Contracts, agencies use private funds to finance energy conservation measures.” Recommend stating, “Under Energy Savings Performance Contracts, agencies contract third-party energy service companies (ESCOs) that provide the up-front capital investment in energy conservation measures. Agencies make annual payments to the ESCOs over the life of the contract from realized savings.”
2. For clarity on page 10, recommend revising sentence “Of these 56 projects, 42 projects had a cost revision greater than 25 percent and 14 projects had a cost revision of 25 percent or less, according to DOD.” to “...14 projects had a cost revision of 25 percent or less (DOD does not require notification from Components and Agencies for projects that have cost or scope revisions of less than 25 percent.)
3. Recommended revision of the first bullet on page 18, “The Marine Corps project will construct a micro-grid that will allow the Air Station to utilize power provided from a landfill methane gas turbine which currently supports daily/normal operations to now also be utilized in the event of an emergency situation where service from the local utility is interrupted.” The generated power is not going to an “energy storage plant” but instead will directly enter the Station’s electrical distribution station; and power, which currently supports normal operations, will also be able to be utilized if there is a disruption in electrical supply from the local company.

Appendix IV: GAO Contacts and Staff Acknowledgments

GAO Contacts

Brian J. Lepore, (202) 512-4523 or leporeb@gao.gov and Frank Rusco, (202) 512-3841 or ruscof@gao.gov.

Staff Acknowledgments

In addition to the contacts named above, the following individuals made contributions to this report: Maria Storts, Assistant Director; Hilary Benedict, Assistant Director; James Ashley; Randy De Leon; Charles Egan; Amie Steele Lesser; Ethan Levy; Sally Newman; Richard Powelson; Terry Richardson; and Michael Willems.

Appendix V: Accessible Data

Agency Comment Letter

Text of Appendix III: Comments from the Department of Defense

Page 1	OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE 3400 DEFENSE PENTAGON WASHINGTON, DC 20301-3400 ENERGY, INSTALLATIONS AND ENVIRONMENT JAN 15 2016 Mr. Brian J. Lepore Director, Defense Capabilities and Management U.S. Government Accountability Office 441 G Street, N.W. Washington, DC 20548 Dear Mr. Lepore: Enclosed is the Department of Defense (DoD) response to the Government Accountability Office (GAO) Draft Report, GA0-16- 162, "DEFENSE INFRASTRUCTURE: Energy Conservation Investment Program Needs Improved Reporting, Measurement and Guidance," dated December 7, 2015 (GAO Code 352015). Sincerely, Peter J. Potochney Deputy Assistant Secretary of Defense (Basing) Performing the Duties of the Assistant Secretary of Defense
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(Energy, Installations and Environment)

Enclosure:

As stated

Page 2

GAO DRAFT REPORT DATED DECEMBER 7, 2015 GA0-16-62 (GAO CODE 352015)

"DEFENSE INFRASTRUCTURE: ENERGY CONSERVATION INVESTMENT PROGRAM NEEDS IMPROVED REPORTING, MEASUREMENT, AND GUIDANCE"

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-
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Page 4

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Data Tables

Data Table for Figure 2: Total DOD Energy Conservation Investment Projects (ECIP) and Projects with Return on Investment Omitted or not Updated for Congressional Committees, Fiscal years 2009 through 2015	
Anticipated return on investment reported (348 projects)	79%
Anticipated return on investment not reported or not updated (93 projects)	21%

Anticipated return on investment not reported or not updated (93 projects)
i.e. 21% of pie chart is subdivided into three categories:

Projects with cost estimate revision greater than 25 percent (42 projects)	10%
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Appendix V: Accessible Data

Projects with cost estimate revision greater than 25 percent (42 projects)	10%
Projects added to replace canceled projects (37 projects)	8%
Projects with cost estimate revision 25 percent or less (14 projects)	3%

Related GAO Products

Defense Infrastructure: DOD Efforts Regarding Net Zero Goals. [GAO-16-153R](#). Washington, D.C.: Jan. 12, 2016.

Defense Infrastructure: Improvements in DOD Reporting and Cybersecurity Implementation Needed to Enhance Utility Resilience Planning. [GAO-15-749](#). Washington, D.C.: July 23, 2015.

Energy Savings Performance Contracts: Additional Actions Needed to Improve Federal Oversight. [GAO-15-432](#). Washington, D.C.: June 17, 2015.

Climate Change Adaptation: DOD Can Improve Infrastructure Planning and Processes to Better Account for Potential Impacts. [GAO-14-446](#). Washington, D.C.: May 30, 2014.

Clear Air Force Station: Air Force Reviewed Costs and Benefits of Several Options before Deciding to Close the Power Plant. [GAO-14-550](#). Washington, D.C.: May 12, 2014.

Defense Infrastructure: Improved Guidance Needed for Estimating Alternatively Financed Project Liabilities. [GAO-13-337](#). Washington, D.C.: April 18, 2013.

Renewable Energy Project Financing: Improved Guidance and Information Sharing Needed for DOD Project-Level Officials. [GAO-12-401](#). Washington, D.C.: April 4, 2012.

Renewable Energy: Federal Agencies Implement Hundreds of Initiatives. [GAO-12-260](#). Washington, D.C.: February 27, 2012.

Defense Infrastructure: DOD Did Not Fully Address the Supplemental Reporting Requirements in Its Energy Management Report. [GAO-12-336R](#). Washington, D.C.: January 31, 2012.

Defense Infrastructure: Department of Defense Renewable Energy Initiatives. [GAO-10-681R](#). Washington, D.C.: April 26, 2010.

The Department of Defense's Energy Conservation Investment Program Needs Closer Monitoring. [GAO-PEMD-82-4](#). Washington, D.C., January 13, 1982.

GAO's Mission

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