



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

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ENERGY AND MINERALS
DIVISION

B-198213

June 25, 1981

The Honorable James B. Edwards
The Secretary of Energy



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Dear Mr. Secretary:

Subject: [DOE Needs to Reestablish a Solar Energy
Goal and Develop Plans to Achieve That
Goal] (EMD-81-100)

As you know, in 1979 the former President set a national goal of meeting one-fifth--20 percent--of the Nation's energy needs with solar and renewable resources by the end of this century. With respect to the Department of Energy's (DOE's) efforts to achieve that goal, we previously issued a report entitled, "20-Percent Solar Energy Goal--Is There a Plan to Attain It?" (EMD-80-64, Mar. 31, 1980). Our primary concern related to the lack of a comprehensive plan for attaining the goal. Accordingly, in that report we recommended that DOE develop and establish such a plan, furnish the plan to the congressional oversight and budget committees to assist them in their deliberations on solar energy policy and budget matters, and periodically review the plan's effectiveness. In commenting on our recommendations, DOE stated it supported the concept of an overall Federal plan for achieving the goal and planned to take actions to develop such a plan.

We recently completed a survey which followed up on actions taken by DOE in response to our past recommendations. We conducted our work primarily at DOE headquarters offices in Washington, D.C. We interviewed DOE officials in regard to the goal and plan, and examined documents they provided. We also contacted officials at the Solar Energy Research Institute (SERI) in Golden, Colorado, to discuss their planning efforts relative to reaching the 20-percent goal.

We found that DOE had taken steps toward developing a plan for achieving the 20-percent goal, but with the change in administration and the administration's recent proposed

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cuts in the Federal solar budget, the viability of the goal is uncertain and those planning efforts are at a standstill. However, anticipated Federal solar energy efforts in the period 1981-86 are projected to amount to nearly \$8.6 billion, including nearly \$7 billion in tax credits. We believe that the substantial amount of Federal support that would be continued under the new administration's philosophy makes it essential that a solar goal be reestablished. Whether the 20-percent goal or a new goal is found to be appropriate, DOE needs to develop a long-range plan for achieving that goal. The plan should include interim goals which would provide a yardstick for measuring the success of Federal efforts to develop and promote the use of solar energy.

The following sections elaborate on the status and need for a solar goal and plan, and present our conclusions and recommendations.

UNCERTAINTY OF A SOLAR GOAL
HAS BROUGHT PLANNING EFFORTS
TO A STANDSTILL

Although DOE took some steps toward developing a plan for achieving the 20-percent solar goal, the viability of the goal is uncertain and those planning efforts are at a standstill. Toward developing a plan, DOE had begun work on determining the contributions each solar technology would make toward achieving the goal. However, with the change in administration, the viability of the goal became uncertain. Without a firm goal, efforts to develop a plan to achieve the goal have stopped.

DOE intended to develop a comprehensive plan for achieving the 20-percent goal as our prior report recommended. In 1980, DOE's solar energy program plan cited the development of such a comprehensive plan. As a step toward formulating a plan, the Solar Subcommittee 1/ met in May 1980 and assigned

1/The Solar Subcommittee is a permanent standing Subcommittee of the Energy Coordinating Committee. The Energy Coordinating Committee was established by Executive Order No. 12083, signed Sept. 27, 1978. It is chaired by the Secretary of Energy and is composed of the heads of 24 Federal departments and agencies and advisors to the President. Membership of the Solar Subcommittee is chaired by DOE's Assistant Secretary for Conservation and Renewable Energy and includes 32 members representing the Federal departments, agencies, and advisory offices of the President.

12 tasks related to the essential elements for achieving the goal to Subcommittee working groups. Reports on the status of those elements and how they may contribute to the goal were discussed at the Subcommittee's last meeting which was held in December 1980. However, since the change in administration, little has been done toward continuing these efforts which are currently at a standstill. For example, as of May 1981, the the Subcommittee had not met because Subcommittee members still had not been named.

The viability of the 20-percent solar goal is, at present, uncertain. The new administration's proposed reductions in Federal funding for DOE's solar energy program for fiscal year 1982 and the administration's recently stated philosophy of supporting long-term, high-risk research and development, and discontinuing commercialization activities, seems to have cast doubt about the viability of the goal.

During testimony on June 12, 1980, before the Subcommittee on Energy Development and Applications, House Committee on Science and Technology, your predecessor stated that the 20-percent solar energy goal would be met irrespective of what the Federal Government might do. He stated that circumstances had changed since the Domestic Policy Review 1/ estimated that the "maximum practical" amount of energy that can be obtained from solar and other renewable energy resources by the year 2000 was about 20-percent or 18.5 quads 2/ of U.S. demand. He explained that oil costs had increased more rapidly than earlier assumed and that technological improvements had increased the technical limits by 6 or 7 quads.

However, on February 24, 1981, you testified before the House Science and Technology Committee, that the previous administration's 20-percent goal is an optimistic one, and that a more realistic goal is probably in order. Yet, a May 1981 SERI study indicated that the 20-percent goal might even

1/A February 1979 report on the Domestic Policy Review was the basis for the 20-percent goal. The review was conducted by an Interagency Solar Energy Policy Committee under the Chairmanship of the Secretary of Energy and over 100 officials representing more than 30 Executive departments and agencies participated.

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2/A quad of energy is equivalent to one quadrillion (10¹⁵) British thermal units (Btus) or 180 million barrels of oil.

be exceeded. ^{1/} As part of the study, which was requested by DOE, SERI examined the opportunities for conserving energy and increasing the use of renewable energy resources (primarily solar energy), while maintaining vigorous growth of the U.S. economy. SERI's report states that the Federal role need not be costly or oppressive, but the Government cannot escape responsibility for national energy policy. With respect to a solar energy goal, SERI reported that U.S. energy demand could be 25 percent lower than initially anticipated and that 20 to 30 percent of this demand could be met by solar energy and other renewable resources by the year 2000. SERI further noted that meeting such goals "must be taken seriously and examined with care."

DOE NEEDS A SOLAR GOAL AND
A PLAN TO ACHIEVE THAT GOAL

DOE needs to either reaffirm the 20-percent goal or establish a new one. Such a goal would enable DOE to resume development of a plan to achieve the goal. Both the goal and plan are needed to provide the necessary focus and direction for Federal solar energy efforts as well as a means by which the effectiveness of such efforts can be evaluated. The sheer magnitude of these efforts--amounting to possibly \$8.6 billion for the period covering fiscal years 1981 to 1986--makes it essential that the goal and plan come into being.

DOE officials told us that the 20-percent goal is not applicable to the present administration's philosophy, DOE is not working toward a particular solar goal, and DOE does not plan to reestablish a goal or to develop plans to attain a goal. They explained that the present philosophy is to rely on the marketplace to determine the appropriate amount of energy that solar is to contribute to the Nation. Further, they stated that to set a goal would be highly speculative and may be inappropriate. In this connection, industry and individual citizens have major roles in determining the extent that solar energy systems will be used in a free marketplace. DOE officials believe that Government should not skew the marketplace by setting a goal and developing a plan to ensure that the goal is achieved. They noted, however, that DOE does make estimates on the extent that certain solar technologies can be accelerated through research and development.

^{1/}In March 1981, DOE submitted the resultant report, prepared in draft form, to the Chairman, Subcommittee on Energy Conservation and Power, House Committee on Energy and Commerce.

We disagree, however, with DOE's view concerning the need for a goal and a plan for achieving that goal. We have held the position that Federal solar energy efforts should be focused toward achieving a quantified long-range goal, with a plan for achieving that goal. Such a plan should include interim goals and an explanation of roles and responsibilities of the Federal agencies involved. (See enc. I for a listing of GAO reports which address this issue.) We are not suggesting that the goal be a rigid one but rather one that would permit periodic updating to enhance its usefulness as a benchmark against which the effectiveness of the Federal solar energy efforts can be measured.

The goal and plan are needed, also, to guide Federal efforts toward ensuring that solar technologies are developed in time to meet the Nation's energy needs. Without a goal, Federal solar energy efforts can either receive insufficient attention or obtain an unnecessarily high priority. This is even more critical in view of the new administration's philosophy of emphasizing long-term research and development and no longer supporting commercialization activities. While direct Federal support of research and development is decreasing, total Federal support of solar energy is rising. Also, a long-range plan, with interim goals, could be used as a tool to measure progress toward the established goal and would help provide a focus for long-term research and development.

We believe that the sheer size of the Federal solar energy efforts that would be continued under the new administration's philosophy make it imperative that a solar goal and plan come into being as soon as possible. In this regard, a total of nearly \$8.6 billion in Federal support is projected for the period fiscal years 1981 through 1986. Based on information provided by DOE's Office of the Controller and the Department of the Treasury estimates, respectively, funding in this period for long-range research and development may amount to about \$1.6 billion and tax credits may be nearly \$7 billion. With respect to the projected funding of research and development, a DOE budget official told us that, although extremely tentative, projected funding for the solar research and development program is to remain at a constant level of effort plus about 8.5-percent annual inflation. As shown in the following schedule, the estimated Federal support for solar energy may total over \$2 billion a year by 1986.

Estimated Federal Support
of Solar Energy

<u>Fiscal year</u>	<u>Estimated budget authority (note a)</u>	<u>Estimated tax credits (note b)</u>	<u>Total estimated Federal support</u>
	----- (in millions) -----		
1981	\$ 479	\$ 506	\$ 985
1982	193	806	999
1983	210	886	1,096
1984	228	1,303	1,531
1985	247	1,641	1,888
1986	<u>268</u>	<u>1,790</u>	<u>2,058</u>
Total	<u>\$1,625</u>	<u>\$6,932</u>	<u>\$8,557</u>

a/DOE budget authority for solar energy research, development, and demonstration proposed by the administration in March 1981, for fiscal years 1981-82; and projected amounts, assuming a constant level of effort, plus 8.5 percent inflation for fiscal years 1983-86. The Office of Management and Budget informed us that the amount of solar funding for agencies other than DOE under the current administration's proposed budget are not readily available.

b/Office of Tax Analysis, Office of the Secretary of the Treasury, estimates.

As the schedule indicates, the administration's proposed approach would reduce Federal support for solar energy in terms of Federal budget authority but would continue to increase overall Federal support when tax credits, which are not included in the budget, are considered. Thus, we believe it is extremely important that a solar energy goal be re-established as soon as possible so that a better basis can be developed for measuring the effectiveness of such Federal efforts.

CONCLUSIONS

Subsequent to issuance of our March 1980 report, DOE took some steps toward developing a plan for achieving the 20-percent solar energy goal. However, uncertainty as to the viability of that goal has brought work on the plan's development to a standstill. DOE no longer believes a solar goal is appropriate and has no plans to reestablish such a goal.

We believe DOE should give high priority to reaffirming the 20-percent goal or establishing a new goal so that a plan for achieving that goal can be developed. Whether the 20-percent goal or a new goal is found to be appropriate, we strongly endorse a flexible performance goal system. The goal should be sufficiently flexible to permit periodic updating to enhance its usefulness as a benchmark to measure the success or failure of those Federal solar energy efforts that are to continue under the new administration's approach. In this regard, such efforts during fiscal years 1981-86 may amount to nearly \$8.6 billion, including nearly \$7 billion in tax credits. A lack of progress toward achieving a goal may indicate that an alternative approach for developing and using solar energy is warranted.

RECOMMENDATIONS

To provide needed focus and direction to the various Federal efforts aimed at promoting the development and use of solar energy and a mechanism for evaluating the effectiveness of such efforts, we recommend that you give high priority to reaffirming the 20-percent goal or establishing a new goal. Once such a goal is either reaffirmed or established, similar high priority should be given to implementing our prior recommendations in this area; namely, that you

- Develop a long-range plan for achieving the solar energy goal. The plan should establish interim goals; contain specific actions needed to attain the goals; and identify the roles and responsibilities of the other Federal agencies in the solar energy effort.
- Periodically review this plan to determine its effectiveness and to identify areas needing modification.
- Furnish this plan to congressional oversight and budget committees as soon as possible so that it can be of assistance to these committees in their deliberations on solar energy policy and budget matters.

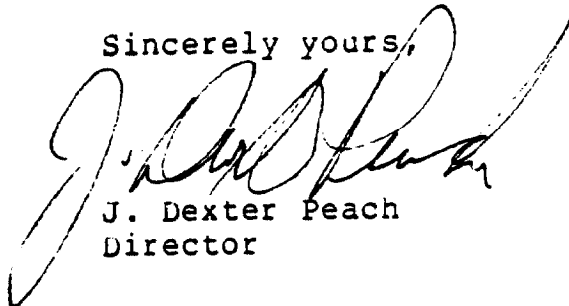
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As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the four committees mentioned above and to the Chairmen of the energy-related congressional committees. We are also sending copies to the Director, Office of Management and Budget.

We discussed matters presented in this report with DOE officials and their comments have been incorporated into this report as appropriate. We appreciate the courtesy and cooperation extended to our staff during the survey and would appreciate being informed of the actions you take on our recommendations.

Sincerely yours,



J. Dexter Peach
Director

Enclosure

LIST OF PRIOR GAO REPORTS THAT ADDRESS
THE NEED FOR SOLAR GOALS AND PLANS
FOR ACHIEVING THOSE GOALS

- "20-Percent Solar Energy Goal--Is There A Plan to Attain It?"
EMD-80-64, Mar. 31, 1980.
- "Commercializing Solar Heating: A National Strategy Needed,"
EMD-79-19, July 20, 1979.
- Report to the Secretary of Energy--"Selected Aspects of DOE's
Solar Photovoltaic Program," EMD-79-40, Apr. 19, 1979.
- "The Magnitude of the Federal Solar Energy Program and the
Effects of Different Levels of Funding," EMD-78-27, Feb.
2, 1978.
- "Energy Policy Decisionmaking, Organization, and National
Energy Goals," EMD-77-31, Mar. 24, 1977.
- "Opportunities to Improve Planning for Solar Energy and Devel-
opment," EMD-77-8, Nov. 30, 1976.