U.S. Department of Energy
Office of Inspector General
Office of Audit Services

Audit Report

Selected Energy Efficiency and Renewable Energy Projects

DOE/IG-0689

May 2005

Department of Energy
Washington, DC 20585

May 12, 2005

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman
Inspector General

SUBJECT: INFORMATION: Audit Report on "Selected Energy Efficiency and Renewable Energy Projects"

BACKGROUND

The Department of Energy, primarily through its Office of Energy Efficiency and Renewable Energy (EERE), funds advanced energy technologies through cooperative agreements with industry and other partners. As of January 2004, EERE had 798 active cooperative agreements, valued at over $3.4 billion, including the Federal contributions. Federal officials who administer cooperative agreements share responsibility for the management and performance of these projects. This includes participating in technical and business aspects of the initiatives, providing extensive assistance to high-risk organizations, and monitoring progress.

Since these agreements are essential to the Department's core mission related to energy technology deployment, we initiated an audit to determine whether EERE cooperative agreements with commercial organizations were being effectively managed.

RESULTS OF AUDIT

Over half of the 20 cooperative agreements included in our review did not receive sufficient management attention. For many of the agreements, Federal project managers either had not completed or did not document reviews to evaluate the merit and technical aspects of the projects. Nor did they perform required site visits. In fact, in some cases, we found that, primarily due to changes in personnel, current project managers were unfamiliar with the nature and progress of the agreements for which they were responsible.

Two of the agreements, in particular, experienced significant problems. Despite the investment of $4.5 million in taxpayer funds in these projects, neither achieved its original objectives. For one of the projects, a cooperative agreement to develop an improved aluminum manufacturing process, EERE did not act to address and resolve serious accounting and solvency issues before entering into the agreement. Although EERE had noted these weaknesses, it continued to support this project until 2003, when the recipient and its parent company filed for bankruptcy. For the second project, an agreement to construct a geothermal demonstration plant, EERE did not review the feasibility of the project on a continuing basis. Even though the recipient changed its business partnering arrangement on several occasions and encountered a number of problems and delays over the 10-year life span of the project, EERE officials never reassessed the business arrangements of the project after it was initially funded. Ultimately, this cooperative agreement had to be terminated.

These problems occurred, in large part, because EERE did not devote sufficient resources to the management of cooperative agreements. We found, for example, that each Federal project official was required to contemporaneously administer up to 50 projects, an unreasonable number of agreements from our perspective. Additionally, EERE did not have in place a method to identify and track high risk projects so that operating problems could be promptly addressed. As a consequence, the risk that in-process projects will fail to achieve their end goals has increased.

During the course of our review, EERE officials acknowledged weaknesses in project management and initiated action to improve their project management approach. For example, EERE established a Project Management Center and developed a broad action plan to implement common project management and business practices across the organization. Further, EERE plans to continue its effort to refine its draft Project Management Guide and it has developed a related draft risk analysis program to identify high-risk projects. According to EERE officials, this will be complemented by the development of a new management information system that should assist in tracking and managing high-risk projects.

While these actions are promising and should help prevent recurrence of problems such as those cited in this report, in our opinion, additional action is required to ensure that the planned improvements are fully implemented and that management of future and ongoing projects is improved. In that connection, we made several recommendations designed to further enhance project management practices.

MANAGEMENT REACTION

Management concurred with the report's findings and recommendations and indicated that it is taking corrective action designed to improve project management oversight. Management comments are included in Appendix 3.

Attachment

cc: Deputy Secretary
Under Secretary for Energy, Science and Environment
Chief of Staff
Assistant Secretary for Energy Efficiency and Renewable Energy

SELECTED ENERGY EFFICIENCY AND RENEWABLE ENERGY PROJECTS

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Commercial Cooperative Agreements

Energy Efficiency and Renewable Energy (EERE) project officials were not always sufficiently involved in managing projects funded by cooperative agreements with commercial organizations. Our review of 20 project files revealed that 12 were missing evidence that an initial assessment of the feasibility of the technology had been performed before the award was made, although this assessment is specifically required by Federal regulation. These reviews are important to the success of the project and provide an independent and objective examination of the technical feasibility of an award. In addition, we noted that 14 project files contained no indication that site visits to verify the status of the project were performed as required after the award. As noted by the Department's Guide to Financial Assistance, site visits help Federal managers evaluate programmatic progress and financial and business management aspects of the project, as well as identify other issues that could affect the success of the project.

In some cases, we noted that current Federal project officials had not reviewed the project files and had no knowledge of the status of a project or whether needed reviews and visits had been performed. While officials told us that many of the projects had been transferred to them only recently as part of a reorganization designed to improve project management, we noted that the project files in question had been in their possession for periods of up to 10 months.

We also observed that two of the projects we reviewed, one agreement to improve aluminum production (aluminum production project) and another to demonstrate the benefit of geothermal electrical power generation (geothermal project) suffered from significant management problems and will not meet their objectives.

<u>Aluminum Production Project</u>

EERE project officials did not ensure that accounting and business weaknesses disclosed through audits by the Defense Contract Audit Agency (DCAA) were corrected. The objective of the agreement was to develop an improved process for aluminum production through the design and implementation of a pilot plant. The plant was originally projected to cost $2.3 million and be operational in 2 years. Before the cooperative agreement was awarded in 1998, DCAA reported that the recipient's financial management system could not properly accumulate and report costs and that adequate timekeeping procedures were not in place. In addition, DCAA expressed serious concerns about the project's completion because of the recipient's poor financial condition.

Shortly after completion of the pre-award audit, EERE finalized the agreement without implementing controls aimed at mitigating the risks associated with the inadequate financial management system and unfavorable financial condition. In 2001, after the original planned completion date had passed, DCAA again reported, during a follow-up audit, that the recipient's financial management system was inadequate and that it was still having significant financial difficulties. In spite of these findings, EERE amended the project several times, increasing the total estimated cost by over $5 million and the schedule by 4 years. Furthermore, the Department continued to provide project funding until 2003, when the recipient and its parent company filed for Chapter 11 bankruptcy. Although several patents were issued as a result of the research in improving aluminum production technology, work on this project has ceased and it will not meet its final objective.

As part of our test work to determine whether the recipient had properly accumulated and claimed costs, we judgmentally sampled costs incurred during Fiscal Years (FY) 2001 through 2004. Specifically, we reviewed $1,067,073 in project expenditures and found that $359,483, or 34 percent, were questionable. The Department reimbursed 70 percent, or about $252,000, of these questionable expenditures. These questionable or potentially unallowable expenditures included:

- $37,060 in legal costs that were not associated with the project;

- $70,743 in engineering costs associated with the construction of an addition to a building that was not a direct expense of the project;

- $87,736 in consulting costs for which there were no detailed invoices to explain the nature of the services provided. Even though we noted that all of the $525,004 in consulting costs in our sample was not supported by contractual agreements, we did not question all of these costs because most of them were supported by invoices with sufficient detail to describe the nature of services provided by the consultants. In addition, the use of many of these consultants was discussed in various technical reviews completed by the Department;

- $142,410 for labor costs that were not supported by certified and approved timesheets. Of this amount, $46,117 was charged in one month for 945 hours of labor for one employee whose employment history did not show assignment to the project. We were told that the hours represented time that the employee had spent on the project in prior months; however, there were no timesheets to support this claim. Another $28,815 of the labor cost was charged for two additional employees whose histories did not show an assignment to the project;

- $16,056 in indirect costs such as rent, postage, janitorial services, and office supplies. These costs were questioned because the agreement between the Department and the recipient indicated that no indirect costs would be charged; and,

- $5,478 in unsupported travel, miscellaneous, and administrative costs.

While EERE officials conducted a number of in-process reviews designed to evaluate proposals for cost and schedule increases related to activities that fell under the original scope of work, it did not specifically take action to resolve the recipient's business and financial risks. Project officials explained that no special controls were imposed because there was a "clear" Dunn and Bradstreet credit appraisal, the parent company guaranteed to provide project working capital, and indirect costs were excluded. These assurances and arrangements, however, proved not to be completely effective and the company continued to suffer from financial problems.

Geothermal Project

In the case of the geothermal project, we found that EERE project officials never reviewed the cooperative agreement's continued feasibility from a business perspective. The intent of the agreement was to demonstrate the economic benefit of geothermal electrical power generation. The project was awarded in 1994, with an estimated cost of $41 million, to design, construct, and operate a 12 megawatt geothermal demonstration power plant by 1998. Even though the recipient changed its business partnering arrangement on several occasions and incurred a number of problems and delays over its life span of almost 10 years, EERE project officials never reassessed the business structure of the organization after the project was initially funded.

Despite problems with the various partnering arrangements, EERE project officials did not determine whether the various partners had the resources or agreements in place to permit them to secure a geothermal source or market for generated power. Such reviews may have helped disclose the instability of the recipient and prompted EERE to institute additional controls to help ensure that the project would be successful. When EERE eventually conducted an independent technical review of the project in 2003, project officials concluded that the agreement was no longer viable and recommended its termination and partial de-obligation of funds. While EERE officials conceded that there had been insufficient progress over the life of the project, they told us that they did not move to terminate it earlier because the recipient had continually "held out a carrot" and promised Department officials that they would deliver a geothermal demonstration plant. The geothermal project was ultimately canceled due to lack of progress.

Substantial Involvement and Monitoring

These problems occurred, in large part, because EERE did not devote sufficient attention or resources to managing its cooperative agreements with commercial organizations. EERE officials acknowledged weaknesses in project management and indicated that they had not been allocated sufficient resources to monitor and assist in the management of cooperative agreements. They indicated that project management responsibilities had been transferred to the Golden Field Office and Morgantown Site Office in 2003 and that project officials at these two offices are responsible for monitoring up to 50 projects simultaneously. Further, officials told us that with this Federal manager-to-project ratio they cannot provide the monitoring and substantial involvement required to properly manage, control, and direct the performance of all of their cooperative agreements.

Additionally, EERE did not have a system to identify high-risk projects, such as the aluminum production and geothermal projects, which would enable them to take timely action to either correct known problems or terminate the agreements. Even given severe resource constraints, had a risk-based system been used, project officials could have focused their attention on those agreements with known weaknesses rather than all agreements under their purview. As noted by the Department's Guide to Financial Assistance, Federal project officials should quickly identify high-risk projects and become substantially involved in their management and performance. In so doing, project officials can take steps to better monitor financial and business information on problem projects. To its credit, EERE developed a draft outline dated February 2005, which describes its plan to perform risk analyses in order to focus its project management resources. EERE also indicated that it is developing a management information system that will, among other things, be used to track high-risk projects.

Opportunities for Improvement

Lack of oversight and involvement by EERE project officials substantially increased the risk that issues affecting project completion will not be identified in a timely manner. For the two problem projects cited in our report, the Department expended a number of years of effort and valuable research funding that could have been applied to other viable projects. For example, after 6 years and expenditures by the Department totaling $3.7 million, the proposed aluminum production technology could not be demonstrated at the pilot plant scale.

For the geothermal project, closer attention by project officials may have enabled the Department to recognize earlier, the risks to completion and take steps to minimize cost and schedule increases. EERE provided reimbursements totaling approximately $825,000 for activities such as environmental assessments, permitting, and project planning. As of 2003, almost 10 years after it was awarded, no progress toward constructing a demonstration power plant had been made and EERE terminated the effort. In total, $4.5 million was spent on these two projects. Without greater involvement, similar failures and unnecessary expenditures may continue.

In the case of other projects for which oversight was insufficient, the risk of failure is substantially increased. Federal managers did not take advantage of important management tools, such as technical merit reviews and site visits, to help identify problems that required resolution or increased monitoring and oversight. Lack of these tools, when coupled with the lack of familiarity and high project-to-manager ratios, substantially increases the risk that scarce research funds will be expended on projects that do not provide a measurable result.

RECOMMENDATIONS

As part of its efforts to improve project management practices, we recommend that the Assistant Secretary for Energy Efficiency and Renewable Energy require that project officials:

1. Review resource allocations and adjust Federal project manager-to-cooperative agreement ratios as necessary to ensure that projects receive adequate monitoring and oversight;

2. Monitor all projects in accordance with established requirements and identify those projects with known weaknesses affecting their financial and business feasibility as high-risk projects; and,

3. Focus attention on high-risk projects by providing timely action to:

    a. review recipients' financial and business conditions;

b. take prompt action to correct identified financial or other weaknesses, including those identified by DCAA; and,

c. review expenditures to ensure that questionable or potentially unallowable costs are not reimbursed.

MANAGEMENT REACTION

The Office of Energy Efficiency and Renewable Energy concurred in full with the report's findings and recommendations and has identified corrective actions aimed at improving its project management practices. Specifically, EERE indicated that it has added nearly 100 Federal employees dedicated to project oversight and will determine the feasibility and methodology for addressing project risk. In addition, EERE indicated that it will focus attention on high-risk projects by assessing recipient financial and business conditions and considering DCAA audit findings and recommendations. EERE also indicated that it will request cost-incurred audits of those awards made to recipients that meet certain dollar thresholds or risk criteria to detect questionable or unallowable costs. Management comments are included in Appendix 3.

AUDITOR COMMENTS

Management comments are fully responsive to the report's recommendations.

OBJECTIVE

To determine whether selected EERE cooperative agreements with commercial organizations were effectively managed.

SCOPE

The audit was performed between March 2004 and April 2005 at the Department's Project Management Centers in Golden, CO, and Morgantown, WV, and at Department Headquarters in Washington, D.C. We reviewed EERE projects under cooperative agreements awarded to commercial entities with total project costs between $5 million and $30 million.

For the project expenditure portion of this review, we initially limited our scope to payments made in FYs 2003 and 2004. There were 9 invoices totaling $1,262,879 in this universe of which $1,133,408 was reimbursed. We further limited this scope to a judgmental sample of project expenditures totaling $996,330. While at the recipient's site, we expanded our scope to include engineering costs totaling $70,743 contained in 8 additional invoices.

METHODOLOGY

To accomplish our audit objective, we:

- Reviewed prior Office of Inspector General and Government Accountability Office reports to identify concerns associated with projects awarded under cooperative agreement;

- Reviewed reports issued by the National Academy of Public Administration to identify project management concerns within the Office of Energy Efficiency and Renewable Energy;

- Reviewed applicable Departmental policy, orders, guidance and manuals, as well as Code of Federal Regulations (CFR) on requirements for financial assistance and cost allowability;

- Selected a judgmental sample of 20 active cooperative agreement projects with commercial organizations;

- Reviewed project specific Defense Contracting Audit Agency reports to identify findings and recommendations made on recipient financial capabilities, accounting systems, and indirect cost and labor rates;

- Performed a detailed review of each project file checking for compliance with requirements of 10 CFR 600 and analyzed them for anomalies associated with the technical progression of the project;

- Held meetings with project officials and program managers responsible for the selected projects to discuss project goals and objectives, status, and noted problems as well as discuss project management roles and responsibilities; and,

- Conducted a project expenditure review at one recipient location to determine whether costs charged to the Department were allowable and supportable.

The audit was conducted in accordance with generally accepted Government auditing standards for performance audits and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. Since computer-processed data was not the primary support to meet our objective, we performed a limited assessment of data reliability. We also assessed the Department's compliance with the *Government Performance and Results Act of 1994*. We found that the Department's Performance and Accountability Report for FY 2004 contained outcome-oriented measures for EERE to complete research and technology development targets.

Management officials waived the exit conference.

PRIOR REPORTS

- *The McNeil Biomass Project* (DOE/OIG-0630, December 2003). The Department of Energy (Department) was directed by Congress to award financial assistance to the McNeil Biomass Project to assist them in achieving its goal of demonstrating commercial-scale biomass gasification. In this report, the Office of Inspector General (OIG) found that the Department continued to fund this project even though there was little or no progress; program officials did not closely monitor the project; and officials did not ensure that objectives and milestones were appropriate. DOE invested approximately $37 million in this project in financial support. Further, DOE continued to provide reimbursement to this project up until the recipient filed Chapter 11 bankruptcy.

- *Financial Assistance for Biomass-to-Ethanol Projects* (DOE/IG-0513, July 2001). The Department awarded financial assistance to two firms under the biomass program, which had a goal to build a full-scale commercial biomass production facility. In this report, the OIG found that the Department did not meet its program goal to have a full-scale commercial biomass production facility; the biomass program faced technological and financial risk; proposals were not solicited competitively; the Department was delayed in meeting its commitment to reduce oil imports; and, cost share for both projects increased. The Department invested approximately $15 million in these projects in financial assistance and construction of the two facilities had not started as of July 2001. Because of appropriations action, management latitude in managing these projects was limited.

Department of Energy
Washington, DC 20585

April 18, 2005

MEMORANDUM FOR GEORGE W. COLLARD
ASSISTANT INSPECTOR GENERAL FOR
AUDIT OPERATIONS
OFFICE OF INSPECTOR GENERAL

FROM: DAVID K. GARMAN
ASSISTANT SECRETARY
ENERGY EFFICIENCY AND RENEWABLE ENERGY

SUBJECT: Response to the Draft Inspector General Report "Selected Energy Efficiency and Renewal Energy Projects" (A04NE004)

Thank you for the opportunity to comment on the draft report concerning project management practices in the Office of Energy Efficiency and Renewable Energy (EERE). We are in full agreement with the deficiencies cited and, as you acknowledged in the report, began a major management initiative subsequent to the reporting period to create the EERE Project Management Center (PMC) to address precisely the problems you identified. EERE had historically relied upon a complicated network of National Laboratories, support service contractors and borrowed time from various Field Operation Offices to cobble together project management services. The PMC has added nearly 100 Federal employees dedicated to project management oversight. This initiative was recently cited by the National Academy for Public Administration as an innovative model that should serve as a guide for the Department of Energy. We are quite confident that the problems you have addressed, and that we also found in our own review of these practices, will be remedied as the PMC matures.

We have reviewed the findings and concur with the recommendations in the report as follows:

1. **Review resource allocations and adjust Federal project manager-to-cooperative agreement ratios as necessary to ensure that projects receive adequate monitoring and oversight.**

   We are aware of the unbalanced ratio of project manager-to-cooperative agreements and have implemented changes in the PMC that have resulted in hiring additional staff, streamlining processes, standardizing reports, and automating systems. The results are allowing project managers to focus more effort and resources in project management oversight as well as minimizing burdensome administrative tasks. Additional staffing has lowered the ratio to approximately 20 projects per project manager/monitor. EERE has also reprogrammed the budget to allow for previously restricted resources to now be used for project monitoring oversight. The PMC will

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continue to engage in activities to improve EERE functions as a business entity and as a research and development organization. We will continue to monitor resources and make adjustments to the federal project manager-to-cooperative agreement ratios as necessary in an effort to insure projects receive adequate resources, monitoring and oversight.

2. **Monitor all project in accordance with established requirements and identify those projects with known weaknesses affecting their financial and business feasibility as high-risk projects.**

   We have established an automated database system to capture project award information. Project data will be studied to determine the feasibility and methodology for addressing project risk.

3. **Focus attention on high-risk projects by providing timely action to:**

   a. **Review recipients' financial and business conditions.**

      The review of the recipient's financial and business conditions will continue to be assessed by the Contracting Officer.

   b. **Take prompt action to correct identified financial or other weaknesses, including those identified by DCAA.**

      DCAA audit findings and recommendations will be considered by the Contracting Officer. It is at the discretion of the Contracting Officer as to whether to incorporate the DCAA's recommendations.

   c. **Review expenditures to ensure that questionable or potentially unallowable costs are not reimbursed.**

      The PMC will request yearly cost incurred audits for all awards within a certain dollar threshold or specific risk category. The review will enhance EERE's oversight of projects and allow early detection of any questionable or unallowable costs so that necessary actions may be taken in an appropriate and timely manner.

Once again, thank you for the opportunity to comment on the draft report. If you have any questions please contact Dreda Perry of my staff at 202-586-0561.

IG Report No. DOE/IG-0689

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