

DOE/IG-0420

AUDIT REPORT

THE U.S. DEPARTMENT OF ENERGY'S SOLAR ENTERPRISE ZONE



APRIL 1998

U.S. DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL
OFFICE OF AUDIT SERVICES

April 24, 1998

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman
Acting Inspector General

SUBJECT: INFORMATION: Audit Report on "The U.S. Department of
Energy's Solar Enterprise Zone"

BACKGROUND

To demonstrate the commercial viability of producing and marketing solar generated power, the Department of Energy is supporting the construction of a solar facility in the State of Nevada. The purpose of the audit was to determine if the Department had fully examined the costs and benefits of siting a solar facility at the Nevada Test Site and at alternative sites in Nevada.

RESULTS OF AUDIT

As a result of our audit work, the Office of Inspector General concluded that there were two major issues that need to be addressed and resolved before a decision is made to locate a solar facility at the Test Site or elsewhere. The first concerns sponsorship of the project. We found that sponsorship within the Department is presently fragmented and that the Office of Energy Efficiency and Renewable Energy, which has the expertise and program responsibility in furthering solar energy, neither manages nor funds the project. The second concern focuses on the establishment of appropriate siting criteria for the solar facility which fully considers cost, commitment, capacity and commercialization issues.

In March 1998, the Deputy Secretary issued guidance on the proposed purchase of solar power by the Nevada Test Site. This guidance established specific purchase criteria and conditions which must be met if the Department is to proceed with this transaction. Our audit concerns encompass this and other issues. The audit report includes additional suggested actions to address these other matters.

Attachment

cc: Deputy Secretary
Under Secretary

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INTRODUCTION AND OBJECTIVE

As described in its Strategic Plan, the Department of Energy (DOE) is responsible for advancing renewable energy technologies. In fulfilling its mission, DOE has identified four sites in southern Nevada, including the Nevada Test Site (NTS), which would be suitable for constructing a solar facility. To further demonstrate the commercial viability of producing and marketing solar generated power, the facility would be built and operated by a commercial company. The purpose of the audit was to determine if DOE had fully explored the costs and benefits of siting a solar facility at the NTS versus the alternative sites.

BACKGROUND

The National Defense Authorization Act for Fiscal Years 1992 and 1993 directed DOE to study the NTS for possible conversion, development, and utilization as a location for a commercial facility for solar generated power. In April 1994, the Nevada Operations Office and the Office of Energy Efficiency and Renewable Energy issued the *Nevada Test Site Solar Feasibility Study* report. The report identified a goal of a 1,000 megawatt (MW) capacity solar facility. However, the report considered only the NTS as a location. Further, it acknowledged that siting a plant on the NTS would: 1) cost millions of dollars for needed upgrades to the electrical distribution infrastructure, and 2) require new transmission capabilities to connect a solar facility on the NTS to the commercial power grid.

In June 1994, the Secretary of Energy formed a task force comprised of state, Federal, and industry representatives and assigned the Assistant Secretary for Energy Efficiency and Renewable Energy as co-chairman. The task force issued a report in December 1994 in which it increased the estimated infrastructure costs needed for a 1,000 MW capacity facility at the NTS. As a result, the task force identified two alternatives -- building a facility off-site or building more than one solar facility. The report also identified three possible off-site locations in southern Nevada and designated these sites, along with the NTS, as the Solar Enterprise Zone (Zone). The purpose of introducing alternative sites was to keep the infrastructure cost to a minimum and to avoid the constraints imposed by the physical limitations of some sites. The task force was dissolved in January 1995 after issuing the final report.

In February 1995, the Assistant Secretary for Energy Efficiency and Renewable Energy asked that a grant from Worker and Community Transition funds be awarded to the Corporation for Solar Technologies and Renewable Resources (CSTRR). The purpose of the grant was to facilitate the commercialization of solar and renewable energy

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technologies within the Zone. In June 1995, the Nevada Operations Office awarded CSTRR a \$7.5 million grant. At the time of this report \$4.0 million of the award had been made available to CSTRR. In October 1996, CSTRR selected a commercial company to construct and operate a 10 MW solar power facility as part of a stepped approach to reach the 1,000 MW goal. This facility is tentatively sited on the NTS.

In March 1998, the Deputy Secretary issued guidance on the proposed Nevada Test Site purchase of solar power. This guidance established specific purchase criteria and conditions which were essential if the Department were to proceed with this transaction.

CONCERNS

It appeared that DOE had not fully explored the costs and benefits of siting a solar facility at the NTS versus the alternative sites. The audit identified two major concerns that need to be addressed by senior DOE officials before a decision is made to locate a solar facility on the NTS or elsewhere. The first is sponsorship of the project within DOE, and the second is the establishment of appropriate siting criteria.

Of the three organizations that have supported the project to date, only one, the Office of Energy Efficiency and Renewable Energy, has expertise and program responsibility for furthering solar technologies. However, that office neither funds nor manages the CSTRR grant. The Nevada Operations Office awarded and administers the CSTRR grant; however, the Operations Office's oversight of DOE efforts in Nevada is primarily focused on defense and environmental activities. The Office of Worker and Community Transition funds the grant. However, that office's focus is on mitigating the impacts on the local economy of site downsizing, not on furthering solar technologies. Because of the fragmented support, CSTRR has sought and received programmatic guidance from various DOE organizations, including the Secretary of Energy's Office. In the future, sponsorship should rest with the office that can best provide solar energy programmatic guidance and support.

With respect to siting criteria, four issues have surfaced concerning the practicality and feasibility of a solar facility. The issues are cost, commitment, capacity, and commercialization.

- Cost. The task force recognized that locating a solar plant on the NTS would require a significant infrastructure expenditure for DOE. To construct a facility with a capacity between 100 and 550 MW, would cost DOE about \$55 million for upgrading its infrastructure and connecting to the local power grid, approximately 60 miles away. A 100 MW capacity facility was

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approximately 60 miles away. A 100 MW capacity facility was also considered, but that would still require an investment of approximately \$2.3 million for infrastructure improvements. The projected 10 MW facility is estimated to require \$1.5 million in infrastructure improvements if it is located at the NTS. In any case, DOE is far short of its 1,000 MW capacity goal unless it considers additional solar facilities. Conversely, a 1,000 MW facility at an off-site location would cost DOE and the power purchasers, most of which currently would be Federal entities, about \$2.9 million to upgrade the infrastructure and connect to the power grid.

- Commitment. Placing the solar power facility at the NTS will commit DOE to a number of long-term obligations, some of which may involve an indeterminate amount of funds. First, land to accommodate the facility will be unavailable for other uses, as may adjacent lands. Second, DOE may need to commit to a long-term purchase agreement for power generated by an on-site solar facility. The company selected by CSTRR has stated that it would want a 30-year purchase guarantee from DOE and other power purchasers. Third, if the effort is not successful, DOE may have a financial or legal obligation to the commercial owners of the facility. Fourth, DOE will have an obligation to seek the necessary funding from the Congress to support the substantial infrastructure improvements that are needed. Conversely, if a plant is built at an off-site location, DOE's obligations will not be as severe because the power can be more easily marketed.
- Capacity. The NTS does not need a facility with a 1,000 MW capacity. In fact, a 25 MW capacity facility would power the peak requirements of the NTS. A facility on the NTS that produces more than 100 MW of power would require the construction of a 60-mile power line so the excess power could be transmitted off-site to a commercial power grid. If a 1,000 MW facility was built off-site near existing transmission facilities, substantial costs for constructing the power lines and upgrading the NTS infrastructure could be avoided. Such a facility would meet the production goal established in the Feasibility Study report, and customers interested in purchasing part of the production have already been identified.
- Commercialization. The principal reason for building a solar

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- Commercialization. The principal reason for building a solar power facility is to demonstrate the future viability of solar power technologies. However, this effort may be hindered if the facility was located on the NTS. For instance, the NTS is 65 miles from Las Vegas and access to, and visibility of, the facility would be restricted. Further, infrastructure improvements will need to be addressed before significant production is practical. If the facility were located off-site, however, it could be more readily accessible and expenditures that may have been required to upgrade the infrastructure could be used to promote the use of solar power.

SUGGESTED ACTIONS

Before DOE makes a long-term commitment to a solar facility at the NTS or elsewhere, the concerns identified in this report should be addressed. Specifically, DOE needs to assign an appropriate programmatic sponsor to this project to serve as the liaison with CSTRR and other DOE elements. The sponsor should develop siting criteria that will facilitate the commercial development of a solar power facility in the most practical, feasible, and cost effective manner. Further, the criteria should consider cost, commitment, capacity, and commercialization.

_____/s/_____
Office of Inspector General

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