



U.S. Department of Energy
Office of Inspector General
Office of Audits and Inspections

Audit Report

Implementation of the Department of Energy's Concentrating Solar Power Program



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November 2012



Department of Energy
Washington, DC 20585

November 1, 2012

MEMORANDUM FOR THE PROGRAM DIRECTOR, CONCENTRATING SOLAR POWER PROGRAM

FROM: *Daniel M. Weeber*
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Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "Implementation of the Department of Energy's Concentrating Solar Power Program"

BACKGROUND

The Department of Energy's Office of Energy Efficiency and Renewable Energy's Concentrating Solar Power Program is intended to broaden the use of concentrating solar power by making the technology cost competitive in the conventional power market. The Department plans to achieve this goal through cost-shared contracts with private industry, as well as facilitating advanced research at its national laboratories. Concentrating solar power technologies concentrate the sun's energy and convert it to heat which is then used to drive an engine or turbine to produce electrical power.

In 2009, the Department issued two Funding Opportunity Announcements to further research and development of concentrating solar power. The first announcement, *Recovery Act: National Laboratory Call for Foundational Photovoltaics and Concentrating Solar Power Research and Development* (Recovery Act Award), issued in May, was aimed at complementing ongoing Department funded concentrating solar power research activities. Under this American Recovery and Reinvestment Act of 2009 announcement, the Department made awards to eight national laboratories and one consortium, totaling approximately \$29.7 million. Of the eight awards, only three were directly related to concentrating solar power activities. These awards, totaling \$24.1 million, were awarded to two national laboratories and one consortium that included a national laboratory.

The second announcement, *Baseload Concentrating Solar Power Generation* (Baseload Award), was issued in July. The Department's objective was to aid the private sector in the development and evaluation of concentrating solar power systems that could lead to utility scale baseload¹ power plants capable of generating electricity at costs competitive with fossil-fired generators. The Department subsequently made 13 awards totaling \$50 million to private industry companies and one university.

¹ Utility scale baseload is the minimum amount of electric power delivered or required over a given period of time at a steady rate.

Given the President's goal of creating new green jobs and helping to ensure 10 percent of the United States' electricity comes from renewable sources, we initiated this audit to determine whether the Department established effective controls over the cooperative agreements and contracts under the Concentrating Solar Power Program.

CONCLUSIONS AND OBSERVATIONS

We found the Department had implemented controls over the selection and monitoring of both its Baseload and Recovery Act Awards. For its Baseload Awards, the Department developed and implemented a control process that, in our opinion, provided reasonable assurance that funds were properly awarded and subsequently managed.

Similarly, for its Recovery Act Awards, the Department implemented a control process that included an application and award selection process, onsite monitoring and regular performance reviews. This control process differed from the Baseload Award in that the Recovery Act Awards were restricted to national laboratories operated by established Management and Operating contractors. For both award types, our test work did not identify problems with supporting documentation for costs claimed by the recipients and reimbursed by the Department. We also found the projects were generally meeting established deadlines and milestones according to available recipient and Department progress and monitoring reports.

Baseload Award

We reviewed the Department's Baseload Award selection process and found the Department had implemented a number of controls over its award recipients. For example:

- Applications were evaluated to determine whether the recipient was eligible for an award and if the proposed project was responsive to the Department's objectives. A subsequent merit review evaluated the application's project description, technical approach and project management plan;
- The Department used a risk analysis to streamline the level of detailed review required for each recipient's sub-awards. We reviewed this process and found that for each Baseload Award recipient, the Department performed a risk management assessment to determine the level of scrutiny needed for subcontractor review, giving more scrutiny to higher risk sub-awards;
- The Department assessed the financial risk associated with each award recipient. Recipients found to be at financial risk had Departmental review of all payment requests; and,
- The Department instituted a cost sharing requirement for each recipient. Recipients were to contribute 20 percent of total project costs in Phases I and II of the award and 50 percent in Phase III.

We also found the Department was monitoring Baseload Award recipients through a series of reviews conducted during each phase of the project, quarterly progress reports, site visits and quarterly teleconferences with industry recipients and university recipients. With each Baseload

Award divided into three phases, the Department planned to make a go/no-go decision before beginning the next phase based on whether the project met the Department's review criteria. For example, the Department determined that one recipient was behind schedule as the end of Phase I approached. Subsequently, the Department and the recipient came to a mutual decision to terminate the award.

During the audit, we conducted site visits and reviewed documentation for two Baseload Award recipients. The Department awarded one recipient approximately \$10.6 million to develop new concentrating solar power receiver technology and the second recipient almost \$4.3 million to develop new solar collector technology. Our test work of supporting documentation for costs and cost shares claimed by the recipients did not disclose any issues. As of June 2012, the Department had made payments to the recipients of approximately \$1.25 million and \$800 thousand respectively. These payments were within the amounts budgeted for Phase I of the projects. The Department had approved the second recipient to move into Phase II of its project and had given the first recipient a conditional "go" decision to move into Phase II of its project.

Recovery Act Award

We also reviewed the Department's Recovery Act Award selection and monitoring process and found the Department had also implemented a number of controls over its award recipients. For example:

- The Department initially evaluated applications to determine if the applicant was eligible for an award and if the proposed project was responsive to the Department's objectives. A subsequent merit review evaluated the application's project impact and the extent to which the proposed work would enhance the manufacturing, testing and evaluation of solar technologies; and,
- The Department monitored Recovery Act Award recipients through site visits, monthly progress reports and teleconferences.

We conducted site visits to two Recovery Act Award recipients, the National Renewable Energy Laboratory (NREL) and Sandia National Laboratories (Sandia). NREL was awarded approximately \$4.4 million in Recovery Act funds and had received approximately \$2.6 million (61 percent) of its award from the Department as of June 2012. NREL used these funds to upgrade and expand the laboratory's solar concentrator and thermal storage test and evaluation facilities. Our test work of project costs did not identify any concerns with the amounts claimed by NREL. According to NREL officials, the project was generally meeting established deadlines. We also found that the Department was monitoring NREL's performance through bimonthly progress reports, teleconferences and site reviews conducted in November 2011 and May 2012.

Sandia was awarded approximately \$17.8 million in Recovery Act funds to upgrade and expand its National Solar Thermal Test Facility (NSTTF). The Department designated NSTTF as a user facility whereby private industry, universities and other laboratories have access to the site to conduct concentrating solar power research. As of June 2012, Sandia had received payments from the Department totaling approximately \$16.3 million (92 percent) of its award. During our review, we noted that Sandia had modified the scope of the project and made baseline changes

that were reviewed and approved by the Department. According to Department and Sandia officials and reports, Sandia was generally meeting the established deadline for completing its Concentrating Solar Power Project. Similarly, we found that the Department was monitoring Sandia's award through bimonthly progress reports, teleconferences and on-site visitations conducted in November 2011 and May 2012.

PATH FORWARD

Our review did not identify any material concerns with the management of the Concentrating Solar Power Program. We encourage the Department to continue its monitoring of the Concentrating Solar Power Program as projects move forward to ensure success in meeting program objectives.

No recommendations are being made in this report; therefore, a formal response is not required. We appreciate the cooperation of the various Department elements, National Laboratory personnel and the private sector during our audit.

Attachment

cc: Deputy Secretary
Associate Deputy Secretary
Acting Under Secretary of Energy
Chief of Staff

OBJECTIVE, SCOPE AND METHODOLOGY

OBJECTIVE

The objective of the audit was to determine whether the Department of Energy (Department) established effective controls over the cooperative agreements and contracts under the Concentrating Solar Power Program.

SCOPE

This audit was performed between October 2011 and October 2012, at Department Headquarters in Washington, DC, as well as the Golden Field Office, Golden, Colorado. The audit included site visits to four award recipients, including Sandia National Laboratories (Sandia) in Albuquerque, New Mexico; National Renewable Energy Laboratory (NREL) in Golden, Colorado; and, two private sector companies.

METHODOLOGY

To accomplish the audit objective, we:

- Reviewed applicable laws, regulations and guidance relevant to the Concentrating Solar Power Program;
- Interviewed key personnel in the Department's Office of Energy Efficiency and Renewable Energy located at Department Headquarters and the Golden Field Office;
- Performed site visits and interviewed key personnel at NREL, Sandia, and two private sector companies;
- Reviewed site recipients' progress reports, invoices, supporting cost documentation, baseline change proposals and project plans; and,
- Analyzed invoices and supporting documentation to determine whether project expenses were reasonable and reimbursable.

We conducted this performance audit in accordance with generally accepted Government auditing standards. These 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 objective. We believe the evidence obtained provides a reasonable basis for our conclusions based on our audit objective. Accordingly, the audit included tests of controls and compliance with laws and regulations to the extent necessary to satisfy the objective. In particular, we assessed the Department's implementation of the *Government Performance and Results Act of 1993* and concluded that the Department tracks the performance of the Concentrating Solar Power Program in its Annual Performance Report. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have

existed at the time of the audit. While our reliance on computer-processed data was minimal, we verified the accuracy of data relative to the audit objective.

The Department waived a coordination meeting for this report on October 3, 2012.

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