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Inspector General
United States
Department of Defense

The Department of the Navy Spent Recovery Act Funds on Photovoltaic Projects That Were Not Cost-Effective

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Acronyms and Abbreviations

ASN(EI&E)	Assistant Secretary of the Navy for Energy, Installations, and Environment
CNIC	Commander, Navy Installations Command
CNO	Chief of Naval Operations
CSI	California Solar Initiative
DC(I&L)	Deputy Commandant (Installations and Logistics)
ECIP	Energy Conservation Investment Program
e-ROI	Energy Return on Investment
FSRM	Facilities, Sustainment, Restoration, and Modernization
LCCA	Life-Cycle Cost Analysis
NAVFAC	Naval Facilities Engineering Command
NFESC	Naval Facilities Engineering Service Center
MILCON	Military Construction
O&M	Operations and Maintenance
PV	Photovoltaic

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
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SEP 22 2011

MEMORANDUM FOR CHIEF OF NAVAL OPERATIONS
COMMANDANT, U.S. MARINE CORPS
PRINCIPAL DEPUTY UNDER SECRETARY OF DEFENSE (COMPTROLLER)
ASSISTANT SECRETARY OF THE NAVY FOR ENERGY, INSTALLATIONS, AND ENVIRONMENT
DEPUTY UNDER SECRETARY OF DEFENSE (INSTALLATIONS AND ENVIRONMENT)
NAVAL INSPECTOR GENERAL

SUBJECT: The Department of the Navy Spent Recovery Act Funds on Photovoltaic Projects That Were Not Cost-Effective (Report No. D-2011-106)

We are providing this report for review and comment. We performed this audit in response to the requirements of Public Law 111-5, "American Recovery and Reinvestment Act of 2009" (Recovery Act), February 17, 2009. We considered management comments on a draft of this report in preparing the final report. We determined that the Department of the Navy did not select and plan photovoltaic projects in accordance with the Recovery Act and applicable energy legislation and policies. As a result, the Navy will not recover $25.1 million of the $50.8 million invested in photovoltaic projects.

DoD Directive 7650.3 requires that all recommendations be resolved promptly. The Department of the Navy comments in response to Recommendations 1, 3, and 6 were not responsive. We request additional comments on these recommendations by October 24, 2011. We also request comments on revised Recommendations 5 and 7. Please see the recommendations table on page ii.

If possible, send a .pdf file containing your comments to audros@dodig.mil. Copies of your comments must have the actual signature of the authorizing official for your organization. We are unable to accept the /Signed/ symbol in place of the actual signature. If you arrange to send classified comments electronically, you must send them over the SECRET Internet Protocol Router Network (SIPRNET).

We appreciate the courtesies extended to the staff. Please direct questions to me at (703) 604-8866 (DSN 664-8866).

Alice F. Carey
Assistant Inspector General
Readiness, Operations, and Support

Results in Brief: The Department of the Navy Spent Recovery Act Funds on Photovoltaic Projects That Were Not Cost-Effective

What We Did

We determined whether the Department of the Navy planned and selected 3 American Recovery and Reinvestment Act (Recovery Act) photovoltaic (PV) projects at 12 Navy and Marine Corps sites in accordance with the Recovery Act and applicable energy legislation and policies. The contract costs for these three projects totaled $62.3 million.

What We Found

Navy and Marine Corps officials did not select and plan cost-effective PV projects in accordance with the Recovery Act and applicable energy legislation and policies. During project planning and selection, officials did not consider whether projects were cost-effective or analyze different types of energy projects to determine the best investments for meeting legislative energy goals. Instead, they relied upon project titles, location, cost, and amount of time to award contracts to select projects.

Officials incorrectly concluded that cost effectiveness was not required for planning Recovery Act energy projects. Energy legislation and policies required the projects to be cost-effective, and the Recovery Act did not waive these requirements; rather, it required agencies to spend funds "consistent with prudent management."

Officials also were not well equipped to handle quick timelines for planning and selecting projects because, at the time of the Recovery Act's implementation, the Navy and Marine Corps did not have processes for completing life-cycle cost analyses, processes for planning and selecting all energy projects, or energy strategies for achieving legislative goals. As a result, the Department of the Navy will not recover $25.1 million of the $50.8 million invested in PV projects.

The Department of the Navy has taken steps to improve its energy programs by restructuring existing offices and establishing new energy offices, developing strategies and policies, and implementing a new project selection tool. Our recommendations should complement these improvements and enable officials to invest in cost-effective projects.

What We Recommend

We make several recommendations for the Navy and Marine Corps to develop energy strategies and comprehensive policies for planning and selecting cost-effective energy projects. We also recommend that the Department of Defense, Department of the Navy, the Navy, and the Marine Corps officials review the actions of officials responsible for planning and selecting PV projects that were not cost-effective, which resulted in Recovery Act funds not recovered. Based on that review, determine whether any administrative actions are necessary.

Management Comments and Our Response

Regarding the development of energy strategies and policies, the Marine Corps' comments were responsive, but the Department of the Navy and the Navy's comments did not describe actions to implement a shore energy strategy and comprehensive policy for planning and selecting energy projects within the Navy. Further, comments regarding the Navy's project selection tool were not responsive because non-financial factors are weighted higher than cost-effectiveness. In addition, officials disagreed with conducting administrative reviews, which we believe are necessary to improve the integrity of the energy program's control environment. As a result of management comments, we revised draft Recommendation 5 to consider the additional costs necessary to obtain California Solar Initiative rebates. We also revised and redirected Recommendation 7 regarding administrative reviews. We request that the parties referenced in the recommendations table on the back of this page provide comments by October 24, 2011.

Recommendations Table

Management	Recommendations Requiring Comment	No Additional Comments Required
Principal Deputy Under Secretary of Defense (Comptroller)	7.	
Deputy Under Secretary of Defense (Installations and Environment)	7.	
Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment	7.	
Commander, Navy Installations Command	3., 6.	2.
Deputy Chief of Naval Operations, Fleet Readiness and Logistics	1., 3., 7.	2.
Deputy Assistant Secretary of the Navy for Energy		2.
Assistant Deputy Commandant for Installations and Logistics (Facilities)	7.	2., 4.
Director, Shore Readiness Division (N46), Office of the Chief of Naval Operations	6.	
Director, Naval Facilities Engineering Command Energy Office	3.	2.
Naval Facilities Engineering Command Southwest Utilities and Energy Manager	5.	

Please provide comments by October 24, 2011.

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Management Comments

Introduction

Objective

Our overall objective was to evaluate DoD's implementation of Public Law 111-5, "American Recovery and Reinvestment Act of 2009" (Recovery Act), February 17, 2009. Specifically, we determined whether the Department of the Navy planned and selected 3 photovoltaic (PV) projects at 12 Navy and Marine Corps sites in accordance with the Recovery Act and applicable legislation and policies. We reviewed Project P856-M at Marine Corps Base Camp Pendleton (Camp Pendleton), Project RM09-1363 at Navy installations in Hawaii, and Project RM09-1440 at Navy installations in California. See Appendix A for a discussion of the audit scope and methodology related to the audit objective.

Recovery Act Goals

In passing the Recovery Act, Congress provided supplemental appropriations to preserve and create jobs; promote economic recovery; assist those most impacted by the recession; increase economic efficiency by investing in science and technology; and invest in transportation, environmental protection, and other infrastructure. The Recovery Act also established unprecedented efforts to ensure the responsible distribution of funds and provide transparency and accountability of expenditures by informing the public of how, when, and where tax dollars were being spent. Further, the Recovery Act states that the President and heads of the Federal departments and agencies were to expend these funds as quickly as possible, consistent with prudent management.

PV Technology and Recovery Act Spending

PVs are semiconductor devices that convert sunlight (solar energy) directly into electricity. PV modules or panels are connected together to form PV arrays. The arrays are connected to a single metering point that transfers the direct current electricity to an inverter, which converts it into electricity compatible with building and utility power systems. An entire PV system includes arrays, a metering point, inverters, and supporting components, such as electrical conductors and wiring. The electricity generated by a PV system is renewable energy because it comes from the sun. Figures 1 and 2 on the following page show examples of PV systems that we reviewed.

Figure 1. Rooftop PV System at Naval Post-Graduate School, Monterey, California

Source: Navy Region Southwest

Figure 2. PV System on Box Canyon Landfill at Camp Pendleton, California

Source: Camp Pendleton Energy Office

DoD received approximately $7.1 billion[1] in Recovery Act funds to use for projects that support the Act's purposes. In March 2009, DoD released expenditure plans that listed DoD projects to be funded by the Recovery Act. The Department of the Navy received $1.17 billion in Recovery Act funds, including $816 million for Operations and Maintenance (O&M) and $280 million for Military Construction (MILCON).[2]

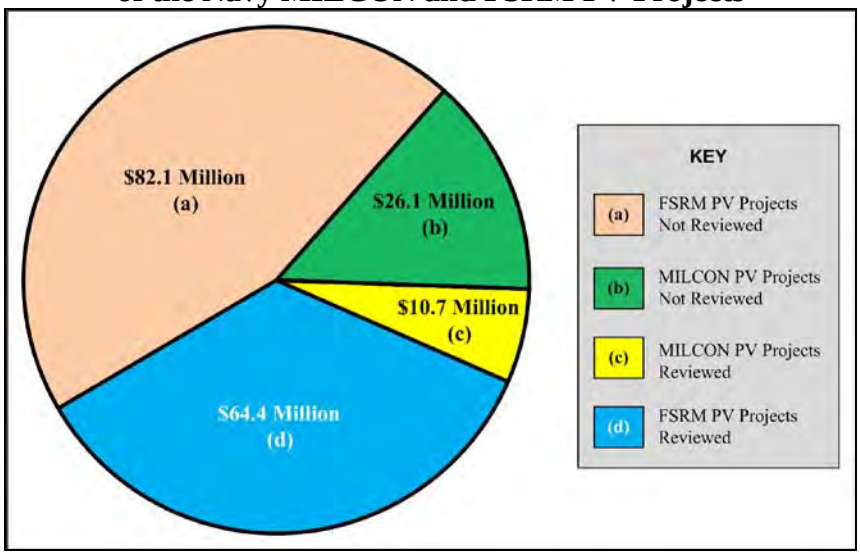
The DoD Recovery Act Expenditure Plans included approximately $183.4 million in funds for Department of the Navy Facilities, Sustainment, Restoration, and Modernization (FSRM)[3] and MILCON PV projects, including $146.5 million for FSRM PV projects and $36.8 million for MILCON PV projects. Figure 3 shows the estimated costs for MILCON and FSRM PV projects that the Department of the Navy planned to execute with Recovery Act funds.

[1]This amount does not include $4.6 billion for the U.S. Army Corps of Engineers. In addition, the original appropriation for DoD was $7.4 billion; however, Public Law 111-226 rescinded $260.5 million.

[2]The original appropriation for the Department of the Navy was $1.22 billion, which included $866 million for Operations and Maintenance. Public Law 111-226 rescinded $50 million in O&M funding for the Department of the Navy. Public Law 111-226 did not affect MILCON and Research, Development, Test, and Evaluation appropriations.

[3]These FSRM projects were funded with O&M appropriations.

Figure 3. Recovery Act Funding Planned for Department of the Navy MILCON and FSRM PV Projects



We reviewed three PV projects with total estimated costs of $75.1 million, including $64.4 million for two FSRM PV projects and $10.7 million for a MILCON PV project. Project RM09-1440, with estimated project costs of $31.8 million, installed PV systems on building rooftops at nine Navy installations in California. Project RM09-1363, with estimated project costs of $32.6 million, installed PV systems on building rooftops at two Navy installations in Hawaii. Project P856-M, a MILCON project with estimated costs of $10.7 million, installed a solar power generating facility on an inactive landfill at Camp Pendleton. The actual contract costs for these three projects combined were $62.3 million, which included investment costs[4] of $50.8 million. See Appendix B for more details about the three Recovery Act PV projects we reviewed and Appendix C for more details on the investment cost of the projects.

Process and Timeline for Selecting Department of the Navy Recovery Act Projects

The Department of the Navy was responsible for selecting Navy and Marine Corps FSRM and MILCON projects to receive Recovery Act funds. The project selection process occurred quickly and involved several Navy and Marine Corps offices. Officials explained that the Commander, Navy Installations Command (CNIC) and Chief of Naval Operations (CNO) Shore Readiness Division (N46)[5] worked closely with Naval Facilities Engineering Command (NAVFAC) Headquarters, Naval Facilities Engineering Service Center (NFESC), NAVFAC regions, and installations to select and recommend Navy energy projects for Recovery Act funding. For the Marine Corps, officials explained that

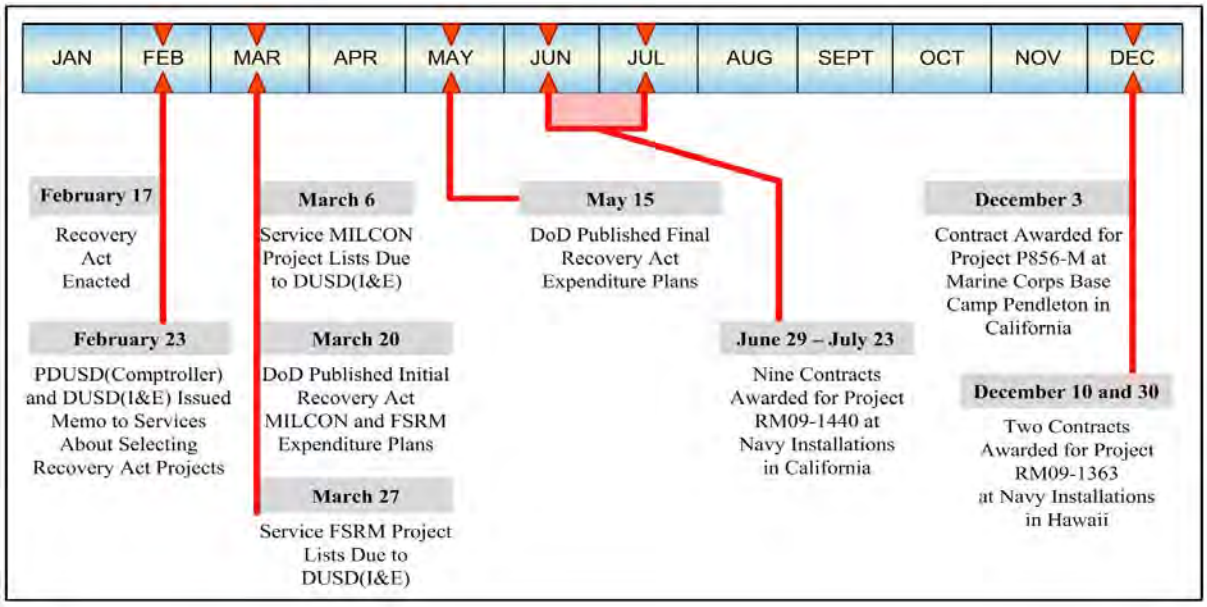
[4]Project investment cost is the cost to implement a PV system minus the residual value of the PV system.

[5]According to Department of the Navy officials, at the time of selecting projects for the Recovery Act, most CNIC officials simultaneously worked at CNO N46. Officials also stated that in September 2009, the Vice Admiral of CNO N4 separated CNIC and CNO N46 duties.

Deputy Commandant (Installations and Logistics) (DC[I&L]), in coordination with installation officials, was responsible for identifying and recommending executable Marine Corps energy projects to receive Recovery Act funds. After CNIC and DC(I&L) finalized the project lists, they submitted the lists to the Assistant Secretary of the Navy (Energy, Installations and Environment) (ASN[EI&E]) and the Assistant Secretary of the Navy (Financial Management and Comptroller), which reviewed and sent the lists to the Deputy Under Secretary of Defense (Installations and Environment) for incorporation into the DoD Recovery Act Expenditure Plans. See Appendix D for additional information on the structure of the Department of the Navy Energy Program.

Timelines for selecting, planning, and executing Recovery Act projects were short. Figure 4 shows the timeline for selecting, planning, and executing Recovery Act projects.

Figure 4. Timeline for Selecting, Planning, and Executing Recovery Act Projects



PDUSD(Comptroller) Principal Deputy Under Secretary of Defense (Comptroller)
DUSD(I&E) Deputy Under Secretary of Defense (Installations and Environment)

The Recovery Act, dated February 17, 2009, and its accompanying documents required the Secretary of Defense to submit expenditure plans for MILCON and FSRM projects within 30 days and 60 days, respectively, after the Act's enactment. The Principal Deputy Under Secretary of Defense (Comptroller) and the Deputy Under Secretary of Defense (Installations and Environment) issued a memorandum on February 23, 2009, directing the Services to provide input for MILCON projects by March 6, 2009, and input for FSRM projects no later than March 27, 2009. DoD published an initial expenditure plan for MILCON and FSRM projects on March 20, 2009, and the final expenditure plans on May 15, 2009. Officials awarded contracts for Project RM09-1440 at Navy installations in California in June and July 2009. In December 2009, officials awarded contracts for Project RM09-1363 at Navy installations in Hawaii and Project P856-M at Camp Pendleton. Recovery Act O&M funds expired on September 30, 2010, and MILCON funds will expire on September 30, 2013.

Review of Internal Controls

Our review of internal controls focused on the Navy and Marine Corps procedures for planning and selecting energy projects using Recovery Act O&M and MILCON funds. We reviewed whether strategies, policies, and procedures adequately defined processes for planning and selecting cost-effective energy projects and whether the strategies and policies aligned with legislative, Federal, and DoD requirements.

We identified internal control weaknesses in the Navy and Marine Corps processes for planning and selecting energy projects. Specifically, internal controls were not in place to ensure that the Recovery Act PV projects selected were cost-effective and were the best investment to contribute toward energy goals. We also identified that a lack of comprehensive energy strategies and policies could affect future project selection decisions. We will provide a copy of the report to senior officials responsible for internal controls.

Finding. Officials Did Not Consider Cost-Effectiveness for Recovery Act PV Projects

Navy and Marine Corps officials did not select and plan PV projects that were justified as required by the Recovery Act; Federal legislation; and DoD, Navy, and Marine Corps policies. According to Federal legislation and DoD policy, an energy project is a justified investment only if it is cost-effective. Officials selected projects that were not justified because they incorrectly determined that Recovery Act energy projects did not have to be cost-effective. Additionally, at the time of the Recovery Act's implementation, the Department of the Navy policies for planning and selecting energy projects lacked:

- processes for completing and documenting life-cycle cost analyses;
- comprehensive processes for planning and selecting energy projects, regardless of funding; and
- a definition for an energy project.

The Department of the Navy also lacked an overall energy strategy. As a result, the Department of the Navy will not be able to recover $25.1 million of the $50.8 million in Recovery Act funds invested in three PV projects.

PV Projects Must Be Cost-Effective

Federal legislation and DoD criteria require renewable energy projects to be cost-effective, which means that a project's estimated savings must exceed its estimated costs over the life of the project. Specifically, the National Defense Authorization Act for 2007; Executive Order 13423, "Strengthening Federal Environmental, Energy, and Transportation Management," January 24, 2007; DoD Instruction 4170.11, "Installation Energy Management," December 11, 2009;[6] and DoD Unified Facilities Criteria 3-400-01, "Energy Conservation," July 5, 2002 (as amended in August 2008) include requirements for renewable energy projects to be cost-effective. The Recovery Act and subsequent related guidance also stress the importance of cost-effectiveness, stating that agencies should spend funds "consistent with prudent management." See Appendix E for additional information on criteria for renewable energy projects.

MILCON, FSRM, and Energy Policies Outline Project Planning Requirements

The Navy and Marine Corps have policies related to planning MILCON and FSRM projects, such as the PV projects we reviewed. Office of the CNO Instruction 11010.20G, "Facilities Projects Instruction," October 14, 2005, provides policy related to the planning requirements for the construction, maintenance, and repair of Navy facilities. Marine Corps Order P11000.12C, "Real Property Facilities Manual,

[6]The November 22, 2005, version of this policy, which was valid during Recovery Act project selection, contained the same requirements for cost-effective renewable energy projects.

Volume II, Facilities Planning and Programming," January 21, 1986, establishes procedures for planning and programming MILCON projects. Marine Corps Order P11000.5G, "Real Property Facilities Manual, Volume IV, Facilities Projects Manual," September 30, 2004, establishes procedures and requirements for FSRM projects. In addition, Unified Facilities Criteria 3-400-01 and the National Institute of Standards and Technology Handbook 135, "Life-Cycle Costing Manual for the Federal Energy Management Program," February 1996, (Handbook 135) provide requirements for energy projects. Together, these policies contain the following requirements for project planning documentation:

- a DD Form 1391 to document the requirement for a project;
- a detailed and accurate cost estimate;
- an economic analysis;
- an environmental assessment; and
- a life-cycle cost analysis (LCCA).

Specifically, the policies require that the DD Form 1391 clearly describe the project requirements and include supporting documentation to communicate project scope, complexity, and cost to help officials select the most cost-effective option to achieve the project objective. Supporting documentation commonly includes a detailed cost estimate and environmental evaluations. In addition, an economic analysis should support the DD Form 1391 by identifying and comparing alternatives for achieving project objectives. Finally, an LCCA should compare the cost-effectiveness of project options identified in the economic analysis. For a PV project, the LCCA should compare project investment costs with electricity savings that result from operating the PV system.

Navy and Marine Corps Officials Should Have Used Planning Documentation to Select Projects

Improved planning for FSRM and MILCON energy projects could have ensured that the Navy and Marine Corps officials selected cost-effective Recovery Act projects. Information in project planning documents, such as the DD Form 1391 and supporting documents, was critical during the Recovery Act project selection process when officials were required to make quick decisions to use Recovery Act funds in a prudent manner. However, CNIC and DC(I&L) officials relied on spreadsheets that included project title, location, cost, and amount of time for contract award as the basis for selecting Recovery Act projects rather than considering project justifications, cost estimates, and economic analyses as required in Navy and Marine Corps policies. In addition, CNIC and DC(I&L) officials did not require LCCAs during Recovery Act project selection to determine whether projects were cost-effective as required by Federal and DoD criteria. However, CNIC and DC(I&L) officials acknowledged that, in general, PV projects were unlikely to be cost-effective. Nevertheless, officials selected the PV projects for Recovery Act funding.

CNIC and DC(I&L) officials acknowledged that, in general, PV projects were unlikely to be cost-effective.

We acknowledge that timelines for planning and selecting Recovery Act projects were short. The Recovery Act required the Secretary of Defense to provide Congress with an expenditure plan for MILCON and FSRM projects within 30 and 60 days, respectively, of the Act's enactment. However, Department of the Navy officials could have made better project selection decisions by considering information contained in project planning documentation. Even if the Department of the Navy could not fully compile planning information within the timeframes for initial project selection, officials should have completed the planning documentation before issuing solicitations and awarding project contracts.

Navy and Marine Corps Officials Should Have Adequately Planned PV Projects Before Awarding Contracts

Navy and Marine Corps officials did not adequately plan Recovery Act PV projects before awarding their contracts. After Department of the Navy officials selected projects and DoD published the Recovery Act expenditure plan in March 2009, officials at Navy and Marine Corps regions and installations were responsible for completing the required project planning documentation outlined in Navy and Marine Corps policies and for executing the projects. Officials awarded contracts for Project RM09-1440 at Navy installations in California in June and July 2009. In December 2009, officials awarded contracts for Project RM09-1363 at Navy installations in Hawaii and Project P856-M at Camp Pendleton. However, at the time the contracts were awarded, most of the planning documentation needed to justify these projects was either inadequate or nonexistent. Although officials properly completed environmental evaluations, we identified deficiencies with project justifications on the DD Forms 1391, cost estimates, economic analyses, and LCCAs.

Navy and Marine Corps officials did not adequately plan Recovery Act PV projects before awarding their contracts.

Project Justifications on DD Forms 1391 Were Misleading

Navy and Marine Corps officials prepared or updated the DD Forms 1391 for Recovery Act projects in February and March 2009; however, the DD Forms 1391 for all three projects lacked accurate project justifications. Navy and Marine Corps policies require a project justification to clearly describe the project's requirement in terms of its impact to mission, life-cycle economics, or other factors.

The justifications for the three PV projects we reviewed focused on the Department of the Navy's progress toward meeting legislative energy goals. Various legislation establishes goals for reducing the Federal Government's energy consumption and increasing its use of renewable energy. The Department of the Navy reports annually on progress toward meeting these goals. Table 1 shows the legislative energy goals and the Department of the Navy's progress toward meeting those goals as reported in DoD's Annual Energy Management Report for FY 2009.

Table 1. Legislative Renewable Energy Goals and Department of the Navy Progress Toward Goals as of FY 2009

Legislation	Requirement	Progress as of FY 2009
Energy Policy Act of 2005	Percent of total electricity consumption must be from renewable electric energy: 3 percent in FY 2009 5 percent in FY 2010	Consumed 0.6 percent of electricity from renewable electric energy and did not meet this goal.
Energy Independence and Security Act of 2007	12 percent reduction in energy consumption per gross square foot in FY 2009, relative to FY 2003.	Achieved a 15.2 percent reduction in energy consumption.
2007 National Defense Authorization Act	DoD must produce or procure at least 25 percent of the total electric energy consumed during FY 2025 and each year after from renewable energy sources.	Produced or procured 18.9 percent of electricty from renewable energy sources.

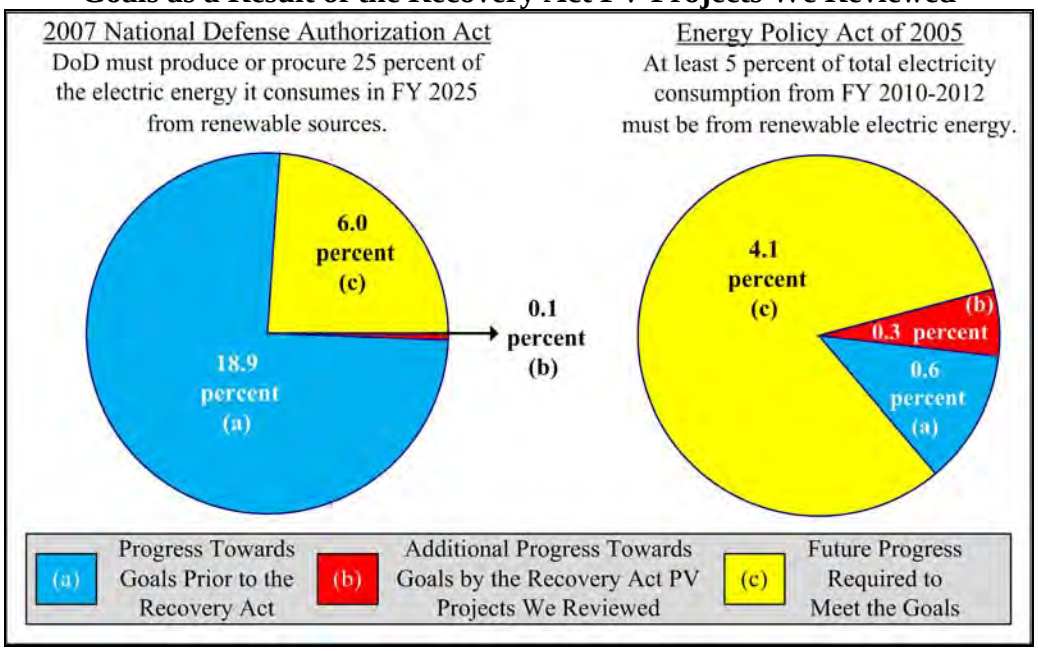
The justifications for the projects we reviewed stated that investments in renewable energy projects provide for the replacement of traditional energy sources and recurring energy payments, allowing for reductions in infrastructure costs and increases in resources for strategic and logistical functions. The justifications also indicated that the projects would contribute substantially to meeting legislative energy goals for reducing energy consumption and increasing use of renewable energy. Specifically, the justifications for the three projects were as follows:

- Project RM09-1440 in California: the DD Form 1391 stated that the project was the most cost-effective investment for achieving the greatest progress toward renewable energy goals.
- Project RM09-1363 in Hawaii: the DD Form 1391 stated that if the project was not implemented, the Department of the Navy would not meet renewable energy goals.
- Project P856-M at Camp Pendleton: the DD Form 1391 stated that if the project was not implemented, the Department of the Navy would not comply with the Energy Policy Act.

However, the contributions of these three Recovery Act projects, collectively, will contribute only minimally toward renewable energy goals. The three projects will increase the Department of the Navy's progress toward the 2007 National Defense Authorization Act goal from 18.9 percent to 19 percent and will increase progress toward

the Energy Policy Act goal from 0.6 percent to 0.9 percent.[7] Figure 5 shows the Department of Navy's progress toward renewable energy goals, including the contributions made by the projects we reviewed.

Figure 5. Additional Progress Toward Meeting Renewable Energy Goals as a Result of the Recovery Act PV Projects We Reviewed



The project justifications on the DD Forms 1391 were misleading because they indicated that the projects would contribute substantially to meeting renewable energy goals when, in fact, the projects' contributions will be minimal. Although it is important for the Department of the Navy to progress toward meeting legislative energy goals, the DD Form 1391 project justifications misrepresented the projects' actual impact on meeting renewable energy goals.

Not All Cost Estimates Were Supported

Not all of the cost estimates for the three PV projects we reviewed were adequately supported. Cost estimates are critical in calculating a project's monetary return on investment. Navy and Marine Corps policies require project justifications to include a verifiable cost estimate that correlates to the project description and scope. The policies also state that cost estimates should be detailed and should itemize specific quantities and unit costs rather than using lump sum costs, whenever possible.

[7]We based these calculations on information from the Department of the Navy's FY 2009 Annual Energy Management Data Report. We considered only the increase in renewable electric energy generation from the three Recovery Act projects we reviewed and assumed all other information remained the same.

The DD Forms 1391 for the three projects we reviewed included cost estimates, and in some cases, officials provided additional documentation to accompany these estimates. However, not all of the cost estimates for the three projects were adequately supported. For example:

- The cost estimate for Project P856-M at Camp Pendleton contained only lump sum costs, and officials could not provide support for how they developed the estimates.
- The cost estimate for Project RM09-1440 in California contained lump sum costs for each of the nine locations included in the project. Officials provided detailed cost estimates for each location. The detailed cost estimates supported the costs on the DD Form 1391 for six of the locations; however, officials could not provide support for the costs for the other three locations.
- The DD Form 1391 for Project RM09-1363 in Hawaii contained cost estimates based on square footage for each building included in the project but did not account for the type of PV system installed or the cost-efficiencies based on building size. Furthermore, personnel could not explain the assumptions used to develop cost estimates.

Officials Prepared Inadequate Economic Analyses and Did Not Consider LCCAs Prior to Awarding Contracts

Navy and Marine Corps officials prepared economic analyses that did not adequately consider alternatives to PV systems. Additionally, officials either did not prepare or did not consider LCCAs before soliciting and awarding contracts. Economic and life-cycle cost analyses are critical for selecting and planning cost-effective energy projects. The economic analysis should evaluate available alternatives for meeting the project objective, and the LCCA should evaluate the cost-effectiveness of the alternatives.

The DD Forms 1391 for the PV projects we reviewed stated that the objective was to save energy and meet energy goals. Therefore, the economic analysis should have evaluated alternatives for achieving this objective, such as reducing energy consumption or executing types of renewable energy projects other than PV systems. However, Navy and Marine Corps officials prepared the economic analyses with the sole objective of installing a PV system. For the PV projects we reviewed, officials evaluated the options of leasing, renovating, or constructing facilities to receive PV systems instead of considering other renewable energy projects. Therefore, officials did not adequately consider alternatives to PV systems to meet the projects' objectives.

After preparing the economic analysis to identify options for achieving the project objective, officials should prepare an LCCA to evaluate all viable alternatives and ensure that the selected alternative is cost-effective. According to Handbook 135, which provides LCCA criteria for energy projects at Federal facilities, agencies must carefully document LCCAs in order to keep track of the evaluation process, create a decision-supporting record, and have information easily accessible for future LCCAs. Handbook 135 states that the primary purpose of an LCCA is to demonstrate that a project's operational savings are sufficient to justify its additional investment cost.

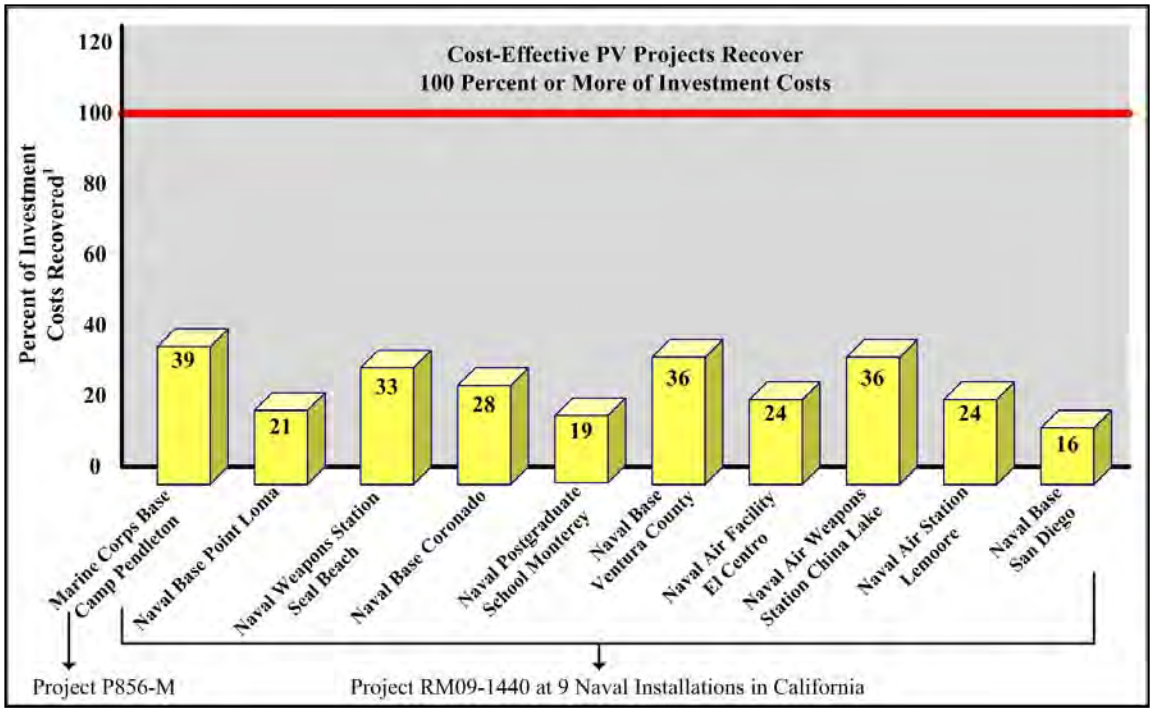
Handbook 135 also states that the amount of time and detail put into development of LCCAs should increase when the pressure to make choices on factors other than economics also increases. This guidance particularly applied to the Recovery Act because the Act required officials to select and execute projects quickly.

However, officials at Navy and Marine Corps regions and installations either did not prepare or did not consider the results of LCCAs before soliciting and awarding contracts for the PV projects we reviewed. For example:

- For Project RM09-1363 in Hawaii, officials did not prepare LCCAs before awarding the contracts for the two project locations. Therefore, Navy officials in Hawaii awarded contracts without assurance that the project was cost-effective.
- For Project RM09-1440 in California, while officials could not provide original LCCAs for the project, contract documents indicated that officials performed LCCAs to evaluate contractor proposals before awarding contacts in June and July 2009. The results of this analysis contained in the award decision documentation showed that 64 to 84 percent of the investment costs for each PV system at nine California locations would not be recovered. Nevertheless, officials awarded contracts for the project.
- For Project P856-M at Camp Pendleton, Marine Corps officials prepared an LCCA in February 2009 before issuing a solicitation for the project in October 2009. Although the LCCA results showed that 61 percent of the system's investment cost would not be recovered, officials awarded a contract for the project in December 2009.

Figure 6 shows the results of LCCAs that Navy and Marine Corps officials performed before contract award, which showed that projects were not cost-effective. Because Navy officials did not prepare LCCAs before awarding contracts for the PV project in Hawaii, its two sites are not listed in the figure.

Figure 6. Department of Navy Calculations of Cost-Effectiveness Available Before Contract Award



[1]The percentages are based on Navy and Marine Corps LCCAs prepared before awarding contracts for PV systems.

As Figure 6 shows, none of the LCCAs prepared by the Navy or Marine Corps showed that the PV projects were cost effective. Despite these results or the lack of LCCAs, officials awarded contracts to complete three projects with investment costs of over $50 million.

Navy and Marine Corps Should Establish Processes for Life-Cycle Cost Analyses

Navy and Marine Corps policies lacked processes for performing and documenting LCCAs, which are essential for determining the cost-effectiveness of energy projects. The DoD Unified Facilities Criteria 3-400-01 states that LCCAs should be prepared for energy projects. LCCAs compare the cost-effectiveness of project options listed on the economic analysis and enable officials to select the most cost-effective one. Based on Handbook 135, LCCAs for PV projects should compare project investment costs with electricity savings that result from operating the PV system, and should account for significant costs and savings during the useful life of the PV system, such as those for equipment replacements, utility rebates, and maintenance. Handbook 135 requires carefully documented LCCAs to keep track of the evaluation process, create a decision-supporting record, and have information easily accessible for future LCCAs. Despite the importance of detailed and accurate LCCAs for Recovery Act PV projects, Navy and Marine Corps officials completed LCCAs that contained inaccurate information.

We reviewed the detailed LCCAs prepared by Navy and Marine Corps officials for the 12 project sites.[8] We identified issues related to lack of support for calculations as well as overstatements and understatements of project savings. For example, NAVFAC Southwest and Camp Pendleton officials were unable to support the amount of utility rebates and cost of electricity charged by their utility companies, but nevertheless used this information in their LCCAs to calculate project savings. If officials had prepared and retained supporting documentation to supplement their LCCAs, they may have detected many of the inaccuracies that we identified.

We also identified misstatement of costs in the LCCAs. Our review of the 12 LCCAs identified overstatements of about $9.1 million because of inaccurate project data. Most LCCA errors resulted in overstated project savings; however, some of the errors also resulted in understated project savings. The most significant LCCA error we identified was a $5.6 million overstatement of the electricity costs saved by operating PV systems instead of buying electricity from a utility provider. Electricity cost savings were overstated because officials did not account for degradation in electricity production over the useful life of the PV system. Further, on eight LCCAs, officials double-counted electricity demand charges (fees assessed by utility companies during peak usage periods). We also identified errors related to costs for replacing inverters, Government monitoring (supervision, inspection, and overhead), and roof replacements, as well as residual value and utility rebates. For example, at one site, residual value was understated by about $1.3 million. See Appendix C for additional details on the LCCAs we reviewed. Table 2 shows how inaccurate LCCA data impacted the cost-effectiveness of the 12 project sites we evaluated.

Our review of the 12 LCCAs identified overstatements of about $9.1 million because of inaccurate project data.

[8]Project RM09-1440 was executed at nine sites in California; Project RM09-1363 was executed at two sites in Hawaii; and Project P856-M was executed at Camp Pendleton. All project sites were located on Navy or Marine Corps installations, and each project site had an LCCA. The LCCAs calculated project costs and savings of implementing PV systems over a 20-year period.

Table 2. Impact of Inaccurate LCCA Data on Cost-Effectiveness of Project Sites

LCCA Category	Number of Accurate LCCAs	Number of Inaccurate LCCAs (Overstated)	Number of Inaccurate LCCAs (Understated)	Overall Impact of Errors on Project Savings	Overall Impact of Errors on Project Savings (in millions of dollars)
Electricity Costs Saved	0	11	1	Overstated	$5.55
Inverter Replacement Costs	8	3	1	Overstated	$0.46
Excluded Roofing Costs	2	6	4	Overstated	$0.30
Supervision, Inspection, and Overhead Rate	3	9	0	Overstated	$0.80
Construction Costs	10	1	1	Understated	$0.50
Maintenance Costs	0	11	1	Overstated	$0.20
Residual Value Rate	11	0	1	Understated	$1.38
Utility Rebates[1]	5	7	0	Overstated	$3.68
Total Impact of LCCA Errors[2]				**Overstated**	**$9.10**

[1] We did not include utility rebates in our LCCA calculations.
[2] The total does not sum accurately because of rounding.

The errors on the LCCAs impacted the estimated project savings for the projects we reviewed. For example, for Project RM09-1440 in California, four of the nine LCCAs NAVFAC Southwest officials completed showed that the projects were cost-effective. However, after we adjusted the LCCAs to correctly account for the errors we identified, none of the PV systems at these four project sites were cost-effective. Although NAVFAC Southwest officials calculated that these four projects would save $2 million, we calculated that the Navy will not recover about $4.6 million of the funds invested.

As shown in Table 2, the costs and savings data that Navy and Marine Corps officials used to prepare LCCAs were not consistently accurate or inaccurate. Although Handbook 135 includes general considerations for preparing LCCAs, the Navy and Marine Corps need to develop detailed procedures that standardize the preparation of LCCAs for their energy programs. Without standard LCCA processes, it may be difficult to accurately compare one project with another and to rely on the accuracy of the estimated project savings.

Without standard LCCA processes, it may be difficult to accurately compare one project with another and to rely on the accuracy of the estimated project savings.

These inconsistencies illustrate the need for the Navy and Marine Corps to develop standardized methods for estimating the costs and savings required to prepare LCCAs. LCCAs that are inconsistent with Federal and DoD policies or that contain inaccurate or unsupported data can lead to decisions to implement energy projects that are not cost effective. Processes for developing LCCAs should include standardized methods for estimating project costs and energy savings during project planning. Updated policies should assist Department of the Navy officials with preparing accurate and supported LCCAs that result in cost-effective energy investments.

The Department of the Navy Did Not Have Comprehensive Policies for Energy Projects

In addition to the lack of processes for performing and documenting LCCAs, the Department of the Navy lacked comprehensive policies for planning and selecting energy projects. Although the Department of the Navy had certain policies and procedures for planning and selecting projects, they were not comprehensive enough to help officials determine whether energy projects, such as the PV projects we reviewed, were good investments. At the time of the Recovery Act's implementation, the Department of the Navy had several policies for the energy program. Additionally, the policies and guidance for the Navy and Marine Corps energy programs included general goals, objectives, and responsibilities for energy management. However, these policies and guidance omitted certain critical elements for ensuring that energy managers consistently select cost-effective and justified energy projects. These missing elements included processes for documentation of LCCAs, comprehensive procedures for planning and selecting energy projects, and a definition of an energy project.

Although the Department of the Navy had certain policies and procedures for planning and selecting projects, they were not comprehensive enough to help officials determine whether energy projects, such as the PV projects we reviewed, were good investments.

Navy and Marine Corps Should Establish Comprehensive Processes for Planning and Selecting Energy Projects

The Navy and Marine Corps energy policies did not include comprehensive processes for planning and selecting energy projects. Although Navy and Marine Corps policies outline detailed processes for planning and executing FSRM and MILCON construction-type projects, which include repair and renovation projects, the policies did not fully address the requirements unique to energy projects.

NFESC published the "Navy and Marine Corps Energy Project Execution Guide" (Project Execution Guide), in November 2007 to assist energy managers with planning, selecting, and executing Energy Conservation Investment Program (ECIP) and financed energy projects. Although the Project Execution Guide provides guidance for planning and selecting energy projects, it is not official policy because NFESC lacks authority to promulgate policy. Further, the Project Execution Guide presents only three ways to execute energy projects: ECIP, utility energy services contracts, and energy savings

performance contracts.[9] This excludes the alternative of executing energy projects with O&M funding. Marine Corps Order P11000.9C, "Real Property Facilities Manual, Volume VI, Energy and Utilities Management," November 12, 1991, provides guidance for ECIP projects and for FSRM energy projects executed with O&M funds. Therefore, neither the Navy nor the Marine Corps policies address the planning and selection of MILCON-funded energy projects other than ECIP projects. Navy and Marine Corps policy should include processes for planning and selecting all energy projects, regardless of funding sources.

Department of the Navy Should Clearly Define an Energy Project

Department of the Navy policies, to include Navy and Marine Corps policies, do not clearly define what constitutes an energy project. DoD Instruction 4170.11[10] and the DoD Unified Facilities Criteria 3-400-01 discuss several types of energy projects, including renewable energy projects, projects involving purchase of efficient energy-consuming products, and projects that have an energy component involving DoD facilities. However, Secretary of the Navy Instruction 4100.9A, "Department of the Navy (DON) Shore Energy Management," October 1, 2001; Office of the Chief of Naval Operations Instruction 4100.5D, "Energy Management," April 12, 1994; and Marine Corps Order P11000.9C do not clearly define the elements of an energy project.

The Project Execution Guide, the use of which is required by NAVFAC officials despite the fact that it is not official policy, includes a definition of an energy project that contradicts DoD policy. The Project Execution Guide states that to be considered an energy project, a project's primary purpose must be to save energy or water. For example, according to the Project Execution Guide, a construction project with a PV component would not qualify as an energy project because saving energy is not its primary purpose. However, based on DoD Unified Facilities Criteria 3-400-01, this project would qualify as an energy project, and the PV component would have to be cost-effective. The contradictory definitions of an energy project included in the DoD policy and Navy guidance demonstrate the need for Department of the Navy policy to clearly define what constitutes an energy project. Given a clear definition that is consistent with DoD policy, the Navy and Marine Corps can be consistent in planning, selecting, and executing energy projects.

> *The contradictory definitions of an energy project included in the DoD policy and Navy guidance demonstrate the need for Department of the Navy policy to clearly define what constitutes an energy project.*

[9]Utility energy services contracts and energy savings performance contracts are methods of contracting in which a utility company or a private contractor incurs the costs to implement an energy project in exchange for a predetermined share of energy savings resulting from the project.

[10]We used the December 2009 version of this instruction. However, as we previously noted, the November 2005 version was valid during Recovery Act project selection and addressed the same types of energy projects as the current instruction.

The Department of the Navy Did Not Have an Energy Strategy

Although energy goals have existed since 1978, the Department of the Navy lacked an energy strategy as the foundation for achieving Federal and legislative energy goals at the time of the Recovery Act. A Department of the Navy energy strategy may have improved Recovery Act energy investments. An energy strategy should outline the energy program management structure and provide guidance on aligning available resources to achieve legislative energy goals. Implementation plans should accompany energy strategies and should identify the specific goals, initiatives, and tasks for meeting strategic goals and assign responsibilities within the organization for carrying out these tasks. An overarching Department of the Navy strategy that outlines specific objectives and metrics will enable installation energy managers to develop plans that effectively align with energy goals. If a strategy had been in place during the Recovery Act's implementation, Navy and Marine Corps officials may have been better equipped to handle the quick timelines for planning and selecting Recovery Act projects that were justified, cost-effective, and contributed the maximum amount to energy goals.

The Department of the Navy lacked an energy strategy as the foundation for achieving Federal and legislative energy goals at the time of the Recovery Act.

Since the Recovery Act's implementation, the Department of the Navy has taken steps to establish energy strategies and implementation plans. In October 2009, the Secretary of the Navy established five ambitious, long-term energy goals focused on energy security and energy independence and also published "Naval Energy-A Strategic Approach." These initiatives identified goals for the Department of the Navy energy program in addition to those established by legislation.

On October 1, 2010, the Secretary of the Navy published the "Department of the Navy's Energy Program for Security and Independence," which serves as the overall energy roadmap for the Navy and the Marine Corps. The Secretary of the Navy also directed the CNO and the Commandant, Marine Corps to develop strategic energy plans by December 2010 that would include requirements, funding profiles, milestones, and a critical path to achieve the Secretary of the Navy's energy goals.

The Navy and Marine Corps have also taken steps to establish energy strategies and implementation plans. In October 2010, the Navy published "A Navy Energy Vision for the 21st Century." This energy vision serves as a high-level overview of where the Navy is heading with its energy program, and it is aligned with the Secretary of the Navy goals. However, this vision does not outline the energy program management structure or provide guidance on aligning resources to achieve energy goals. While there is currently no implementation plan for this vision, Navy officials stated that CNO N46 is in the early stages of developing a shore energy implementation plan. It is critical that an energy strategy include an implementation plan that cites specific tasks and metrics and assigns responsibilities for the energy program.

Additionally, in March 2011, the Marine Corps published the "United States Marine Corps Expeditionary Energy Strategy and Implementation Plan." This strategy communicates the Commandant of the Marine Corps' vision, mission, goals, and objectives for the energy program, both on the battlefield and at Marine Corps installations. The implementation planning guidance identifies specific tasks, responsibilities, and timeframes for achievement. Taken together, the strategy and the implementation plan provide foundational guidance for energy investments and management across the Marine Corps.

Having energy strategies for the Navy and Marine Corps that align with an overall energy strategy for the Department of the Navy may help officials select energy projects that are justified, cost-effective, and contribute maximally toward achieving energy goals. The combination of strategies and detailed implementation plans will enable officials to be better equipped when planning and selecting energy projects.

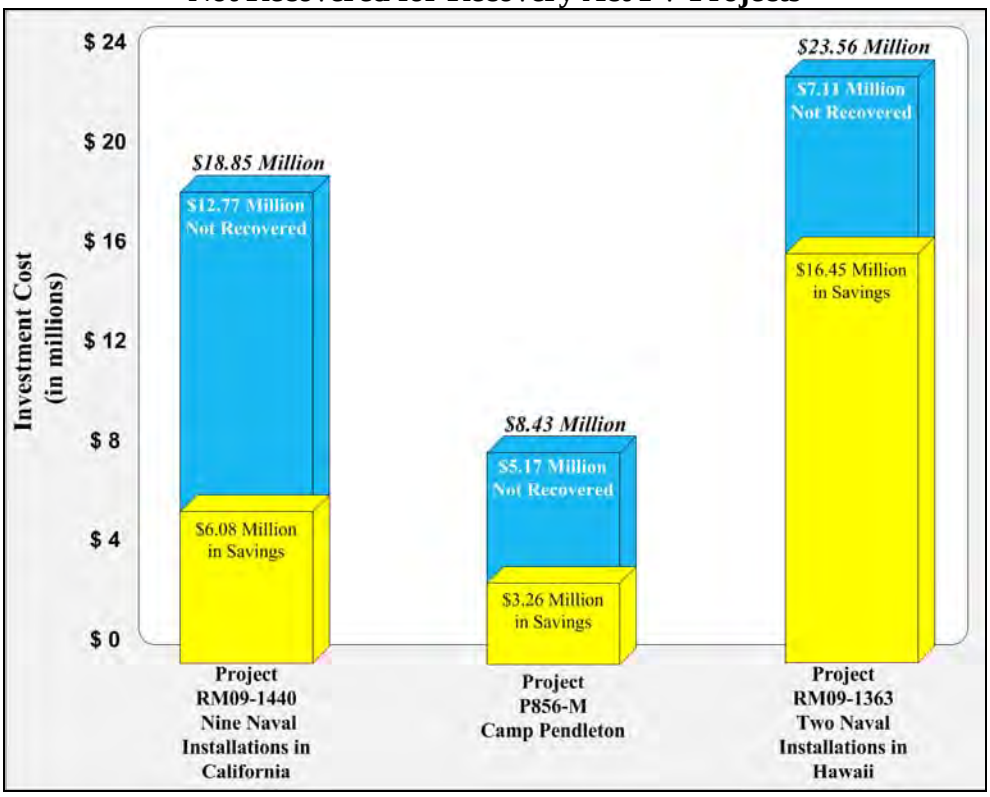
Navy and Marine Corps Recovery Act PV Projects Were Not Cost-Effective

Despite the requirements in Federal legislation and DoD policy, Navy and Marine Corps officials invested in Recovery Act PV projects that were not cost-effective. By definition, cost-effective means that a project's estimated savings exceed its estimated costs over the life of the project. Project investment cost is the cost to implement a PV system[11] minus the residual value of the PV system after 20 years.[12] We compared the investment costs of the PV projects we reviewed with the electricity costs avoided by operating them over a 20-year study period and determined that the PV projects implemented by the Department of the Navy were not life-cycle cost-effective. Specifically, the three projects we reviewed will not recover $25.1 million of the $50.8 million in Recovery Act funds invested. For example, Project P856-M at Camp Pendleton will not recover $5.17 million of the $8.43 million invested in the project. Refer to Appendix C for additional information on calculations of investment cost and costs not recovered. Figure 7 shows the savings for the three PV projects we reviewed, as well as the amount of the investment costs that will not be recovered over the life of the projects.

[11]The cost to implement the PV system includes Government supervision, inspection, and overhead.

[12]Handbook 135 states that the study period for a life-cycle cost analysis generally is the system service life. We analyzed the costs and benefits of implementing PV systems over a 20-year period because each system had at least a 20-year warranty.

Figure 7. Investment Costs, Project Savings, and Funds Not Recovered for Recovery Act PV Projects



As Figure 7 shows, the total costs of the three PV projects that we reviewed exceed the estimated savings. Because projects were not cost-effective, they were not justified Recovery Act projects. Officials selected projects that were not justified because there was a prevailing belief among Navy and Marine Corps officials that Recovery Act FSRM and MILCON energy projects did not have to be cost-effective. CNIC officials acknowledged that a key requirement for an energy project is its ability to pay for itself in a reasonable amount of time. However, Navy and Marine Corps officials stated that Recovery Act projects were different from typical energy projects. Officials determined that the FSRM and MILCON Recovery Act PV projects we that reviewed were exempt from normal processes that require preparation of DD Form 1391s, cost estimates, and other supporting documentation, specifically because the Recovery Act provided supplemental funding with unique purposes and goals. CNIC officials explained that for the Recovery Act, DoD goals focused on stimulating the economy, creating jobs, and improving energy efficiency, and NFESC officials stated that cost-effectiveness was a requirement only for Recovery Act ECIP projects, not the FSRM and MILCON PV projects that we reviewed. Therefore, officials concluded cost-effectiveness was not intended to be a necessary consideration for the FSRM and MILCON energy projects we reviewed. However, the Office of Management and Budget issued guidance in February 2009 stating that the Recovery Act does not waive existing requirements. Therefore, the Recovery Act did not waive requirements for energy projects to be cost-effective.

The Department of the Navy Could Recover Up to $3.34 Million by Obtaining Utility Rebates

For the two projects in California that we reviewed, the Department of the Navy may be able to recover approximately $3.34 million by obtaining rebates. Three utility companies participate in the California Solar Initiative (CSI) program, which offers rebates for customers who implement solar energy systems. Because the amount of the rebates decreases as more customers claim them, it is more beneficial for customers to claim the rebates as soon as possible. Additionally, Navy and Marine Corps officials stated that the CSI rebates were limited to one megawatt per installation.

The Department of the Navy may be able to recover approximately $3.34 million by obtaining rebates.

NAVFAC Southwest officials included CSI rebates on six of the nine LCCAs prepared in June 2010 for Project RM09-1440 at Navy installations in California. However, in October 2010, NAVFAC Southwest officials acknowledged that they had not applied for CSI rebates because they thought saving these rebates, which are restricted to one megawatt per installation, for future projects would provide a better benefit to the Government. However, because the CSI rebates decrease over time, the rebates may be worth less or the CSI rebate program may end before installations execute future projects. In October 2010, NAVFAC Southwest officials agreed to apply for the CSI rebates for Project RM09-1440, which could recover up to $2.17 million.

In January 2011, NAVFAC Southwest officials stated that they submitted CSI rebate applications for one of the eligible project sites, Naval Weapons Station Seal Beach. However, officials later stated that the applications were rejected because the systems did not meet CSI metering and monitoring requirements. An amendment to the request for proposal for the PV systems at Naval Weapons Station Seal Beach stated that NAVFAC would not pursue rebates, which explains why the systems did not meet CSI requirements.

As of August 2011, only one of the participating utility companies, which includes Naval Weapons Station Seal Beach and Naval Base Ventura County, had funding for rebates for non-residential customers. According to NAVFAC Southwest officials, these sites will not be eligible for rebates unless they spend additional funds on meters and monitoring contracts. NAVFAC Southwest officials should determine the life-cycle cost effectiveness of implementing meters and monitoring contracts and then develop and implement a plan to acquire meters, monitoring contracts, and rebates for systems where rebate funds are available and the economic return of the rebate exceeds the cost of the system upgrades.

Project P856-M at Camp Pendleton was completed in January 2011. However, officials stated that the installation has reached its one megawatt limit and will not receive a CSI rebate unless they can negotiate an expansion of the CSI rebate program specifically for Camp Pendleton. Camp Pendleton officials applied for a CSI rebate and are negotiating

expansion of the rebate program. If Camp Pendleton receives an expansion of the rebate and the rebate program is reinstated, it could recover up to $1.17 million.

We were unable to identify Navy or Marine Corps policies pertaining to financial incentive programs[13] for energy projects such as the CSI rebate. A NAVFAC Southwest official confirmed that there were no Navy policies or guidance related to financial incentive programs. Navy and Marine Corps energy policies should include responsibilities for securing incentives, such as CSI rebates, for energy projects and provide guidelines for claiming these incentives. Energy policies should also require responsible officials to claim incentives for energy projects or to document their justification for saving incentives for future projects.

The Department of the Navy Is Taking Actions to Improve the Energy Program

The Department of the Navy is taking positive steps to improve its energy program. The Department of the Navy, including the Navy and Marine Corps, has established new offices to centralize and coordinate energy efforts. Additionally, the Navy issued guidance related to energy projects and implemented a new project selection tool.

Centralization and Coordination of the Energy Program

The Department of the Navy, to include the Navy and Marine Corps, has centralized the energy programs under new offices throughout their organizations. The Department of the Navy created the office of the Deputy Assistant Secretary of the Navy for Energy under the Assistant Secretary of the Navy (Energy, Installations and Environment) to lead the coordination of the energy program and advocate for funding and resources on energy initiatives for the Navy and Marine Corps. The Deputy Assistant Secretary of the Navy for Energy will also develop energy policy and guidance for the Department of the Navy.

The Navy separated the CNO N46 office and the CNIC office, thereby separating the previously-combined requirements generation and approval responsibilities. Additionally, NAVFAC established the NAVFAC Energy Office to centralize and integrate all energy needs within NAVFAC. Additionally, in October 2009, the Marine Corps established the Expeditionary Energy Office to analyze, develop, and direct the Marine Corps energy strategy to improve its expeditionary capabilities and to meet the Secretary of the Navy's goals and all other energy goals.

Navy Has Issued Updated Policy and Implemented a New Project Selection Tool for Energy Projects

The Navy has taken additional steps to issue updated policy and implement a project selection tool related to energy projects. CNO N46 is drafting an updated version of the Office of the Chief Naval Operations Instruction 4100.5E, "Energy and Water

[13] Marine Corps Order P11000.9C encourages activities to apply for and accept approved incentives, but does not include responsibilities or procedures for handling incentive programs.

Management." NAVFAC also issued Engineering and Construction Bulletin 2011-01 on December 20, 2010, which established energy and sustainability standards for new building construction and building renovation projects. It requires LCCAs to adhere to Handbook 135 and states that, per Executive Order 13423, renewable energy generation projects shall be implemented when life-cycle cost-effective.

Navy officials also explained that CNIC, in coordination with CNO N46 and the NAVFAC Energy Office, will be using a new project selection tool called Energy-Return on Investment (e-ROI). The e-ROI tool uses weighted average analysis of elements, such as contribution toward renewable energy goals and providing backup power to critical facilities, to rank O&M shore energy projects and facilitate their selection. Although agencies should consider these relevant factors when selecting energy projects, they do not negate existing Federal and DoD regulations that require all energy projects to be life-cycle cost-effective. Therefore, CNO N46 should review the e-ROI tool to ensure it adheres to life-cycle cost-effectiveness requirements in legislation and Federal and DoD criteria for energy projects.

We commend the Department of the Navy, as well as the Navy and Marine Corps, for taking action to improve their energy efforts. The centralization of the energy programs in the Navy and Marine Corps and at the Department of the Navy level and the additional guidance related to energy projects are positive steps toward improving the Department of the Navy energy program.

Conclusion

The legislation that establishes energy goals includes clear requirements that energy projects be life-cycle cost-effective. While shortened time frames for executing Recovery Act funds hindered the typical processes for selecting and planning energy projects, the Recovery Act required officials to ensure the prudent use of Recovery Act funds. Additionally, according to Federal legislation and DoD policy, an energy project is a justified investment only if it is cost-effective.

Navy and Marine Corps officials did not select and plan PV projects that were justified. As a result, the Department of the Navy invested $50.8 million in Recovery Act funds for three PV projects, but will only recover about $25.8 million. However, Navy and Marine Corps officials lacked the tools to help ensure that the projects they selected and planned were good investments. Specifically, at the time of the Recovery Act, the Navy and Marine Corps had policies and procedures in place for selecting and planning energy projects, but the policies did not address selection and planning of FSRM and MILCON energy projects, such as the PV projects we reviewed. In addition, the definition of an energy project included in Navy guidance contradicted the definition in DoD policy. The policies also did not establish standard processes for performing and documenting life-cycle cost analyses, which are critical for project planning and determining the cost-effectiveness of a project. As a result, we identified that Navy and Marine Corps officials overstated project savings in life-cycle cost analyses by about $9.1 million. Overstating project savings may result in decisions to fund future energy projects that are not cost-effective.

Additionally, the Department of the Navy did not have an energy strategy or implementation plan as the foundation for achieving Federal and legislative energy goals at the time of the Recovery Act. Energy strategies and implementation plans that provide guidelines on aligning resources and specific tasks and responsibilities to achieve energy goals may help to guide Navy and Marine Corps officials to select more cost-effective projects in the future.

Despite the deficiencies in energy strategies and policies, Navy and Marine Corps officials within CNIC, NAVFAC, and DC(I&L) involved with selecting Recovery Act projects were responsible for ensuring prudent use of Recovery Act funds. Proper planning for Recovery Act projects may have ensured that officials selecting projects had all necessary information to select projects that were cost-effective and contributed the most toward meeting legislative energy goals. Instead, officials responsible for project selection did not require project justifications, life-cycle cost analyses, or economic analyses for selected energy projects. Further, officials acknowledged that the PV projects selected were not cost-effective. These project decisions contradicted Recovery Act guidelines, as well as Federal and DoD energy policies, and the Department of the Navy officials involved with project selection and planning should be held accountable for their decisions.

The Department of the Navy has taken steps to improve its energy programs by restructuring its organization, writing strategies and draft policies, and implementing new project selection tools. Our recommendations should complement these improvements and enable officials to invest in projects that contribute toward energy goals cost-effectively.

Management Comments on the Finding and Our Response

Summaries of management comments on the finding and our responses are in Appendix F.

Recommendations, Management Comments, and Our Response

Revised and Redirected Recommendations

As a result of management comments, we revised draft Recommendation 5 to consider the additional costs necessary to obtain California Solar Initiative rebates. We revised and consolidated draft Recommendations 7 and 8, and we redirected the new Recommendation 7 to include the Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment; the Principal Deputy Under Secretary of Defense (Comptroller); and the Deputy Under Secretary of Defense (Installations and Environment).

1. We recommend that the Deputy Chief of Naval Operations, Fleet Readiness and Logistics, develop:

a. A comprehensive shore energy strategy that outlines the energy program management structure and aligns resources with legislative energy goals; and

b. An implementation plan that identifies specific tasks, metrics, and responsibilities for meeting energy goals.

Department of the Navy Comments

The Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment responded on behalf of the Deputy Chief of Naval Operations, Fleet Readiness and Logistics. The Principal Deputy partially agreed, stating that the Department of the Navy is in the process of developing a comprehensive energy strategy that will include tasks, metrics, and responsibilities for achieving energy goals. The Principal Deputy also stated that the Department of the Navy recently established a Deputy Assistant Secretary of the Navy for Energy to align legislative energy goals with the Secretary of the Navy's energy goals. The Principal Deputy disagreed with the recommendation to align resources with legislative goals, stating that it was not within the purview of the DODIG to prioritize the use of Service funding.

Our Response

Although the Principal Deputy partially agreed with Recommendation 1.a., the comments are not responsive. As stated in our report, we recognize the steps that the Department of the Navy, the Navy, and the Marine Corps have taken to improve their energy programs, to include the development of an overall energy roadmap for the Department of the Navy. However, the Principal Deputy's comments only discussed actions at the Department of the Navy level. The "Department of the Navy's Energy Program for Security and Independence," October 1, 2010 states that energy planning, programming, and budgeting also need to occur at the component level. Within the Navy, the Chief of Naval Operations is responsible for all shore energy matters. As directed by the

Secretary of the Navy Memorandum "Department of the Navy's Energy Program for Security and Independence," October 1, 2010, the Chief of Naval Operations must develop strategic plans, baselines, and metrics to outline energy requirements, funding, profiles, and a critical path to achieve the Secretary of the Navy goals, which are aligned with and exceed the requirements of legislative energy goals.

We agree that it is not in our purview to prioritize the use of Service funds; however, that was not the intent of the recommendation. The intent of the recommendation was for the Chief of Naval Operations to develop a comprehensive energy strategy in response to the requirements already established by the Secretary of the Navy. This strategy and its implementation plan should outline the Navy's plan for allocating resources to meet energy goals. We request that the Deputy Chief of Naval Operations, Fleet Readiness and Logistics, provide comments in response to the final report regarding the development of a shore energy strategy and implementation plan for the Navy.

2. We recommend that the Deputy Assistant Secretary of the Navy for Energy, in coordination with the Deputy Chief of Naval Operations, Fleet Readiness and Logistics; the Commander, Navy Installations Command; the Director, Naval Facilities Engineering Command Energy Office; and the Assistant Deputy Commandant for Installations and Logistics (Facilities):

a. Establish a standard definition of a shore energy project that aligns with DoD policy; and

b. Incorporate the definition into Secretary of the Navy energy policy.

Department of the Navy Comments

The Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment responded on behalf of the Deputy Assistant Secretary of the Navy for Energy; the Deputy Chief of Naval Operations, Fleet Readiness and Logistics; the Commander, Navy Installations Command; the Director, Naval Facilities Engineering Command Energy Office; and the Assistant Deputy Commandant for Installations and Logistics (Facilities). The Principal Deputy agreed and stated that the Navy and Marine Corps have developed definitions for energy projects and the Deputy Assistant Secretary of the Navy for Energy will work with the appropriate Navy and Marine Corps offices to establish a common definition for the Department of the Navy.

Navy Comments

The Inspector General, Navy Installations Command, on behalf of the Commander, Navy Installations Command, agreed and stated that the Office of the Chief Naval Operations Instruction 4100.5E, "Navy Shore Energy Management," which is currently in the final draft phase, defines an energy project. Specifically, the Instruction defines an energy project as "a facility or utility system improvement, regardless of funding source, conceived and developed for the purpose of increasing energy or water efficiency, energy security, and sustainability for a facility or group of facilities."

Marine Corps Comments

The Acting Assistant Deputy Commandant for Installations and Logistics (Facilities) agreed and stated that the Assistant Deputy Commandant for Installations and Logistics (Facilities) will coordinate with the Deputy Assistant Secretary of the Navy for Energy.

Our Response

The comments from the Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment; the Inspector General, Navy Installations Command; and the Acting Assistant Deputy Commandant for Installations & Logistics (Facilities) are responsive. The actions meet the intent of the recommendation and no further comments are required.

3. We recommend that the Deputy Chief of Naval Operations, Fleet Readiness and Logistics, in coordination with the Commander, Navy Installations Command; and the Director, Naval Facilities Engineering Command Energy Office:

a. Develop comprehensive policy for planning, prioritizing, selecting, and executing cost-effective FSRM and MILCON shore energy projects in accordance with DoD and Federal requirements that includes:

1. Processes for performing and documenting life-cycle cost analyses;

2. Standardized methods for estimating project costs and energy savings during project planning; and

3. Responsibilities for obtaining incentives for energy projects, guidelines for claiming incentives, and justifications for saving incentives for future projects.

b. Integrate the policy into standard Navy processes for planning, prioritizing, selecting, and executing FSRM and MILCON energy projects.

Department of the Navy Comments

The Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment responded on behalf of the Deputy Chief of Naval Operations, Fleet Readiness and Logistics; the Commander, Navy Installations Command; and the Director, Naval Facilities Engineering Command Energy Office. The Principal Deputy agreed and reiterated the below comments provided by the Inspector General, Navy Installations Command.

Navy Comments

The Inspector General, Navy Installations Command, on behalf of the Commander, Navy Installations Command, agreed and stated that current Navy guidance and the draft Office of the Chief Naval Operations Instruction 4100.5E mandate the use of the e-ROI tool as

the standardized method for evaluating and prioritizing FSRM and MILCON energy projects. The Inspector General stated that the e-ROI tool includes standard formats for documenting LCCAs, project costs, energy savings, and incentives that are applicable to energy projects. The Inspector General stated that CNIC requires a DD Form 1391 for each project submittal. In addition, the Inspector General stated that Office of the Chief of Naval Operations Instruction 11010.20G, "Facilities Projects Instruction," October 14, 2005, and NAVFAC P-442, "Economic Analysis Handbook," October 1993 provide policy and guidance for performing cost estimates and economic analyses for energy and non-energy projects.

Regarding incentives, the Inspector General stated that the DoD Financial Management Regulation, Volume 12, Chapter 12 provides guidance for claiming incentives for energy projects. The Inspector General also stated that local procedures provide guidance for obtaining incentives, and the region or installation Resource Efficiency Manager is responsible for identifying and applying for incentives, as outlined in the scope of work for hiring those officials.

Regarding the integration of policy, the Inspector General also concurred and stated that the "CNIC N4 Project Development and Assessment Warning Order for Shore Program Objective Memorandum, Fiscal Years 2014-2018 (POM-14)" and Addendum 8 to that Memorandum publish the standard processes for planning, prioritizing, selecting, and executing FSRM and MILCON energy projects.

Our Response

Although the Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment and the Inspector General, Navy Installations Command, agreed with the recommendation, their comments are not responsive. The Inspector General, Navy Installations Command, cited numerous sources of policies and processes regarding energy projects, whereas the intent of the recommendation was for the Navy to consolidate policies and guidance for the energy program. We request that the Deputy Chief of Naval Operations, Fleet Readiness and Logistics, in coordination with the Commander, Navy Installations Command, and the Director, Naval Facilities Engineering Command Energy Office, provide comments in response to the final report to identify specific actions that will provide a comprehensive policy for planning, prioritizing, selecting, and executing shore energy projects.

We agree that the e-ROI tool provides a standard format for documenting life-cycle project costs and energy savings. However, it does not document the calculations the life-cycle cost analyst used to arrive at the costs and savings the analyst input into the e-ROI tool. In addition, current Navy guidance for e-ROI does not describe standardized processes for how to calculate the project costs and savings that comprise the LCCA. Our report highlighted the need for such standardized processes and documented support for calculations because of errors and inconsistencies we identified in LCCAs. In addition, while Office of the CNO Instruction 11010.20G and NAVFAC P-442 provide instructions for completing a DD Form 1391 and performing cost estimates and economic

analyses, these policies do not address how to calculate costs and savings that are unique to energy projects, such as electricity rates, system electricity production, rebate amounts, maintenance, and equipment replacement costs.

Regarding incentives, the DoD Financial Management Regulation, Volume 12, Chapter 12 discusses types of allowable energy incentives, how to account for energy savings, and procedures for using incentives within allowable time frames. However, the Financial Management Regulation does not describe procedures and responsibilities related to applying for the incentives or a requirement to justify saving the incentives for future projects. We also agree that the e-ROI tool provides a standard format for entering incentive amounts; however, during our audit, officials were unable to provide any local procedures regarding incentives. In addition, while a scope of work or position description may identify officials responsible for obtaining incentives, such a document does not constitute policy.

Finally, the "CNIC N4 Project Development and Assessment Warning Order for Shore Program Objective Memorandum, Fiscal Years 2014-2018 (POM-14)" provides guidance for submitting and prioritizing projects as part of DoD's two-year Planning, Programming, Budgeting, and Execution process. However, it is not a comprehensive policy that addresses all areas of planning, selecting, and executing energy projects.

4. We recommend that the Assistant Deputy Commandant for Installations and Logistics (Facilities):

a. Develop comprehensive policy for planning, prioritizing, selecting, and executing cost-effective FSRM and MILCON shore energy projects in accordance with DoD and Federal requirements that includes:

1. Processes for performing and documenting life-cycle cost analyses;

2. Standardized methods for estimating project costs and energy savings during project planning; and

3. Responsibilities for obtaining incentives for energy projects, guidelines for claiming incentives, and justifications for saving incentives for future projects; and

b. Integrate the policy into standard Marine Corps processes for planning, prioritizing, selecting, and executing FSRM and MILCON energy projects.

Department of the Navy Comments

The Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment agreed and reiterated the below comments provided by the Acting Assistant Deputy Commandant for Installations and Logistics (Facilities).

Marine Corps Comments

The Acting Assistant Deputy Commandant for Installations and Logistics (Facilities) partially agreed with Recommendation 4.a., and agreed with Recommendation 4.b. The Acting Assistant Deputy Commandant stated that when selecting and planning Project P856-M, Marine Corps officials used information published by the Department of Energy and other reports assessing renewable energy opportunities within the Department of the Navy. The Acting Assistant Deputy Commandant stated that his office is currently revising Marine Corps Order P1100.9C to incorporate requirements for project planning documentation and to address requirements established in the "United States Marine Corps Expeditionary Energy Strategy and Implementation Plan." The Marine Corps will integrate the updated policies into processes for planning, prioritizing, selecting, and executing FSRM and MILCON energy projects.

Our Response

Although the Acting Assistant Deputy Commandant for Installations and Logistics (Facilities) did not fully agree, the comments are responsive and the actions meet the intent of the recommendations. No further comments are required.

5. We recommend that the Naval Facilities Engineering Command Southwest Utilities and Energy Manager:

> **a. Determine the life-cycle cost effectiveness of implementing meters and monitoring contracts to obtain California Solar Initiative rebates at each applicable site for Project RM09-1440, and**
>
> **b. Develop and implement a plan to acquire meters, monitoring contracts, and rebates for systems where rebate funds are available and the economic return of the rebate exceeds the cost of the system upgrades.**

Department of the Navy Comments

The Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment responded on behalf of the Naval Facilities Engineering Command Southwest Utilities and Energy Manager. The Principal Deputy agreed with the recommendation and stated that NAVFAC Southwest officials are assessing the economic value of pursuing California Solar Initiative rebates in light of current program conditions and will pursue rebates for the systems that promise a return over the cost of implementing program requirements. The Principal Deputy explained that two of the three California Solar Initiative program territories no longer have funding for non-residential systems, which means there is no assurance that any new applications in those territories will receive funding. In addition, the Principal Deputy stated that NAVFAC Southwest will need to invest an additional $160,000 for meters and third party monitoring systems, in order for the PV systems to meet the eligibility requirements to receive the incentives.

Our Response

The Principal Deputy's comments are partially responsive. We agree that NAVFAC Southwest officials should not invest additional funds for systems located in program territories that have no available CSI rebate funds. However, four of the PV systems that we reviewed are located at Naval Weapons Station Seal Beach and Naval Base Ventura County, which are in the Southern California Edison program territory. According to the CSI Web site, Southern California Edison still has CSI rebate funds available for non-residential customers. However, NAVFAC Southwest officials have not determined the cost-benefit of implementing meters and monitoring contracts at Naval Weapons Station Seal Beach and Naval Base Ventura County in exchange for available CSI rebates. Using costs for meters and monitoring contracts provided by NAVFAC Southwest officials,[14] we calculated that NAVFAC Southwest could save between $505,759 and $791,580[15] by obtaining rebates for the four PV systems at Naval Weapons Station Seal Beach and Naval Base Ventura County.

Although two CSI program territories stopped providing rebates for Government systems, NAVFAC Southwest officials should have requested the rebates when the projects were completed and should have considered the rebate eligibility requirements during project planning. These situations serve as an example and emphasize the need for the Navy to develop and establish policy that addresses responsibilities and procedures for obtaining incentives, as discussed in Recommendation 3.a.

The PV projects at Navy installations in California were completed between February and June 2010; however, as stated in our report, NAVFAC Southwest officials decided that saving these rebates for future projects would provide a better benefit to the Government. Applying for the rebates when the projects were completed and the rebates were still available could have allowed the Government to potentially recover $2.17 million of the investment cost.

We understand that the PV systems need to meet specific requirements to be eligible to receive the incentives, such as alternate metering and third-party monitoring; however, NAVFAC Southwest officials should have been aware of these requirements during the planning phase of Project RM09-1440 and included them as contract requirements. Even though the PV systems would not meet the requirements needed to be eligible to receive the rebates, NAVFAC Southwest officials included utility rebates on the LCCAs for six of the nine project locations.

We request that the Navy provide comments to the final report in response to our revised recommendation. Specifically, NAVFAC Southwest officials should complete life-cycle cost analyses related to acquiring rebates as soon as possible, especially for projects in

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[14] We did not verify the accuracy of the metering and monitoring contract costs provided by NAVFAC Southwest officials.

[15] The savings will depend on the CSI rebate step. The CSI program has ten steps, and rebates decrease as the program progresses through the steps. As of August 2011, the program was in step eight.

program territories that still have CSI rebate funding available for non-residential projects. In addition, NAVFAC Southwest officials should develop and implement a plan to immediately pursue available rebates in situations where additional system investments and spending will be offset by the amount of the rebate.

6. We recommend that the Director, Shore Readiness Division (N46), Office of the Chief of Naval Operations, Fleet Readiness and Logistics, in coordination with Commander, Navy Installations Command, review the e-ROI tool to ensure it adheres to life-cycle cost-effectiveness requirements in legislation and Federal and DoD criteria for energy projects. If the tool does not adhere to these requirements, we recommend that the Director, Shore Readiness Division, modify e-ROI so that only projects that are life-cycle cost-effective receive funding.

Department of the Navy Comments

The Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment responded on behalf of the Director, Shore Readiness Division (N46), Office of the Chief of Naval Operations, Fleet Readiness and Logistics; and the Commander, Navy Installations Command. The Principal Deputy agreed and stated that the e-ROI tool complies with Federal Energy Management Program life-cycle costing methods and procedures set forth in 10 Code of Federal Regulations 436, subpart A, "Methodology and Procedures for Life-Cycle Cost Analyses," November 20, 1990. Further, the Principal Deputy stated that only projects that are life-cycle cost-effective receive funding.

Navy Comments

The Inspector General, Navy Installations Command, on behalf of the Commander, Navy Installations Command, agreed and stated that the financial benefit calculations within the e-ROI tool utilize a standard format mandated by the Energy Policy Act of 1992 to assess the long-term cost-effectiveness of submitted projects.

Our Response

Although officials agreed with the recommendation, their comments are not responsive. While the financial benefit calculations within the e-ROI tool may comply with Federal requirements, e-ROI only applies a weight factor of 39 percent to those financial benefits. Non-financial factors comprise 61 percent of the decision, and some of these factors are scored using a subjective rating scale. While non-financial factors are important considerations in the project selection process, we agree with the Principal Deputy that only projects that are life-cycle cost-effective should receive funding. Thus, projects that are not life-cycle cost-effective should not be considered for funding, regardless of their non-financial attributes. The e-ROI tool should enable Navy officials to identify life-cycle cost effective projects and then make funding decisions on those projects considering financial and non-financial factors. The DoD Energy Manager's Handbook supports this position and states that cost effectiveness is the overriding criteria behind Federal investments in energy efficiency. The Handbook also states that an installation is not required to meet energy-reduction goals if it cannot do so cost-effectively.

We request that the Director, Shore Readiness Division (N46), Office of the Chief of Naval Operations, Fleet Readiness and Logistics, and the Commander, Navy Installations Command, provide comments in response to the final report identifying specific actions to ensure that the use of the e-ROI tool will only permit projects with at least a 1.0 savings-to-investment ratio to be funded, which is in accordance with energy legislation and policies.

7. We recommend that the Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment; the Principal Deputy Under Secretary of Defense (Comptroller); the Deputy Under Secretary of Defense (Installations and Environment); the Deputy Chief of Naval Operations, Fleet Readiness and Logistics; and the Assistant Deputy Commandant for Installations and Logistics (Facilities):

a. Review the actions of officials responsible for planning and selecting PV projects that were not cost-effective, which resulted in Recovery Act funds not recovered; and

b. Based on that review, determine whether any administrative actions are necessary.

Department of the Navy Comments

The Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment responded on behalf of the Deputy Chief of Naval Operations, Fleet Readiness and Logistics, and the Assistant Deputy Commandant for Installations and Logistics (Facilities). The Principal Deputy disagreed with our conclusion that Recovery Act energy projects had to be cost-effective[16] and, as a result, also disagreed with the original recommendations for the Navy and Marine Corps to conduct an administrative review to identify individuals who disregarded project planning requirements and selected projects that were not cost-effective. The Principal Deputy stated that Navy and Marine Corps staff developed and submitted valid projects consistent with the guidance and time constraints they were given. The Principal Deputy stated that pursuing administrative action against individuals at lower levels in the chain of command would be misguided, unproductive, and unfair when there is disagreement over whether the projects had to be cost-effective.

Marine Corps Comments

The Acting Assistant Deputy Commandant for Installations and Logistics (Facilities) disagreed with the recommendation, stating that Marine Corps officials selected Project P856-M in accordance with Federal legislation, DoD policy, and life-cycle cost analysis

[16] See Appendix F, page 58 for a summary of the Department of the Navy's comments on the finding and our response.

guidance. The Acting Assistant Deputy Commandant stated that the effort by Camp Pendleton officials contributes to the achievement of Federally mandated renewable energy goals and demonstrates excellence in managing limited resources.

Our Response

The comments are not responsive. This report clearly outlines the legislation, Executive Orders, and Federal and DoD policies that require energy projects to be cost-effective. The comments from the Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment and the Acting Assistant Deputy Commandant for Installations and Logistics (Facilities) do not provide evidence to the contrary. Therefore, we maintain our position that Navy and Marine Corps officials did not properly plan and select Recovery Act PV projects and that $25.1 million of the $50.8 million investment cost of the systems will not be recovered.

We also disagree that Navy and Marine Corps staff developed and submitted valid projects consistent with the guidance and time constraints they were given. During our interviews with officials from DoD, Department of the Navy, Navy, and Marine Corps organizations (see Appendix A for the listing of these), officials were only able to provide one document which they relied upon as direction for selecting Recovery Act projects. This document was a memorandum issued on February 23, 2009 by the Principal Deputy Under Secretary of Defense (Comptroller) and the Deputy Under Secretary of Defense (Installations and Environment). This memorandum directed the Services to comply with the Recovery Act and Office of Management and Budget Memorandum M-09-10 when selecting projects. Office of Management and Budget Memorandum M-09-10, "Initial Implementing Guidance for the American Recovery and Reinvestment Act of 2009," February 18, 2009, stated that the Recovery Act does not automatically provide Federal agencies with a waiver of existing legislative or administrative requirements. Therefore, Navy and Marine Corps officials did not adhere to the guidance they were provided when they selected energy projects for the Recovery Act.

Since Navy and Marine Corps officials did not comply with Recovery Act project selection instructions and energy legislation and policies, we believe administrative reviews are necessary and will improve the integrity of the energy program's control environment. According to Government Accountability Office publication, "Standards for Internal Control in the Federal Government," November 1999, management is responsible for good internal control and a positive control environment is the foundation for all other control standards. In addition, we believe that administrative reviews are in line with Recovery Act requirements of transparency and accountability. By performing administrative reviews and initiating appropriate administrative actions, Navy and Marine Corps management will improve the control environment of the energy program by showing that deviation from legislative requirements for cost-effectiveness is not an acceptable practice. Without such reviews, management risks sending the message that it agrees with selecting and implementing energy projects that are not cost-effective, which is contrary to the legislation and Executive Orders governing the energy program. Based

on the Government Accountability Office's internal control standards, failing to hold personnel accountable may encourage Navy and Marine Corps officials to select future energy projects that are not cost-effective.

Based on management comments and a subsequent meeting, we revised and consolidated our original recommendations. We request that the Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment; the Principal Deputy Under Secretary of Defense (Comptroller); the Deputy Under Secretary of Defense (Installations and Environment); the Deputy Chief of Naval Operations, Fleet Readiness and Logistics, and the Assistant Deputy Commandant for Installations and Logistics (Facilities) provide comments in response to the final report on this new recommendation regarding the need for administrative reviews.

Appendix A. Scope and Methodology

We conducted this performance audit from November 2009 through August 2011 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.

Our audit scope encompasses Recovery Act Projects RM09-1440, RM09-1363, and P856-M. We reviewed documentation including the official contract files, DD Form 1391s, cost estimates, economic analyses, and life-cycle cost analyses, as well as contractor proposals and cost data. We reviewed Federal, DoD, Navy, and Marine Corps policy and guidance related to construction and energy projects, and we compared this policy and guidance with our audit results. We also reviewed energy legislation, annual DoD and Department of the Navy energy reports, and energy strategy documents. We interviewed personnel from the following organizations:

- Office of the Under Secretary of Defense (Comptroller)
- Office of the Deputy Under Secretary of Defense for Installations and Environment
- Office of the Assistant Secretary of the Navy (Energy, Installations, and Environment)
- Office of the Deputy Assistant Secretary of the Navy for Energy
- Office of the Deputy Chief of Naval Operations for Fleet Readiness and Logistics
- Headquarters, United States Marine Corps, Deputy Commandant for Installations and Logistics
- Marine Corps Expeditionary Energy Office
- Commander, Navy Installations Command
- Navy Facilities Engineering Command (Operations and Energy Offices)
- Navy Facilities Engineering Command Engineering Service Center
- NAVFAC Southwest
- NAVFAC Hawaii
- Camp Pendleton Energy Office

Use of Computer-Processed Data

We relied on computer-processed data to determine whether Navy and Marine Corps officials accurately completed LCCAs for their projects and to perform our own LCCAs. We obtained or calculated the following information for LCCAs:

- PV project costs (excluding roof replacements);
- Government supervision, inspection, and overhead cost;
- PV system residual value;
- Inverter replacement year and associated costs;

- Site electricity costs;
- PV system electricity generation;
- Utility rebate amounts;
- Maintenance costs;
- Discount rates, inflation rates, and energy-escalation rates; and
- LCCA study periods.

We concluded that the data we used were sufficiently reliable by performing direct data tests using information from the following sources:

- Contracts and modifications (some were obtained from Electronic Document Access);
- Requests for proposal;
- Contractor price schedules;
- Contractor technical proposals;
- Business clearance memoranda;
- Navy and Marine Corps LCCAs;
- Spreadsheets of contractor prices, roof sizes, electricity rates, rebates, and other documentation from Navy and Marine Corps officials;
- Roof condition data from the Facilities Condition Assessment Program; and
- PV system technical data and various cost data published on Federal Web sites (e.g., Department of Energy and the National Renewable Energy Laboratory) and non-Federal Web sites (e.g., utility companies and the California Solar Initiative).

One example of a direct data test we performed was verifying that the amount of PV electricity production stated in contractor technical proposals was reasonable. We did this by calculating the efficiency of PV systems. PV system efficiency is the electricity production of the system divided by the product of the project site's solar radiance,[17] the size of the PV system, and the number of days in a year. We gathered the information needed to calculate PV system efficiency from contracts, contractor technical proposals, business clearance memoranda, and Federal and non-Federal Web sites. For 11 of 12 project sites, we calculated that PV systems were, on average, about 69 percent efficient. Because the system efficiency of all but 1 project site were very close to the average, we concluded that the electricity production figures stated in 11 contractor technical proposals were reliable to use for LCCAs. The electricity production figures from one contractor proposal showed that the PV systems on two buildings were more than 100 percent efficient, whereas the other three buildings at the project site were around 69 percent efficient. We concluded that we could rely upon the contractor technical proposal's electricity production at those three buildings, and we adjusted the electricity production of the other two buildings before developing LCCAs.

[17] Solar radiance is an estimate of the number of hours of sunlight per day that a PV panel may be able to collect. The National Renewable Energy Laboratory developed a map that shows solar radiance values for the United States.

Use of Technical Assistance

Before selecting DoD Recovery Act projects for audit, personnel in the Quantitative Methods and Analysis Division of the DoD Office of Inspector General analyzed all DoD agency-funded projects, locations, and contracting oversight organizations to assess the risk of waste, fraud, and abuse associated with each. Quantitative Methods and Analysis Division personnel selected most audit projects and locations using a modified Delphi technique, which allowed them to quantify the risk based on expert auditor judgment and other quantitatively developed risk indicators. Quantitative Methods and Analysis Division personnel selected 83 projects with the highest risk rankings.

Quantitative Methods and Analysis Division personnel did not use classical statistical sampling techniques that would permit generalizing results to the total population because there were too many potential variables with unknown parameters at the beginning of this analysis. The predictive analytic techniques employed provided a basis for logical coverage not only of Recovery Act dollars being expended, but also of types of projects and types of locations across the Military Services, Defense agencies, National Guard units, and public works projects managed by the U.S. Army Corps of Engineers.

Prior Coverage

The Government Accountability Office (GAO), the Department of Defense Inspector General (DoD IG), and the Military Departments have issued reports and memoranda discussing DoD projects funded by the Recovery Act. You can access unrestricted reports at http://www.recovery.gov/accountability. In addition, during the last 5 years, GAO has issued two reports discussing DoD's progress toward legislative energy goals. Unrestricted GAO reports can be accessed over the Internet at http://www.gao.gov.

GAO

GAO Report No. GAO-10-104, "DoD Needs to Take Actions to Address Challenges in Meeting Federal Renewable Energy Goals," December 18, 2009

GAO Report No. GAO-10-22, "Federal Energy Management – Agencies are Taking Steps to Meet High-Performance Federal Building Requirements," October 30, 2009

Appendix B. Projects Reviewed

Project RM09-1440, PV Systems at Navy Installations in California

Project RM09-1440, completed in June 2010, installed photovoltaic roof systems at nine locations in California. To execute this project, NAVFAC Southwest personnel awarded nine task orders totaling $30.5 million to three contractors. Table B-1 shows the total contract cost, number of buildings, system size, and the annual electricity production output for the nine locations that received PV systems.

Table B-1. PV Systems at Navy installations in California

Location	Contract Cost	Number of Buildings	System Size (kilowatts)	Annual Electricity Production (megawatt hours)[1]
Naval Base Point Loma	$4,165,711	7	449.340	649.891
Naval Weapons Station Seal Beach	$2,359,127	2	258.720	370.830
Naval Base Coronado	$3,924,266	3	451.584	674.544
Naval Support Detachment Monterey	$2,617,100	3	181.440	262.587
Naval Base Ventura County	$4,877,000	2	588.000	859.067
Naval Air Facility El Centro	$2,971,027	5	201.600	325.406[2]
Naval Air Weapons Station China Lake	$4,147,127	3	453.600	741.043
Naval Air Station Lemoore	$2,866,076	5	213.375	314.040
Naval Base San Diego	$2,617,100	3	231.840	340.235
Total	**$30,544,534**	**33**	**3,029.499**	**4,537.643**

[1] This number is based on contractor proposals, and it shows estimated electricity production in the first year of operation.

[2] We adjusted this number because the estimate from the contractor proposal appeared to be overstated, based on the system size.

Project RM09-1363, PV Systems at Navy Installations in Hawaii

Project RM09-1363 will install photovoltaic systems on the rooftops of various facilities at Naval Station Pearl Harbor in Oahu, Hawaii, and at the Pacific Missile Range Facility in Kauai, Hawaii. To execute this project, NAVFAC Hawaii awarded two task orders totaling more than $22 million to two contractors. The project will be completed in July 2011. Table B-2 shows the total contract cost, number of buildings, system size, and the annual electricity production output for the two locations that received PV systems.

Table B-2. PV Systems at Navy Installations in Hawaii

Location	Contract Cost	Number of Buildings	System Size (kilowatts)	Annual Electricity Production (megawatt hours)[1]
Pacific Missile Range Facility	$6,791,916	10	787.8	1,182
Naval Station Pearl Harbor	$15,594,449[2]	5	2,470.0	3,460
Total	**$22,386,365**	**15**	**3,257.8**	**4,642**

[1]This number is based on contractor proposals, and it shows estimated electricity production in the first year of operation.

[2]This amount includes a contract modification for $365,894, which was not funded by the Recovery Act. We did not include this amount in our LCCA analysis.

Project P856-M, PV System at Marine Corps Base Camp Pendleton, California

Project P856-M, completed in January 2011, installed a photovoltaic facility on the Box Canyon inactive landfill at Marine Corps Base Camp Pendleton, California. NAVFAC Southwest awarded the contract for this project in December 2009 to Synergy Electric Company, Inc. for approximately $9.4 million.[1] According to the contractor's proposal, the system will be 1,480.5 kilowatts in size, and it will produce 2,270.473 megawatt hours of electricity in its first year of operation.

[1] NAVFAC Southwest subsequently issued a contract modification for $12,711. We did not include this amount in our LCCA analysis.

Appendix C. Life-Cycle Cost Analysis Errors and Calculations of Project Savings

We identified errors in the Navy and Marine Corps LCCAs for the three Recovery Act PV projects we reviewed. We also calculated project investment cost, which is the cost to implement the PV system[2] minus the residual value of the PV system after 20 years.[3] The investment cost of the three PV projects we reviewed was $50.8 million. This appendix presents additional information about LCCAs, our analysis, and how we calculated project savings. We rounded all dollar values to the nearest tens of thousands for consistency.

Factors to Consider in Preparing LCCAs

The DoD Unified Facilities Criteria 3-400-01 states that LCCAs should be prepared for energy projects. An LCCA is an economic method of project evaluation in which all costs arising from owning, operating, maintaining, and ultimately disposing of a project are considered potentially important to that decision. Handbook 135 states that the primary reason for an LCCA is to demonstrate that a project's operational savings are sufficient to justify its additional investment cost. For example, when energy projects increase the initial capital cost of a new building or when energy projects result in retrofit costs for an existing building, an LCCA can determine whether these projects are economically justified based on reduced energy costs and other factors over the project life.

LCCAs use a savings-to-investment ratio to describe the cost-effectiveness of a project. According to 10 Code of Federal Regulations sec. 436.18 (1996), energy projects, such as PV projects, are cost-effective if the savings-to-investment ratio is estimated to be greater than one, which generally means that the future energy costs saved by implementing the project exceed its investment costs. Handbook 135 outlines the factors officials must consider when preparing an LCCA. In general, these factors include the study period, initial investment costs, energy-related benefits, maintenance costs, equipment replacement costs, and residual value. These items are defined by Handbook 135.

- The study period is the time over which the costs and benefits related to a capital investment decision are of interest to the investor. The system life is an appropriate study period for most LCCAs of Federal energy projects.
- Initial investment costs are acquisition-related, including all costs related to planning, design, purchase, and construction.

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[2] The cost to implement the PV system includes Government supervision, inspection, and overhead.

[3] Handbook 135 states that the study period for a life-cycle cost analysis generally is the system service life. We analyzed the costs and benefits of implementing PV systems over a 20-year period because each system had at least a 20-year warranty.

- The energy-related benefits of a project include its annual energy savings and corresponding reduction in utility bills. Energy-related benefits may also include utility rebates obtained through rebate programs.
- Maintenance costs include recurring costs to ensure the system operates correctly for as long as possible.
- Equipment replacement costs are for replacing system components having a useful life shorter than that of the study period.
- Residual value exists when a system's expected life exceeds the life of the study period.

Handbook 135 also requires officials to consider discount rates, inflation, and energy escalation rates for LCCAs. These factors are built into the National Institute for Standards and Technology Building Life-Cycle Cost computer program, which we used to perform LCCAs and calculate savings-to-investment ratios.

Navy and Marine Corps LCCAs

Navy and Marine Corps officials prepared LCCAs for each of the 12 project sites at different stages of project completion. However, only officials at Camp Pendleton prepared an LCCA before Navy and Marine Corps officials selected Recovery Act projects. Additionally, based on the documentation we received, officials did not prepare LCCAs for project RM09-1363 in Hawaii or Project RM09-1440 in California until after the requests for proposals were solicited.[4]

Comprehensive Example of LCCA Errors and Corrected Calculations for One Site in California

We reviewed the LCCAs for the 12 project sites and identified errors related to initial investment costs, energy benefits, utility rebates, maintenance costs, equipment replacement costs, and residual value. To more thoroughly demonstrate the errors we identified, our corrections to the calculations, and the overall impact on the project savings, we provided a comprehensive example of LCCA errors for one project site in California. To avoid identifying the project site directly, we will simply refer to it as "the site" for this example. Our discussion will address each LCCA factor outlined in Handbook 135.

NAVFAC Southwest officials prepared an LCCA for one site for Project RM09-1440. The LCCA for the site showed a 1.32 savings-to-investment ratio and estimated monetary benefits of $0.96 million over a 20-year study period. We calculated that the errors on the LCCA for the site overstated project savings by $2.65 million. We estimated that the savings-to-investment ratio for the site was 0.45 and that $1.68 million of the investment

[4] The business clearance memoranda we obtained for Project RM09-1440 included savings-to-investment ratios. This indicates that LCCAs were likely performed before the contract award; however, we were unable to obtain detailed calculations or explanations of the costs and savings used to support the savings-to-investment ratios in the business clearance memoranda.

costs would not be recovered during the 20-year study period. We completed our calculations using the Building Life-Cycle Cost program as required by the Unified Facilities Criteria 3-400-01.

Study Period. Navy officials used a 20-year study period for the LCCA for the PV project at the site. We agreed that this study period was appropriate because all of the PV systems we reviewed obtained at least a 20-year warranty on PV panels. In addition, although the projects we reviewed were not part of ECIP, the DoD policy for ECIP renewable energy projects, such as PV projects, states that the study period should be 20 years.

Initial Investment Costs. In this report, the term "initial investment costs" differs from the term "investment costs." Specifically, initial investment costs include contract costs for the PV system and Government supervision, inspection, and overhead. In contrast, investment costs include the initial investment costs but subtract the residual value remaining for PV systems with a warranty that exceeds the 20-year study period.

Navy officials should have included an additional $90,000 of initial investment costs on the LCCA they prepared for the site. The understatement of initial investment costs occurred because of two errors. First, Navy officials did not accurately account for roof replacement costs. Based on contractor cost data we obtained, Navy officials should have excluded from the initial investment costs $50,000 more in roof replacement costs. Second, Navy officials estimated their supervision, inspection, and overhead rate at 4 percent even though Office of the Chief of Naval Operations Instruction 11010.20G, "Facilities Projects Instruction," October 14, 2005, requires a supervision, inspection, and overhead rate of 8 percent. Navy officials were unable to provide documentation to justify the use of a lower supervision, inspection, and overhead rate on their LCCA. Had Navy officials used the correct rate, the LCCA would have included an additional $0.14 million for supervision, inspection, and overhead costs. Table C-1 shows the initial investment costs Navy officials used on their LCCA for the site and our adjustments to the contract costs and supervision, inspection, and overhead costs.

Table C-1. Navy LCCA Errors for Initial Investment Costs for the Site

Initial Investment Cost Items	Amount from Navy LCCA (millions)	Auditor Adjustment (millions)	Amount Used in the LCCA Performed by DoD OIG Auditors (millions)
Contract Costs for Implementing PV System	$ 3.56	-$ 0.05	$ 3.51
Supervision, Inspection, and Overhead	0.14	+ 0.14	0.28
Totals	**$ 3.70**	**+$ 0.09**	**$ 3.79**

Utility Costs Reduced by Operating PV Systems. The PV systems we reviewed produce electricity and will, therefore, reduce Department of Navy utility costs for electricity. The reduction of utility costs depends on the amount of electricity each PV system generates and the corresponding utility cost for electricity at each project site. For example, if a PV system generates 1,000 megawatt-hours of electricity during a year, and the cost of electricity is $100 per megawatt-hour, then the PV system will reduce electricity costs for that site by $100,000 during that year. Discount factors, which convert amounts of money realized in the future into their present-value equivalent, must also be applied to account for the time-value of money. Since our LCCAs account for costs and savings over a 20-year period, it appears that utility savings over the duration of the LCCA would be $2 million ($100,000 times 20 years). However, the $2 million in future savings does not account for the time-value of money because a dollar can buy more now than it will 10 years from now. Therefore, we must apply a discount rate to calculate the current value of future savings.

We calculated that Navy officials overstated utility cost savings on the LCCA by $1.92 million. First, Navy officials did not account for degradation in performance as the PV system ages. The contractor's technical proposal included the total amount of electricity the system should produce over 25 years, which indicated that the system would produce less electricity as it aged. However, for all 20 years of their LCCAs, Navy officials used higher electricity production figures than those on the contractor's proposal for the first year. As a result, Navy officials overstated the amount of electricity the system would generate over 20 years by 1,551 megawatt-hours. Second, Navy officials overstated the cost of electricity for the site at $260 per megawatt-hour. We determined that the actual cost was approximately $117 per megawatt-hour. When we asked about this discrepancy, Navy officials acknowledged that they had incorrectly calculated utility rates. In addition, while not an error, it is important to note that DoD and the National Institute for Standards and Technology use slightly different discount factors for LCCAs. According to Handbook 135, either source's discount factors are valid for performing LCCAs. We used discount factors published by the National Institute for Standards and Technology because they are integrated into the Building Life-Cycle Cost computer program. Table C-2 shows the information Navy officials used to calculate reductions in utility costs by installing PV systems at the site and our adjustments.

Table C-2. Navy LCCA Errors for Calculating Reductions in Utility Costs at the Site

	Electricity Generated by PV System Over 20 Years (megawatt-hours)	Utility Cost for Electricity (dollars per megawatt-hour)	Discount Factor	Total Discounted Reduction in Utility Costs (millions)
Navy LCCA Calculations	17,740	$ 260	.726	**$ 3.35**
Auditor Adjustments	-1,551	-$ 143		
DoDIG LCCA Calculation[1]	16,189	$ 117	.752	**$ 1.43**
Total Amount Overstated				**$ 1.92**

[1]This row does not calculate accurately because of rounding.

Utility Rebates. Some of the project sites in California were eligible for utility rebates under the CSI program. This program offered rebates to customers who implement solar energy systems. The amounts of the rebate varied depending on the energy generated by the system and decreased as more rebates were issued.

The PV system implemented at the site was eligible for a CSI utility rebate of $0.59 million. Although Navy officials included a rebate on their LCCA for the site, and the project at that site was completed in February 2010, Navy officials have not applied for the rebate. Additionally, as of January 2011, the State of California temporarily suspended the rebate program. Therefore, we did not include utility rebates in our calculations of project savings.

Maintenance Costs. According to the winning contractor's technical proposal for the PV system at the site, the contractor will provide 1 year of free maintenance. However, the contractor's technical proposal also stated that after the first year, maintenance will cost $1,471 annually. Despite the information in the technical proposal, Navy officials included no maintenance costs in their LCCA for the site. We adjusted the Navy LCCA to include the discounted amount of $21,000 in maintenance costs.

Inverter Replacement Costs. Inverters convert direct current electricity into electricity used for facilities. According to Marine Corps officials, inverters typically last 10 years and may need replacing during the useful life of the PV system. Navy officials did not include inverter replacement costs in the 20-year LCCA for the site. However, since the Navy obtained a 20-year warranty on the inverters for this system, we agreed that not including inverter replacement costs on the LCCA for that site was appropriate. We did not make adjustments to the Navy LCCA for inverter replacement costs.

Residual Value of PV Systems. Some of the project sites we reviewed had warranties on the PV panels that exceeded the 20-year study period. For these project sites, it would be unfair to compare the energy benefits achieved by a PV system over 20 years with its complete contract cost because the PV system will likely generate additional benefits after the 20-year study period. In accordance with Handbook 135, we calculated a residual value for PV systems with warranties exceeding 20 years. The residual value ensures that energy benefits over 20 years are compared with contract costs applicable to those same 20 years. For example, if a system's contract cost was $10 million and it had a warranty for 25 years, we compared 80 percent (20-year study period divided by 25-year warranty) of the system's contract cost, or $8 million, with its energy benefits over 20 years. This would result in a residual value of 20 percent of the contract costs.

Navy officials should not have included $11,000 in the residual value on the LCCA for the site. Although Navy officials applied the correct residual value rate of 20 percent (because their system had a 25-year warranty), Navy officials based the residual value calculation on incorrect contract costs for implementing the PV system (see Table C-1 for corrected contract costs). We determined that the appropriate residual value for the PV system was $0.70 million, which is 20 percent of the $3.51 million contract cost.

Impact of LCCA Errors on the Project Savings of the Site. Our adjustments to the errors on the LCCA prepared by Navy officials for the PV project at the site showed the Navy will not recover an estimated $1.68 million of the investment costs for the PV system. The LCCA prepared by Navy officials for the PV system at the site showed that $0.96 million of monetary benefits would be achieved by implementing the project. Table C-3 is a summary of our adjustments to the costs and savings needed to prepare an accurate LCCA for the site and shows the total impact of LCCA errors on estimated project savings. As Table C-3 shows, the LCCA for the site originally showed the Navy would recover $0.96 million by implementing the PV system at the site. However, with the auditor adjustments, we calculated that the Navy would not recover more than $1.68 million.

Table C-3. Project Costs and Savings Resulting from Auditor Adjustments to Navy Errors on the LCCA for the Site

LCCA Cost or Savings Category	Project Costs and Savings from Navy LCCA (millions)	Auditor Adjustment (millions)	Project Costs and Savings From LCCAs with Auditor Adjustments (millions)[1]
Contract Costs for Implementing PV System	- $ 3.56	+ $ 0.05	- $ 3.51
Supervision, Inspection, and Overhead Cost	- $ 0.14	- $ 0.14	- $ 0.28
Residual Value	+ $ 0.71	- $ 0.01	+ $ 0.70
Total Investment Costs	**- $ 2.99**	**- $ 0.10**	**- $ 3.09**
Inverter Replacement Costs	- $ 0.00	$ 0.00	- $ 0.00
Maintenance Costs	- $ 0.00	- $ 0.02	- $ 0.02
Utility Savings	+ $ 3.34	- $ 1.92	+ $ 1.43
Utility Rebates	+ $ 0.61	- $ 0.61	+ $ 0.00
Future Costs and Savings	**+$ 3.95**	**-$ 2.55**	**+$ 1.41**
Total Costs Recovered or Not Recovered	**+$ 0.96**	**- $ 2.65**	**- $ 1.68**

[1]Some rows and columns do not sum accurately because of rounding.

Based on the adjusted initial investment costs and residual value, we determined that the "investment cost" of the PV system at the site was $3.09 million ($3.79 million initial investment minus $0.70 million residual value). We then calculated the cost-effectiveness of this project by subtracting the $1.41 million of costs estimated to be recovered by implementing this PV system (utility savings of $1.43 million minus $0.02 million in maintenance costs) from the $3.09 million investment cost. Using this calculation, we estimated that over $1.6 million of project investment costs would not be recovered ($3.09 million investment cost minus $1.41 million recovered).

Impact of Errors on Detailed LCCAs Prepared by Navy and Marine Corps Officials and Summary of Adjusted LCCAs

The table on page 15 details the overall results of the inaccuracies for all 12 project sites we reviewed. Table C-4 is a summary of the auditor adjustments to the costs and savings from Navy and Marine Corps LCCAs for the projects we reviewed.

Table C-4. Auditor Adjustments Made to Inaccurate Navy and Marine Corps LCCAs for Three PV Projects

	Project P856-M at Marine Corps Base Camp Pendleton[1]	Project RM09-1363 at 2 Naval Installations in Hawaii[1]	Project RM09-1440 at 9 Naval Installations in California[1]
Study Period From Navy and Marine Corps LCCAs	20 Years	20 Years	20 Years
Auditor Adjustments to the Study Period	None	None	None
Initial Investment Cost of the PV System From Navy and Marine Corps LCCAs	$ 10.96	$ 23.36	$ 22.08
Auditor Adjustments to the Initial Investment Cost of the PV System	-$ 0.66[2]	+$ 0.21	+$ 1.05
Utility Costs Reduced by PV System From Navy and Marine Corps LCCAs	$ 3.59	$ 16.70	$ 12.31
Auditor Adjustments to the Utility Costs Reduced by PV System	-$ 0.01	-$ 0.17	-$ 5.37
Utility Rebates From Navy and Marine Corps LCCAs	$ 1.14	$ 0.00	$ 2.54
Auditor Adjustments to Utility Rebates	-$ 1.14	None	-$ 2.54
Inverter Replacement Costs From Navy and Marine Corps LCCAs	$ 0.65	$ 0.00	$ 0.00
Auditor Adjustments to Inverter Replacement Costs	-$ 0.35	None	+$ 0.81
Estimated Maintenance Costs From Navy and Marine Corps LCCAs	$ 0.03	$ 0.00	$ 0.00
Auditor Adjustments to Estimated Maintenance Costs	-$ 0.01	+$ 0.08	+$ 0.13
Residual Value of PV System From Navy and Marine Corps LCCAs	$ 0.53	$ 0.00	$ 4.25
Auditor Adjustments to Residual Value of PV System	+$ 1.34	None	+$ 0.04

[1]Dollar values are in millions and are appropriately discounted.

[2]We did not consider this an error because the Camp Pendleton LCCA was completed before contract award and was based on a cost estimate. The adjustment, which improves project savings, is based on actual contract costs.

Auditor-Calculated Project Savings

Because Navy and Marine Corps LCCAs contained errors, we performed our own LCCAs using the Building Life-Cycle Cost program. We also determined project savings based on project investment costs and the total discounted savings for each project. For example, if a project had an investment cost of $5 million and discounted savings of $3 million, then the project was not cost-effective because the Navy would not recover $2 million of the investment costs. The investment cost was the amount to implement the PV system, including Government supervision, inspection, and overhead minus the residual value of the PV system at the end of the 20-year LCCA study period. Table C-5 shows our calculations of project savings and investment costs for each of the 12 project sites we audited.

Table C-5. Calculation of Project Savings and Investment Costs Not Recovered for the 12 PV Project Sites

Project Number	Project Site	Savings-to-Investment Ratio	Investment Cost (millions)	Estimated Project Savings (millions)	Estimated Investment Cost Not Recovered (millions)[1]
RM09 1363	Pacific Missile Range Facility, Kauai, Hawaii	0.94	$ 7.11	$ 6.68	$ 0.42
	Naval Station Pearl Harbor, Oahu, Hawaii	0.59	16.46	9.76	6.69
P856 M	Marine Corps Base Camp Pendleton, California	0.39	8.43	3.26	5.17
RM09 1440	Naval Air Weapons Station, China Lake, California	0.51	2.26	1.15	1.10
	Naval Base Ventura County, California	0.45	3.09	1.40	1.68
	Naval Weapons Station, Seal Beach, California	0.42	1.56	0.66	0.91
	Naval Post-Graduate School, Monterey, California	0.31	1.33	0.41	0.91
	Naval Air Facility, El Centro, California	0.30	1.86	0.55	1.31
	Naval Base San Diego, California	0.29	1.61	0.47	1.14
	Naval Base Coronado, California	0.27	2.61	0.72	1.89
	Naval Base Point Loma, California	0.24	2.97	0.71	2.26
	Naval Air Station Lemoore, California	-0.05[2]	1.55	0.00	1.55
Total[1]			$ 50.84	$ 25.78	$ 25.06

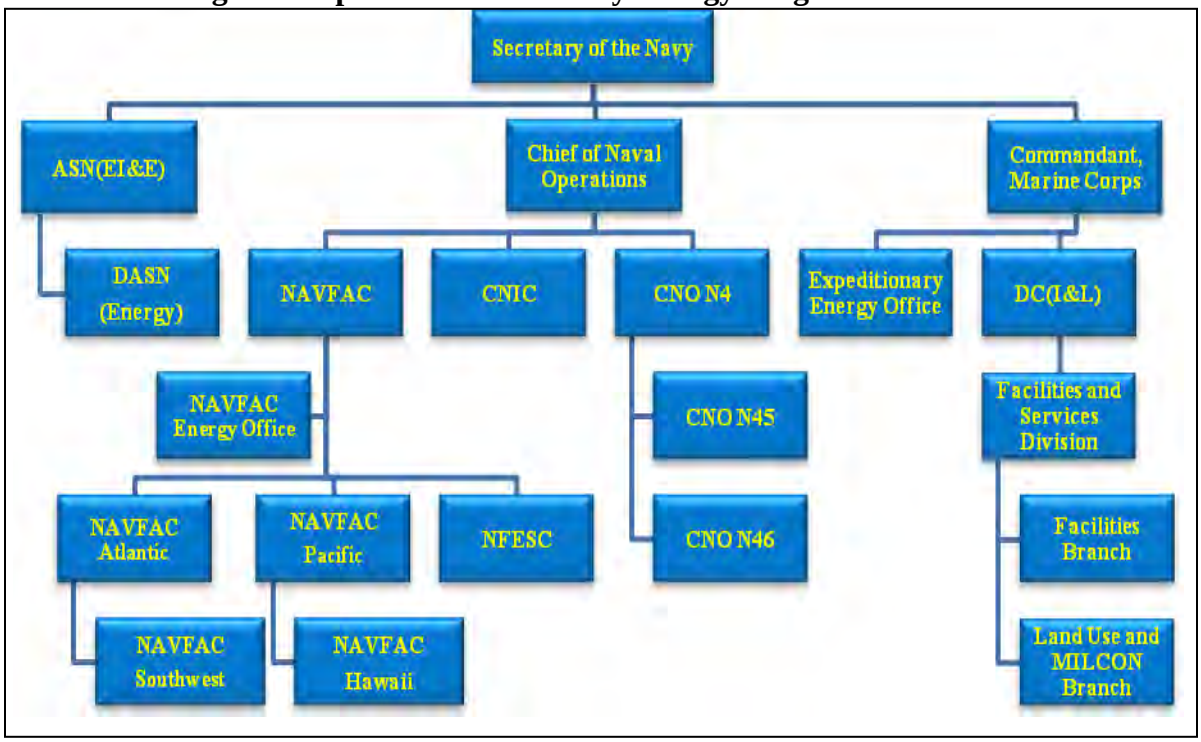
[1]Some columns and rows do not sum properly because of rounding.

[2]This savings-to-investment ratio is negative because of future costs for replacing inverters and performing maintenance. Because a negative savings-to-investment ratio would indicate that the Navy would not recover more than it has spent, we estimated that all investment costs for the PV system at Naval Air Station Lemoore will not be recovered.

Appendix D. Department of the Navy Energy Program Organization

The Department of the Navy is responsible for the Navy and Marine Corps energy programs. The Assistant Secretary of the Navy for Installations and Environment was the executive agent responsible for the Department of the Navy's energy program. In March 2010, the office was renamed the ASN(EI&E) because the Department of the Navy created the office of the Deputy Assistant Secretary of the Navy for Energy. The Deputy Assistant Secretary of the Navy for Energy is responsible for operational, expeditionary, and shore energy for the Navy and Marine Corps. The figure shows the structure of the energy programs within the Department of the Navy.

Figure. Department of the Navy Energy Program Structure



DASN (Energy) Deputy Assistant Secretary of the Navy for Energy

The Deputy Chief of Naval Operations, Fleet Readiness and Logistics (CNO N4) serves as the Navy's Executive Agent for energy and energy-related matters. The Shore Readiness Division (CNO N46) is responsible for the Navy's shore energy program, policies, and resourcing. CNO N46 works in coordination with CNIC and NAVFAC to plan and execute shore energy projects. CNIC proposes shore energy projects to CNO N46, which approves these projects and obtains funding resources. NAVFAC provides CNIC with technical support during the development of requirements and is responsible for executing the shore energy projects. NFESC develops standard energy business practices and provides program planning, execution, reporting, and financial management support to NAVFAC. In December 2009, NAVFAC established the NAVFAC Energy Office to serve as the energy program office for NAVFAC.

The Commandant, United States Marine Corps, is responsible for all shore energy matters, and in coordination with ASN(EI&E), plans, programs, budgets, and executes the Marine Corps shore energy management program. DC(I&L) is responsible for establishing installation energy and water management policy. In October 2009, the Commandant, United States Marine Corps, created the Expeditionary Energy Office to analyze, develop, and direct the Marine Corps' energy strategy.

Appendix E. Criteria for Selecting and Planning Renewable Energy Projects

Federal legislation and DoD and Department of the Navy policies provide criteria for the selection and planning of renewable energy projects. DoD issued additional guidance related to the Recovery Act project selection. This appendix provides additional details on these policies for cost-effectiveness.

Legislative and Federal Requirements

Federal legislation and DoD policy contain requirements for the cost-effectiveness of renewable energy projects. Section 8254(b) of the National Energy Conservation Policy Act of 1978 (amended) states that the application of energy conservation measures[1] to existing Federal buildings shall be made using life-cycle cost methods and procedures established by the Secretary of Energy. Section 2911 of the National Defense Authorization Act for 2007 requires energy conservation measures to demonstrate an economic return on investment.

Executive Order 13423, "Strengthening Federal Environmental, Energy, and Transportation Management," January 24, 2007, requires agencies to conduct energy activities in a "fiscally sound" manner. In establishing goals for the use of renewable energy, the Energy Policy Act of 2005 states that these measures should be "economically feasible." In January 2008, the Department of Energy published guidance on implementing the requirements in Executive Order 13423 and the Energy Policy Act of 2005. The guidance stated that, "where life-cycle cost-effective, each agency shall implement distributed generation systems in new construction or retrofit projects, including renewable systems such as solar electric."

10 Code of Federal Regulations 436, subpart A, "Methodology and Procedures for Life-Cycle Cost Analyses," November 20, 1990, establishes procedures for estimating and comparing the life-cycle cost-effectiveness of energy conservation measures in Federal buildings. Handbook 135 expands on the life-cycle cost methods and criteria published in 10 Code of Federal Regulations 436, subpart A.

The Recovery Act requires agencies to spend funds "consistent with prudent management," and Office of Management and Budget Memorandum M-09-10, "Initial Implementing Guidance for the American Recovery and Reinvestment Act of 2009," February 18, 2009, stated that the guidance did not provide Federal agencies with a waiver of existing legislative or administrative requirements.

[1] As defined in the National Energy Conservation Policy Act, energy conservation measures include renewable energy projects.

The Principal Deputy Under Secretary of Defense (Comptroller) and the Deputy Under Secretary of Defense (Installations and Environment) issued a memorandum on February 23, 2009, directing the Military Departments to submit project lists for Recovery Act funding. The memorandum stated that, when selecting projects, the Military Departments should comply with the execution requirements in the Recovery Act and Office of Management and Budget Memorandum M-09-10.

DoD and Department of the Navy Policies for Renewable Energy Projects

DoD Instruction 4170.11, "Installation Energy Management," December 11, 2009,[2] states that it is DoD policy to invest in cost-effective renewable energy sources. Specifically, the Instruction states that "renewable energy systems shall be considered when cost-effective through a life-cycle cost analysis," and DoD is committed to installing renewable energy technologies "when it is life-cycle cost-effective."

DoD Unified Facilities Criteria 3-400-01 establishes minimum standards and policy for energy conservation in new construction and renovation of existing facilities. The Unified Facilities Criteria states that "renewable energy shall be used in each design to the maximum extent that is life-cycle cost-effective," and it requires LCCAs to demonstrate that projects are cost-effective.

Secretary of the Navy Instruction 4100.9A, "Department of the Navy (DON) Shore Energy Management," October 1, 2001, also emphasizes the requirement for shore energy projects to be cost-effective. Specifically, the instruction states that projects should minimize energy consumption, minimize costs, and utilize renewable energy resources.

[2] The November 22, 2005, version of this policy, which was valid during Recovery Act project selection, contained the same requirements discussed in this paragraph.

Appendix F. Management Comments on the Finding and Our Response

The Acting Assistant Deputy Commandant for Installations and Logistics (Facilities) stated that DoD OIG findings were based on an incomplete interpretation of legislation and policies. In addition, the Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment disagreed with our conclusion that the Recovery Act energy projects reviewed had to be cost-effective. We maintain that our analysis and interpretation of legislation and policies, to include how we performed LCCAs, is accurate and appropriately presented in the report. The complete text of these comments can be found in the Management Comments section of this report.

Marine Corps Comments on Project Cost-Effectiveness

The Acting Assistant Deputy Commandant for Installations and Logistics (Facilities) stated that when selecting Recovery Act PV projects, Marine Corps officials considered monetary factors and other special considerations including impact to mission execution, real estate and encroachment issues, and environmental and cultural resource requirements. The Acting Assistant Deputy Commandant stated that the DoD OIG did not consider these non-monetary factors and incorrectly determined that the term "cost-effective" is limited to monetary considerations. The Acting Assistant Deputy Commandant cited section 2911, title 10, United States Code (10 U.S.C. § 2911) as a basis for considering non-monetary factors. The Acting Assistant Deputy Commandant also cited non-monetary benefits that are addressed in Handbook 135, specifically that, "if the decision-maker judges that the non-monetary benefits of a project are greater than the LCC [life cycle cost] penalty, the project can be accepted as cost effective." The Acting Assistant Deputy Commandant also stated that a unique and valuable aspect of Project P856-M is that it was located on a landfill, effectively transforming unusable land into a site producing renewable energy.

Our Response

We believe that we have correctly applied the term "cost-effective," and that it should not include consideration of non-monetary factors. According to 10 Code of Federal Regulations sec. 436.18 (1996), Federal agencies shall measure cost-effectiveness by considering investment costs, non-fuel operation and maintenance cost, replacement cost, salvage value, and energy costs. We appropriately considered these costs in our LCCA calculations.

With regard to 10 U.S.C. § 2911, the section that the Acting Assistant Deputy Commandant cited applies to a requirement for the Secretary of Defense to develop and implement energy performance goals and an energy performance master plan. It does not relate to project selection at the Service levels. However, 10 U.S.C. § 2911 later states that for purposes of implementing the energy performance plan, the Secretary of Defense shall provide that the selection of energy conservation measures "shall be limited to those measures that…demonstrate an economic return on the investment." Therefore, non-monetary considerations do not negate the requirement for projects to be cost-effective.

The Acting Assistant Deputy Commandant cited Handbook 135, which outlines factors officials must consider when preparing an LCCA. While Handbook 135 allows decision-makers to consider significant non-monetary effects as part of an investment decision, it states that these considerations should be included in the project documentation. Marine Corps officials did not provide any documentation for Project P856-M to show their analysis of non-monetary factors and document their conclusion that these factors outweighed the amount of investment cost the project would not recover.

In addition, since Handbook 135 was last updated in 1996, legislation and DoD policy have significantly impacted the factors that decision-makers must consider when selecting energy projects. For example, the current and previous versions of DoD Instruction 4170.11, both updated more recently than NIST Handbook 135, require energy projects to be cost-effective. As previously stated, 10 U.S.C. § 2911, which was established by the National Defense Authorization Act of 2007, requires energy projects to demonstrate an economic return on investment. Additionally, the DoD Energy Manager's Handbook, updated in 2005, states that "legislation and executive orders clearly specify life cycle cost effectiveness as the overriding criteria behind Federal investment in energy efficiency."

We acknowledge that the PV project at Camp Pendleton utilized land that otherwise would remain vacant. However, while it may be appropriate to consider non-monetary factors like this when selecting projects, officials must first determine that a project is cost-effective. Appendix E outlines the Federal legislation and DoD policy that require renewable energy projects to be cost-effective.

Marine Corps Comments on Life-Cycle Cost Analysis

The Acting Assistant Deputy Commandant stated that our LCCAs did not consider:

- monetary benefits associated with the ownership of renewable energy certificates;
- provisions established by the Energy Policy Act of 2005, which allow double-counting the contribution of renewable energy generated on-site and consumed by a Federal facility; and
- a provision established by the Energy Independence and Security Act of 2007, which increased allowable system service life from 25 to 40 years.

Our Response

None of the three points discussed by the Acting Assistant Deputy Commandant impact the accuracy of our LCCAs, as discussed in subsequent paragraphs. In addition, when Marine Corps officials prepared the LCCA for the Camp Pendleton project, they did not consider these three items, which is why we did not discuss them in the report.

Renewable Energy Certificates. It would have been inappropriate to include Renewable Energy Certificates (RECs) in the Camp Pendleton LCCA. According to the Department of Energy's January 28, 2008 "Renewable Energy Requirement Guidance for the Energy Policy Act of 2005 and Executive Order 13423," an agency may not receive credit toward energy goals if it sells its RECs, unless in doing so it purchases an equal

amount of RECs from another source. Since a primary objective of the Camp Pendleton PV project, according to DD Form 1391, was to make progress toward the Energy Policy Act of 2005 goal, officials would be unable to sell RECs and claim progress toward energy goals unless they purchased an equal amount of RECs from another source. It is not likely that selling 100 RECs and buying 100 from a different source would result in a significant monetary gain or loss. Therefore, it is not appropriate to include RECs in the Camp Pendleton LCCA.

Double-Counting of Energy. The double-counting of energy applies to measuring Agency progress toward specific energy goals. It is not an actual monetary benefit; rather, it is an incentive to implement renewable energy projects on Federal lands. It would be inappropriate, on an LCCA, to state that a system with an actual electricity production of 1,000 kilowatt-hours produces 2,000 kilowatt-hours.

40-Year LCCAs. We agree with the Marine Corps that the Handbook 135 maximum study period of 25 years is outdated because the Energy Independence and Security Act of 2007 extended the maximum study period to 40 years, and we updated the report to reflect this fact. We also acknowledge that the Camp Pendleton PV system may last more than 20 years (because it obtained a 25 year PV panel warranty), which is why we subtracted residual value from the cost of the system to ensure our LCCA results fairly accounted for a potentially longer life. In fact, because of the residual value accounted for in our 20-year LCCA, the amount not recovered for the Camp Pendleton project over 20 years is almost the same as the amount for our 40-year analysis (note that the 40-year analysis assumes that the PV panels will not need to be replaced). Table F-1 illustrates the results of 20-, 25-, and 40-year LCCAs for Camp Pendleton.

Table F-1. Camp Pendleton 20-Year, 25-Year, and 40-Year LCCA Results

LCCA Term	Investment Cost (millions)	Discounted Energy Savings (millions)	Amount Not Recovered (millions)	Savings-to-Investment Ratio
20 Years	$ 8.43	$ 3.26	$5.17	**0.39**
25 Years	$ 10.30	$ 3.99	$6.32[1]	**0.39**
40 Years	$ 10.30	$ 5.23	$5.08[1]	**0.51**

[1]Amounts are rounded.

Although a maximum study period of 40 years is allowed for LCCAs, we believe that a 20-year study period was reasonable and appropriate. Specifically, the panels for each PV system that we reviewed had either 20 or 25 year warranties. In addition, there is no guarantee that the PV panels will last longer than 20 to 25 years or that there will be funding in the future for replacement panels and inverters to continue operation of the system. Further, based on Table F-1, in which we assumed that no PV panel replacement costs would be incurred during a 40-year period for the Camp Pendleton PV system, the amount of investment cost not recovered exceeds $5 million. This amount not recovered is approximately the same amount we estimated over a 20-year study period, accounting for an appropriate amount of residual value.

Marine Corps Comments on Project Planning and Selection

The Acting Assistant Deputy Commandant for Installations and Logistics (Facilities) disagreed with our finding that Marine Corps officials did not select and plan cost-effective PV projects in accordance with the Recovery Act and applicable energy legislation and policies. The Acting Assistant Deputy Commandant cited the Energy Policy Act of 2005 and the National Defense Authorization Act of 2007, which direct the use of renewable energy in DoD facilities. The Acting Assistant Deputy Commandant also cited that a purpose of the Recovery Act was to invest in the domestic renewable energy industry. The Acting Assistant Deputy Commandant stated that Marine Corps officials considered cost-effectiveness in their decision to execute Project P856-M; however, officials recognized the potential return-on-investment limitations of the project if it was evaluated strictly on a monetary basis. The Acting Assistant Deputy Commandant stated that Project P856-M contributes to the achievement of Congressionally-mandated renewable energy goals and demonstrates excellence in managing limited resources.

The Acting Assistant Deputy Commandant for Installations and Logistics (Facilities) also disagreed with our finding that Marine Corps officials were not well-equipped to handle quick timelines for planning and selecting projects because, at the time of the Recovery Act's implementation, the Marine Corps did not have processes for completing LCCAs, processes for planning and selecting all energy projects, or energy strategies for achieving legislative goals. With regard to Project P856-M at Camp Pendleton, the Acting Assistant Deputy Commandant stated that Marine Corps officials used available reports assessing renewable energy opportunities within the Department of the Navy, as well as information published by the Department of Energy. The Acting Assistant Deputy Commandant also cited several examples of documented planning related to the selection and justification of renewable energy projects on Department of the Navy installations. The Acting Assistant Deputy Commandant stated that these plans and reports analyzed benefits and drawbacks of developing specific renewable technologies and assessed potential opportunities to utilize renewable energy sources. However, the Acting Assistant Deputy Commandant acknowledged that the project planning package for Project P856-M may not reflect full consideration of these documents during the project planning and selection process.

The Acting Assistant Deputy Commandant stated that policy and instruction related to the energy program is contained in Marine Corps Order P11000.9C, which is being revised to incorporate requirements from the recently published "United States Marine Corps Expeditionary Energy Strategy and Implementation Plan."

Our Response

We acknowledge that renewable energy projects like the PV project at Camp Pendleton will contribute toward Federal energy goals such as the requirement from the Energy Policy Act of 2005 to derive a specific percentage of total electricity consumption from renewable electric energy – 3 percent each year in in FY07-FY09 and 5 percent each year in FY10-FY12. However, as explained in the report, the projects we reviewed will contribute only minimally toward renewable energy goals.

We also acknowledge that the Recovery Act had unique goals and emphasized investments in renewable energy. However, the Recovery Act also provided for high levels of accountability and transparency for how funds were spent, and implementing guidance from the Office of Management and Budget stated that the Recovery Act did not waive requirements from existing legislation or policy.

We disagree that Marine Corps officials adequately considered the cost-effectiveness of Project P856-M at Camp Pendleton. We determined that the project would not recover $5.17 million of the $8.43 million investment cost; therefore, the project is not cost-effective. Further, we determined that before the contract award, officials had LCCA information available, which showed that the project would not recover 60 percent of the investment cost, but officials disregarded this information and awarded the contract.

Regarding the planning documents and reports cited by the Acting Assistant Deputy Commandant, we determined that the reports analyze the feasibility of implementing renewable energy projects, but they still emphasize cost-effectiveness. For example, the Report to Congress, "DoD Renewable Energy Assessment," March 14, 2005 states that, "where economical, DoD should pursue on-installation production of renewable energy." The report clarifies that PV systems can be economical where there are very high utility costs or where State and Federal rebates and tax incentives are in effect. In addition, a July 2007 National Renewable Energy Laboratory report on PV systems at Camp Pendleton states that the economic feasibility of PV systems will be largely dependent on Federal, State, and local incentives. The report identifies that with the Federal, State, and local incentives, simple payback periods for the proposed projects range from approximately 5 to 20, and without any economic incentives, the simple payback periods range from 39 to 52 years. Therefore, while we agree that the Department of the Navy had numerous reports on the feasibility of PV systems available, those reports acknowledged the requirement for project to be cost-effective and they identified challenges in implementing projects without incentives.

We discussed Marine Corps Order P11000.9C in our report and identified that it was not comprehensive because it only addressed ECIP projects and FSRM energy projects executed with O&M funds. The policy did not address the planning and selection of MILCON-funded energy projects such as the Recovery Act project at Camp Pendleton. However, we commend the Marine Corps for taking steps to update this policy.

Department of the Navy Comments on Project Planning and Selection and the Requirement for Projects to be Cost-Effective

The Principal Deputy Assistant Secretary of the Navy for Energy, Installations, and Environment provided comments on the project planning and selection process.[24] Specifically, the Principal Deputy disagreed with our conclusion that the Recovery Act energy projects reviewed had to be cost-effective. The Principal Deputy stated that the

[24] The Principal Deputy provided these comments in response to Recommendations 7 and 8; however, we determined that they were more applicable to the finding.

Office of Management and Budget instructed agencies to support projects that achieved long-term benefits such as fostering energy independence. In addition, DoD pursued three broad goals in its use of Recovery Act funding, one of which was to improve energy efficiency.

The Principal Deputy stated that two projects were FSRM projects and, according to the DoD FSRM program plan, FSRM projects were selected primarily based on mission requirements, quality of life impact, National Environmental Policy Act documentation status, and an acquisition strategy that focused on executing projects quickly. The Principal Deputy also stated that the justification for the FSRM projects to install PV systems in California and Hawaii did not refer to cost-effectiveness. Instead, the justification stated that the projects would make progress toward energy usage reduction goals in the Energy Independence and Security Act of 2007 and to reduce overall recurring utility costs in Navy shore facilities. Finally, the Principal Deputy stated that the Department of the Navy identified, developed, and submitted FSRM projects in response to a request from the Office of the Secretary of Defense, which did not include a requirement for LCCA information. Based on all of these factors, the Principal Deputy concluded that the intent of Office of the Secretary of Defense was to select Recovery Act FSRM energy projects based on contribution toward achievement of energy goals rather than cost-effectiveness.

Regarding the project at Camp Pendleton, the Principal Deputy stated that this was an ECIP project and it was selected in accordance with Federal legislation and DoD policy. Further, the Principal Deputy stated that the selection was justified in accordance with life cycle cost analysis guidance. The Principal Deputy referenced a statement from the Director of Facilities Energy, Office of the Deputy Undersecretary of Defense (Installations and Environment) in response to a previous DoD IG report on a Recovery Act ECIP project, which stated that ECIP policy does not require individual renewable energy projects to meet standards for savings-to-investment ratio and payback.

Our Response

We acknowledge that the Recovery Act and subsequent Federal and DoD guidance provided unique goals for Recovery Act projects, and these goals emphasized energy efficiency. However, we maintain our position regarding the requirement for Recovery Act energy projects to be cost effective. Specifically, the Recovery Act provided for unprecedented transparency and accountability and it required the "prudent management" of funds. Office of Management and Budget Memorandum M-09-10, "Initial Implementing Guidance for the American Recovery and Reinvestment Act of 2009," February 18, 2009, stated that the guidance did not provide Federal agencies with a waiver of existing legislative or administrative requirements. As explained in Appendix E, Federal legislation and DoD policy clearly requires renewable energy projects to be cost-effective.

We disagree with the Principal Deputy's statement that the justifications for the PV projects at Navy installations in California and Hawaii did not refer to cost-effectiveness. The DD Form 1391s for both of these projects stated, "energy program requirements and fiscal imperatives constitute a clear mandate to implement the type of cost effective, energy/water efficiency opportunities represented by this project." In addition, we identified in the report that the project justifications on the DD Form 1391s were misleading because they indicated that the projects would contribute substantially to meeting renewable energy goals when, in fact, the projects' contributions will be minimal.

We acknowledge that DoD Instruction 4170.11 allows a percentage of the annual ECIP budget to be programmed against renewable energy projects that do not meet the criteria for savings-to-investment ratio and payback in order to expand the use of renewable energy applications and to meet energy goals. However, the Recovery Act project to install a PV system at Camp Pendleton was not an ECIP project; therefore, this portion of the DoD policy is not applicable to the project. In addition, as stated in the report, the project will not recover $5.17 million of the $8.43 million invested in the project. Therefore, the project is not justified in accordance with life-cycle cost analysis guidance.

Office of the Assistant Secretary of the Navy, Energy, Installations, and Environment Comments

DEPARTMENT OF THE NAVY
OFFICE OF THE ASSISTANT SECRETARY
(ENERGY, INSTALLATIONS AND ENVIRONMENT)
1000 NAVY PENTAGON
WASHINGTON DC 20350-1000

JUN 13 2011

MEMORANDUM FOR THE INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

SUBJ: Draft DoD IG Report: "The Department of the Navy Spent Recovery Act Funds on Photovoltaic Projects That Were Not Cost-Effective" (Project No. D2010-D000LH-0081.000)

This is in response to your memorandum of May 3, 2011 requesting comments on the subject draft report. Department of the Navy comments are provided in the attachment. Detailed Navy and Marine Corps comments are also attached.

Although we agree with most of the report's recommendations, we strongly disagree with the recommendations that the Navy and Marine Corps conduct administrative reviews to identify individuals who, in DoD IG's view, disregarded requirements for the selection of projects and institute administrative actions, as may be warranted, as the result of those reviews. As discussed with your staff and as illustrated by OSD's comments for similar DoD IG reports, there is a fundamental disagreement over the IG's conclusion that such projects were required to be cost-effective. Navy and Marine Corps staffs developed and submitted valid projects consistent with the guidance and time constraints they were given. Accordingly, pursuing administrative actions against individuals in lower levels of the chain of command would be misguided and unproductive.

Thank you for the opportunity to comment on the subject draft report. We would welcome the opportunity to meet with you and/or your staff to discuss the DoD IG findings and recommendations, and our comments and concerns, prior to publication of the final report. My point of contact is [redacted]

Roger M. Natsuhara
Principal Deputy

Attachments
As stated

Copy to:
NAVINSGEN
ODUSD (I&E)
OUSD (C)
OASN (FM&C)
CNO
CMC
CNIC
NAVFAC

DoD IG Draft Report: "The Department of the Navy Spent Recovery Act Funds on Photovoltaic Projects That Were Not Cost-Effective"
(Project No. D2010-D000LH-0081.000)
Department of the Navy Comments

DoD IG Recommendation 1. We recommend that the Deputy Chief of Naval Operations, Fleet Readiness and Logistics, develop:

a. A comprehensive shore energy strategy that outlines the energy program management structure and aligns resources with legislative energy goals; and

b. An implementation plan that identifies specific tasks, metrics, and responsibilities for meeting energy goals..

Department of the Navy Response: Partially concur. The Department of Navy (DoN) is in the process of developing a comprehensive energy strategy to include both shore and tactical energy. The DoN recently established a Deputy Assistant Secretary of the Navy for Energy to align legislated energy goals with the Secretary of the Navy's energy goals. It is intended that the comprehensive energy strategy will include tasks, metrics and responsibilities for achieving energy goals. The Department non-concurs with the recommendation to align resources with legislative energy goals as we do not believe it within the purview of the DODIG to prioritize the use of Service funding.

DoD IG Recommendation 2. We recommend that the Deputy Assistant Secretary of the Navy for Energy, in coordination with the Deputy Chief of Naval Operations, Fleet Readiness and Logistics; the Commander, Naval Installations Command; the Director, Naval Facilities Engineering Command Energy Office; and the Assistant Deputy Commandant for Installations and Logistics (Facilities):

a. Establish a standard definition of a shore energy project that aligns with DoD policy; and

b. Incorporate the definition into Secretary of the Navy Energy policy.

Department of the Navy Response: Concur. The Navy and Marine Corps have developed definitions for energy projects. The Deputy Assistant Secretary of the Navy for Energy will work with the appropriate Navy/Marine Corps offices to establish a common definition for use within the DoN.

DoD IG Recommendation 3. We recommend that the Deputy Chief of Naval Operations, Fleet Readiness and Logistics, in coordination with the Commander, Naval Installations Command; and the Director, Naval Facilities Engineering Command Energy Office:

Attachment

a. Develop comprehensive policy for planning, prioritizing, selecting, and executing cost-effective FSRM and MILCON shore energy projects in accordance with DoD and Federal requirements that includes:

1. Processes for performing and documenting life-cycle cost analyses;
2. Standardized methods for estimating project costs and energy savings during project planning; and
3. Responsibilities for obtaining incentives for energy projects, guidelines for claiming incentives, and justifications for saving incentives for future projects; and

b. Integrate the policy into standard Navy processes for planning, prioritizing, selecting, and executing FSRM and MILCON energy projects.

DoD IG Recommendation 4. We recommend that the Assistant Deputy Commandant for Installations and Logistics (Facilities):

a. Develop comprehensive policy for planning, prioritizing, selecting, and executing cost-effective FSRM and MILCON shore energy projects in accordance with DoD and Federal requirements that includes:

1. Processes for performing and documenting life-cycle cost analyses;
2. Standardized methods for estimating project costs and energy savings during project planning; and
3. Responsibilities for obtaining incentives for energy projects, guidelines for claiming incentives, and justifications for saving incentives for future projects; and

b. Integrate the policy into standard Marine Corps processes for planning, prioritizing, selecting, and executing FSRM and MILCON energy projects.

Department of the Navy Response: Concur with recommendations and 3. and 4.

Current Navy guidance and the draft OPNAVINST 4100.5E mandates the use of the OPNAV-accredited energy Return on Investment (eROI) decision tool as the standardized method for evaluating and prioritizing FSRM energy (SRM-e) and MILCON shore energy projects.

In the course of selecting and planning the Marine Corps Base Camp Pendleton project, the Marine Corps utilized available reports assessing renewable energy opportunities within the DoN as well as an abundance of information published by the Department of Energy related to the implementation of renewable energy projects. The Marine Corps is revising its guidance to better capture those elements in project documentation and address applicable requirements.

DoD IG Recommendation 5. We recommend that the Naval Facilities Engineering Command Southwest Utilities and Energy Manager apply for California Solar Initiative rebates as soon as possible.

Department of the Navy Response: Concur. A review of the 34 systems in the NAVFAC Southwest area of responsibility revealed that 24 systems are located within California Solar Initiative (CSI) incentive program territories and thus eligible for the incentive. As installed, 13 of these systems will require an alternate meter to satisfy program reporting requirements. A total of 23 of these systems will require implementation of a third-party monitoring contract to qualify for receiving the CSI Performance Based Incentive (over a 60-month period). Estimated cost to implement these requirements is $160,000. Currently, two of the three CSI program territories no longer have funding for Non-Residential systems and are accepting applications only pending availability of future funding or where previously approved fund reservations drop out; this means that any new application for incentive funding is no longer assured of being approved and funded. A total of 17 out of the 24 eligible DoN ARRA systems are impacted by this funding constraint. NAVFAC Southwest is assessing the economic value of pursuing CSI incentives in light of current program conditions. CSI incentive will be pursued for the systems that promise return over the cost of implementing the program requirements.

Revised

DoD IG Recommendation 6. We recommend that the Director, Shore Readiness Division (N46), Office of the Chief of Naval Operations, Fleet Readiness and Logistics, in coordination with Commander, Naval Installations Command, review the e-ROI tool to ensure it adheres to life-cycle cost-effectiveness requirements in legislation and Federal and DoD criteria for energy projects. If the tool does not adhere to these requirements, we recommend that the Director, Shore Readiness Division, modify e-ROI so that only projects that are life-cycle cost-effective receive funding.

Department of the Navy Response: Concur. The e-ROI tool complies with the Department of Energy (DOE) 10 CFR 436, Federal Energy Management and Planning Programs and the Federal Energy Management Program (FEMP) NIST Handbook 135, *Energy Price Indices and Discount Factors for LLC Analysis*. Only projects that are life-cycle cost-effective receive funding.

FEMP life-cycle costing methods and procedures set forth in 10 CFR 436 subpart A, are to be followed by all federal agencies in evaluating the cost effectiveness of potential energy and water conservation projects and renewable energy projects in new and existing federal owned and leased buildings.

DoD IG Recommendation 7. We recommend that the Deputy Chief of Naval Operations, Fleet Readiness and Logistics:

a. Initiate an administrative review to identify individuals in the Navy responsible for disregarding the requirements for planning and selecting cost-effective projects, which resulted in Recovery Act funds not recovered;

b. Initiate as appropriate any administrative actions warranted by the review.

DoD IG Recommendation 8. We recommend that the Assistant Deputy Commandant for Installations and Logistics, (Facilities):

a. Initiate an administrative review to identify individuals in the Marine Corps responsible for disregarding the requirements for planning and selecting cost-effective projects, which resulted in Recovery Act funds not recovered; and

b. Initiate as appropriate any administrative actions warranted by the review.

Department of the Navy Response: Strongly non-concur with recommendations 7. and 8. As discussed with DoD IG and ODUSD (I&E) staffs, and as illustrated in OSD comments on similar DoD IG reports, there is a fundamental disagreement over the IG's conclusion that such projects were required to be cost-effective. Given this disagreement – even within OSD – pursuing administrative actions against individuals in lower levels of the chain of command would be misguided and unproductive.

In identifying projects for use of ARRA funds, OMB instructed agencies to support projects that achieved long-term benefits such as fostering energy independence. DoD pursued three broad goals in its use of ARRA funding. One of those goals was to improve energy efficiency.

Two of the three projects reviewed by the DoD IG were Facilities Sustainment, Restoration, and Modernization (FSRM) projects. According the DoD FSRM program plan, FSRM projects were selected based primarily on the following criteria: (1) mission requirements; (2) quality of life impact; (3) National Environmental Policy Act (NEPA) documentation status; and (4) acquisition strategy with a focus on the ability to execute projects quickly.

In its spending plan provided to Congress, OSD identified Navy FSRM project involving the installation of photovoltaic systems in California and Hawaii and stated the following in its justification for these projects:

"If this project is not provided, progress towards the Energy Usage Reduction Goal of Energy Independence and Security Act (EISA) 2007 will be slowed. This project will reduce the overall recurring utility costs in Navy shore facilities.

The justification did not refer to cost-effectiveness.

These projects were identified, developed, and submitted in response to the OSD call for ARRA projects. OSD did not request LCCA information for FSRM projects. Measurements of effectiveness for FSRM projects did not include LCCA factors.

In contrast, OSD requested LCCA info for Energy Conservation Investment Program (ECIP) projects and included LCCA factors in its measures of effectiveness.

Notwithstanding the DoD IG assertions, the above suggests that OSD's intent for the selection of energy projects for ARRA funding, especially FSRM projects, was based more on contribution towards achievement of energy goals rather than cost-effectiveness.

The tbird project reviewed by DoD IG involved an ECIP project at Marine Corps Base Camp Pendleton. The selection of this project was in accordance witb Federal legislation and DOD policy. Further tbe selection was justified in accordance with life cycle cost analysis guidance.

In his response to a DoD IG draft report on a similar ARRA project at Naval Station Norfolk, the ODUSD (I&E) Director of Facilities Energy wrote:

"We consider proceeding with this project to be in the best interests of the Department and consistent with the intentions of the Recovery Act ECIP program. Recovery Act funding for ECIP was provided to the Military Services based on the combined requirements of the Recovery Act and goals of ECIP. As described in the Recovery Act ECIP Program Plan, ECIP is generally designated for projects that reduce energy and water consumption, but ECIP also provides a critical funding source for investments in small-scale renewable energy technologies. P0764 contributes to these overall program goals by promoting renewable energy in the Norfolk area.

ECIP policy does not require individual renewable energy projects to meet the SIR and payback standard. To support renewable energy projects, both the 2005 and 2009 editions of DoDI 4170.11 permit a portion of the ECIP program to be used for renewable energy projects that are below the SIR or payback period thresholds. This approach is also consistent with the consolidated appropriations committee report for the ECIP program in 2009, which strongly

supports the Department's use of ECIP to promote renewable energy resources."

Accordingly, pursuing any form of administrative action against individuals at lower levels would unfairly place blame on them when there is apparent disagreement - even within OSD.

Commander, Navy Installations Command Comments

Final Report Reference

DEPARTMENT OF THE NAVY
COMMANDER, NAVY INSTALLATIONS COMMAND
716 SICARD STREET, SE, SUITE 1000
WASHINGTON NAVY YARD, DC 20374-5140

5740
Ser N00G/11U62273
9 Jun 11

From: Inspector General, Navy Installations Command
To: Assistant Secretary of the Navy (Installations and Environment)

Subj: THE DEPARTMENT OF THE NAVY SPENT RECOVERY ACT FUNDS ON PHOTOVOLTAIC PROJECTS THAT WERE NOT COST-EFFECTIVE (PROJECT NO. D2010-D000LH-0081.000)

Ref: (a) DoD IG memo of 3 May 11

Encl: (1) CNIC Response to Subject Report
(2) CNIC N4 Project Development and Assessment Warning Order for Shore Program Objective Memorandum, Fiscal Years 2014-2018 (POM-14)
(3) Addendum 8 CNIC N4 Project Development and Assessment Warning Order for Shore Program Objective Memorandum, Fiscal Years 2014-2018 (POM-14)

1. Per reference (a), CNIC reviewed the draft report. Specific comments are provided in enclosure (1). Enclosures (2) and (3) are forwarded as supporting documents to enclosure (1) and referenced therein.

2. While we concur with Recommendations 2, 3, and 6, we do not concur with Recommendation 7.

3. The technical point of contact is [redacted] CNIC N4, at commercial [redacted] or email [redacted] The Audit Liaison is [redacted] CNIC OIG, at commercial [redacted] or email [redacted]

GERALD R. MANLEY

Copy to:
N00
N4

Omitted because of length. Copies will be provided upon request.

COMMANDER, NAVY INSTALLATIONS COMMAND (CNIC)
COMMENTS TO RECOMMENDATIONS FOR DOD
IG REPORT THE DEPARTMENT OF THE NAVY SPENT
RECOVERY ACT FUNDS ON PHOTOVOLTAIC
PROJECTS THAT WERE NOT COST-EFFECTIVE
(PROJECT NO. D2010-D000LH-0081.000)

Below are CNIC's responses to the recommendations.

FINDING. OFFICIALS DID NOT CONSIDER COST-EFFECTIVENESS FOR RECOVERY ACT PV PROJECTS

Recommendation 2: We recommend that the Deputy Assistant Secretary of the Navy for Energy (DASN(E), in coordination with the Deputy Chief of Naval Operations, Fleet Readiness and Logistics; the Commander, Naval Installations Command; the Director, Naval Facilities Engineering Command Energy Office; and the Assistant Deputy Commandant for Installations and Logistics (Facilities):

a. Establish a standard definition of a shore energy project that aligns with DoD policy.

Response: Concur. An "Energy Project" is defined within Draft OPNAVINST 4100.5E, Navy Shore Energy Management, as:

> "A facility or utility system improvement, regardless of funding source, conceived and developed for the purpose of increasing energy or water efficiency, energy security, and sustainability for a facility or group of facilities."

b. Incorporate the definition into Secretary of the Navy energy policy.

Response: Concur. The Draft OPNAVINST 4100.5E is in the Final Draft phase, pending final administrative review prior to signature by the Deputy Chief of Naval Operations.

Recommendation 3: We recommend that the Deputy Chief of Naval Operations, Fleet Readiness and Logistics, in coordination with the Commander, Navy Installations Command; and the Director, Naval Facilities Engineering Command Energy Office:

a. Develop comprehensive policy for planning, prioritizing, selecting, and executing cost-effective FSRM and MILCON shore energy projects in accordance with DoD and Federal requirements that includes (1) Processes for performing and documenting life-cycle cost analyses; (2) Standardized methods for estimating project costs and energy savings during project planning; and

Enclosure (1)

(3) Responsibilities for obtaining incentives for energy projects, guidelines for claiming incentives, and justifications for saving incentives for future projects.

Response: Concur. Current Navy guidance and the Draft OPNAVINST 4100.5E mandates the use of the OPNAV accredited energy Return on Investment (eROI) decision tool as the standardized method for evaluating and prioritizing FSRM energy (SRM-e) and MILCON Shore Energy projects.

The eROI tool includes the same format as the OSD Energy Conservation Investment Program (ECIP) Life Cycle Cost Analysis (LCCA), and is in accordance with ECPact 1992 mandates. Based on the Energy Category, the economic life is calculated from year one throughout the life cycle taking into consideration project cash flows, recurring energy savings, utility cost, non-energy savings, capital expenditures; as well as the relative value of non-financial attributes related to energy projects such as carbon reduction and legal compliance.

CNIC guidance for energy project submittal includes the requirement to submit a 1391 and eROI template for each project. OPNAVINST 11010.20G and NAVFAC P-442 provide policy and guidance for performing detailed cost estimates and economic analysis. The guidance is the same for energy projects and for non-energy projects. The eROI tool includes a standardized format for documenting project costs and energy savings. The eROI tool also documents the simple payback period, which is a required criteria for approval of all projects.

The DoD Financial Regulation (FMR), Volume 12, Chapter 12 is the guidance document for claiming incentives for energy projects. According to the DoD FMR, incentives obtained during a fiscal year must be spent within that fiscal year. The DoD FMR allows the carryover of unobligated balances resulting from energy conservation measures. The eROI tool includes a standardized format for documenting incentives that are applicable for energy projects.

Incentives and rebates vary by state and by local utility provider. Local procedures provide guidance for obtaining incentives from energy projects. The Scope of Work for hiring the region or installation Resource Efficiency Manager (REM) establish the REM as the local point of contact to identify and apply for incentives.

b. Integrate the policy into standard Navy processes for planning, prioritizing, selecting, and executing FSRM and MILCON energy projects.

Response: Concur. Enclosure (2) publishes the standard processes for planning, prioritizing, selecting and executing FSRM and MILCON energy projects. Specific details for energy projects are given in enclosure (3).

Recommendation 6: We recommend that the Director, Shore Readiness Division (N46), Office of the Chief of Naval Operations, Fleet Readiness and Logistics, in coordination with Commander, Naval Installations Command, review the e-ROI tool to ensure it adheres to life-cycle cost-effectiveness requirements in legislation and Federal and DoD criteria for energy projects. If the tool does not adhere to these requirements, we recommend that the Director, Shore Readiness Division, modify e-ROI so that only projects that are life-cycle cost-effective receive funding.

Response: Concur. The financial benefit calculations within the Navy eROI energy investment decision tool utilize the same standardized (EPAct 1992 mandated) format for performing and documenting Life Cycle Cost Analyses (LCCA) as the OSD Energy Conservation Investment Program (ECIP) in order to assess the long-term cost-effectiveness of submitted projects.

Omitted because of length. Copies will be provided upon request.

Assistant Deputy Commandant, Installations and Logistics (Facilities) Comments

DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
3000 MARINE CORPS PENTAGON
WASHINGTON, DC 20350-3000

IN REPLY REFER TO:
11300
LFF-1
MAY 2 0 2011

From: Assistant Deputy Commandant, Installations and Logistics (Facilities)
To: Headquarters Marine Corps, Programs and Resources Department (RFR)

Subj: DODIG DRAFT REPORT, THE DEPARTMENT OF THE NAVY SPENT RECOVERY ACT FUNDS ON PHOTOVOLTAIC PROJECTS THAT WERE NOT COST-EFFECTIVE, PROJECT NO. D2010-D000LH-0081.000, 3MAY11

Ref: (a) MCO P11000.9C, Energy and Utilities Management
(b) United States Marine Corps Expeditionary Energy Strategy and Implementation Plan, March 2011

Encl: (1) ADC I&L (LF) Response to DODIG Draft Report, PROJECT NO. D2010-D000LH-0081.000, 3MAY11

1. Thank you for the opportunity to comment on the subject draft report resulting from the DODIG performance audit conducted from November 2009 through May 2011. The Marine Corps has concerns, which are articulated in enclosure (1), regarding the validity of the findings.

2. The only Marine Corps project reviewed under the subject DODIG project was Project P856-M, which constructed a 1.4 megawatt photovoltaic system on the closed landfill at MCB Camp Pendleton. This office does not fully concur with two of the three recommendations addressed to ADC I&L (Facilities). Enclosure (1) provides our detailed response.

a. Regarding the sufficiency of the project selection process, in the course of selecting and planning Project P356-M, the Marine Corps utilized available reports assessing renewable energy opportunities within the Department of the Navy as well as an abundance of information published by the Department of Energy related to the implementation of renewable energy projects. While the project package may not reflect this effort, the effort was sufficient to determine cost effectiveness. We are revising ref (a) to better capture those elements in project documentation and address the requirements established by ref (b).

b. Regarding the recommendation to initiate an administrative review and initiate appropriate administrative action, this

Enclosure (1)

Subj: DODIG DRAFT REPORT, THE DEPARTMENT OF THE NAVY SPENT RECOVERY ACT FUNDS ON PHOTOVOLTAIC PROJECTS THAT WERE NOT COST-EFFECTIVE, PROJECT NO. D2010-D000LH-0081.000, 3MAY11

office strongly nonconcurs. As indicated in enclosure (1), the DODIG findings are based on an incomplete interpretation of legislation and policies.

3. The selection of Project P856-M by Marine Corps officials was in accordance with Federal legislation and DOD policy. Further the selection was justified in accordance with life cycle cost analysis guidance. The effort put forth by personnel at MCB Camp Pendleton is tremendously appreciated by the Marine Corps. It contributes to the achievement of federally mandated renewable energy goals and demonstrates excellence in managing limited resources. As stated by the Director Facilities Energy, Office of the Deputy Under Secretary of Defense (Installations and Environment) during the DoDIG outbrief to ADC I&L (Facilities), the efforts of Marine Corps Officials to select and authorize the Camp Pendleton Photovoltaic Project were in line with the intent of the Secretary of Defense.

4. I request the opportunity to discuss the concerns presented in enclosure (1) with DODIG officials prior to release of a final report. The POC for this issue is [redacted] HQMC LFF, phone: [redacted] e-mail: [redacted]

A. M. EDMONDS
By direction

Enclosure (1)

ASSISTANT DEPUTY COMMANDANT
INSTALLATIONS AND LOGISTICS (FACILITIES)
RESPONSE TO:

Department of Defense Office of Inspector General, Draft Report, The Department of the Navy Spent Recovery Act Funds on Photovoltaic Projects That Were Not Cost-Effective, Project No. D2010-D000LH-0081.000, 3 May 2011

1. RESPONSE TO PRIMARY FINDING:

PRIMARY FINDING: *Marine Corps officials did not consider cost-effectiveness for Recovery Act PV Projects.*

ADC I&L (FACILITIES) RESPONSE: Marine Corps officials took into consideration monetary factors, as well as other special considerations required by United States Code Title 10, Chapter 173 (Energy Security), Section 2911 (Energy performance goals and plan for Department of Defense). In determining cost-effectiveness, the DODIG report does not take into consideration non monetary benefits as addressed in NIST Handbook 135, Life Cycle Costing Manual for the Federal Energy Management Program, Department of Commerce, National Institute of Standards and Technology, 1995 edition.

- The only Marine Corps project reviewed under the subject DODIG Report was Project P856-M, which constructed a 1.4 megawatt (MW) photovoltaic (PV) system on a closed landfill at MCB Camp Pendleton.

- United States Code Title 10, Section 2911 states that "for the purpose of developing and implementing the energy performance goals" at a minimum, the Department of Defense (DOD) will give special consideration to the following:

  - Cost effectiveness, cost savings, and net present value of alternatives.

  - The value of diversification of types and sources of energy used.

  - The value of the use of renewable energy sources.

  - The potential for an action to serve as an incentive for members of the armed forces and civilian personnel to reduce energy consumption or adopt an improved energy performance measure.

- In addition, Marine Corps officials gave consideration to impacts on mission execution, real estate and encroachment issues, and environmental and cultural resource requirements.

- United States Code Title 42, Chapter 91 (National Energy Conservation Policy), Section 8254 (Establishment and use of life cycle cost methods and procedures) requires the Department of Energy (DOE) to "establish practical and effective present value methods for estimating and comparing life cycle costs."

  - Guidance for Federal agencies to perform a Life Cycle Cost Analysis (LCCA) is provided in Handbook 135. Per page 11 of the DODIG Report, Handbook 135 "provides LCCA criteria for energy projects at Federal facilities." Per page 32 of the DODIG Report, "Handbook 135 outlines the factors officials must consider when preparing an LCCA."

  - Per an LCCA conducted internally by DODIG (see Appendix C of DODIG Report), the conclusion was drawn that Project P856-M was not cost effective, thus its selection under the American Recovery and Reinvestment Act of 2009 (Recovery Act) was not justified.

- However, the DODIG Report and the LCCA performed by DODIG for Project P856-M do not take into consideration non-monetary benefits articulated to them by Marine Corps officials and has incorrectly determined that the term "cost effective" is limited solely to monetary considerations. Section 4.6.4.3 of Handbook 135 addresses "non-monetary" benefits and costs.

  - Non monetary benefits and costs are "project-related effects for which you have no objective way of assigning a dollar value."

  - Per Section 4.6.4.3 of Handbook 135, "you can subjectively judge whether or not the non-monetary benefits outweigh the LCC penalty."

  - Section 4.6.4.3 of Handbook 135 specifically states, "If the decision-maker judges that the non-monetary benefits of a project are greater than the LCC penalty, the project can be accepted as cost effective."

- Of great value to Marine Corps officials was the unique aspect of this project in comparison to other potential projects in that P856-M was located on the site of the Box Canyon landfill – effectively transforming unusable land into a site producing renewable energy.

- In addition, the validity of the LCCA performed internally by DODIG falls into question because it does not take into consideration the following:

  - Monetary benefits associated with the ownership of renewable energy certificates. (Refer to Renewable Energy Requirement Guidance for EPACT 2005 and Executive Order 13423, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Federal Energy Management Program, dated 28 January 2008).

- Double counting provisions established by the Energy Policy Act of 2005 for renewable energy generated on-site and consumed by a Federal agency.

- Handbook 135 has not been revised to address Section 441 of the Energy Independence and Security Act of 2007 which increased allowable system service life from 25 to 40 years. While arguably the panels installed by Project P856-M may have a service life of 20 - 25 years, the supporting infrastructure should last in excess of 40 years. This will allow for the potential installation of more efficient panels in the future. The DODIG LCCA assumes a life cycle of only 20 years for all the infrastructure constructed by the project.

Revised

2. RESPONSE TO SECONDARY FINDINGS:

SECONDARY FINDING 1: *Marine Corps officials did not select and plan cost-effective PV projects in accordance with the Recovery Act and applicable energy legislation and policies.*

ADC I&L (FACILITIES) RESPONSE: Congressional legislation directs the use of renewable energy in DOD facilities. The selection and planning of Project P856-M by Marine Corps officials was in accordance with the Recovery Act as well as Congressional legislation and DOD policy related to the implementation of renewable generation projects on a Marine Corps installation. Project P856-M contributes to the achievement of congressionally mandated renewable energy goals and demonstrates excellence in managing limited resources.

- Congressional legislation directs the use of renewable energy in DOD facilities:

  - Energy Policy Act 2005 (EPAct 2005):

    - Defines "renewable energy" as electric energy generated from solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.

    - Requires the Secretary of Energy to ensure that, to the extent economically feasible and technically practicable, the following amounts of the total electricity consumed by the Federal Government come from renewable energy:

      - Not less than 3% in fiscal years 2007-2009.
      - Not less than 5% in fiscal years 2010-2012.
      - Not less than 7.5% in fiscal year 2013 and thereafter.

- Provides a bonus to Federal agencies by allowing them to double count renewable energy if it is produced on-site and used at a Federal facility.

- National Defense Authorization Act of 2007:

  - DOD will produce or procure not less than 25 percent of the total quantity of electric energy it consumes within its facilities and in its activities during fiscal year 2025 and each fiscal year thereafter from renewable energy sources (as defined in section 203(b) of EPAct 2005).

  - DOD will produce or procure electric energy from renewable energy sources whenever the use of such renewable energy sources is consistent with the considerations specified in United States Code Title 10, Section 2911.

- The selection and planning of Project P856-M by Marine Corps officials was in accordance with the Recovery Act as well as Congressional legislation and DOD policy related to the implementation of renewable generation projects on a Marine Corps installation.

  - The Recovery Act was passed by Congress and signed into law by President Obama on 17 February 2009. The purpose of the $787 billion Recovery package was to "jump-start the economy to create and save jobs." "Long term investment goals" included "investing in the domestic renewable energy industry" (source: www.recovery.gov).

  - Memorandum (Department of Defense Report to Congress on the Military Construction (MILCON) and Facilities Sustainment, Restoration, and Modernization (FSRM) Expenditure Plans for the American Recovery and Reinvestment Act of 2009) dated 23 February 2009, signed by Deputy Under Secretary of Defense (Installations & Environment) was sent to the Military Departments requesting the submittal of projects for funding consideration.

    - Input for MILCON projects was due to DUSD(I&E) by 6 March 2009.

    - The DUSD(I&E) Facilities Energy Directorate was designated as responsible to "separately collect projects supporting the Energy Conservation Investment Program (ECIP)."

  - In response, Marine Corps officials submitted $71 million in project investment under MILCON and $114 million under FSRM to the Assistant Secretary of Navy (Installations & Environment) for consideration.

  - Project P856-M was submitted by Marine Corps officials as a MILCON project. The project cost for P856-M was developed per "*Proposal for Turnkey 1,156.7 kWac Photovoltaic System for Box Canyon Marine Corps*

Base Camp Pendleton." Offered to: San Diego Gas & Electric, Offered by: Independent Energy Solutions, Inc., dated 16 March 2008.

- Cost effectiveness was given consideration by Marine Corps officials in their decision to execute Project P856-M. Generally speaking, monetary factors related to the implementation of PV systems within the Southwestern United States are consistent across projects. Based on experience with projects developed and submitted under ECIP, Marine Corps officials recognized the potential return-on-investment limitations of P856-M if evaluated strictly on a monetary basis.

- Typically, P856-M would have received consideration under ECIP. However, for the following reasons, it was not submitted to the DUSD(I&E) Facilities Energy Directorate for consideration:

  - Per experience related to prior PV projects implemented on Marine Corps installations, Marine Corps officials concluded that P856-M would not achieve specific return on investment requirements established for ECIP.

  - Project scope and cost for P985-M were well above traditional ECIP projects submitted by the Marine Corps. Note: The Marine Corps is typically only allotted $4-6 million of ECIP funding annually, so projects above 1 MW are generally not developed. PV projects executed under ECIP are usually much smaller in terms of renewable energy capacity and aggregated with quicker payback energy conservation measures such as lighting retrofits.

- The implementation of Project P856-M contributes to the achievement of congressionally mandated renewable energy goals and demonstrates excellence in managing limited resources.

  - Of great value to Marine Corps officials was the unique aspect of this project in comparison to other potential projects in that P856-M was located on the site of the Box Canyon landfill. The 28-acre Box Canyon Landfill is located in the southwest portion of MCB Camp Pendleton, approximately 200 feet south of Vandegrift Boulevard and 0.5 mile northeast of the intersection of Vandegrift Boulevard and Stewart Mesa Road. The site contains approximately 1,093,000 cubic yards of fill (waste and cover soils). The final closure of the landfill was completed in February 2003.

  - Although Project P856-M was unlikely to achieve the return on investment criteria established for ECIP projects, as provided for in section 4.6.4.3 of Handbook 135, Marine Corps officials were well within the boundaries of Congressional legislation and DOD policy to select and execute this project under the MILCON program as provided for in United States Code Title 10 Section 2911.

- Section 4.6.4.3 of Handbook 135 specifically states, "If the decision-maker judges that the non-monetary benefits of a project are greater than the LCC penalty, the project can be accepted as cost effective."

- United States Code Title 10 Section 2911 specifically states that "for the purpose of developing and implementing the energy performance goals," in addition to cost effectiveness, special consideration will be given to the "value of diversification of types and sources of energy used" and the "value of the use of renewable energy sources."

– Marine Corps Project P856-M:

- Represents the largest PV system on a Marine Corps base – and ranks among the largest solar installations in San Diego County.

- Consists of 6,300 KD235 modules produced locally by Kyocera Solar Inc. at their San Diego facility.

- Stands on the site of the Box Canyon landfill – effectively transforming unusable land into a site producing renewable energy.

- Went on-line 15 December 2010. To-date (10 May 2011), the PV system at Box Canyon has produced 978,460 kilowatt hours (kWH) of electricity feeding MCB Camp Pendleton's electric grid and is expected to produce about 2,400 megawatt-hours (MWH) annually (enough electricity to power 400 average homes).

SECONDARY FINDING 2: *Marine Corps officials were not well-equipped to handle quick timelines for planning and selecting projects because, at the time of the Recovery Act's implementation the Marine Corps did not have processes for completing life-cycle cost analyses, processes for planning and selecting all energy projects, or energy strategies for achieving legislative goals.*

ADC I&L (FACILITIES) RESPONSE: In the course of selecting and planning Project P856-M, the Marine Corps utilized available reports assessing renewable energy opportunities within the Department of the Navy as well as an abundance of information published by DOE related to the implementation of renewable energy projects. Policy and instruction related to the Marine Corps Facilities Energy and Water Management Program is contained in MCO P11000.9C which is in the process of being revised to incorporate requirements directed by the recently published *Unites States Marine Corps Expeditionary Strategy and Implementation Plan*.

- The Marine Corps' Facilities Energy & Water Management Campaign Plan was signed by the Commandant in April 2009. Coordination within the Marine Corps was initiated by ADC I&L (Facilities) prior to passage of the Recovery Act.

- Instruction pertaining to section and justification of ECIP projects is provided for in MCO P11000.9C. It should be noted that traditionally the Marine Corps is only allocated five percent of the annual ECIP appropriation. The Recovery Act provided $120 million to ECIP, of which the Marine Corps received $38 million (32%).

- Planning related to the selection and justification of renewable energy projects on Department of the Navy installations including an analysis of the benefits and drawbacks of developing specific renewable technologies and assessments of potential opportunities to utilize renewable sources has been documented in the following:

  - Report to Congress, DOD Renewable Energy Assessment, Final Report, 14 March 2005.

  - Renewable Energy Technology Review, Department of the Navy, Navy Region Southwest - Marine Corps Installations West, April 2007.

  - Strategic Renewable Energy Action Plan, Department of the Navy, Navy Region Southwest - Marine Corps Installations West, April 2007.

- Information available from DOE's National Renewable Energy Laboratory identified the Southwest region as a prime area to implement PV generation projects within the continental Unites States.

3. **RESPONSE TO RECOMMENDATIONS**:

Recommendation 2. We recommend that the Deputy Assistant Secretary of the Navy for Energy, in coordination with the Deputy Chief of Naval Operations, Fleet Readiness and Logistics; the Commander, Naval Installations Command; the Director, Naval Facilities Engineering Command Energy Office; and the Assistant Deputy Commandant for Installations and Logistics (Facilities):

a. Establish a standard definition of a shore energy project that aligns with DoD policy; and

b. Incorporate the definition into Secretary of the Navy energy policy.

ADC I&L (LF) Response. Concur. ADC I&L (LF) will coordinate with Deputy Assistant Secretary of the Navy (Energy).

Recommendation 4. We recommend that the Assistant Deputy Commandant for Installations and Logistics (Facilities):

a. Develop comprehensive policy for planning, prioritizing, selecting and executing cost-effective FSRM and MILCON shore energy projects in accordance with DoD and Federal requirements that includes:

1. Processes for performing and documenting life-cycle cost analyses;

2. Standardized methods for estimating project costs and energy savings during project planning; and

3. Responsibilities for obtaining incentives for energy projects, guidelines for claiming incentives, and justifications for saving incentives for future projects.

ADC I&L (LF) Response. Partially concur. In the course of selecting and planning Project P856-M, the Marine Corps utilized available reports assessing renewable energy opportunities within the Department of the Navy as well as an abundance of information published by the Department of Energy related to the implementation of renewable energy projects. ADC I&L (Facilities) is revising ref (a) to better capture those elements in project documentation and address the requirements established by ref (c).

b. Integrate the policy into standard Marine Corps processes for planning, prioritizing, selecting, and executing FSRM and MILCON energy projects.

ADC I&L (LF) Response. Concur. Updated policies will be integrated into processes for planning, prioritizing, selecting and executing FSRM and MILCON energy projects.

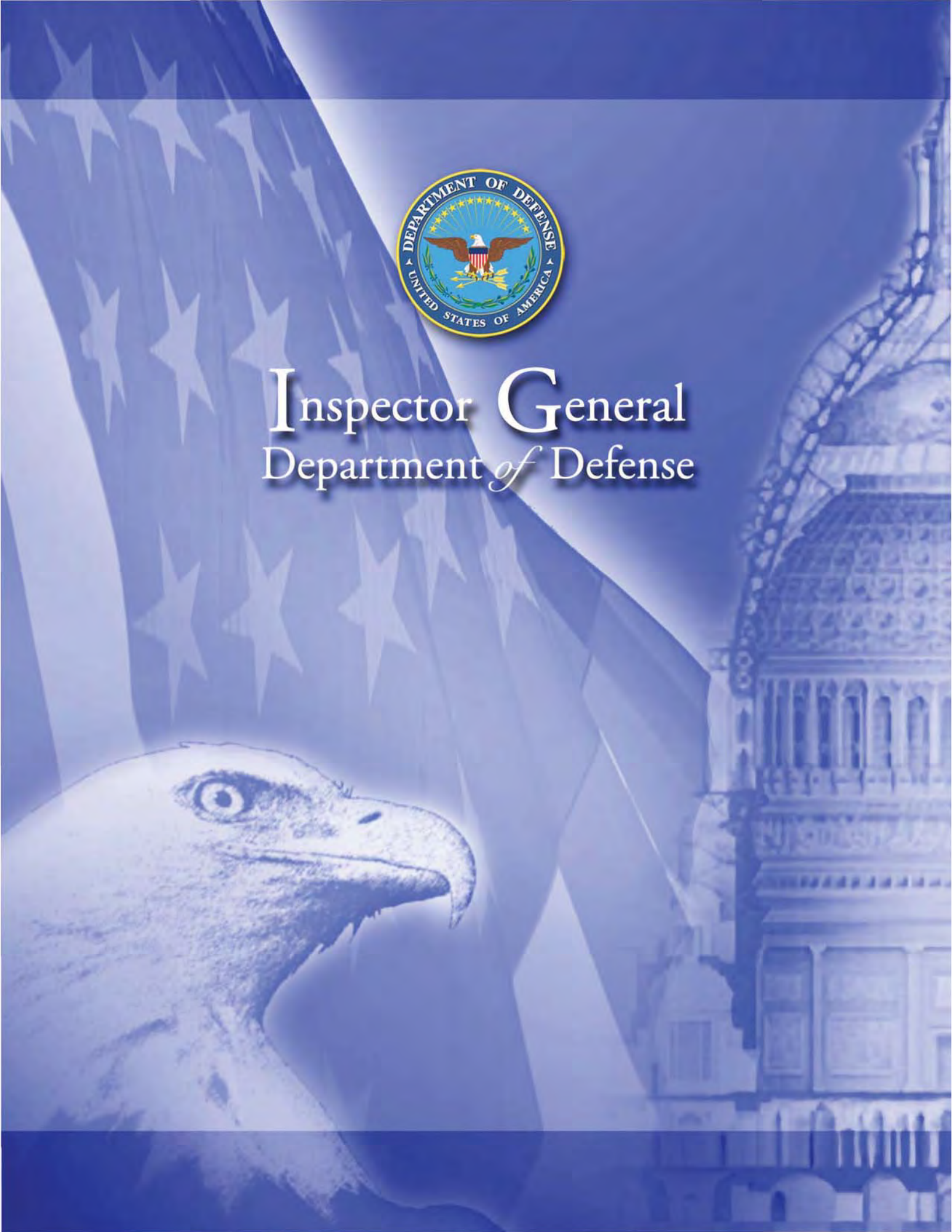
Recommendation 8. We recommend that the Assistant Deputy Commandant for Installations and Logistics (Facilities):

a. Initiate an administrative review to identify individuals in the Marine Corps responsible for disregarding the requirements for planning and selecting cost-effective projects, which resulted in Recovery Act funds not recovered; and

ADC I&L (LF) Response. Strongly Nonconcur. As indicated in enclosure (1), I believe the findings are based on an incomplete interpretation of current legislation and policies. As such, I am requesting the opportunity to discuss the concerns presented in enclosure (1) with DODIG officials prior to release of a final report

b. Initiate as appropriate any administrative actions warranted by the review.

ADC I&L (LF) Response. Strongly Nonconcur. The enclosed discussion demonstrates that the selection of Project P856-M by Marine Corps officials was in accordance with Federal legislation and DOD policy. Further the selection was justified in accordance with life cycle cost analysis guidance. The effort put forth by personnel at MCB Camp Pendleton is tremendously appreciated by the Marine Corps. It contributes to the achievement of federally mandated renewable energy goals and demonstrates excellence in managing limited resources.



Inspector General
Department of Defense