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BY THE COMPTROLLER GENERAL

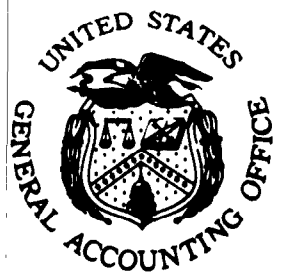
Report To The Congress

OF THE UNITED STATES

State Energy Conservation Program Needs Reassessing

The State Energy Conservation Program did not reach its goal of reducing the energy consumption 5 percent in each State by 1980. The program also overstated its 1980 reported savings. The administration proposes to dismantle the Department of Energy and terminate the program. If the program is authorized beyond fiscal year 1982, the Department or its successor agency needs to

- concentrate on program measures of proven effectiveness;
- reevaluate the program's progress to establish goals that are more realistic and attainable;
- ensure accurate reporting of energy savings; and
- improve the program's financial, planning, and progress reporting and monitoring.



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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

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To the President of the Senate and the
Speaker of the House of Representatives

This report discusses the need to improve the administration and effectiveness of the Department of Energy's State Energy Conservation Program.

This report is the last in a series of three annual reports to the Congress required by section 462 of the Energy Conservation and Production Act (42 U.S.C. 6892) on four Department of Energy programs--weatherization assistance for low-income persons, State energy conservation plans, energy conservation and renewable-resource obligation guarantees, and national energy conservation and renewable-resource demonstration for existing dwelling units.

This report generally covers activities during 1979 and 1980, except where, in certain instances, we have updated data to reflect the current situation. The final report on the low-income weatherization program was issued in October 1981. The remaining two programs were never implemented by the Department of Energy, and their legislative authority has expired.

The Department of Energy was asked to provide official comments on this report; however, the comments were not received in time to be included in this report without delaying the report's issuance.

Copies of this report are being sent to the Director, Office of Management and Budget; the Secretary of Energy; and the chairmen of energy-related congressional committees.

Charles A. Bowsher
Comptroller General
of the United States

D I G E S T

The report is the last in a series of three annual reports to the Congress required by the Energy Conservation and Production Act. As required by the act, it covers fiscal year 1979 and addresses program effectiveness, energy savings, financial controls, and compliance monitoring. Data has been updated to 1980. (See p. 6.)

The administration's fiscal year 1983 budget proposes to dismantle the Department of Energy, and terminate the State Energy Conservation Program. However, it is uncertain whether or not the Congress will approve these proposals.

Because of the time required to implement the GAO recommendations, and the likelihood that State activities involving fiscal year 1982 funds are well underway, GAO's recommendations are not apt to have an impact on the 1982 program. Therefore, the recommendations should be viewed as changes that need to be made by the Department or its successor agency should the program continue beyond fiscal year 1982.

NEED TO ASSESS AND IMPROVE
PROGRAM EFFECTIVENESS

Program measures in the buildings, utility, and industrial areas accounted for about 85 percent of the planned 1980 savings in the six States reviewed by GAO. The principal problems hampering program effectiveness in these areas were that the States

- undertook a large number of programs that accounted for minimal energy savings but a major share of State Energy Conservation Program funds,
- undertook programs in the buildings areas using methods with serious limitations in encouraging energy savings,
- set overly optimistic goals as to the population to be reached and the extent of compliance, or did not know the effect of

programs on consumption because they failed to measure savings attributable only to the State Energy Conservation Program.

However, the program has been effective in terms of developing a State capability to manage energy programs. (See p. 20.)

GAO's analysis of the 126 program measures in five States indicated that 27 programs (about 21 percent) accounted for the major share of planned energy savings in those States (from 68 to 89 percent). Although the remaining 99 programs accounted for a small portion of the States' planned 1980 savings (from 11 to 32 percent), they accounted for a large share (49 to 90 percent) of the States' planned 1980 State Energy Conservation program expenditures. (See p. 10.)

Program measures aimed at the residential area in four of the six States placed primary emphasis on types of audit and media outreach efforts that GAO previously reported as having serious limitations in encouraging energy conservation. (See p. 12.)

In addition, many residential programs did not attain their planned savings because they were based on overly optimistic goals as to the population to be reached and the extent of compliance with State recommended conservation actions. For example, by 1980 the residential audit programs of two States planned to reach all of the target residences in those States and expected a certain compliance with the recommended actions. Both the number of residences reached and the extent of compliance were considerably below expectations. (See p. 13.)

State program measures in the utility and industrial areas also did not attain planned savings because of overly optimistic goals. In addition, some savings reported in these areas were not an accurate indication of program effectiveness because of failure to measure savings attributable only to the State Energy Conservation Program. (See pp. 14 and 15.)

Eight mandatory program measures were fully implemented in the six States. (See p. 17.)

UNCERTAIN ENERGY SAVINGS

The goal of the State Energy Conservation Program was to reduce energy consumption by 5.2 quadrillion British thermal units during 1980. Energy savings reported by the States for 1980 were 3.1 quadrillion British thermal units, about 59 percent of the goal.

However, GAO's review indicated that savings goals were based on overly optimistic factors, and the savings reported for 1980 was significantly overstated and not a valid measure of program progress. (See p. 23.)

The six States included in GAO's review reported savings for 1980 of about 798 trillion British thermal units. However, GAO believes that these savings were significantly overstated because of

- the inclusion of savings resulting from programs other than the State Energy Conservation Program;
- the failure to determine the impact on savings of other factors such as price, economic conditions, voluntary actions, and the actions and funding of other public and private entities involved in carrying out the program measures;
- the basing of estimates on surveys and/or assumptions that were questionable, inadequate or unsupported; and
- the failure to submit adequate documentation. (See p. 23.)

In two previous reports, GAO pointed out the need for the Department to provide specific guidance and technical assistance to the States to measure energy savings. The Department provided the States with such assistance which should have been helpful in avoiding the problems GAO noted. However, the continued existence of these problems in the 1980 savings estimates indicates that the Department or its successor agency needs to take action to assure that the States are using the assistance provided.

FINANCIAL MANAGEMENT
AND PROGRAM MONITORING

Effective monitoring and assessment of the State Energy Conservation Program continue to be hampered by deficiencies in financial, planning, and progress reporting systems. The continued existence of these problems indicates a need for the Department or its successor agency to improve these systems for effective monitoring and management of the program.

The Department's and the States' ability to monitor and assess the effectiveness of program measures was limited by the lack of (1) accurate cost and energy savings by program measure, and (2) sufficiently detailed State plans and progress reports. The Department's monitoring was also hampered by insufficient staffing in the regions. (See pp. 29 and 31.)

RECOMMENDATIONS

To improve the effectiveness of the program if it is authorized beyond fiscal year 1982, GAO recommends that the Secretary of Energy or the head of the successor agency:

- In cooperation with the States, reassess the scope and future course of the program, including efforts to (1) concentrate on program measures of demonstrated effectiveness in reducing energy consumption and (2) assist in establishing program goals that are realistic and attainable.
- Require that energy savings guidance previously provided is used by the States.
- Revise planning and reporting requirements to assure that (1) State financial systems provide accurate program measure cost information, and (2) State plans and progress reports contain sufficient information to assess program measure status.

AGENCY COMMENTS

The Department of Energy was asked to provide official comments on this report; however, the comments were not received in time to be included in this report without delaying the report's issuance.

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ABBREVIATIONS

Btu	British thermal unit
DOE	Department of Energy
ECPA	Energy Conservation and Production Act
EPCA	Energy Policy and Conservation Act
GAO	General Accounting Office
SECP	State Energy Conservation Program

CHAPTER 1

INTRODUCTION

Title IV of the Energy Conservation and Production Act (ECPA) (P. L. 94-385, Aug. 14, 1976) authorizes four programs to encourage the implementation of energy conservation and renewable-resource energy measures in dwelling units, nonresidential buildings, and industrial plants. The programs authorized are

- supplemental State energy conservation plans,
- weatherization assistance for low-income persons,
- energy conservation and renewable-resource obligation guarantees, and
- national energy conservation and renewable-resource demonstration for existing dwelling units.

This is our third annual report on the administration and implementation of the Department of Energy's (DOE's) base and supplemental State Energy Conservation Program (SECP), and it generally covers activities during 1979 and 1980. ^{1/} In certain instances, we have updated data to indicate the current situation.

In our first report on the SECP, we noted that at the close of calendar year 1977, the participating jurisdictions and States planned to save about 5.5 quadrillion British thermal units (Btu's) ^{2/} in 1980 as a result of the SECP. However, we noted that most States were experiencing delays in implementing program measures which were likely to reduce the planned savings for 1980.

^{1/}The first report covered the above four programs for fiscal year 1977 and was entitled "Evaluation of Four Energy Conservation Programs--Fiscal Year 1977," EMD-78-81, Nov. 21, 1978. The second report on the SECP covered 1978 and was entitled "Delays and Uncertain Energy Savings in Program to Promote State Energy Conservation," EMD-80-97, Sept. 2, 1980.

A second report on the weatherization program covered 1978 and was entitled "Slow Progress and Uncertain Energy Savings in Program to Weatherize Low-Income Households," EMD-80-59, May 15, 1980. A third report on the weatherization program covered 1979 and 1980 and was entitled "Uncertain Quality, Energy Savings, and Future Production Hamper the Weatherization Program," EMD-82-2, Oct. 26, 1981. The remaining programs were never implemented by DOE, and their legislative authority has expired.

^{2/}A British thermal unit is the amount of energy needed to raise the temperature of 1 pound of water by 1 Fahrenheit degree.

We concluded that DOE needed to periodically assess the impact of these delays on the planned savings, give more guidance to the States in measuring energy savings, and develop an adequate monitoring system.

In our second report, covering 1978, we reported that program progress was hampered by long delays in enacting required State legislation, slippages in milestone dates, and reductions in scope of many State program measures. States reported energy savings for 1978 of 747 trillion Btu's and planned by 1980 to save 5.8 quadrillion Btu's. However, we concluded that it was unlikely that the 1980 goal would be reached and that reported savings for 1978 were overstated and not a valid measure of actual savings. We also identified deficiencies in the financial and progress reporting systems which needed to be corrected before the States and DOE could effectively monitor and manage the program.

IMPACT ON GAO RECOMMENDATIONS OF PROPOSALS
TO DISMANTLE DOE AND TERMINATE THE SECP

During our review, the administration's fiscal year 1982 budget proposed the elimination of the SECP. The administration believed that State energy planning and management grants did not merit Federal support given the widespread public awareness of energy conservation benefits and the high level of private investment in energy conservation. The Congress also considered several proposals for energy block grant programs which included the SECP. 1/

The funds appropriated to DOE for fiscal year 1982 included funding of the SECP at a level of about half of the amounts provided in prior years (see p. 4). However, the administration's fiscal year 1983 budget proposes the dismantling of DOE and the division of its responsibilities principally between the Departments of Commerce and the Interior. The budget also proposes the termination of State and local conservation grant programs, including the SECP. It is uncertain whether or not the Congress will approve these proposals.

Because of the time required to implement the recommendations made in this report and the likelihood that State activities involving fiscal year 1982 funds are well underway, our recommendations are not apt to have any impact on the 1982 SECP. Thus,

1/In a report entitled "Options for Establishing an Energy Conservation Consolidated Grant Program," EMD-81-115, July 8, 1981, to the Chairman, Subcommittee on Energy Conservation and Power, House Committee on Energy and Commerce, we discussed various options for establishing an energy conservation consolidated grant program.

given the tenuous future of DOE and the SECP, our recommendations should be viewed as changes that need to be made by DOE or its successor agency should the program continue beyond fiscal year 1982.

PURPOSE AND ADMINISTRATION OF STATE
ENERGY CONSERVATION PROGRAMS

DOE established procedures and guidelines for developing and implementing specific State energy conservation programs and provided Federal financial and technical assistance to States in support of these programs. The purposes of the SECP are to promote energy conservation and reduce the growth rate of energy demand in both the public and private sectors. These purposes are to be achieved through strong State support of Federal energy conservation programs and by each State's development of its own commitments to energy conservation.

Eligibility for the program was extended to 57 jurisdictions 1/--the 50 States, Guam, the District of Columbia, Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific, and the Northern Mariana Islands.

The SECP is administered on a decentralized basis through DOE regional offices. 2/ DOE headquarters has overall responsibility for program development and the administration of financial and technical assistance to the States. Headquarters' duties have included

- supplying program administration guidelines and criteria,
- developing methodologies and data for States to estimate energy savings,
- developing the data base model for forecasting 1980 energy consumption by State, and
- developing a monitoring system.

DOE regional offices serve as the primary interface with the States. The regions are responsible for

- reviewing and approving State plans and budgets,
- authorizing funds,

1/ Referred to hereinafter as States.

2/ Under a field structure realignment announced by DOE on April 24, 1981, the functions of DOE's regional offices were scaled down significantly and assumed by DOE's eight operations offices.

- providing technical assistance to the States,
- monitoring and evaluating each State's plan implementation,
- validating energy savings estimates, and
- negotiating the energy savings goal of each State.

Each participating State is responsible for submitting a proposed energy conservation plan, financial reports, and progress reports. In addition, the State is responsible for establishing and maintaining adequate procedures and internal financial controls governing the management and use of Federal funds.

The SECP is divided into a base and supplemental program. The base program, established on December 22, 1975, by the Energy Policy and Conservation Act (EPCA) (42 U.S.C. 6321 et seq.), provided the basis for State involvement in energy conservation and authorized Federal financial support to States beginning in fiscal year 1976. The supplemental program, established by ECPA, provided additional financial assistance to States beginning in fiscal year 1977. The following table shows SECP funding since its inception through 1982.

SECP funding by fiscal year (millions)

<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>Total</u>
<u>\$5.0</u>	<u>\$35.0</u>	<u>\$71.5</u>	<u>\$57.8</u>	<u>\$47.8</u>	<u>\$47.8</u>	<u>\$24.0</u>	<u>\$288.9</u>

Base program requirements

Under the base program, to be eligible for Federal assistance each State is required to develop and implement a comprehensive State energy conservation plan in which the progress of the required and optional program measures ^{1/} would achieve the overall SECP goal of reducing the States' projected energy consumption in 1980 by 5 percent or more. The plan must contain a detailed description of both required and any planned optional measures, including the estimated cost of implementation and the projected energy savings associated with each measure. EPCA required each proposed State energy conservation plan to include

- mandatory lighting efficiency standards for non-Federal public buildings;

^{1/}Program measures are State actions, excluding those involving Federal programs, designed to effect energy conservation.

- mandatory thermal efficiency standards and insulation requirements for non-Federal new and renovated buildings;
- a traffic law or regulation which, to the maximum extent practicable and consistent with safety, permits the operator of a motor vehicle to turn the vehicle right at a red stop light after stopping;
- mandatory energy efficiency standards and policies relating to the procurement practices of a State and its political subdivisions; and
- programs to promote the availability and use of carpools, vanpools, and public transportation.

In addition to the five required measures, the following optional measures could be included in each State plan

- restrictions in the hours and conditions of operating public buildings,
- restrictions on the use of decorative or nonessential lighting,
- programs of public education to promote energy conservation, and
- other appropriate methods to encourage and to improve efficiency in the use of energy.

Supplemental program requirements

Under the supplemental program, to qualify for Federal assistance DOE regulations require each State to develop and implement a plan containing a detailed description of additional required and any planned optional program measures, including the estimated cost of implementation, the estimated energy savings associated with each measure, and a schedule of when and how the measure will be achieved.

According to ECPA, each supplemental plan is required to include procedures for

- carrying out a continuing public education effort to increase significantly public awareness of (1) the energy and cost savings likely to result from the implementation of energy conservation measures 1/ and renewable-resource

1/Measures which modify any building or industrial plant constructed before Aug. 14, 1976, and are likely to reduce energy costs to recover the cost of the measure within the lesser of its useful life or 15 years.

energy measures 1/ and (2) information and other assistance for planning, financing, installing, and monitoring the effectiveness of measures likely to conserve or improve efficiency in the use of energy;

--ensuring that effective coordination exists among various local, State, and Federal energy conservation programs within and affecting the State; and

--encouraging and carrying out energy audits 2/ for buildings and industrial plants within the State.

Any number and variety of additional energy conservation measures could be included if the measures contributed to energy savings.

OBJECTIVES, SCOPE, AND METHODOLOGY

Section 462 of ECPA requires the Comptroller General to report to the Congress annually for fiscal years 1977, 1978, and 1979 on the activities being carried out under the four ECPA programs. Specifically, ECPA requires GAO to review four program aspects--program effectiveness, energy savings, an accounting by State of program expenditures, 3/ and compliance monitoring.

Although required to report only on the supplemental State energy conservation program, our review also included the base State energy conservation program because the two programs are integrally related and together form the SECP.

In reviewing the above four aspects in the SECP, our objective was to address the following questions:

--How timely and effective has the implementation of planned energy conservation measures been?

1/Measures which modify any building or industrial plant constructed before Aug. 14, 1976, by changing the source of energy from non-renewable to renewable and which are likely to reduce energy costs sufficiently to recover the cost of the measure within the lesser of its useful life or 25 years.

2/A process which identifies and specifies the energy and cost savings likely to be realized through the purchase and installation of conservation or renewable-resource measures.

3/In fulfilling this mandate, rather than include information on the program expenditures by State, GAO considered it more meaningful to evaluate financial controls over the expenditure of program funds at the State and DOE regional levels.

--Are the energy savings reported a valid measure of the program's impact on energy use?

--Are program financial, planning and progress reporting and monitoring systems adequate?

The review was performed in accordance with GAO's current "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions."

Our overall plan for the three annual reports was to review implementation of the SECP in each of the 10 DOE regions at least once, and within those regions, States having significant programs. On a combined basis, our 3 reports have included each of the 10 DOE regions and 21 States in those regions (see app. I). In this report, we covered three regional offices and six States within those regions. These six States accounted for about 26 percent of the total grants awarded under the SECP from fiscal year 1976 through fiscal year 1980 (see app. II), and about 30 percent of the planned and 26 percent of the reported SECP energy savings for 1980 (see app. III).

This report includes the DOE regional offices in Chicago (Region V), New York (Region II), and San Francisco (Region IX). Chicago and New York, which were not included in our prior reports, were selected in accordance with our overall plan to include each regional office at least once. Although we included the San Francisco regional office during our 1977 review, it was included in this review because limited progress had been made on the SECP during our earlier review.

At DOE headquarters and in the three DOE regional offices, we analyzed legislation; program regulations, policies, and procedures; program financial and progress records and reports; and other pertinent program documents, correspondence, and studies. We obtained comments regarding program problems and accomplishments from responsible DOE regional and headquarters officials. DOE was asked to provide official comments on this report, however, the comments were not received in time to be included in this report without delaying the report's issuance.

Of the six States covered in the current review, New Jersey and New York were selected because they were the only two States in their DOE region; California was selected because it operated the largest program within its DOE region; and Indiana, Michigan, and Ohio, three of the six States in DOE region V, were selected taking into consideration the amount of DOE grant funds awarded and the planned energy savings. Our work in each of the six States included analyzing State conservation plans, financial records, and other pertinent program documents and correspondence. We also obtained information and comments from State officials.

In reviewing program effectiveness in the six States, we determined the status of compliance with the mandatory measures and reviewed individual program measures accounting for about 73 percent of the States' projected 1980 energy savings. The individual program measures selected were generally those with significant projected 1980 energy savings. We compared the planned implementation of each program measure, as outlined in the State conservation plan, with the actual status of the measure through calendar year 1980.

In reviewing energy savings, we reviewed the 1980 energy savings reported for selected measures in five of the six States. The selected measures accounted for about 93 percent of the six States' reported 1980 savings. Reported savings for 1980 were reviewed for (1) the adequacy and accuracy of supporting documentation, (2) the validity of surveys and assumptions used in estimating the savings, and (3) the reasonableness of attributing the savings to the SECP. We did not review the Michigan reported savings of 15.93 trillion Btu's because of its small amount. The savings, spread over 16 measures, were not significant in any single measure.

CHAPTER 2

EFFORTS NEEDED TO ASSESS AND IMPROVE

PROGRAM EFFECTIVENESS

Program measures in three areas--buildings, utilities, and industrial--accounted for about 85 percent of the planned savings for 1980 in the six States. The principal problems hampering program effectiveness in these areas were as follows:

- The States undertook a large number of programs that accounted for minimal energy savings but a major share of SECP funds.
- The States undertook many types of programs in the residential area that were previously reported by GAO 1/ as having serious limitations in encouraging energy conservation.
- The States set overly optimistic goals as to the population to be reached and the extent of compliance, or the States did not know the effect of programs on consumption because they failed to measure savings attributable only to the SECP.

Based on the experience gained in the SECP and other programs, DOE or its successor agency needs to encourage the States to concentrate their efforts on the most effective program measures if the SECP is authorized beyond fiscal year 1982.

The eight mandatory SECP program measures were generally fully implemented in the six States. Lighting standards for existing buildings in two States were voluntary rather than mandatory as required. Also, in two States the establishment and/or enforcement of thermal and lighting building codes were delegated to local governments, and the States did not monitor their enforcement.

Although, as discussed in chapter 3, the specific amount of energy conserved as a result of the SECP is unknown, the program has been effective in terms of developing--for the first time--a capability to manage energy programs in many States.

1/"Residential Energy Conservation Outreach Activities--A New Federal Approach Needed," EMD-81-8, Feb. 11, 1981.

NEED TO CONCENTRATE EFFORTS ON PROGRAM
MEASURES OF DEMONSTRATED EFFECTIVENESS

Our review of the SECP disclosed that (1) there were numerous program measures which accounted for minimal energy savings but a major share of SECP funds; (2) many types of program measures were based on methods having serious limitations in encouraging conservation; and (3) many buildings, utility, and industrial programs were either based on overly optimistic goals, or their savings were inaccurate for judging effectiveness.

Our analysis of 126 program measures in five States indicated that about 21 percent of them accounted for 68 percent or more of those States' planned 1980 energy savings. Although the remaining measures accounted for only 32 percent or less of the States' planned 1980 energy savings, they accounted for about 49 to 90 percent of their planned 1980 SECP expenditures.

Many of the types of program measures undertaken by the States in the buildings area were previously reported by us as having serious limitations in encouraging energy conservation. About 36 percent of the planned 1980 savings of the six States involved program measures in the buildings area and many of these program measures consisted of providing class B or class C audits 1/ or general information which are of limited effectiveness in achieving energy conservation actions. Also, many of the programs in the buildings area were based on overly optimistic goals.

In addition, many programs in the utility and industrial areas either did not attain their goals because they were overly optimistic or their effect on energy consumption was unknown because of failure to measure savings attributable to the SECP.

Numerous program measures with
minimal energy savings took
major share of funds

The six States had a total of 172 program measures in 1980. Our analysis of 126 programs in 5 States 2/ indicated that 27 programs accounted for 68 to 89 percent of the planned 1980 energy

1/A class B audit consists of identification of energy savings by the State based on information supplied by the owner, operator, or occupant in a questionnaire. A class C audit consists of owner, operator, or occupant identification of energy savings in accordance with guidelines and materials furnished by the States.

2/Programs for Ohio were not included in this analysis because planned 1980 expenditures were not readily available for each of the 46 programs. However, we noted that 10 of the 46 programs in Ohio accounted for about 66 percent of the planned 1980 energy savings.

savings. The remaining 99 programs, although they accounted for only 11 to 32 percent of the States' planned energy savings, accounted for about 49 to 90 percent of their planned 1980 SECP expenditures. The following table details our analysis for the five States.

State	Total number of programs	Programs accounting for most of energy savings			Balance of programs		
		Number	Percentage of planned 1980		Number	Percentage of planned 1980	
			Savings	Expenditures		Savings	Expenditures
California	24	4	89	10	20	11	90
Indiana	14	3	78	18	11	22	82
Michigan	37	7	68	20	30	32	80
New Jersey	25	6	87	20	19	13	80
New York	<u>26</u>	<u>7</u>	75	51	<u>19</u>	25	49
	<u>126</u>	<u>27</u>			<u>99</u>		

Source: GAO analysis of States' 1980 SECP plans.

For example, three Indiana program measures--building codes and lighting standards, industrial technical promotion, and residential audits--accounted for 78 percent of the State's planned 1980 savings. Although the remaining 11 program measures accounted for only 22 percent of the planned 1980 savings, they accounted for 82 percent of the planned 1980 expenditures, and about 82 percent of the total budgeted SECP expenditures from 1978 to 1980 of about \$4.5 million.

A DOE study of the SECP reported similar findings. ^{1/} The study reported that much of the State implementation effort was dissipated on conservation programs with minimal energy savings. The report also stated that the conservation program resources in the nine States sampled were diluted by 131 programs (out of 175 programs) that accounted for less than 15 percent of the 1980 goal and required a disproportionate share of SECP resources.

Program measures in the buildings area

By 1980, the six States planned to save about 554 trillion Btu's as a result of various programs in the buildings area, about 36 percent of their total planned savings. About one-third of the planned savings in this area was to be from mandatory thermal and lighting standards which are discussed later in this chapter. The balance of the savings were to be from program measures primarily affecting the residential area, consisting mainly of programs providing audits or general public education and outreach.

^{1/}"An Evaluation of the State Energy Conservation Program from Program Initiation to September 1978," DOE/CS/1697-01, Mar. 1980, p. 2-11.

Planned savings for these measures totaled about 368 trillion Btu's; however, reported savings totaled only about 155 trillion Btu's.

The principal reasons for the failure of the States to reach their goals were (1) a heavy reliance on class B and C audits and general media outreach which we previously reported as not the most effective outreach methods and (2) optimistic goals that were not reevaluated to consider the impacts of delays, scope changes, and compliance experience.

Reliance on class B and C audits and media outreach

Our analysis of program measures aimed at the residential area indicated that four of the States (Indiana, Michigan, New York, and Ohio) placed primary emphasis on class B and C audits and media outreach activities. The following table details our analysis for the four States.

<u>State</u>	<u>Type of program</u>
Indiana	Class B and C audits
Michigan	Class B audits and media outreach
New York	Class B and C audits and media outreach a/ Class A utility audits subsequently added
Ohio	Class B and C audits

a/A class A audit consists of onsite visits by auditors and evaluations of energy consumption and energy systems.

Source: GAO analysis of States' 1980 SECP plans.

In a report on residential energy conservation outreach activities 1/, we reported that the effect of outreach on consumer action depends on the information provided and the way it is delivered to the consumer. We noted that energy savings increase as the information provided on energy conservation options becomes more comprehensive and more tailored to specific individuals, and the delivery system becomes more personalized. We also noted that (1) research studies on outreach impacts indicated

1/"Residential Energy Conservation Outreach Activities--A New Federal Approach Needed," EMD-81-8, Feb. 11, 1981.

that mass media methods were of limited effectiveness 1/ and (2) an evaluation comparing energy savings resulting from class A and class B audit programs indicated that onsite energy audits (class A) resulted in greater energy savings than audits which do not include onsite visits (class B and C). 2/ We further reported that two analyses 3/ of audits under the Residential Conservation Service Program 4/ confirmed the importance of personal interaction by trained auditors in the class A audits provided by utilities under that program.

Overly optimistic goals and compliance

Four of the six States (Indiana, Michigan, New York, and Ohio) reported significantly less savings than planned as a result of their residential audit programs. The planned savings from these programs were based on overly optimistic goals as to the population to be reached and/or their compliance with the recommended actions.

For example, New York's Home Audit program was initially designed to assist the owners of one and two family residences with a class B audit. The 1980 goal of 75.2 trillion Btu's was based on reaching all these types of residences in the State with a class B audit and expected compliance of 10 to 30 percent with five conservation actions by 1980.

1/These studies include: Marvin E. Olsen, "Public Acceptance of Energy Conservation," Energy Policy in the United States: Social and Behavioral Dimensions, ed. Seymour Warkov (New York: Praeger Publishers, 1978), pp. 91 to 109; William H. Cunningham and Sally Cook Lopreato, Energy Use and Conservation Incentives: A Study of the Southwestern United States (New York: Praeger Publishers, 1977); and David B. Montgomery and Dorothy Leonard-Barton, "Toward Strategies for Marketing Home Energy Conservation," Conference on Technology For Energy Conservation, Washington, D.C., June 8, 1977, pp. 135 to 142.

2/Massachusetts Energy Office, "Energy Conservation Analysis Program: Final Evaluation Report," prepared for the Massachusetts State Employment and Training Council, Nov. 1978.

3/U.S. Department of Energy, "Residential Conservation Service Program: Regulatory Analysis," Oct. 1979; and Booze-Allen-Hamilton, Inc., "Electric and Gas Utility Marketing of Residential Energy Conservation Case Studies," prepared for U.S. Department of Energy, May 1980.

4/Established by the National Energy Conservation Policy Act (P. L. 95-619, Nov. 9, 1978) and requires most utilities to offer comprehensive onsite energy audits (class A) to residential consumers.

The program was subsequently expanded to include class A, B, and C audits by the major utilities and class C audits for single and multifamily residences through State developed workbooks.

The program accomplishments through 1980 as reported by the State were as follows:

- About 1,100,000 class C audit workbooks for single family residences were received by users. Per 1970 Bureau of Census data there were about 2.5 million single family residences. The State estimates that only about 13 percent of the recipients took at least 1 of the 5 conservation actions from use of the workbooks.
- About 69,000 class A and 4,300 class B audits were performed by utilities.
- Energy savings for 1980 reported as a result of the program were 3.27 trillion Btu's.

In another example, Indiana's residential energy audit program was designed to promote conservation retrofitting of single family residences in the State through class B and C audits. The planned savings of 29.5 trillion Btu's were based on the assumption that all single family homes (about 1.3 million per 1970 Bureau of Census data) would be audited by 1980, and that 20 percent would comply with each of five conservation actions by the close of 1980. At the close of 1980 only about 6,490 residences had been audited, and savings of only 0.3 trillion Btu's were reported.

Similar findings were noted in a DOE study of the SECP. ^{1/}The report noted that residential audit programs in five sample States were expected to account for 13 to 40 percent of their 1980 energy savings goals. The report cited three elements critical to the success of the programs--distributing audit materials to all homeowners, eliciting a high response rate, and stimulating respondents to weatherize--and stated that all five programs had problems in one or more of these areas.

Inaccurate attribution of utility program savings to the SECP

Five of the six States' plans included utility energy conservation programs that accounted for about 26 percent of the planned 1980 savings of the six States. However, the involvement of the State energy offices in these programs was generally

^{1/}"An Evaluation of the State Energy Conservation Program from Program Initiation to September 1978," DOE/CS/1697-01, Mar. 1980, p. 2-10.

minimal and SECP impact on the programs was unknown because of failure to measure savings attributable to it.

Five of the States (California, Indiana, Michigan, New Jersey, and New York) were implementing utility programs. Planned and reported 1980 savings for these programs in the five States were about 399 trillion Btu's and 91 trillion Btu's, respectively. Most utility conservation program measures were carried out by each State's public utility commission and the utilities, and generally consisted of actions toward rate reform and increasing utility efficiency. Involvement of the State energy offices and SECP funding in implementing the programs was in most instances minimal. Therefore, there was an apparent lack of connection between SECP funding and the actions taken by the State public utility commission.

For example, New Jersey's utility program attempted to create economic incentives to conserve electrical and natural gas use through promotion of time of day metering, summer/winter rate differentials, flattened residential rates, and educational programs. The program was primarily carried out by the State public utility commission and the utilities. In its report on 1980 SECP energy savings, the State noted that the DOE contractor assigned to assist the States in estimating savings was critical of the program because of the apparent lack of connection between SECP funding and actions taken in the utility area.

Overly optimistic goals and inaccurate attribution of savings for industrial programs

Industrial program measures accounted for about 23 percent of the planned 1980 savings for the six States. Planned and reported 1980 savings in the six States for industrial measures were about 356 trillion Btu's and 176 trillion Btu's, respectively. The type of services provided under these measures covered a broad range of activities, and generally their success was less than expected due to either implementation delays and/or failure to attain the expected compliance. Also, their effect on energy consumption in some instances was unknown because of inaccurate measurement of savings attributable to the SECP. Table 1 summarizes our analysis of the primary emphasis of programs in the six States.

Examples of programs in two States--New Jersey and Indiana--illustrate some of the problems in this area.

New Jersey initiated a program for large boiler efficiency standards and boiler operator training. It was expected to save 22.7 trillion Btu's by 1980 based on 90 percent compliance with the standards by about 8,000 boilers and an average savings per boiler of 3.8 percent. Implementation of the standards was delayed and compliance manuals were not distributed until July 1980.

At the close of 1980, New Jersey reported that only 27 boilers were in compliance with an average savings per boiler of 2.7 percent.

Table 1

Primary Emphasis of Industrial Programs

<u>State</u>	<u>1980 Savings (trillion Btu's)</u>		<u>Primary emphasis of programs</u>
	<u>Planned</u>	<u>Reported (note a)</u>	
California	2.39	2.39	Pilot study of cast metal industry and boiler operator training.
Indiana	117.48	92.13	Educational programs, information transfer, promotional campaigns, and class C audits for small and medium industry.
Michigan	36.00	1.55	Technical assistance, educational programs, information transfer, and development of class C audit workbooks and class A audit manual.
New Jersey	30.05	19.35	Boiler efficiency standards, workshops, class C audit, and pilot program of class A audits.
New York	46.10	14.20	Educational programs, information transfer, class A audits, and resource recovery.
Ohio	<u>124.10</u>	<u>46.64</u>	Eight measures were demonstration or study projects to assess potentials, transfer information, and/or develop manuals. Four measures were for training, audits, or conservation incentives.
	<u>Total 356.12</u>	<u>176.26</u>	

a/In ch. 3 we note that many of the 1980 savings reported by the six States are overstated or unsupported and are not a valid measure of actual program progress.

Source: GAO analysis of States' 1980 SECP plans.

Although the savings reported for Indiana's industrial technical promotion program indicated a successful program, its effectiveness was unknown because of inaccurate savings measurement. The program was designed to encourage industrial, manufacturing, and commercial companies to voluntarily adopt energy efficient practices and ethics. The program consisted of three parts:

--In-house energy management--class C audits, seminars, and information dissemination.

--General conservation promotion and technical information--technical assistance, promotional campaign, and information analysis and transfer.

--Forecast monitoring system reporting--development of reporting procedures, surveys, and assessment of savings.

Savings of about 92 trillion Btu's were reported for 1980 for the program, about 82 percent of the planned savings. This would seem to indicate that the program was very effective. However, the actual effectiveness of the program was not known, because in reporting results the State assumed that all energy conservation savings reported were the result of its program. The State used a survey questionnaire to compile results of the program. However, the questionnaire did not refer to the SECP; thus many of the energy conservation actions may not have resulted from the SECP. In our analysis of energy savings in chapter 3, we noted a similar problem in savings reported for other programs. Without measuring savings attributable to SECP measures, their effectiveness cannot be determined.

STATUS OF MANDATORY PROGRAMS

DOE reported that compliance with most of the required program measures has been achieved. ^{1/} DOE also reported that in 1980 it conducted a reassessment of State compliance with thermal and lighting standards that provided the basis for development of ways in which DOE can work with States that have not fully implemented the standards.

With regard to the other mandatory measures, DOE reported that

--all States were in compliance with energy audits, public education, and intergovernmental coordination requirements;

--56 States have carpool, vanpool, and public transportation programs;

--54 States have energy efficiency procurement practices; and

--52 States have right turn on red.

^{1/}"Annual Report to the President and the Congress on the State Energy Conservation Program for Calendar Year 1980," DOE/CE-0016, July 1981, pp. 6 and 7.

The status at the close of 1980 of the mandatory program measures in the six States is discussed in the following sections. 1/

Thermal and lighting efficiency standards

DOE regulations called for the State thermal and lighting efficiency standards to be in place and ready for implementation by January 1, 1978, unless DOE granted an extension. Planned and reported 1980 savings resulting from implementation of these standards in the six States were about 186 trillion Btu's and 143 trillion Btu's, respectively.

Four of the States had adopted and implemented all the required standards, and two States had adopted and implemented all the required standards except mandatory lighting standards for existing buildings. Lighting standards for existing public buildings adopted by Indiana and Michigan were voluntary rather than mandatory as required by ECPA.

In addition, in Indiana and Ohio building code establishment and/or enforcement was delegated, in part, to local government agencies, and the States had no monitoring system to ensure compliance. In Indiana, for example, State enforcement of the code is limited to public buildings. For one and two family residential dwellings, over 600 local building councils have authority to pass and enforce their own codes. However, the State had no monitoring system to assure compliance by the local agencies.

Right turn on red

States are required to include in their motor vehicle code a traffic law or regulation which permits the operator of a motor vehicle to make a right turn at a red light after stopping, except where specifically prohibited by a traffic sign. Under DOE regulations, this measure must apply to all political subdivisions of the State. Planned and reported 1980 energy savings resulting from implementation of this measure in the six States were 2.36 trillion Btu's and 3.06 trillion Btu's, respectively.

The right-turn-on-red measure was operational in 31 States prior to passage of EPCA. Of the remaining 26 States, 4 were granted waivers due to the lack of signalized intersections, 21 States have subsequently enacted the measure, and 1 State (New York) was not in full compliance. The State of New York, with the exception of New York City, was in compliance. Efforts were underway to bring New York City into compliance.

1/Concerning the 1980 energy savings shown in the discussion of each of these measures, in ch. 3 we note that many of the 1980 savings reported by the six States are overstated or unsupported and are not a valid measure of actual program progress.

Procurement standards

Each State must establish mandatory procurement standards and policies to improve energy efficiency in the State and its political subdivisions. Such standards could include provisions on purchasing the most energy-efficient item over its lifetime instead of purchasing the least expensive item. Planned and reported 1980 energy savings resulting from implementation of this measure in the six States were 8.02 trillion Btu's and 1.87 trillion Btu's, respectively. Five of the States were in compliance with this requirement. Indiana was granted an extension until March 30, 1982, for compliance with the requirement.

Vanpool, carpool, public transportation

Under DOE regulations, each State is required to promote the availability and use of vanpools, carpools, and public transportation by implementing a program in one urbanized area of 50,000 or more population or in the largest urbanized area in the State. Planned and reported 1980 energy savings resulting from implementation of this measure in the six States were 106.06 trillion Btu's and 73.21 trillion Btu's, respectively.

States can choose from among 12 program actions, such as park-and-ride lots; a carpool/vanpool matching and promotion campaign; and parking taxes, parking fee regulations or surcharge on parking costs. All six States were in compliance with this measure.

Public education

Each State must include in its plan procedures for carrying out a continuing public education effort to increase significant public awareness of the energy and cost savings resulting from implementation of energy measures. Planned and reported 1980 energy savings resulting from implementation of this measure in the six States were 91.14 trillion Btu's and 98.93 trillion Btu's, respectively.

According to the program guidelines, each State must provide a public awareness program regarding energy audits for buildings and industrial plants, including as a minimum, a campaign publicizing the availability of energy audits in at least one urbanized area with a population greater than 50,000 or in the largest urbanized area in the State. The campaign must clearly refer to the range of technical assistance available to the owner or occupant of the building or industrial plant and provide a point of contact and telephone number with the organization administering the energy audits. In addition, each State must include in its plan procedures to increase public awareness of information pertaining to planning, financing, installing, and monitoring the effectiveness of measures likely to conserve energy.

All of the six States had implemented this measure.

Energy audits

Under DOE regulations each State must provide and make available, to the extent feasible, class A energy audits in at least one political subdivision for the buildings or industrial plants in at least 1 of 10 DOE-specified categories (such as hospitals, educational institutions, office buildings, and retail stores) and as many class C energy audits as is practicable within the State in the remaining 9 categories. The State must also make available class B or C audits to all individuals, as requested by such individuals, who are occupants of residential dwelling units in a State at no direct cost to those persons.

All six States met this program requirement. Planned and reported 1980 energy savings resulting from implementation of this measure in the six States were 188 trillion Btu's and 42.93 trillion Btu's, respectively. However, as previously discussed in this chapter, the effectiveness of class B and C audits is limited.

Intergovernmental coordination

Each State must include procedures it deems necessary to ensure that effective coordination exists among local, State, and Federal energy conservation programs within and affecting the State. All the States we reviewed had met this requirement. Planned and reported 1980 savings resulting from implementation of this measure were 5.71 trillion Btu's and 3.08 trillion Btu's, respectively.

DEVELOPMENT OF A STATE CAPABILITY

The SECP has been effective in terms of developing for the first time a capability to manage energy programs in many States, although the size and scope of authority of State energy offices varied among the States. According to DOE, when the SECP began in 1976 there was very little organized capacity within the States for energy conservation planning and implementation. ^{1/} DOE stated that the SECP, during its first 5 years of operation, has succeeded in getting the States to view energy as a concern and enhancing the States' abilities to handle comprehensive planning and implementation.

^{1/}"Annual Report to the President and the Congress on the State Energy Conservation Program for Calendar Year 1980," DOE/CE-0016, July 1981, p. 6.

In our three reviews of the SECP, we examined its implementation in 21 States. In 13 States, the energy offices were established by legislation or executive mandate as independent State agencies, and in 8 States the energy offices were established by executive mandate as a division of an existing State agency.

The size and scope of authority of the 21 State energy offices varied considerably. In a few States, the energy offices had staffs ranging from 100 to 200 persons and were responsible for planning and administering all energy programs including, in addition to the SECP, other Federal energy conservation programs such as the Energy Extension Service, the Energy Conservation Program for Schools and Hospitals, the Low-Income Weatherization Program, and the Residential Conservation Service Program. In contrast, the energy offices in some States had a minimal amount of staff and served primarily as coordinating offices for the SECP with responsibility for execution of program measures delegated to other State agencies or contracted out.

At a congressional hearing on the administration's fiscal year 1982 budget proposal to eliminate the SECP, we pointed out that the immediate loss of Federal funds may cause some States, because of budget constraints or requirements, to eliminate State energy offices, resulting in a loss of this management and coordination capability at the State level. ^{1/} We stated that this loss would affect not only the conservation area, but it would also affect the States' growing responsibilities in emergency response planning activities, such as gasoline supply distribution.

CONCLUSIONS

In our prior report, we pointed out the need for DOE to reassess the scope and progress of the States' programs to (1) determine changes and improvements needed, (2) assist States in establishing realistic goals, and (3) establish time frames for accomplishment of overall SECP goals.

Our current review disclosed that, although the SECP has been effective in terms of developing a State capability to manage energy programs, the following problems hamper the effectiveness of the SECP:

- Involvement of the States in a large number of program measures that require a disproportionate share of SECP resources in relation to their planned savings.

^{1/}"Statement of J. Dexter Peach, Director, Energy and Minerals Division, General Accounting Office, May 28, 1981, before the Subcommittee on Energy Conservation and Power, House Committee on Energy and Commerce, on Energy Block Grants."

--A heavy emphasis in the buildings area on program measures with serious limitations in encouraging energy conservation.

--Continuing problems with overly optimistic goals and unknown effect of programs on energy consumption because of inaccurate measurement of savings attributable to the SECP.

These problems and the fact that 1982 SECP funding is significantly less than in prior years indicate that if the SECP is authorized beyond fiscal year 1982, DOE or its successor agency needs to reassess the scope and future course of the SECP. Based on DOE's experience in administering the SECP and other State conservation programs, and the numerous studies of conservation programs and approaches, we believe that DOE should have the capability to (1) encourage the States to concentrate their efforts on program measures of demonstrated effectiveness in reducing energy consumption and (2) assist the States in establishing program goals that are realistic and attainable.

RECOMMENDATION

If the SECP is authorized beyond fiscal year 1982, we recommend that the Secretary of Energy or the head of the successor agency, in cooperation with the States, reassess the scope and future course of the SECP. This reassessment should include efforts to (1) concentrate on program measures of demonstrated effectiveness in reducing energy consumption and (2) assist States in establishing program goals that are realistic and attainable.

During the review and approval of annual State plans and budgets, DOE should carefully analyze the program measures to assure that:

--Each program measure and its approach are based on methods of demonstrated cost effectiveness.

--Each program measure's objectives, milestones, and goals for population to be reached, expected compliance and energy savings are realistic and attainable based on overall experience with the particular type of measure and an evaluation of the past accomplishments of each program measure under review.

Based on this analysis, DOE should provide guidance to the States on any changes or improvements needed in the program measure plans, including disapproval of any program measure that DOE considers unable to meet the above assurances.

CHAPTER 3

UNCERTAIN ENERGY SAVINGS

Achievement of the 1980 savings goal--a reduction in the projected energy consumption of each State by 1980 of 5 percent or more--was not reached, and energy savings reported for 1980 were overstated and unsupported. Planned 1980 savings for many of the program measures were based on overly optimistic goals as to the population to be reached and the extent of compliance. Our review of energy savings reported by the States in 1980 indicates that many of the claimed savings are overstated or unsupported and are not a valid measure of actual program progress.

In our last report, we noted similar problems and recommended that DOE provide more specific guidance and technical assistance to the States in this area. Although DOE has provided a savings guide and technical assistance to the States since our last report, the continuing existence of the same problems indicates a need for DOE or its successor agency to take action to ensure that the States are using this assistance in estimating savings if the SECP is authorized beyond fiscal year 1982.

STATES DID NOT ACHIEVE 1980 GOAL

The 1980 energy savings goals contained in the 57 participating States' 1980 SECP plans totaled 5.2 quadrillion Btu's. However, savings reported by these States as resulting from the SECP totaled 3.1 quads--about 59 percent of the 1980 goal. In our last report, we stated our belief that the 1980 savings goal of SECP would not be attained. Our belief was based on the fact that planned savings were based on optimistic and unsupported projections and were not reevaluated to consider the impact of delays and scope reductions.

We noted similar problems in this review. In chapter 2, we discussed problems concerning savings goals that were overly optimistic as to the population to be reached and the extent of compliance. We also discussed the heavy reliance in residential programs on types of outreach that are not the most effective in achieving energy conservation.

Although the States reported savings of 3.1 quadrillion Btu's in 1980, based on our current and past reviews, we believe that this is significantly overstated and is not a valid measure of program progress.

1980 ENERGY SAVINGS REPORTED BY THE SIX STATES ARE OVERSTATED

The six States reported SECP savings in 1980 of about 798 trillion Btu's--about 51 percent of their goal of about 1.5 quadrillion Btu's (see app. III). However, based on our review

of savings reported for selected measures in five States ^{1/} as summarized in table 2, we believe that the 1980 savings were significantly overstated.

The principal causes for overstatement of the savings estimates were (1) the inclusion of savings resulting from programs other than the SECP; (2) no determination of the impact on savings of (a) other factors, such as price, economic conditions, voluntary actions and other SECP measures, and/or (b) the actions of other public and private agencies; (3) no supporting documentation or inadequate documentation submitted to DOE; and (4) highly questionable or unsupported surveys and assumptions supporting the estimates.

Savings not resulting from SECP

Four of the six States claimed savings of about 177 trillion Btu's which resulted from non-SECP funded programs, primarily the federally funded programs for schools and hospitals, residential conservation service, and emergency building temperature restrictions. For example, the New York savings estimate included about 77 trillion Btu's resulting from the schools and hospitals grant program, a separately funded DOE grant program.

No determination of impact of other factors and agencies

Savings of about 211 trillion Btu's were claimed for program measures in three States without determining the impact of (1) other factors such as price, economic conditions, voluntary actions unrelated to the SECP, and other SECP measures and (2) the actions and funding of other public and private entities involved in carrying out the program measures.

For example, Ohio claimed that about 42 trillion Btu's were saved by its carpool measures. Ohio claimed that 90 percent of the carpool savings resulted from its SECP measures. This assumption did not adequately consider the impact on energy savings of (1) other factors such as the price of gasoline and voluntary actions to carpool independent of the SECP measures; (2) the actions of numerous State and local government agencies and private employers who were involved in carrying out the measures; and (3) the separate funding received from both the Federal and the Ohio Departments of Transportation to assist in these measures.

^{1/}The measures reviewed in each State accounted for a significant portion of each State's reported 1980 savings. We did not review the Michigan reported savings of 15.93 trillion Btu's because of its small amount. The savings, spread over 16 measures, were not significant in any single measure.

Table 2

Summary of Questionable 1980 Energy Savings by
Problem Type for the Five States Reviewed by GAO

Number of program measures and reported 1980 savings in trillion Btu's

<u>Problem type</u>	<u>Calif.</u>	<u>Ind.</u>	<u>N.J.</u>	<u>N.Y.</u>	<u>Ohio</u>	<u>Total</u>
1. Savings resulted from non-SECP funded programs.	(3) 36.75	(1) 1.39	(7) 13.42	(4) 125.08	-	(15) 176.64
2. State attributed all or most of savings to the SECP funded programs and did not determine the impact of other factors.	-	(3) 146.03	(3) 17.70	-	(7) 47.41	(13) 211.14
3. State submitted no documentation to DOE to support the estimate, or the documentation was inadequate.	(9) 60.81	(1) 4.92	-	(2) 54.99	(1) 7.04	(13) 127.76
4. Savings were based on surveys and/or assumptions that were questionable, inadequate, or unsupported.	(1) 2.52	(2) 47.17	(2) 16.55	(3) 18.98	(10) 105.65	(18) 190.87
5. Savings were planned 1980 savings rather than actual.	(2) 12.15	-	-	-	-	(2) 12.15
6. Savings estimates contained mathematical errors or duplicated other savings.	-	-	(1) 21.51	-	(1) 1.34	(2) 22.85
Total	(15) <u>112.23</u>	(7) <u>199.51</u>	(13) <u>69.18</u>	(9) <u>199.05</u>	(19) <u>161.44</u>	(63) <u>741.41</u>

Source: GAO analysis of States' 1980 SECP energy savings reports.

Inadequate supporting documentation

Savings totaling about 128 trillion Btu's were claimed by four States where either no supporting documentation was submitted to DOE or the supporting documentation was inadequate to evaluate the savings. For example, California reported savings of about 61 trillion Btu's for nine program measures for which no supporting documentation was submitted to DOE.

Questionable surveys and assumptions

Savings of about 191 trillion Btu's were claimed by five States where surveys and/or assumptions supporting the estimates were highly questionable, inadequate, or unsupported.

For example, Indiana and Ohio reported savings of about 48 trillion Btu's from thermal and lighting standards, based on the assumption of 100 percent compliance with the standards. However, as discussed in chapter 2 neither State was monitoring local enforcement of the standards to determine the extent of compliance.

In another example, Ohio reported savings of about 5 trillion Btu's from its class B and C residential audit measures, but the savings were significantly overstated because they were based on an inadequate survey and unsupported assumptions. Ohio surveyed 1,200 of the 19,600 residences receiving class B audits and claimed that the survey indicated that 86.9 percent of the residences complied with the recommended conservation actions. Using the results of the survey, savings were estimated based on 86.9 percent of the 19,600 residences taking conservation actions, multiplied by a factor of 2 on the assumption that each recipient influenced one other residence to take similar actions. The following problems were noted with the survey and assumptions made:

- It is uncertain to what extent survey findings represent the total population because of the small number of usable responses. Of the 1,200 residences surveyed, only 230 responded and only 168 responses were usable. The compliance rate of 86.9 percent was based only on the respondents to the survey (146 of 168 usable responses indicating some conservation actions taken), and did not consider that almost 1,000 of the 1,200 residences surveyed did not respond.
- There was no support for the assumption that each of the 19,600 residences receiving class B audits influenced one other residence to take energy conservation actions.

The savings for the class C residential audit program were not based on a survey of the program users but on the unsupported assumption that class C audits resulted in effects similar to those claimed for the class B audits noted above. States that

have attempted to measure class C audit activities have found workbook usage rates to be well below 10 percent. Ohio, however, assumed that (1) all of the 81,000 workbooks distributed were actually used to perform an audit, (2) 86.9 percent of the recipients took conservation actions, and (3) an equal number of non-recipients were influenced to take similar actions.

DOE assistance to the States in estimating energy savings

In both our prior SECP reports, we pointed out the need for DOE to provide specific guidance and technical assistance to the States to measure energy savings resulting from the SECP.

To assist the States in evaluating their programs and improving their energy savings estimates, DOE awarded a contract to Price-Waterhouse & Co., to develop a guide for use by the States in analyzing and reporting savings under the SECP and to provide technical assistance to the States in this area. In May 1980 the guide, entitled "A Guide to the Evaluation of State Energy Conservation Programs," was published and provided to the States.

The guide discusses and describes a framework for analysis of alternative evaluation strategies and practical approaches to designing and conducting surveys to provide a firm basis for State energy savings estimates. The guide should have been very helpful in avoiding the problems we noted with State energy savings estimates. However, the continued existence of these problems in the 1980 savings estimates, indicates that, if the SECP is authorized beyond fiscal year 1982, DOE or its successor agency needs to take action to ensure that States are using the assistance provided in estimating savings.

CONCLUSIONS

The 57 States did not attain their 1980 savings goal of 5.2 quadrillion Btu's. Also, based on our review of savings reported by the six States for 1980, we believe that the 1980 savings of 3.1 quadrillion Btu's reported by the 57 States is significantly overstated and is not a valid measure of actual program progress and effectiveness.

The planned 1980 energy savings for many of the program measures were based on overly optimistic goals as to the population to be reached and the extent of compliance. Our review of energy savings reported for 1980 indicates that reported savings were significantly overstated because of the following principal reasons:

- Inclusion of savings resulting from non-SECP funded programs.

--Attribution of all or most of the savings to SECP measures without determining the impact of other factors.

--Savings based on surveys and/or assumptions that were highly questionable, inadequate, or unsupported.

--Inadequate or no documentation to support the estimates.

In our prior reports, we noted similar problems and in our last report we recommended that DOE provide more specific guidance and technical assistance in this area. DOE has provided the States with a guidance manual and technical assistance which should have been helpful to the States in avoiding the problems we noted with savings estimates. However, the continued existence of these problems in the 1980 savings estimates, indicates that, if the SECP is authorized beyond fiscal year 1982, DOE or its successor agency needs to take action to ensure that the States are using the assistance provided in estimating savings.

RECOMMENDATION

If the SECP is authorized beyond fiscal year 1982, we recommend that the Secretary of Energy or the head of the successor agency require that energy savings guidance previously provided is used in estimating future energy savings.

CHAPTER 4

FINANCIAL MANAGEMENT AND PROGRAM

MONITORING SYSTEMS NEED IMPROVEMENT

Effective monitoring and assessment of the SECP continue to be hampered by deficiencies in financial, planning, and progress reporting systems. The continued existence of these problems indicates a need for DOE to improve these systems before it and the States can effectively monitor and manage the program.

State monitoring of the program was inadequate because of problems encountered in some States in accruing and reporting costs by program measure preventing the determination of program measure cost effectiveness, and a lack of specific data in State plans on planned actions against which to compare actual progress. We also noted that two States were using SECP funds to finance non-SECP activities.

DOE's ability to monitor the States and assess the effectiveness of program measures was limited by the lack of

- (1) accurate costs and energy savings by program measure,
- (2) sufficiently detailed State plans and progress reports, and
- (3) sufficient staffing in the regions.

IMPROVEMENTS NEEDED IN STATE FINANCIAL, PLANNING, AND PROGRESS REPORTING

Our review of the financial control and program monitoring systems in the six States revealed that the systems in some States need improvement before DOE can begin effectively monitoring and managing the SECP.

DOE relies heavily on the States to comply with the accounting and reporting requirements provided in the grant agreements, namely, that States comply with the recordkeeping provisions of ECPA. This requires, among other things, that States maintain adequate accounting records to fully disclose receipt and disposition of grant proceeds, a biennial independent financial audit, and compliance with pertinent Federal regulations and directives.

The reporting system requires the States to prepare two separate reports--a Quarterly Financial Status Report to show the status of funds by budgeted categories (as budgeted in the State's application for the grant and sometimes amended during the grant); and a Quarterly Implementation Report citing the achievement of significant milestones on each program measure, discussing the reasons any significant milestones were not achieved and significant problems, successes or other items worthy of note. In addition, each State is required to submit annually a State plan describing each of the program measures it plans to undertake.

Reporting costs

DOE requires the States to prepare quarterly financial status reports on an accrued expenditure basis by program measure. However, we noted many instances where overall accruals and allocation of costs by program measure were inaccurate.

The accrual basis of accounting consists of recognizing financial transactions or events as they occur. For example, expenditures under the accrual basis are recognized regardless of when cash payments are made, whether invoices have been rendered, or, in some cases whether goods or tangible property have been physically received. Since some States maintain their official accounting records on a cash basis (financial transactions are recorded in the accounts only when cash is received or disbursed), special efforts are required to prepare financial status reports on an accrued expenditure basis. These efforts generally consist of estimating the costs of work performed during a reporting period which will not be paid until future periods and allocating the costs to program measures.

We noted problems with the reporting of accrued expenditures by program measure in four of the six States. California reported program costs on a cash basis, Indiana reported cash expenditures plus an informal estimate of accrued expenditures, New Jersey did not report costs by program measure, and New York's method of allocating costs to programs was arbitrary. In addition, the Ohio State auditor questioned the allocation of costs to program measures.

For example, New York did not maintain records of cost by program measure. In reporting program measure costs to DOE, New York allocated costs to program measures based on each program's percentage share of the budgeted expenditures in the State plan for that year. Since actual activity and costs on a program measure may vary considerably from what was planned, this method of allocation could be very inaccurate.

Use of funds for non-SECP activities

In New York and Indiana we noted that SECP funds were used to fund salaries of employees whose work was partially or totally unrelated to the SECP, and in Indiana SECP funds were used for travel advances for non-SECP employees.

For example, the Indiana Energy Group, an office within the Indiana Department of Commerce, was using SECP funds to (1) establish a travel advance fund which non-SECP employees were using, and (2) pay the salaries of employees involved in non-SECP activities. We examined 26 travel advances totaling \$6,490 and found that 15 advances totaling \$4,483 were made to non-SECP employees. The salaries of three State employees who were performing activities not included in the approved SECP plan had been paid from SECP funds for about 2-1/2 years. We brought this to the attention of

DOE regional officials who investigated it and are taking action to recover the unallowable charges from the State.

Program monitoring by the States

All of the six States were performing financial audits of SECP expenditures on a biennial basis or more frequently. However, concerning the adequacy of State monitoring of program progress from the standpoint of attainment of milestones and goals we noted that (1) annual State plans often did not contain any specific data on planned actions against which to compare actual progress and (2) lack of adequate program measure cost data (see p. 30) and energy savings (see p. 23) prevent determination of program cost-effectiveness.

In reviewing the six State plans, we noted that individual program measure descriptions were generally lacking specifics on the actions to be taken during the year such as the number of audits, number of seminars and expected attendance, and number of workbooks to be distributed. For example, Indiana's 1980 plan contained a residential energy audit program providing for class B audit questionnaires to be distributed. The plan gave very broad milestones for actions such as distributing audit questionnaires, and collecting and analyzing results. However, no specifics were given as to how many of these actions the State planned to do in 1980.

Without more specifics in the annual plans on the various actions planned during the year, neither DOE nor the States have adequate data against which to compare actual progress.

IMPROVEMENTS NEEDED IN DOE MONITORING

Until DOE requires more accurate and detailed financial, program planning and program progress information, it cannot adequately monitor the progress of the SECP. Monitoring activities in the regional offices we visited have also been hampered by insufficient staff.

In previous sections of this report, we discussed several planning and reporting problems which make progress difficult to assess. The lack of accurate costs and energy savings for program measures prevents measurement of cost effectiveness (see pp. 23 and 30). The above noted lack of sufficient data in State plans on planned actions by program measure gives no standard against which to compare accomplishments.

We also noted that the States' quarterly progress reports often contained insufficient data for assessment of progress. For example, in our review of New York's progress reports, we noted they were inadequate because of

- failure to discuss milestones and provide data on progress in relation to milestones;
- tendency to be repetitive of previous reports; and
- changed milestones and added, deleted, or shifted activities with no explanation.

In many instances, inadequate progress reporting was the result of the lack of specificity in the annual State plans as discussed above. In its quarterly progress report, each State reports for each program measure whether or not it has met the milestones planned for that period. Because many of the milestones in the State plan were stated in generalities, the progress reporting on these milestones was also very general.

For example, the progress reports for the first two quarters of 1980 for the Indiana residential energy audit measure (which was noted above in our discussion of inadequate State plans), stated only that the class B audit questionnaires were distributed throughout the State by various organizations. No information was given on the number of questionnaires distributed, the number completed and returned for analysis, or any analysis of actions taken as a result of the audits.

Monitoring of the SECP consisted primarily of desk audits of State reports and even these desk audits were limited in some instances to a portion of the reports. DOE regional officials stated that the monitoring was limited due to insufficient staff.

For example, region V (Chicago) was responsible for program monitoring in six States. Until March 1980, when two staff members were added, only three staff members were assigned to the program, each monitored the programs of two States. During 1979, onsite visits to the States were restricted because all regional SECP staff were assigned to work on another Federal conservation program for about 4 months. The first onsite visit by DOE regional staff to Michigan was not until July 1980.

The SECP staffing in the other two regions was two to three persons, and monitoring was generally limited to desk audits of State reports. Region IX staff had not made an onsite visit to California since 1978, and region II review of quarterly financial reports was limited to a spotcheck of about 10 percent of the reports. Regional officials stated that monitoring was limited due to insufficient staff.

CONCLUSIONS

In our last report, we noted that DOE's ability to monitor the States and assess the effectiveness of program measures was limited by lack of accurate costs by program measure and insufficiently detailed progress reports and insufficient regional staffing.

Our current review disclosed that effective monitoring and assessment of the SECP continue to be hampered by a lack of

- accurate cost reporting and energy savings to assess program cost effectiveness,
- sufficient details in State plans on planned actions against which to compare actual progress,
- sufficiently detailed progress reports from the States, and
- sufficient staffing in the DOE regions.

We also noted in two States the use of SECP funds for non-SECP activities.

The continued existence of these problems indicates that, if the SECP is authorized beyond fiscal year 1982, there is a need for DOE or its successor agency to improve the financial, planning, and progress reporting systems used in the SECP for effective monitoring and management of the program.

RECOMMENDATIONS

If the SECP is authorized beyond fiscal year 1982, we recommend that the Secretary of Energy or the head of the successor agency revise the SECP planning and reporting requirements to assure the following:

- Financial systems at the State level are sufficient to provide accurate cost information by program measure. During periodic monitoring visits to State energy offices, DOE should determine the basis for each State's reporting of program measure costs, and provide needed policy guidance and technical assistance to States whose systems are not providing accurate accrued expenditure cost data.
- State plans contain sufficient detail on actions planned during the year against which to compare actual progress. Plans should contain adequate descriptions of milestones, including specifics on quantifiable actions--such as the number of workshops, training classes or audits--planned during the year.

We recommend that during reviews of quarterly State progress reports, the Secretary of Energy or the head of the successor agency should assess their adequacy in providing a realistic evaluation of program accomplishments. Progress reporting by the States should be in sufficient detail to provide accurate and complete information on the status of each program measure. Where progress reports are deemed inadequate, the Secretary of Energy

or the head of the successor agency should provide the necessary guidance and instructions to the State for improvement of the progress reports.

We also recommend that the Secretary of Energy or the head of the successor agency review with the States the requirements concerning the use of SECP funds to assure that funds are not used to finance non-SECP activities.

LIST OF DOE REGIONS AND STATES
INCLUDED IN GAO'S THREE REVIEWS

DOE regional <u>offices</u>	States in the regions participating in the SECP	States included in GAO review		
		<u>1977</u>	<u>1978</u>	<u>1979-80</u>
Atlanta	Alabama Florida Georgia Kentucky Mississippi North Carolina South Carolina Tennessee	Ky. N.C.		
Boston	Connecticut Maine Massachusetts New Hampshire Rhode Island Vermont		Conn. Mass.	
Chicago	Indiana Illinois Michigan Minnesota Ohio Wisconsin			Ind. Mich. Ohio
Dallas	Arkansas Louisiana New Mexico Oklahoma Texas		La. Tex.	
Denver	Colorado Montana North Dakota South Dakota Utah Wyoming	Colo. N. Dak.		
Kansas City	Iowa Kansas Missouri Nebraska	Mo. Neb.		
New York	New Jersey New York Puerto Rico Virgin Islands			N.J. N.Y.

Philadelphia	Delaware District of Columbia Maryland Pennsylvania Virginia West Virginia	Md. Pa.	
San Francisco	American Samoa Arizona California Guam Hawaii Nevada Northern Mariana Islands Trust Territory of the Pacific	Calif. Hawaii	Calif.
Seattle	Alaska Idaho Oregon Washington	Idaho Wash.	

GRANTS AWARDED FROM FY 1976 THROUGH
FY 1980 TO THE SIX STATES REVIEWED BY GAO

	<u>FY 1976</u>	<u>FY 1977</u>	<u>FY 1978</u>	<u>FY 1979</u>	<u>FY 1980</u>	<u>Total</u>
California	\$ 286,302	\$2,078,000	\$ 3,555,000	\$ 4,405,700	\$ 3,163,700	\$13,488,702
Indiana	107,002	797,000	1,811,300	1,464,800	1,226,500	5,406,602
Michigan	150,733	1,250,000	2,728,100	2,192,300	1,847,800	8,168,933
New Jersey	130,991	1,043,000	1,947,100	1,618,700	1,382,900	6,122,691
New York	258,900	2,351,000	4,240,400	3,337,700	2,839,700	13,027,700
Ohio	<u>170,522</u>	<u>1,448,000</u>	<u>2,863,200</u>	<u>2,246,000</u>	<u>1,893,700</u>	<u>8,621,422</u>
Total	<u>\$1,104,450</u>	<u>\$8,967,000</u>	<u>\$17,145,100</u>	<u>\$15,265,200</u>	<u>\$12,354,300</u>	a/ <u>\$54,836,050</u>

a/Grants awarded under the SECP from FY 1976 through FY 1980 totaled \$213,952,096. The total awarded the six States in this period represents about 26 percent of the total awarded all States.

Source: "Annual Report to the President and the Congress on the State Energy Conservation Program for Calendar Year 1980," DOE/CE-0016, July 1981, Appendix A.

(003486)

PLANNED AND REPORTED SELECT 1980 ENERGY
SAVINGS FOR MANDATORY AND OPTIONAL PROGRAM
MEASURES FOR THE SIX STATES REVIEWED BY GAO

Mandatory measures (by type)	Planned (P) and reported (R) 1980 energy savings in trillion Btu's													
	Calif.		Ind.		Mich.		N.J.		N.Y.		Ohio		Total	
	P	R	P	R	P	R	P	R	P	R	P	R	P	R
Lighting and thermal	14.55	29.60	17.19	17.13	32.82	10.49	28.09	21.51	68.50	33.15	25.10	30.81	186.25	142.69
Transportation	2.44	3.64	5.30	22.82	24.40	0.29	1.08	3.60	0	0	72.84	42.86	106.06	73.21
Right turn-on-red	0	0	0	0	0.16	1.25	1.10	1.10	1.10	0.71	0	0	2.36	3.06
State procurement	2.29	0.63	2.24	0.25	0.01	0.01	0.35	0.10	1.30	0.88	1.83	0	8.02	1.87
Energy audit	11.36	25.00	34.58	0.31	18.00	0.88	16.51	4.48	75.20	3.27	32.35	8.99	188.00	42.93
Public education	1.46	1.46	7.09	30.04	15.09	0.09	0	0	46.60	40.68	20.90	26.66	91.14	98.93
Coordination	2.21	0	0	0	2.50	0.01	0	0	1.00	0	0	3.07	5.71	3.08
Total mandatory	<u>34.31</u>	<u>60.33</u>	<u>66.40</u>	<u>70.55</u>	<u>92.98</u>	<u>13.02</u>	<u>47.13</u>	<u>30.79</u>	<u>193.70</u>	<u>78.69</u>	<u>153.02</u>	<u>112.39</u>	<u>587.54</u>	<u>365.77</u>
Optional measures (by sector)														
Agriculture	0	0	5.38	4.92	3.20	0	0	0	1.50	0	6.12	1.80	16.20	6.72
Industry	2.39	2.39	112.39	92.13	27.50	0.67	30.05	19.35	46.10	14.20	124.10	46.64	342.53	175.38
Transportation	0	0	0	0	6.17	0.80	0.08	0	25.20	5.67	0	0	31.45	6.47
Utility	223.59	52.08	7.21	0	34.00	0	116.86	11.50	17.00	27.34	0	0	398.66	90.92
Buildings	2.14	2.52	6.76	1.39	41.03	0.87	18.22	8.92	33.55	87.93	5.10	2.09	106.80	103.72
Government	14.81	12.17	6.09	31.08	5.28	0.57	0.71	1.75	1.44	0.41	0	0	28.33	45.98
Other	0.59	0.59	0	0	1.16	0	24.98	2.06	11.90	0	0	0	38.63	2.65
Total optional	<u>243.52</u>	<u>69.75</u>	<u>137.83</u>	<u>129.52</u>	<u>118.34</u>	<u>2.91</u>	<u>190.90</u>	<u>43.58</u>	<u>136.69</u>	<u>135.55</u>	<u>135.32</u>	<u>50.53</u>	<u>962.60</u>	<u>431.84</u>
Total mandatory and optional	<u>277.83</u>	<u>130.08</u>	<u>204.23</u>	<u>200.07</u>	<u>211.32</u>	<u>15.93</u>	<u>238.03</u>	<u>74.37</u>	<u>330.39</u>	<u>214.24</u>	<u>288.34</u>	<u>162.92</u>	<u>a/1550.14</u>	<u>b/797.61</u>

a/Planned 1980 savings for all States was 5,241.59 quadrillion Btu's. The 1980 savings planned by the six States represents about 30 percent of the total planned savings for all States.

b/Reported 1980 savings for all States was 3,091.3 quadrillion Btu's. The 1980 savings reported by the six States represents about 26 percent of the total reported savings for all States.

Source: "Annual Report to the President and the Congress on the State Energy Conservation Program for Calendar Year 1980," DOE/CE-0016, July 1981, Appendixes C, D, F, and G.



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