

U.S. GAO Audits on Energy Efficiency: One SAI's Experience

Presentation to INTOSAI WGEA

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Introduction

The U.S. government plays a role in several areas of energy efficiency and energy conservation, including:

- Establishing standards (appliance standards, fuel economy standards)
- Providing consumer information (EnergyStar program, U.S. Energy Information Agency)
- Tax credits to support efficiency
- Low income assistance
- Research and development
- Energy use

GAO has been asked—through congressional mandates and requests—to review many of these issues.

Introduction

Several recent GAO reviews have focused on the federal government's energy efficiency and energy conservation efforts—and the resulting savings—as an “energy user.”

Selected reports include:

- DOD Renewable Energy Projects: Improved Guidance Needed for Analyzing and Documenting Costs and Benefits, GAO-16-487 (Sept. 8, 2016).
- Defense Infrastructure: Energy Conservation Investment Program Needs Improved Reporting, Measurement, and Guidance, GAO-16-162 (Jan. 29, 2016).
- Energy Savings Performance Contracts: Additional Actions Needed to Improve Federal Oversight, GAO-15-432 (June 17, 2015).

DOD Renewable Energy Projects (GAO-16-487)

Background: The Department of Defense (DOD) has pursued renewable energy projects on its installations to meet federal energy production and consumption goals. Projects have included solar photovoltaic arrays (small-scale and large-scale), wind turbines, and biomass projects.

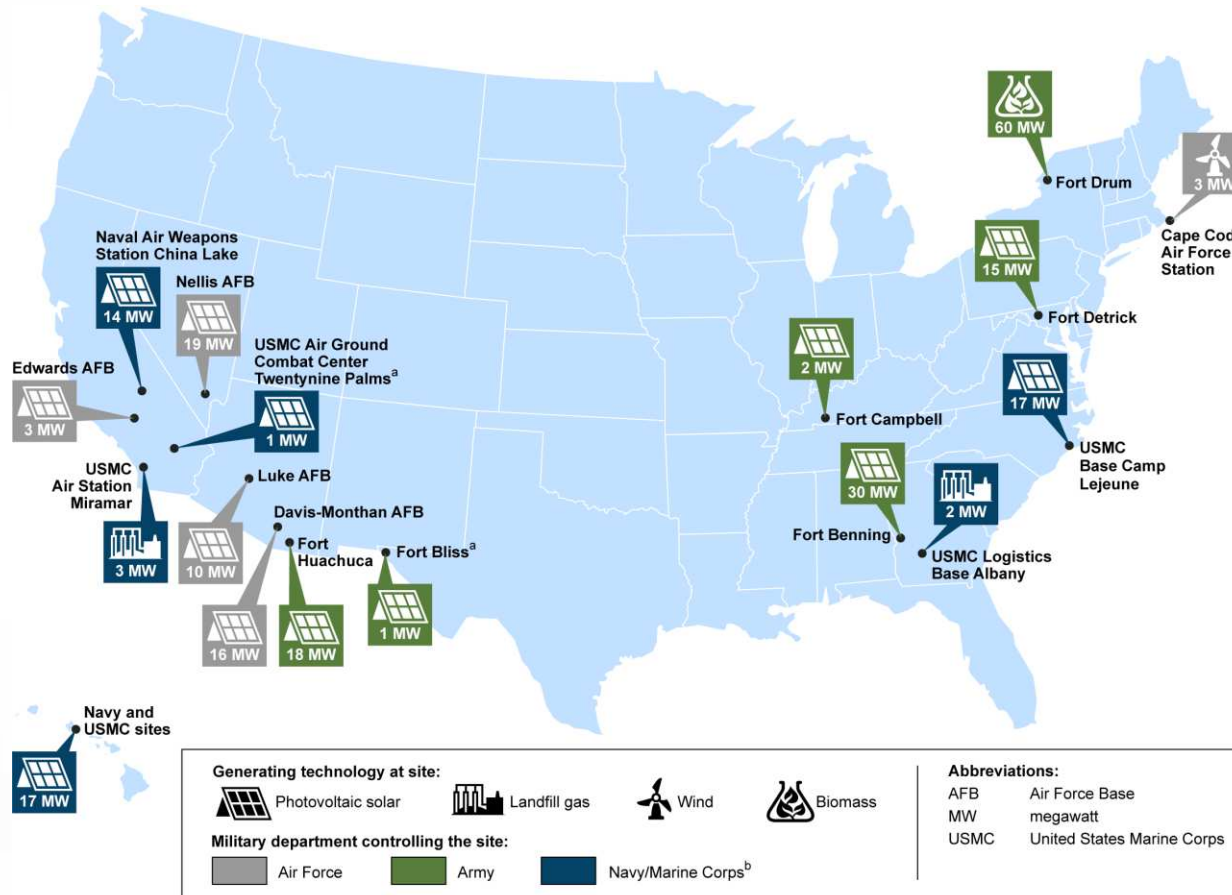
Key objective: What was DOD's approach for developing and analyzing the financial costs and benefits of selected renewable energy projects?

Key methodologies:

- Examined documentation available to approving officials for 17 renewable energy projects greater than 1 megawatt.
- Reviewed DOD guidance on analyses of financial costs and benefits.
- Evaluated whether DOD's analyses of the 17 projects followed its guidance and the extent to which DOD assessed and documented any uncertainties with the estimates.
- Reviewed GAO's 2009 cost estimating guide

DOD Renewable Energy Projects (continued)

Location and Types of DOD Renewable Energy Projects GAO Reviewed



Sources: Department of Defense; Map Resources (map). | GAO-16-487

DOD Renewable Energy Projects (continued)

Key finding: DOD worked with private developers to develop renewable energy and used various approaches to analyze the financial costs and benefits of projects, but project documentation was not always clear or complete. For example, projects involving power purchase agreements were not always clear about the key assumptions used to estimate financial costs and benefits.

Key Recommendations: We made 8 recommendations to DOD, including:

- Modify guidance for presenting land values in project documentation to apply to the range of financing mechanisms DOD has used.
- Clarify how to describe sensitivity analyses in project documentation for projects involving long-term power purchase agreements on DOD land.
- Clarify how project documentation should present information on all costs of a project, including the value of the land and compensation received for it and, in turn, how that value and compensation would affect the estimated costs and benefits of purchasing electricity from the project.

DOD Energy Conservation Investment Program (ECIP) (GAO-16-162)

Background: ECIP provides funding for projects at military installations to conserve energy or water, generate electricity from renewable sources, promote energy security, or accomplish a combination of these goals.

Key objective: To what extent have completed ECIP projects resulted in cost savings or lower energy use?

Key methodologies:

- Developed and administered a questionnaire for 35 ECIP projects that met certain criteria.
- Reviewed documentation on project scope, measurement and verification plans, and savings documentation for each project.

DOD Energy Conservation Investment Program (continued)

Example of an ECIP-Funded Solar Wall Project



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

DOD Energy Conservation Investment Program (continued)

Key finding: Of the 35 completed projects, only 8 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.

Key Recommendations: We made 5 recommendations to DOD, including to:

- Include projected measurement and verification costs in project proposals as they develop projects.
- Provide additional guidance on the range of measurement and verification options that are appropriate for different project sizes and types, and how to scope ECIP projects to conform to available funding.

Energy Savings Performance Contract (ESPC) Program (GAO-15-432)

Background: ESPCs are a type of share-in-savings contract under which agencies use private funds to finance energy conservation measures.

Objective: To what extent have agencies' ESPC projects achieved expected cost and energy savings?

Key methodologies:

- Reviewed contract documents and annual measurement and verifications reports for a nongeneralizable sample of 20 projects across the seven largest federal agencies.
- Identified instances where contractors noted changes in the performance or operation of equipment that could have affected savings.

Energy Savings Performance Contract Program (continued)

Examples of ESPC Cogeneration Plant and Biomass Projects



Source: GAO. | GAO-15-432

Components of the General Services Administration's cogeneration ESPC project in White Oak, Maryland.



Components of the Department of Energy National Renewable Energy Laboratory's biomass ESPC project in Golden, Colorado.

Energy Savings Performance Contract Program (continued)

Key finding: Cost and energy savings for most projects reviewed met or exceeded expectations, but savings were overstated for 14 projects. Estimates of savings that were reported but not achieved ranged from negligible to nearly half of a project's reported annual savings.

Key Recommendations: We made several recommendations to the seven agencies in the review, including:

- For future contracts, revise contract vehicles or guidance to require that measurement and verification reports include estimates of cost and energy savings that were not achieved because of agency actions.
- For current contracts, work with contractors to determine the best way to obtain estimates of cost and energy savings that are not achieved because of agency actions and include these estimates in measurement and verification reports, and where economically feasible.

Thank you!

Questions or comments?

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