

DOCUMENT RESUME

ED 195 397

SE 033 222

TITLE Delays and Uncertain Energy Savings in Program to Promote State Energy Conservation. Report to the Congress by the Comptroller General of the United States.

INSTITUTION Comptroller General of the U.S., Washington, D.C.

REPORT NO EMD-80-97

PUB DATE 2 Sep 80

NOTE 86p.

AVAILABLE FROM U.S. General Accounting Office, Distribution Section, Room 1518, 441 G St., N.W., Washington, DC 20548 (single copy free).

EDRS PRICE MF01/PC04 Plus Postage.

DESCRIPTORS Energy: \*Energy Conservation: \*Federal Programs: Measurement Techniques: Money Management: \*Program Evaluation: \*Public Administration: Public Policy: \*State Programs

IDENTIFIERS Department of Energy: Energy Consumption: \*State Energy Conservation Program

ABSTRACT

Presented is a study and assessment of the United States Department of Energy State Energy Conservation Program (SECP). The goal of the SECP is to reduce energy consumption in each state by 5% by 1980. However, it is unlikely that this goal will be attained or that the savings reported for 1978 are a valid measure of the program's impact on energy use. Before SECP can reach its potential, the Department of Energy needs to: (1) reevaluate SECP's progress to establish more realistic goals; (2) assure that energy savings are reported on a consistent and adequately supported basis; and (3) improve program financial and progress reporting and monitoring. (Author/WB)

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COMPTROLLER GENERAL  
Report To The Congress  
OF THE UNITED STATES

Delays And Uncertain Energy Savings  
In Program To Promote  
State Energy Conservation

Under the State Energy Conservation Program Act, the U.S. Energy Commission is required to submit a report to the Congress by October 1, 1980. The report should include information on the progress of the program to promote energy conservation in state buildings. Below the program, the Department

- to include the program's progress to meeting goals and milestones that are measurable and attainable;
- to include estimated and actual energy savings as reported on a consistent and verifiably supported basis; and
- to include program financial and program reporting and monitoring.

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COMPTROLLER GENERAL OF THE UNITED STATES

WASHINGTON D.C. 20548

B-197845


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.

Section 462 of the Energy Conservation and Production Act (42 U.S.C. 6892) requires the Comptroller General to report to the Congress annually for fiscal years 1977, 1978, and 1979 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 is our second annual report on the State Energy Conservation program, and it covers activities through 1973. A report on the low-income weatherization program for 1978 was issued separately.

We are sending copies of this report to the Director, Office of Management and Budget, and to the Secretary of Energy.

  
Comptroller General  
of the United States

D I G E S T

Before the State Energy Conservation program can reach its potential, improvements need to be made at the Federal and State levels to:

- Reevaluate the scope, direction and progress of program measures.
- Assure that States' reports of both actual and projected future energy savings are consistent and adequately supported and that energy savings goals are reevaluated periodically.
- Improve financial and progress reporting by the States and program monitoring by the Department of Energy.

The Energy Policy and Conservation Act, as amended by the Energy Conservation and Production Act, established the State Energy Conservation Program. Through 1978, \$111.5 million was provided to the Department of Energy to run the program.

The Energy Conservation and Production Act 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 State Energy Conservation programs. This is GAO's annual report, covering 1978 as the conditions existed at that time. The report addresses four aspects of the program--program effectiveness, energy savings, financial controls, and compliance monitoring.



## PROGRAM EFFECTIVENESS

The ultimate success of the State Energy Conservation Program should be measured not only in terms of the States' achievement of their energy savings goals but also in terms of the timely and effective implementation of all planned energy conservation measures. However, the program has been hampered by long delays in enacting required State legislation, slippages in milestone dates, and reductions in scope in many State program measures.

By law, in order to qualify for Federal assistance each State energy conservation plan is required to include eight program measures--lighting and thermal building standards, promotion of carpools, vanpools and public transportation, mandatory energy efficient State procurement standards, a traffic law or regulation permitting a right turn at a red stop light, public education, energy audits, and coordination. Implementation of mandatory measures, especially lighting and thermal standards, was significantly delayed because of problems in the passage of required State legislation. Only two of the eight States GAO reviewed had implemented lighting and thermal standards by the close of 1978.

Although 41 States had adopted some type of thermal efficiency standards by September 1979, in at least 14 of these States, standards

- had not been established for all required building categories,
- were not mandatory for all new construction, or
- were not mandatory in all jurisdictions of the State.

These shortcomings could reduce substantially the number of buildings constructed with conservation features and further reduce projected energy savings for 1980. (See p. 9.)

The authorizing legislation provides that State energy conservation plans may also include optional measures to conserve and improve efficiency in the use of energy. Nationwide, optional measures accounted for about 71 percent of the 1980 program savings goal of about 5.8 quadrillion British thermal units.

There were delays in meeting milestone dates for many optional program measures because of problems in establishing and administering the measures and overly ambitious and optimistic goals. Six of the eight States had significant industrial conservation programs (accounting for 11 to 87 percent of the State's 1980 energy conservation goal) that were either not operating or were behind schedule because of design, implementation and staffing problems. A number of other optional programs were delayed or reduced in scope. (See p. 14.)

A prior GAO report found problems in the Department of Energy's administration of the State Energy Conservation program. That these problems continue indicates a need for the Department of Energy to reassess the scope and progress of the States' programs to determine whether program measures need to be changed, and whether program goals and milestones are realistic and attainable.

#### ENERGY SAVINGS

The goal of the State Energy Conservation Program is to reduce energy consumption by 5.8 quadrillion British thermal units during 1980. Reported energy savings for 1978 were 747 trillion British thermal units--13 percent of the goal.

However, based on a review of selected savings data, GAO does not believe it is likely that this goal will be attained by 1980. GAO also believes that the reported savings for 1978 were overstated and were not a valid measure of actual savings. (See p. 26.)

After reviewing selected mandatory and optional program measures in eight States, GAO identified 44 program measures where achievement of the savings goals is unlikely. These program measures account for total projected 1980 savings of 1.1 quadrillion British thermal units or about 76 percent of the eight States' total goals. GAO based its conclusions on the following factors:

- Savings were based on optimistic and unsupported projections which were not sufficiently evaluated by the Department of Energy.
- Key assumptions for similar projects in several States varied significantly and were generally unsupported.
- Savings projections were not reevaluated to consider the impact of delays and reductions in scope.

The four Department of Energy regions reviewed by GAO included 21 States that reported a total savings of about 252 trillion British thermal units for 1978. However, GAO's review of some of these States' reported savings disclosed problems involving (1) mathematical errors, (2) lack of support for assumptions used in calculations, (3) use of projections rather than estimates of actual savings, and (4) savings claimed which were the result of programs other than the State Energy Conservation Program. (See p. 36.)

GAO previously recommended that the Department of Energy consider the impact of program measure delays on the 1980 energy savings goal, and provide procedures for States to report actual savings on an annual basis. The problems GAO noted in its current report still indicate that improvements are needed in estimating, measuring, and reporting energy savings to allow the Department of Energy and the States to accurately assess the status and impact of the program.



FINANCIAL MANAGEMENT AND  
PROGRAM MONITORING

GAO identified deficiencies in the financial and progress reporting systems used in the State Energy Conservation Program which must be corrected before the States and the Department of Energy can effectively monitor and manage the program. (See p. 44.)

Although accounting systems at the State level generally were adequate to control and report on total grant funds, problems were encountered in some States in accruing and reporting costs by program measure (which are needed to measure individual program cost effectiveness), and in adhering to letter of credit procedures. Although six of the eight States GAO reviewed had adequate monitoring systems in terms of program progress and attaining milestones, the lack of accurate costs by program measure prevented measuring program cost effectiveness.

In order to adequately administer, control, and measure the success of the State Energy Conservation Program, the Department of Energy needs to monitor and compare program results with program expenditures. Until the final quarter of fiscal year 1978, all States were not asked to submit financial data in a format which would allow for comparing program results with expenditures, and, as noted, the accuracy of this data was questionable. In addition, the format used by the States in their narrative progress reports and the content of the reports varied considerably, making progress difficult to assess. Monitoring activities in the regional offices GAO visited have also been hampered by insufficient staff. (See p. 49.)

In its official response to GAO's report, the Department of Energy stated that it has developed a reporting and monitoring system and has submitted it to the Office of Management and Budget for approval.

## RECOMMENDATIONS

The Secretary of Energy should:

- Reassess the compliance determinations for those States considered to be in compliance with the mandatory State Energy Conservation Program requirements, especially mandatory thermal and lighting standards. In making the reassessment the Secretary should determine (1) whether States have and are using enforcement authority to assure implementation of building thermal and lighting efficiency standards, and (2) the status of local implementation of State-enacted building thermal and lighting efficiency standards. If any State is determined not to be in full compliance, the Secretary should grant an extension of time for such States to comply. However, the Secretary should consider the advisability of granting further extensions to those States which do not appear to be making good-faith efforts.
- In cooperation with the States, reevaluate both mandatory and optional program measures in order to (1) determine if changes and improvements are needed in their scope and direction to make them attainable; (2) establish program measure goals and milestones that are realistic and attainable; and (3) revise State plans and goals accordingly.
- Provide specific guidance and technical assistance needed by the States to estimate and measure both projected future and actual energy savings as a result of the program. This guidance and assistance should assure that (1) compliance and energy savings factors used for similar program measures are consistent and adequately supported, (2) periodic reevaluations are made of State goals to reflect program changes and slippages, and (3) annual savings reported by the States are reasonably accurate and a valid measurement of energy savings resulting from the State Energy Conservation Program.

--Based on the reevaluation of the scope and progress of State plans and program measures recommended above, work with the States to revise their energy savings goals.

The Secretary of Energy should assure that the States implement the Department's monitoring system, when approved by the Office of Management and Budget, to provide the Department with the following assurances:

--Financial systems at the State level are sufficient to provide accurate cost information by program measure.

--Progress reporting by the States is in sufficient detail to provide accurate, consistent, and complete information on the status of each program measure.

Also the Secretary of Energy should review with the States the Federal requirements concerning the use of Federal funds, focusing on letter of credit procedures.

#### AGENCY COMMENTS

The Department of Energy stated its basic agreement with the general points and recommendations made by GAO in the report as to the condition of the SECP in 1978, and cited the following ongoing or planned corrective actions. (See app. VII.)

--Reassessing State compliance with the lighting and thermal standards, including developing schedules for assessing compliance with other required measures during fiscal year 1981.

--Providing assistance to the States during the past year to help them evaluate their programs and thus improve their methodologies for projecting and measuring energy savings. The Department plans to continue these efforts in fiscal year 1981.

--Developing accounting policy and procedures manuals for departmental and State staffs.

--Implementing a program progress reporting and monitoring system in fiscal year 1981, if approved by the Office of Management and Budget.

The Department of Energy also made the following comments which they believe would highlight some of the positive aspects of the program.

--Program effectiveness should also be measured in terms of (1) first-time development of a State capability to manage energy conservation programs, (2) State innovativeness or resourcefulness applied in program development and implementation, and (3) program cost effectiveness. GAO agrees that these elements are critical to effective program implementation. However, these elements are but a means to attain the program's ultimate objective and measurement of its effectiveness--timely and effective implementation by the States of their energy conservation measures to achieve their energy savings goals.

--The report does not recognize the difficulties in implementing some program measures. GAO recognizes that there are many problems in implementing program measures, especially mandatory measures, which may take considerable effort and time to overcome. GAO's purpose in elaborating on the many delays in program measures is to point out that these problems indicate a need for the Department of Energy to reassess the States' programs to (1) determine changes and improvements needed, (2) assist States in establishing program goals and milestones that are realistic and attainable, and (3) revise State plans and overall program goals to reflect the results of the reassessment.

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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
NECPA	National Energy Conservation Policy Act
SECP	State Energy Conservation Program

## CHAPTER 1

### INTRODUCTION

Title IV of the Energy Conservation and Production Act (ECPA) (Public Law 94-385), enacted August 14, 1976, authorizes four programs to encourage and facilitate the implementation of energy conservation and renewable-resource 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 demonstrations for existing dwelling units.

While originally the responsibility of the Federal Energy Administration and the Department of Housing and Urban Development, all of the programs authorized by title IV were transferred by the Department of Energy Organization Act (42 U.S.C. 7151, 7154.) to the Department of Energy (DOE), effective October 1, 1977. 1/

In our first annual report 2/ on these programs, we made several recommendations for improving the programs, some of which were implemented by DOE and some were not. We comment on those recommendations in appropriate sections of this report.

This is our second annual report, and it generally covers activities under the base and supplemental State Energy Conservation Program (SECP) through calendar year 1978. A

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1/For purposes of the report, DOE will be used when referring to the Federal Energy Administration and its activities prior to Oct. 1, 1977.

2/The first report covered fiscal year 1977. It was entitled "Evaluation of Four Energy Conservation Programs--Fiscal Year 1977," EMD-78-81, Nov. 21, 1978.

separate report was issued on weatherization assistance for low-income persons. <sup>1/</sup> The remaining two programs-- energy conservation and renewable-resource obligation guarantees, and energy conservation and renewable resource demonstrations for existing dwelling units--were not reviewed because the programs were not implemented by DOE. Further discussion of these two programs is on page 6 and appendix I.

#### 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 56 jurisdictions or States--the 50 States, Guam, the District of Columbia, Puerto Rico, the Virgin Islands, American Samoa, and the Trust Territory of the Pacific. The Trust Territory of the Pacific is the only jurisdiction which declined to participate, citing geographic dispersion of more than 200 populated islands in a 3 million-square-mile area as an impeding factor for implementing a cost effective program.

The SECP is administered on a decentralized basis through the 10 DOE regional offices. DOE headquarters has overall responsibility for program development and the administration of financial and technical assistance to the States. Headquarters' duties include

- supplying program administration guidelines and criteria,

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<sup>1/</sup>"Slow Progress and Uncertain Energy Savings in Program to Weatherize Low-Income Households," EMD-80-59, May 15, 1980.

- 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,
- 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 for fiscal years 1976-78. The supplemental program, established by ECPA, provided additional financial assistance to States in fiscal years 1977-79. Total funding for the SECP through fiscal year 1978 was \$111.5 million and the eight States we reviewed in detail received grants totaling about \$22 million (see app. II). To receive Federal financial assistance, States must fulfill specific legislative requirements.

## 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/ will 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;
- 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 operation of public buildings,
- restrictions on the use of decorative or nonessential lighting,
- controls on transportation,

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

--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 energy measures 2/ 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

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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.

2/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.



--encouraging and carrying out energy audits 1/ 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.

OBLIGATION GUARANTEES AND EXISTING DWELLING UNITS DEMONSTRATION PROGRAMS NOT IMPLEMENTED

ECPA established two programs offering financial incentives to encourage conservation and the use of renewable resources--the energy conservation and renewable-resources obligation guarantees program, and the energy conservation and renewable-resource demonstration program for existing dwellings units. At the time of our first report, neither program was implemented, and we recommended that DOE implement them. The legislative authority for these programs has since expired. Legislation has been enacted 2/ that would to a great extent carry on nationwide the type of initiatives intended by these two programs. Because of this, we no longer believe that our prior recommendation to proceed with the programs is relevant. However, we believe that DOE missed an opportunity to test in these two programs, some of the enacted programs. Further discussion of these two programs is contained in appendix I.

OBJECTIVES, SCOPE, AND METHODOLOGIES

Section 462 of ECPA requires the Comptroller General to report to the Congress annually for fiscal years 1977, 1978, and 1979 on the activities 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 SECP expenditures 3/, and compliance monitoring.

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1/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.

2/National Energy Conservation Policy Act (NECPA), Public Law 95-619, and Energy Security Act, Public Law 96-294.

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

Our review covered only the SECP program because the obligation guarantee and demonstration programs were not implemented. 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.

Our overall objective for the three annual reports is to review the implementation of the SECP in each of the 10 DOE regions at least once. In the current report, we covered SECP implementation in four DOE regional offices and eight States within those regions (see app. III). The eight States were selected taking into consideration high expected energy savings, large DOE grant funds, indicated problems in program implementation, and substantial expenditures of program funds.

At DOE headquarters and in the four DOE regional offices, we analyzed legislation; program regulations, policies, and procedures; program financial and progress records and reports; internal audit reports; and other pertinent program documents, correspondence, and studies. We obtained comments regarding program problems and accomplishments from responsible DOE regional and headquarters officials. We also obtained official comments from DOE on this report (see app. VII).

Our work in each of the eight States included analyzing State conservation plans, financial records, and other pertinent program documents and correspondence. We also obtained information and comments from State officials and from contractors responsible for developing State plans or implementing specific conservation measures for the State.

In the eight States, we reviewed the implementation of and projected 1980 energy savings for all mandatory measures, and for selected optional measures accounting for about 60 to 95 percent of the States' projected 1980 energy savings. The optional 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 1978.

We also reviewed the 1978 energy savings reported for selected measures in 7 of the 21 States included in the four DOE regions. The selected measures accounted for 45 to 94 percent of the States' reported 1978 savings. Projected savings for 1980 and reported savings for 1978 were evaluated for reasonableness and accuracy, with particular emphasis on the adequacy of support for assumptions regarding (1) the percentage of a population participating in and taking action as a result of a program measure, and (2) the energy savings resulting from a program measure.

## CHAPTER 2

### UNSATISFACTORY PROGRESS OF THE STATE

#### ENERGY CONSERVATION PROGRAM

The ultimate success of the SECP should be measured not only in terms of the States' achievement of their energy savings goals but also in terms of the timely and effective implementation of all planned energy conservation measures. However, timely and effective implementation of the SECP has been hampered by long delays in enacting required State legislation, slippages in milestone dates and reductions in scope. For example, the implementation of mandatory measures, especially lighting and thermal standards, was significantly delayed because of problems in the passage of required State legislation. Only two of the eight States reviewed had implemented lighting and thermal standards by the close of 1978.

Many optional program measures, which nationwide account for about 71 percent of the projected States' 1980 program energy savings, (see app. IV) experienced slippages in milestone dates because of problems in establishing and administering the measures and overly ambitious and optimistic goals. Six of the eight States had significant industrial conservation programs that were either not operating or were behind schedule because of problems in designing, implementing and staffing. A number of other optional programs experienced milestone slippages or reductions in scope.

In our first report (see p. 1), we noted delays in the implementation of program measures and inadequate provision of technical assistance to the States by DOE. We recommended changes in DOE's administration of the SECP, including (1) continued coordination of the development of thermal and lighting standards, and (2) provision of technical assistance needed by the States to implement the program. The continued existence of these problems indicates a need for DOE to reassess the scope and progress of the States' programs in order to (1) determine changes and improvements needed, (2) assist the States in establishing program goals and milestones that are realistic and attainable, and (3) revise State plans and overall SECP goals to reflect the results of the reassessment and to establish a timeframe for accomplishment of overall SECP goals.

## DELAYS IN IMPLEMENTING MANDATORY MEASURES

The base and supplemental programs require that each State energy conservation plan include the eight mandatory measures. Progress toward implementation of these required measures, especially lighting and thermal building standards and procurement standards, has been slow and DOE's compliance determinations were unreliable. In most States implementation of these measures requires action by the State legislature and problems have occurred in the passage of this legislation.

The status at the close of 1978 of the mandatory program measures in the eight States as reviewed by GAO is shown in the following table.

<u>Program measure</u>	<u>States with measure implemented</u>	<u>States with measure not implemented</u>
Thermal and lighting efficiency	Connecticut <sup>1/</sup> Massachusetts	Idaho, Washington, Louisiana, Texas, Pennsylvania, Maryland
Right turn-on-red	Idaho, Washington Louisiana, Texas, Connecticut, Pennsylv- ania, Maryland	Massachusetts
State procurement	Washington, Connecticut Massachusetts, Pennsylv- ania, Maryland	Idaho, Texas, Louisiana
Transportation	Idaho, Washington, Massachusetts, Con- necticut, Pennsylvania, Maryland	Louisiana, Texas
Public education	All States	
Energy audits	Idaho, Texas, Massa- chusetts, Connecticut, Pennsylvania	Washington, Louisiana, Maryland
Coordination	All States	

<sup>1/</sup>Lighting standards applied to new buildings only.

### Thermal and lighting efficiency standards

Delays in implementing thermal and lighting efficiency standards occurred because (1) standards were not adopted in a timely manner by some States and (2) some standards were not mandatory for all required construction. 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. Total 1980 savings estimated

to result from implementation of these standards was about 595 trillion British thermal units (Btu's). <sup>1/</sup> This represents about 10 percent of the total SECP savings goal for 1980 of about 5.8 quadrillion Btu's. (See app. IV). Total 1980 savings estimated to result from implementation of the standards in the eight States was about 101 trillion Btu's (see app. V).

In its annual report on the SECP for calendar year 1978, DOE stated that by the close of 1978, 39 States and 4 Territories had either adopted thermal and lighting energy efficiency standards for new and renovated buildings or had passed legislation requiring the development of standards consistent with SECP requirements. Legislative actions in another two States were pending, and the remaining States had no existing authority.

Six of the eight States we reviewed did not have the required standards authorized and implemented at the close of 1978. For example, Washington had only partially implemented the mandatory thermal and lighting efficiency standards. During the 1977 legislative session, legislation was enacted to establish thermal efficiency standards for new residential construction. The legislation amended the State's uniform building code to require building code authorities throughout the State to enforce minimum insulation standards after January 1, 1978. Further legislative action in 1978 was not feasible since the legislature was not in session.

DOE extended Louisiana's deadline for enacting thermal and lighting efficiency standards to July 1978. The State energy office submitted a bill during the 1978 legislative session which would have authorized the Secretary of the Louisiana Department of Natural Resources to adopt rules establishing thermal and lighting efficiency standards. The final version of the bill, however, merely authorized the Secretary to develop rules which must be submitted to the legislature for approval.

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<sup>1/</sup>A British thermal unit (Btu) is the amount of energy needed to raise the temperature of one pound of water by one Fahrenheit degree.

In a separate report 1/ on Federal programs to make new buildings energy efficient, we reported that the effectiveness of the thermal efficiency standards program is questionable. In many of the States covered in the report, the standards were not implemented by January 1, 1978--DOE's target date. We estimated that these delays could reduce the projected 1980 energy savings by the equivalent of about 46,000 barrels per day of oil. We also reported that DOE's determination of State compliance with the thermal efficiency standards was unreliable because DOE had not applied its criteria in a consistent manner.

We reported that although 41 States had adopted some type of thermal efficiency standards by September 1979, in at least 14 of these States (1) standards have not been established for all required building categories, (2) standards are not mandatory for all new construction, or (3) standards are not mandatory in all jurisdictions of the State. These shortcomings could reduce substantially the number of buildings constructed with conservation features and further reduce projected energy savings of about 262 trillion Btu's for 1980 from implementation of thermal building standards.

#### 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. Under DOE regulations this measure must apply to all political subdivisions of the State. Nationwide, implementation of the measure was estimated to save 3 trillion Btu's by 1980 (see app. IV); in the eight States the measure was estimated to save about 0.6 trillion Btu's (see app. V).

The right-turn-on-red measure was operational in 31 States prior to passage of EPCA. Of the remaining 24 States, American Samoa was granted a waiver to this required measure since no stop light intersections existed there, and the remaining 23 had enacted a law meeting the requirements.

#### 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

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1/ "Uncertainties About The Effectiveness of Federal Programs to Make New Buildings More Energy Efficient." EMD-80-32, Jan. 28, 1980.



provisions on purchasing the most energy-efficient item over its lifetime instead of purchasing the least expensive item.

Nationwide, the implementation of the measure was estimated to save about 41 trillion Btu's by 1980 (see app. IV); in the eight States the measure was estimated to save about 3.5 trillion Btu's (see app. V).

Five of the eight States we reviewed had adopted procurement standards. Three States--Texas, Louisiana and Idaho--did not have a mandatory procurement program. For example, Texas' procurement program was carried out by the State Board of Control. Although the Board of Control can recommend product specifications, it cannot force State agencies to adhere to the specifications. The program is not mandatory and Texas did not plan to require State agencies to use energy efficient procurement specifications which the board is developing.

#### 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. Estimated 1980 savings from this measure are about 119 trillion Btu's nationwide (see app. IV) and about 25 trillion Btu's in the eight States (see app. V). 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.

According to DOE, at the close of 1978, the requirement had been met by all States. However, our review of the implementation of this requirement in the eight States disclosed that two States--Louisiana and Texas--had not fully implemented the measure.

For example, Louisiana designed a program to establish about 29,000 carpools and 500 vanpools in seven metropolitan areas by December 31, 1979, and save about 3.5 trillion Btu's during 1980, most of which would be attributable to the carpool program element. The Louisiana Energy Office awarded a carpooling contract to the city of Baton Rouge in November 1977.

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The city advised the energy office that as of July 1978, insurmountable internal problems had prevented the program from being implemented and the energy office cancelled the contract. The energy office was not promoting carpooling during seminars on vanpooling as originally planned and as of December 1978, did not know if a carpooling program would be implemented.

### 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. Estimated 1980 savings from this measure are about 122 trillion Btu's nationwide (see app. IV), and about 1.5 trillion Btu's in the eight States (see app. V).

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 eight States we reviewed had implemented this measure.

### Energy audits

Under DOE regulations each State must provide and make available, to the extent feasible, Class A 1/ energy audits in at least one political subdivision for the buildings or industrial plants in at least 1 of 10 DOE-specified categories

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1/A Class A audit consists of onsite visits by auditors and evaluations of energy consumption and energy systems.

(such as hospitals, educational institutions, office buildings, and retail stores) and as many Class C 1/ energy audits as is practicable within the State in the remaining 9 categories. The State must also make available Class B 2/ 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. Estimated 1980 savings from this measure are about 790 trillion Btu's nationwide (see app. IV) and about 17.2 trillion Btu's in the eight States (see app. V).

Three of the eight States we reviewed--Louisiana, Maryland and Washington--had not met this program requirement by the close of 1978.

### 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. By the close of 1978 all the eight States we reviewed had met this requirement. Total estimated 1980 savings from this measure is only about 6 trillion Btu's (see app. IV) and the eight States attributed no savings to it (see app. V).

### INEFFECTIVE IMPLEMENTATION OF OPTIONAL PROGRAM MEASURES

State energy conservation plans may also include optional program measures to conserve and improve efficiency in the use of energy. Nationwide, these optional program measures accounted for about 71 percent of the States' total program savings goal for 1980 of about 5.8 quadrillion Btu's (see app. IV).

In the eight States, we reviewed optional program measures accounting for sizeable portions of their projected 1980 energy savings. We found, however, significant slippages in meeting established milestone dates for implementing the measures. Six of the eight States' plans included significant industrial conservation program measures that were either not operating or were behind schedule because of problems in

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1/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/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.

designing and implementing the programs. A number of other program measures were not operating or were behind schedule because of problems in enacting required legislation or in designing and implementing the measures. We also noted instances where the scope of the measures had been significantly reduced from what was proposed in the State plan, and one instance where measurement of program results had been done and which indicated that public response to it was significantly less than was estimated in the State plan.

Delays in implementing industrial conservation

Nationwide, industrial conservation program measures accounted for about 29 percent of the estimated 1980 energy savings. (See app. IV.) Of the eight States, all but Massachusetts chose to implement an industrial conservation program measure, which accounted for a significant portion of their projected 1980 savings. The Texas industrial program measure was operating on schedule, however, the programs in four States were not operating and those in two States were operating, but behind schedule. The following table shows for the seven States implementing an industrial program, the projected 1980 energy savings in Btu's and as a percentage of the total State 1980 savings and the status of the program at the close of 1978.

<u>State</u>	<u>Projected 1980 energy savings (trillion Btu's)</u>	<u>Percentage of total State 1980 savings</u>	<u>Status at the close of 1978</u>
Connecticut	5.5	11	Not operating due to delay in designing and awarding contract for implementation.
Maryland	26.2	32	Not operating due to delays in defining function and developing curriculum.
Pennsylvania	157.2	52	Major segment delayed.
Louisiana	184.2	87	Operating but behind schedule. Most program elements from 9 months to 2 years behind scheduled milestones.
Texas	283.8	53	Operating on schedule.
Idaho	5.4	27	Not operating due to delay in designing and establishing program.
Washington	28.3	32	Not operating due to delay in staffing and designing program.

The following discussion of the Connecticut and Louisiana programs illustrates in more detail the problems encountered in this area.

Connecticut's industrial conservation program measure is expected to reach at least 1440 firms and efforts are aimed at energy intensive industries. Firms will be reached through workshops conducted by a consultant. Plans call for at least 24 workshops by the close of 1979 with an average attendance of 60 firms.

Connecticut was unable to conduct any workshops in 1978, because of problems in designing and awarding a contract to carry out this program measure. The services to be provided include the development of workshop material, presentation of workshops, development of a mechanism to monitor and evaluate program activity, and development of an incentive awards program.

Louisiana's industrial program consisted of a series of energy management seminars and two types of workshops. The seminars were designed to encourage the larger industrial firms to establish energy management programs. The first type of workshop (technology transfer) is to provide small industrial firms with information concerning energy conservation opportunities in selected manufacturing processes (e.g., grain drying and fiber processing). The second workshop series is to emphasize energy conservation opportunities associated with efficient boiler operation.

Louisiana's savings goal for 1980 was based on the assumption that the seminars would begin in January 1978, and the workshops would begin in April 1978. Louisiana started conducting boiler efficiency workshops during April 1978, as initially planned. But by the close of 1978 no energy management seminars or technology transfer workshops had been held.

Louisiana's revised plan called for starting the energy management seminars during April 1979 (15 months later than initially planned). However, at the close of 1978, the contract to develop seminar materials had not been awarded. Louisiana's revised milestone schedule allows 12 months of lead time from beginning preparation and distribution of final seminar materials to conducting the first seminars, resulting in a probable overall delay of 2 years.

Louisiana's revised plan called for starting the technology workshops during December 1978 (8 months later than initially planned). However, at the close of 1978, the contract to develop workshop materials had not been awarded, and the revised milestone schedule allows 2 months to identify workshop sponsors and develop workshop materials, resulting in a probable overall delay of almost 1 year.

#### Problems in implementing other programs

Nationwide, optional measures other than industrial accounted for about 42 percent of the total projected 1980 energy savings (see app. IV). We reviewed several optional measures in each of the eight States. In six of the States many measures were either not operating or were operating behind schedule because of failure to enact required legislation and problems in designing and implementing the measures, as shown in the table on pages 18 and 19.



Status of Selected Optional Program Measures  
in Six States

<u>State</u>	<u>Program measure</u>	<u>Projected 1980 energy savings (trillion Btu's)</u>	<u>Percentage of total State 1980 savings</u>	<u>Status at the close of 1978</u>
Connecticut	Residential furnace inspection, residential thermal performance standards.	2.7	5	Legislation required for operation not enacted.
	Increasing penalty for exceeding 55 MPH speed limit.	2.5	5	Legislation required for operation not enacted.
	Mandatory auto inspection.	4.5	9	Not operating. Required legislation provides for implementation in 1981.
	Waste oil recovery.	0.4	1	Legislation required for operation not enacted.
		<u>10.1</u>	<u>20</u>	
Massachusetts	Conservation in hospitals.	4.5	3	Regulatory changes required for operation not made.
	Mandatory bottle deposits.	4.5	3	Legislation required for operation not enacted.
	Mandatory auto inspection.	4.4	3	Legislation required for operation not enacted.
		<u>13.4</u>	<u>9</u>	
Maryland	Annual vehicle registration fee.	7.8	9	Legislation required for operation not enacted.
	Transportation sales tax exemption.	1.1	1	Legislation required for operation not enacted.

<u>State</u>	<u>Program measure</u>	<u>Projected 1980 energy savings (trillion Btu's)</u>	<u>Percentage of total State 1980 savings</u>	<u>Status at the close of 1978</u>
	Residential-pre-sale home weatherization.	2.0	2	Legislation required for operation not enacted.
	Public education programs.	11.0	13	Operating but behind schedule.
		<u>21.9</u>	<u>25</u>	
Louisiana	Municipal utilities.	<u>11.0</u>	<u>5</u>	Started operating about 6 months behind schedule.
Texas	Existing residences.	109.0	20	Some program elements not in operation or behind schedule.
	Existing commercial buildings.	56.6	11	One of two program elements not in operation.
	Public schools.	32.1	6	Five of seven program elements behind schedule or in developmental stage.
		<u>197.7</u>	<u>37</u>	
Washington	Residential audits.	7.7	9	At close of FY 1978 only about 5 percent of planned audits completed.
	Commerce and industry buildings - self audits.	9.6	11	Not in operation.
		<u>17.3</u>	<u>20</u>	

The following discussion of program measures in Massachusetts and Texas illustrates in more detail the problems noted in this area.

Among several activities covered by Massachusetts' Program and Policy Development measure were (1) mandatory bottle deposits, (2) automobile efficiency inspections, and (3) hospital conservation, all of which required legislative or regulatory changes that did not occur. The mandatory bottle deposit bill was rejected by the State legislature in 1977. Legislation for auto efficiency inspections was never introduced after a study showed that because of the cost of the inspections, passage was unlikely.

There has been little success regarding actions directed to hospitals. The State Energy Office hoped that (1) new rate setting legislation could be used to encourage greater energy efficiency in hospitals, (2) life-cycle cost estimates could be introduced as a condition for approved capital expenditures in hospitals, and (3) energy budgets for hospitals, if proved practicable, could be implemented. We were told by State Energy Office officials, however, that regulatory agencies did not act in a timely manner on the above and consequently there was no progress in 1978.

Texas planned an existing residences program to reach homeowners through three program elements--utilities workshops, local energy audit assistance, and statewide awareness activities. The only element implemented on schedule was the utilities workshops. The local energy audit assistance element, which is designed to make Class B audits available to homeowners, was initially planned to begin in the second quarter of 1978. The statewide awareness element, which is to use the news media to disseminate information to homeowners on energy efficient purchasing and use of appliances, was initially planned to start in the fourth quarter of 1977. However, because of delays in awarding contracts to implement the elements, neither was operating in 1978.

#### Reductions in scope and limited response

Our review of selected optional program measures in the eight States also disclosed two program measures which, although operating, had been reduced in scope from original plans and one program measure where public response was significantly less than planned.

Idaho's residential homeowners' energy audit program initially planned to provide audit assistance to homeowners throughout the State on request. It was estimated that the program would be underway in half the State's communities by the close of 1978 and would save 3 trillion Btu's by 1980 (16 percent of the State's 1980 goal). However, because of problems in designing and selecting an audit system, the program was not implemented as originally planned. Instead, the State made available to requestors copies of DOE's "Home Energy Savers Workbook," and planned to develop and operate on a pilot basis a homeowners' audit program.

Massachusetts' energy extension service was planned to provide energy conservation services to various sectors of public and private non-residential structures and was estimated to save about 32 trillion Btu's in 1980. However, in 1978 the plan was revised and several sectors, including hotels, motels, sports facilities and warehouses, will not be reached by the program.

With one exception, the States we reviewed had not done any random sampling to determine the response to their program measures. Massachusetts sampled participants in one of its major program measures and the results indicated that public action on the conservation measures was significantly less than expected, as discussed below.

The emphasis of Massachusetts' Public Information and Education project was directed to residential conservation efforts through expanded compliance with "Project Conserve" <sup>1/</sup> recommended objectives. The core of this pilot project was a homeowner's energy use questionnaire which was analyzed via computer. The homeowner then received a "Home Energy Report" which contained energy conservation recommendations for attic insulation, storm door and windows, weatherstripping and caulking and lower thermostat settings. Each report contained an estimate of the cost, annual fuel and dollar savings, pay-back period and return on investment for the recommended measures. Over 140,000 or 15 percent of the State's 925,000 homeowners completed "Project Conserve" questionnaires.

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<sup>1/</sup>Project Conserve was a pilot project begun in March 1976 and funded by the former Federal Energy Administration.

The 1980 savings estimate of about 21 trillion Btu's was based on compliance levels with "Project Conserve" objectives. However, the attainability of these compliance levels appears questionable in view of the results of a 1977 survey of persons participating in the program. The projected compliance and actual compliance indicated in the survey are shown in the following table.

<u>Conservation measure</u>	<u>Degree of compliance (Percent of population taking action)</u>	
	<u>Projected for 1980</u>	<u>Actual 1977 action</u>
Winter thermostat decrease	30	a/ 7
Summer thermostat increase	20	b/ 4
Caulking and weatherstripping	21	5
Storm windows	12	2
Attic insulation	35	5

a/An average 4 degrees reduction was achieved for daytime settings, a decrease of only 2 degrees was achieved at night.

b/Notes supporting this figure indicate that 4 percent more aptly represents homeowners who thought it easiest to save energy by reducing the use of air conditioning. This could mean shutting off the unit for greater periods of time.

### CONCLUSIONS

In our prior report, we pointed out the need for changes in DOE's administration of the program including

- continued coordination of the development of thermal and lighting standards required under the program, and
- provision of assistance needed by the States to implement the program.

Our current review, however, disclosed that the timely and effective implementation of the SECP has been hampered by long delays in enacting required State legislation, slippages in milestones, and reductions in scope. The implementation of mandatory measures, especially thermal and lighting standards, has been delayed because of problems in passage of required State legislation. Also, DOE's compliance determinations were unreliable. Many of the optional program measures experienced slippages in milestone dates and reductions in scope because of problems in establishing and administering the measures and overly ambitious and optimistic goals.

These implementation problems continue to indicate a need for DOE to reassess the scope and progress of the States' programs to (1) determine changes and improvements needed, (2) assist the States in establishing program goals and milestones that are realistic and attainable, and (3) revise State plans and overall SECP goals to reflect the results of the reassessment and to establish a timeframe for accomplishment of overall SECP goals.

#### RECOMMENDATIONS

We recommend that the Secretary of Energy reassess the compliance determinations for all States previously determined to be in compliance with the State Energy Conservation Program mandatory requirements, especially compliance with the mandatory thermal and lighting standards measures. In making the reassessment the Secretary should determine

- whether States have and are using enforcement authority to assure implementation of building thermal and lighting efficiency standards, and
- the status of local implementation of State-enacted building thermal and lighting efficiency standards.

If any State is determined not to be in full compliance, the Secretary should grant an extension of time for such State to comply. However, the Secretary should consider the advisability of granting further extension to those States which do not appear to be making good-faith efforts.

We also recommend that the Secretary of Energy, in cooperation with the States, reevaluate both mandatory and optional program measures in order to

- determine if changes and improvements are needed in their scope and direction to make them attainable,
- establish program measure goals and milestones that are realistic and attainable, and
- revise State plans and goals accordingly.

#### AGENCY COMMENTS AND OUR RESPONSE

DOE agreed with our recommendations in this chapter and stated that it is following up on our recommendations that a reassessment be made of State compliance with the mandatory program measures. DOE said that it is presently reassessing State compliance with the lighting and thermal efficiency standards and is developing schedules for reviewing compliance with the other required measures during fiscal year 1981. Based on these reassessments, DOE will determine the best approach to take with States which are not in compliance.

DOE states that our report measures SECP effectiveness in terms of the States' achievement of their energy savings goals and effective implementation of all planned energy conservation measures. DOE believes that SECP effectiveness should also be assessed in terms of (1) first time development of a State capability to manage energy conservation programs, (2) the innovativeness or resourcefulness applied by the States to program development and implementation, and (3) program cost-effectiveness.

We agree that development of a State capability to manage conservation programs and a State's innovativeness and resourcefulness in managing its conservation programs are critical elements to effective implementation of the SECP. However these elements are but a means to attain the ultimate objective and measure of the SECP's effectiveness--timely and effective implementation by the States of their energy conservation measures to achieve their energy savings goals.

Concerning program cost-effectiveness, in chapters 3 and 4 we point out its importance, but conclude that neither DOE nor the States have adequate savings or cost data to measure program cost effectiveness.



DOE believes that the report does not recognize the difficulties in implementing some program measures, such as lighting and thermal efficiency standards and State energy efficient procurement practices. Our purpose in elaborating on the many program measure delays is not to be critical of the delays. We recognize that there are many very real and practical problems in implementing program measures, especially mandatory measures, which may take considerable effort and time to overcome.

Our purpose is to point out that these implementation problems indicate a need for DOE to reassess the States' programs to (1) determine changes and improvements needed, (2) assist the States in establishing program goals and milestones that are realistic and attainable, and (3) revise State plans and SECP goals to reflect the results of the reassessment.

## CHAPTER 3

### UNCERTAIN ENERGY SAVINGS

Achievement of the 1980 energy savings goal--a reduction in the projected energy consumption of each State by 1980 of 5 percent or more--is unlikely and energy savings reported for 1978 are overstated and unsupported. Projected 1980 energy savings for many of the significant State projects we reviewed, were based on optimistic "best case" projections and contained critical assumptions on savings attainable which were not adequately supported and were not sufficiently evaluated by DOE. Critical assumptions in some States' projects required actions which, although possible, were not very probable. Also, the key assumptions and savings projected for similar projects in various States differed significantly and no justifications were given for the differences.

Savings projected by the States for 1980 also did not adequately consider the impact of delays and scope reductions in implementing projects. As discussed in chapter 2, we noted numerous delays in implementation of mandatory program measures such as thermal and lighting standards and in implementation of many optional program measures. Our review of energy savings reported by States in 1978 indicates that many of the claimed savings are overstated or unsupported and are not a valid measure of actual program measure progress.

The problems we noted indicate a need for DOE to provide more specific guidance and technical assistance to the States to more accurately and consistently estimate and measure energy savings resulting from the SECP.

#### STATES ARE UNLIKELY TO ACHIEVE 1980 ENERGY SAVINGS GOALS

Our review of selected mandatory and optional program measures in the eight States disclosed 44 program measures with total projected 1980 savings of 1.1 quadrillion Btu's (about 76 percent of the total 1980 savings for the eight States) where achievement of the savings goals is unlikely because:

- Savings were based on optimistic and unsupported projections which were not sufficiently evaluated by DOE.

--Key assumptions for similar projects in several States varied significantly and were generally unsupported.

--Savings projections were not reevaluated to consider the impact of program measure implementation delays and scope reductions.

The number of program measures where achievement of the 1980 savings goal is unlikely, and their impact on 1980 energy savings varied among the eight States. As shown in the following table, the percent of a State's 1980 savings goal accounted for by these program measures ranged from 34 to 93 percent.

<u>State</u>	<u>Program measures where achievement of estimated savings unlikely</u>		
	<u>Number of measures</u>	<u>Projected 1980 1980 energy savings (trillion Btu's)</u>	<u>Percent of State 1980 savings goal</u>
<b>Region I</b>			
Connecticut	5	16.8	34
Massachusetts	5	72.8	50
<b>Region III</b>			
Maryland	7	58.4	70
Pennsylvania	3	180.7	60
<b>Region VI</b>			
Louisiana	5	193.2	91
Texas	8	490.8	93
<b>Region X</b>			
Idaho	5	11.0	54
Washington	6	55.8	63

Savings projections were optimistic and unsupported and inadequately evaluated by DOE

Energy savings estimates for program measures in the eight States were overly optimistic and overstated. Many contained critical assumptions regarding (1) the population to be reached, (2) the number of participants who would take energy conserving actions, and (3) the amount of energy savings.

Concerning these assumptions we noted that

--most had not been adequately evaluated by DOE; and

--some were not adequately supported and required actions which were possible, but not probable.

#### Ineffective DOE validation process

Before funding the State programs in 1977, DOE regions established teams to review the base and supplemental plans submitted by the States. The reviews included the projected energy savings and generally consisted of checking the mathematical accuracy of calculations and the reasonableness of State developed estimating methodologies. However, our review of selected State projects, which is discussed later in this chapter, and the validation procedures used by four DOE regions indicates that the 1980 savings projections were not adequately reviewed by DOE.

Each State's plan was directly linked to scheduled progress toward, and achievement of, a State energy conservation goal. The goal was expressed in terms of a percentage reduction of energy that would have been consumed in the State in 1980 were it not for the implementation of the plan. The actual goal established for each State was determined by DOE in consultation with the State, after consideration of many factors including the constraints on the State's opportunities to conserve energy and the level of Federal funding available for such purposes. A 1980 savings goal, stated in Btu's, was established in the States' plans for each of their program measures. Each individual State's goal was derived by dividing its total estimate of 1980 State energy savings (total of program measures in the State plan) by its total State energy consumption forecasted for 1980. The four DOE regions in our review, included 21 States that planned to reduce their energy consumption by about 2.1 quadrillion Btu's in 1980 (see app. VI).

The State plan review process was designed to evaluate the plans for overall content, program effectiveness and projected energy savings. DOE provided the regions with procedures for reviewing the reasonableness of energy savings, including general guidance on compliance factors 1/ and suggested energy savings methodologies for some types of program

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1/Estimates of cooperation expected from individuals, corporations and other entities to participate in and take energy conservation actions as a result of a program measure.

measures. In evaluating the reasonableness of estimates based on State developed formulas, the regions had to rely on judgments and general DOE guidelines on compliance factors.

DOE recommended that compliance factors used by the States not exceed 30 percent for voluntary program measures. DOE was concerned about the use of compliance factors and the magnitude of savings estimates. We noted, however, numerous instances where regions approved compliance factors exceeding 30 percent and approved highly divergent compliance factors for similar program measures in different States without obtaining adequate justification. These instances are discussed in more detail in subsequent sections of this chapter.

In two DOE regions, the review of estimated 1980 savings was not well documented. In region I we were only able to obtain limited documentation substantiating that review procedures, as described by regional officials, actually occurred. The documentation maintained often reflected only the final negotiated savings estimates and did not show the calculations made and questions raised on the original estimates. Regional officials said that much of the review process was done verbally and not documented.

Documentation of the review process was also a problem in region VI. After reviewing Texas' savings estimates, region VI staff made several recommendations for reducing compliance factors and savings estimates. The final estimates for program measures comprising a significant portion of Texas' 1980 projected energy savings did not consider all of the region's recommended changes, and included changes not recommended which increased the estimates. The region had no documentation on their review of the final estimates.

One of the four regions stated that the review process was hampered by insufficient staff. The staffing situation in the four regions will be discussed in more detail in Chapter 4.

#### Savings projections were optimistic and unsupported

Savings projections for a number of the program measures were based on compliance factors that were optimistic and unsupported. Critical assumptions for some program measures required actions that were possible, but not probable. To illustrate the type of problems we noted, a discussion follows of one program measure each from the States of Louisiana, Maryland, Massachusetts, and Texas.

In projecting 1980 energy savings for Louisiana's industrial conservation program, the State energy office estimated savings for the three following categories of industrial energy users in the State:

Category A--energy intensive industries that have participated in Louisiana's industrial conservation program which was implemented in 1975 before the SECP program was enacted. These industries represent 67 percent of total industrial energy consumption. The State estimated that 100 percent of those reached by the program in this category would take action to attain the targeted energy savings.

Category B--energy intensive industries that have not participated in the State program and represent 21 percent of total industrial energy use. The State estimated that 75 percent of those reached by the program in this category would take action to attain the targeted energy savings.

Category C--non-energy intensive industries that have not participated in the State program and represent 12 percent of industrial consumption. The State estimated that 30 percent of those reached by the program would take action to attain the targeted energy savings.

Region VI believed that Louisiana's compliance factors were reasonable and adequately supported. Regional officials did not ask Louisiana to reduce the 100 percent factor for the Category A industries because it was based on the assumption that industries in this category participated in the State program and will continue to participate in the SECP funded program.

The Category A industries consist of 9 refineries and 41 chemical plants that participated in the prior State program. Under the prior program Louisiana distributed an energy conservation program guide to industry which encouraged establishing energy management programs and reporting energy savings to the State. The SECP funded industrial program will rely on seminars to encourage industry to establish energy management programs and report conservation achieved to the State. Since the Category A industries participated in the State program and reported energy savings, it may be reasonable to assume they will continue to conserve and report accomplishments to the State. We do not believe, however, that it is reasonable to assume all category A plants will attend the seminars planned for the SECP funded program, modify their energy management programs, and achieve the estimated savings.

We believe that the 75 percent compliance factor applicable to Category B industries is too optimistic for two reasons. First, the primary difference between the SECP funded program and the prior State funded program--using workshops and seminars instead of a conservation booklet--may not be sufficient to achieve a compliance factor for Category B industries of 75 percent. Secondly, one of Louisiana's contractors sent a questionnaire to 75 large industrial plants to determine why the plants were not reporting energy use to the State and to identify program changes necessary to obtain their cooperation. Less than 20 percent of the 75 industrial plants responded to the questionnaire.

Officials in Louisiana's energy office believe the industrial sector will save more than the estimated 184 trillion Btu's; however, they could not provide us with any data supporting their belief.

Maryland's energy savings estimate for its industrial conservation measures was based upon several unsupported factors which greatly affect the projected energy savings. First, the potential energy savings for each major industrial category was calculated by applying 1980 improvement percentage goals to projected consumption levels. These two factors were based upon DOE and State data. Then compliance factors, intended to reflect industries' willingness to conserve energy and the impact of the State's conservation program, were applied to the potential energy savings to arrive at the expected energy savings. For the most energy intensive industries, compliance factors ranging from 65 to 85 percent (varying with type of industry) were used. These factors, which were critical elements of the equation, could not be supported by the State's Energy Policy Office. An official of that office explained that the consultant who developed their conservation plan did not document the basis for the probability factors used in the estimates.

Maryland's total estimated industrial energy savings were initially reported to DOE in a lump sum without attributing them to the three specific industrial program measures in the plan. DOE later required a breakdown of the estimated savings by program measure, and to comply, the State arbitrarily prorated the total savings to the three program measures. A State energy office official acknowledged that it cannot be shown how the prorated savings are brought about by the program measures.



Compliance factors used in the estimates for several of the elements in the Massachusetts energy extension service program measure were not well supported and appear questionable. Factors used in estimating energy savings for the measures are shown in the following table.

<u>Element</u>	<u>Percent of square footage reached</u>	<u>Percent reached taking action</u>
Retail business--lighting	75	75
Retail business--non-lighting	75	50
Office buildings	90	<u>a/40</u> and 45

a/40 percent for high-cost actions, and 75 percent for low-cost/no-cost actions.

Our analysis of these estimates disclosed that they were not supported by any studies or operational experience, but reflected the views of some trade group executives. For example, the figure used for office buildings was based on estimates given by a member of the Boston Building Owners and Managers Association and an official of the Massachusetts Board of Realtors.

The savings estimate for Texas' public school conservation measure was based on several unsupported or questionable factors. After an initial review of Texas' savings estimate for the measure, DOE region VI recommended that Texas reduce the compliance factor from 90 to 30 percent and the energy consumption figure by 50 percent. If Texas had made the recommended changes, total savings for the measure would have decreased from 22 to about 5 trillion Btu's. The final estimate, however, increased to about 33 trillion Btu's because Texas did not make all the recommended changes, and made other changes that were not recommended as follows:

--The compliance factor of 90 percent ~~was not~~ reduced. Neither Texas nor region VI had any studies or data indicating that 90 percent compliance was reasonable.

--Although the Btu consumption per square foot was reduced from 810,000 Btu's to 170,000 Btu's, the square footage of public school space to which it was applied was increased from about 88 million to about 394 million. The 88 million square feet was a State developed figure obtained from the Texas Education Agency; the 394 million square foot

figure was interpolated from a DOE estimate <sup>1/</sup> of total school space in the Southern States by 1990 which, in addition to public school space, included private school, college, laboratory, museum and library space.

--The initial estimate used an energy savings factor of 30 percent that was based on conservation achieved in a prior public school conservation program run by the Texas Education Agency. The final estimate used energy savings factors of 70 percent for new and 49 percent for existing school buildings which were based on optimum design measures. According to the contractor who developed the Texas public school measure, the measure was based on low-cost and no-cost measures that would not require capital expenditures.

Regional officials said they performed a cursory review of the final estimate without seeking any additional information or clarification from Texas and one official stated that it appears that the review process did not function properly in this instance.

Key assumptions vary significantly among States for similar program measures

We reviewed a number of similar program measures contained in the plans of the 21 States included in the four DOE regions covered by our review. Some key assumptions used in projecting 1980 energy savings varied significantly among the States, resulting in differing savings estimates for similar measures. Differing assumptions as to compliance and energy savings can be justified for similar projects in different States due to such variable factors as climate, energy prices, and income levels. However, for the program measures we reviewed, no such justification was given and there was no evidence that DOE requested it.

The following table illustrates the differing assumptions used by 7 of the 21 States concerning the percentage of residences reached by their residential conservation programs where conservation actions would be taken as a result of the program measure.

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<sup>1/</sup>"Project Independence Blueprint, Residential and Commercial Energy Use Patterns 1970-1990." Nov. 1974.

Compliance factors (percent of residences reached taking action)

<u>State</u>	<u>Program measure</u>	<u>Turning down thermostat in winter</u>	<u>Turning up thermostat in summer</u>	<u>Caulking and weatherstripping</u>	<u>Installing storm windows</u>	<u>Installing attic insulation</u>
Idaho	Residential homeowners energy audit	35	35	30	25	35
Pennsylvania	Project Conserve	40	30	25	20	25
Massachusetts	Project Conserve	30	20	21	12	35
Maryland	Home energy savers	20	30	35	20	20
Oregon	Residential energy conservation	5 for moderate cost insulation 10 for no cost actions				
Texas	Existing residences (single family)	0 to 40 for high cost actions 35 to 45 for no cost actions				
Washington	Residential energy audit	75 for all actions				

As shown in the table, neighboring States sometimes used widely divergent compliance factors for similar projects. Washington, for example, assumed that 75 percent of the residences audited in their residential energy audit project would take action as a result of the audit and accomplish a 30 percent reduction in energy use. In comparison, Oregon assumed that only 5 percent of the homeowners audited in their residential energy conservation project would retrofit residences with moderate cost insulation, and that only 10 percent would implement practices not requiring any cash outlay. Because the estimated percentage of homeowners taking action as a result of each program varied so significantly, it is obvious that the effect on the projected savings calculations was also significant.

Alaska, Idaho, and Washington all used differing assumptions in projecting the energy savings which would result from their industrial/commercial conservation programs. As

part of these programs, all three States planned to offer workshops at which opportunities for conserving energy would be discussed. Each State made assumptions concerning (1) the percentage of those invited who would actually attend the workshops and (2) the percentage of those attending who would take action to conserve energy. The following table shows these assumptions.

<u>State</u>	<u>Percent invited who attend</u>	<u>Percent attending who take action</u>
Alaska	90	20
Idaho	50	50
Washington	75	80

The only assumption for which support was provided in the calculations was the 20 percent used by Alaska, which was based on a report prepared for the Department of Housing and Urban Development. The other assumptions were made by the respective State energy offices, with no justification shown in the plans.

Region X representatives were aware of the differing assumptions used by the States in their region, but thought the calculations were reasonable given the state of the art in energy estimating at the time they were made. The States were generally given the benefit of the doubt on the assumptions and, where DOE could not prove otherwise, were left unchallenged. DOE has previously pointed out that the reasonableness of quantifying energy savings is a range rather than an absolute, and that due largely to problems of data availability, some assumptions have to be made.

We agree with the premise that quantifying energy savings is often a range and not an absolute. However we do not believe that this range should be so broad as to be meaningless--for example, from 0 to 75 percent compliance in the residential measures--and we do not believe that the burden of proof concerning assumptions made should be on DOE. We believe that the assumptions must be evaluated on some consistent basis. DOE, as noted earlier, recommended compliance rates for optional programs of up to 30 percent. Therefore, for program measures using higher compliance factors, the State should be required to justify and explain how its program measure will attain a higher rate. This was not done for the measures we reviewed.

Projections do not reflect  
program measure delays and  
scope reductions

In chapter 2 we concluded that timely and effective implementation of the SECP has been hampered by significant delays, slippages in milestone dates, and reductions in scope. However, in most instances, these delays and reductions have not been reflected in the States' energy estimates by reducing the estimates accordingly.

Six of the eight States had not implemented lighting and thermal standards at the close of 1978 and other mandatory programs had not been implemented by all eight States (see p. 9). We also noted milestone slippages and scope reductions for optional program measures in the eight States accounting for 31 percent to 92 percent of those States projected 1980 energy savings (see p. 14).

In our prior report on the SECP, we recommended that DOE take steps to ensure that information on program progress and its effect on 1980 energy savings goals is reported and adequately considered. DOE agreed with our recommendation. However, during 1978 in the eight States we reviewed, most State 1980 energy savings projections were not adjusted to reflect these delays.

NEED FOR GUIDANCE IN ESTIMATING  
ACCURATE ANNUAL ENERGY SAVINGS

Our review of 1978 reported savings indicates that they were significantly overstated and were not a valid measure of the impact of the program on energy use. The errors and lack of support leave no doubt that the States need more guidance from DOE to assure that the savings reported to the Congress are a reliable and accurate measure of the program's effectiveness.

Energy savings reported for 1978  
are overstated and unsupported

Total savings reportedly resulting from the SECP in 1978 were 747 trillion Btu's--about 13 percent of the 1980 savings goals. The reported 1978 savings of 252 trillion Btu's for the 21 States in the four DOE regions amounted to only about 12 percent of those States' 1980 goal. (See app. VI.) However, based on a review of savings reported for

selected measures 1/ in seven of the States as summarized in the following table, we believe that the 1978 savings were significantly overstated.

<u>State</u>	<u>Program measure</u>	<u>Savings reported for 1978 (trillion Btu's)</u>	<u>Percent of total State 1978 savings</u>	<u>Comments</u>
Region I				
Connecticut	Residential conservation	3.6		Based on a projection.
	Industrial conservation	<u>1.0</u> <u>4.6</u>	58	Assumption from limited walk-through audit work that 5 percent of firms instituted conservation.
Massachusetts	Energy extension service	11.5		Both estimates based on questionable sampling techniques
	Policy and program development	<u>12.4</u> <u>23.9</u>	59	
Region II				
Pennsylvania	Industrial conservation	<u>12.5</u>	45	Principal program element not operational in 1978.
Region VI				
Louisiana	Industrial conservation	<u>16.3</u>	94	Mathematical error resulted in overstatement by about 16.1 trillion Btu's.
Region X				
Alaska	Operation outreach	<u>3.1</u>	45	Based on a projection using an unsupported success rate.
Idaho	Industrial conservation	<u>3.6</u>	80	A savings that occurred before and was not the result of the State program.
Oregon	Public awareness	2.6		Based on unsupported projection.
	Industrial/commercial	7.5		Overstated by 6.9 trillion Btu's because of (1) mathematical error, and (2) savings not resulting from the State program.
	Residential conservation	5.5		Overstated by 1.3 trillion Btu's because of mathematical error.
		<u>15.6</u>	77	

1/The measures selected for review in each State were those accounting for a significant portion of each State's reported 1978 savings.

Among the problems we noted were, (1) mathematical errors, (2) lack of support for assumptions used in estimates, (3) use of projections rather than estimates of actual savings, and (4) savings claimed which resulted from programs other than the SECP. The following discussion of program measure savings in four States illustrates these problems.

#### Mathematical error

As a result of a mathematical error, Louisiana's savings estimate was overstated by about 16.2 trillion Btu's. Louisiana reported a savings of about 17 trillion Btu's for 1978, of which 16.3 trillion Btu's were reportedly the result of its industrial conservation program measure. The major part of the estimate was based on savings reported by four companies which attended seminars on boiler efficiency improvements. One of the companies, a sugar factory, reported savings of about 15.7 billion cubic feet of natural gas which equals about 16.2 trillion Btu's. As a result of discussions with a Louisiana Energy Office official and an official of the sugar factory, we learned that 15.7 million (equaling about 0.02 trillion Btu's) rather than 15.7 billion cubic feet of natural gas were saved during 1978.

#### No support for assumption

One of Alaska's reported savings was based on an unsupported assumption. In calculating the amount of energy saved by its Operation Outreach Program, Alaska used an assumed success rate of 66.7 percent. The result was a 1978 savings figure of 3.14 trillion Btu's which is almost half of the total 1978 savings reported by Alaska. No support was provided for the assumed success rate showing that the program elements actually had an impact on energy use--that household energy use was reduced, private and commercial driving habits were improved, or vehicle purchase decisions were affected.

#### Use of projection

One of the major savings reported by Connecticut was based on a projection rather than an estimate of actual program impact. Connecticut reported savings of about 8 trillion Btu's, almost half of which resulted from its residential conservation program measure. The residential program measure estimate was derived by comparing (1) a 1977 State projection of 1978 residential energy demand with conservation activities and (2) a State projection of 1978 residential energy demand without any conservation activity. The validity of such a method is questionable because (1) it is based



on a projected rather than an actual energy demand and (2) it implies that the total reduction is the result of the program measure without adequately measuring the actual impact of the program and considering the possible impact of other factors on energy demand.

#### Savings not resulting from SECP

Idaho reported energy savings for an activity on which it had little impact. Idaho reported savings of 3.6 trillion Btu's for its Industry and Commerce project, as a result of the conversion by a lumber mill of a gas-fired kiln to a wood waste-fired kiln. The conversion "came on line operating up to speed" in the fall of 1977. The Idaho basic plan is dated October 1, 1977, and did not mention this project; neither did the subsequent progress reports. An Idaho Office of Energy representative told us that the savings were claimed because the project occurred in Idaho and conceded that the conversion was not attributable to the activities of the State Office of Energy.

#### Additional guidance needed to measure energy savings

In our first report on the SECP we commented on the difficulties the States were encountering in estimating energy savings and the need for DOE to provide additional guidance in this area. During 1978, DOE took several actions to assist the States in measuring and reporting energy savings. However, considering the problems we noted in this review, it appears that DOE has still not provided sufficient guidance to the States and, as a result, States are still experiencing problems in measuring actual energy savings.

DOE requires each State to estimate and report energy savings (in Btu's) actually achieved by program measures for each calendar year. In our first SECP report we concluded that DOE did not provide sufficient guidance to the States and, as a result, the States experienced problems in determining actual energy savings achieved for 1977. We also concluded that, because States were required to estimate and report savings achieved in a calendar year before the close of the year, reported savings would necessarily include some projected energy savings. However, our 1978 review disclosed that the problem was much broader than including projected savings for only a portion of a year. As discussed in the previous section, State reported savings for 1978 were based on projections or estimates which were not valid measures of actual program impact.

DOE developed a workbook 1/ to assist the State energy offices in establishing the data collection systems necessary to evaluate the annual energy savings from their energy conservation programs. The workbook was also designed to assist the States in evaluating the effectiveness of implementation strategies used for major program measures. DOE offered the services of a consultant to assist States in their 1978 energy savings computations, and also sponsored a series of these workshops in 1978 to discuss with State energy office representatives energy savings data collection and methods for estimating savings. Idaho and Washington officials commented, however, that the workshop was more of a forum for the States to discuss their program measures and share ideas. In this respect, the workshop they attended was no doubt helpful; however, the Idaho and Washington officials claimed they learned little about measuring energy savings.

Nevertheless, the States have continued to experience difficulties in measuring annual energy savings which must be overcome before DOE can use annual savings estimates as reliable indicators of program progress and effectiveness.

DOE regional and State officials stated that among the problems in measuring savings were the measurement of public information and education programs and obtaining feedback from program participants. Even when it is readily apparent that energy is being saved, State officials stated that it is very difficult to show that the savings resulted from the program measure. For example, Louisiana's energy office gathered energy consumption data which can be used to determine if consumption in various consuming sectors was increasing or decreasing from year to year. However, energy office officials believed it would be extremely difficult, perhaps impossible, to determine how much of any given consumption reduction is attributable to the SECP and specific conservation measures in the program.

Another problem in measuring conservation achieved was collecting data from participants in workshops and seminars. Louisiana officials believed that it will be difficult to convince workshop participants to fill out questionnaires or

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1/TRW Energy Systems Planning Division Report for DOE, "Standard Evaluation Methodology Packages for State Energy Conservation Programs."

otherwise report conservation achieved to the State. Without feedback from individuals reached by a program measure, Louisiana officials believed that it would not have an adequate basis for estimating or tabulating the amount of energy conserved.

### CONCLUSIONS

The goal of the SECP is to reduce energy consumption by 5.8 quadrillion Btu's in 1980. However, based on our review of selected savings data, we do not believe that the 1980 goal will be attained or that the savings reported for 1978 are a valid measure of the program's impact on reducing energy consumption.

Projected 1980 energy savings for many of the significant State projects we reviewed, were based on optimistic "best case" projections and contained critical assumptions on savings attainable which were not adequately supported and were not sufficiently evaluated by DOE. Critical assumptions in some States' projects required actions which, although possible, were not very probable. Also, the key assumptions and savings projected for similar projects in various States differed significantly, without any justification given for the differences. Savings projected by the States for 1980 also did not adequately consider the impact of widespread delays and scope reductions in implementing projects.

Our review of energy savings reported for 1978 indicates that reported savings were significantly overstated because of problems involving (1) mathematical errors, (2) unsupported assumptions, (3) use of projections, and (4) savings claimed that were not the result of the SECP.

We previously recommended that DOE (1) consider the impact of program measure delays on the 1980 energy savings goal and (2) provide procedures for States to report actual savings on an annual basis. The problems we noted in this review still indicate that improvements are needed in estimating, measuring and reporting energy savings to allow DOE and the States to accurately assess the status and impact of the program.

## RECOMMENDATIONS

We recommend that the Secretary of Energy:

- Provide specific guidance and technical assistance needed by the States to estimate and measure both projected future and actual energy savings as a result of the SECP. This guidance and assistance should assure that (1) compliance and energy savings factors used for similar program measures are consistent and adequately supported, (2) periodic reevaluations are made by DOE and the States of State goals to reflect program changes and slippages and (3) annual savings reported by the States are a reasonably accurate and a valid measurement of SECP energy savings.
- Based on the reevaluation of the scope and progress of State plans and program measures recommended in chapter 2, work with the States to revise their energy savings goals.

## AGENCY COMMENTS AND OUR RESPONSE

DOE recognized that States have been overly optimistic in their 1980 energy savings projections of 5.8 quadrillion Btu's. DOE, however, believed it is important to keep in mind that the SECP was the first State grant program in energy conservation funded by DOE, and that many of the problems encountered in the program's first year were associated with the ground breaking nature of the SECP and the consequent lack of experience on the part of State and Federal administrators, particularly in the area of estimating energy savings. We agree that the problems in this area could, in part, have been the result of the items noted by DOE. However, our purpose in pointing out these problems is that they indicate the States' need for guidance and technical assistance and the need to revise the savings goal of the program based on the recommended evaluation of State plans and program measures.

DOE agreed with our recommendations on providing specific guidance and technical assistance to the States to estimate and measure both projected future and actual energy savings and to work with the States to revise the savings goals of the program to reflect the results of the evaluation recommended in chapter 2. DOE states that in the past year it has

provided assistance to the States to help them evaluate their SECP programs and thus improve their methodologies for projecting and measuring energy savings. DOE said it plans to continue these efforts in fiscal year 1981.

In the report we make reference to the goal of the SECP-- to reduce energy consumption by 5.8 quadrillion Btu's in 1980. DOE maintained that the distinction needs to be drawn between the legislated SECP goal of 5 percent of 1980 projected energy consumption, which is 4.1 quadrillion Btu's, and the sum of the individual State goals or projections for 1980, which is 5.8 quadrillion Btu's.

We fail to see any basis in EPCA or the DOE regulations for stating that the legislative SECP goal is 5 percent of the 1980 projected energy consumption or 4.1 quadrillion Btu's. The goal of the SECP, based on EPCA and DOE regulations, is a reduction in energy consumption in each State by 1980 of 5 percent or more. In terms of Btu's, the overall SECP goal is the sum total of the States' goals as specified in their plans--5.8 quadrillion Btu's.

## CHAPTER 4

### FINANCIAL MANAGEMENT AND PROGRAM

#### MONITORING SYSTEMS NEED IMPROVEMENT

We identified deficiencies in the financial and progress reporting systems used in the SECP which must be corrected before the States and DOE can effectively monitor and manage the program. Although accounting systems at the State level were generally adequate to control and report on total grant funds and six of the eight States had adequate monitoring systems in terms of program progress and milestones attainment, problems were encountered in some States in accruing and reporting costs by program measure preventing the determination of program cost effectiveness. Moreover, DOE's ability to monitor the States and assess the effectiveness of program measures has been limited by (1) the lack of accurate costs by program measure, (2) the lack of sufficiently detailed progress reports from the States, and (3) a lack of sufficient staffing in the regions.

#### IMPROVEMENTS NEEDED IN STATE FINANCIAL AND PROGRESS REPORTING

Our review of the financial control and program monitoring systems in the eight 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.

In addition, 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 States 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.

DOE also established a grants management and planning system--a comprehensive system for program planning and management for individual States. A basic objective of the system is to provide pertinent financial and performance information for effective management of the SECP. The system emphasizes the matching of program measure expenditures against program measure accomplishments (cost/benefit analysis) in order to determine the overall effectiveness of the measure.

### Financial controls at the State level

Our review disclosed that generally State accounting systems were adequate to control and report on total expenditures and status of grant funds. However, we found that problems were encountered in some States in (1) accruing and reporting costs by program measure, and (2) adhering to letter of credit procedures.

### State financial controls

In our prior report, we noted that five of the eight States covered in our review did not maintain current and accurate accounting records. At that time, DOE guidelines required each region to certify a State's financial management system. We recommended that DOE review and certify State accounting systems.

In 1978, DOE amended the guidelines by removing the certification requirement and requiring the regions to follow the standards in Office of Management and Budget Circular A-102, Attachment G, "Standards for Grantee Financial Management Systems." Circular A-102 encourages agencies to make suggestions and assist grantees in establishing or improving financial management systems. DOE believed that the certification requirement exceeded the intention of Circular A-102.

In our current review, we noted that one region had obtained from responsible State officials a certification that the accounting system complied with Circular A-102. In two other regions, regional staff had visited States to review the accounting systems. Also, according to DOE, audits and certification by State auditors or Certified Public Accountants were underway or completed in all States. Therefore, we are not making a similar recommendation in this report.



### 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.

According to a DOE Region VI official, the States would rather report on a cash basis because estimates would not be necessary, and the reporting task would be simplified. The regional official believed that three of the five States in the region were preparing financial status reports on the cash expenditure basis and certifying that the reports were prepared on an accrued expenditure basis.

For example, although Louisiana's accounting system and financial status reports provided for accurate disclosure of expenditures and unexpended Federal funds, the reports were not reliable indicators of program activity during any given reporting period. Because the reports were prepared on a cash basis, expenditures reported did not include costs of work performed during a reporting period which will be paid in future periods. For example, the total expenditures in Louisiana's financial report for the quarter ending March 31, 1978 did not include approximately \$49,915 of work performed by contractors during the reporting period and previous periods.

We reviewed Texas' financial status reports for the 1977 and 1978 base and supplemental grants covering the quarters ending March 31, and June 30, 1978. These reports did not

adequately reflect the status of expended and unexpended Federal funds because they were not consistently prepared on an accrued expenditure basis and did not always show expenditures by program measure.

Massachusetts' quarterly financial status reports were not accurate as to allocation of costs to program measures. The personnel, fringe benefit, travel, supplies and "other" object classes were charged to only three program measures as well. Further, the method of distributing those costs was arbitrary.

#### Letter of credit procedures

In our prior report, we noted that States were not always following letter of credit procedures. We recommended that DOE review with States the Federal requirements concerning letter of credit procedures. In our current review, we noted instances where States were not following the procedures.

DOE uses the letter of credit to distribute grant funds to States. The letter of credit is an instrument certified by DOE regional officials and authorizes a State to draw Federal funds. DOE's policy limits the amount of funds advanced to the greater of \$10,000 or the minimum amount needed for current operations. The timing and amount of cash that a grantee may withdraw should be as close to actual daily disbursements as is administratively feasible. Withdrawals are made by submitting a Request for Payment on Letter of Credit and Status of Funds Report to the Treasury Regional Disbursing Office, and a copy to the DOE regional office.

The Treasury Department has reported several instances and we noted one instance where States did not follow these policies. The Treasury Department has been notifying DOE region III that there are deficiencies in the request for payment documents of States in the region. There were deficiencies (e.g., forms not completed, excess cash drawdowns) in 33 percent of the requests during fiscal year 1977 and 25 percent of the requests for the first 9 months of fiscal 1978. For example, in May 1978, Delaware requested the Treasury to provide \$12,000. The request form showed that at the time, the State had a balance of \$49,546 funds available for disbursements. DOE region III requested the State to provide an explanation of the request for additional funds. The State's reply was that they were following their State auditors guidelines to have funds on hand to pay anticipated con-

tractual obligations. The State agreed to follow DOE procedures on drawing down funds only when needed for current disbursements.

We also noted one instance of an excessive cash balance maintained by the Idaho Office of Energy. Idaho withdrew \$20,000 in May 1978 and had not used any of the funds by August. We were told by Idaho officials that they had expected three large bills when the drawdown was made, but the bills had not been submitted as had been expected. However, the excessive balance was not reduced by returning the funds.

#### Program monitoring at the State level

DOE developed a comprehensive grants management and planning system for the States. The system emphasizes matching projected and actual accrued expenditure rates with planned and actual program progress to provide program control. DOE anticipated that this system would be implemented in 1978 by at least one State in each region and would be required for all States in 1979. Only one of the eight States we reviewed implemented this system during 1978.

All of the States we reviewed except Maryland and Washington were adequately monitoring program progress from the standpoint of attainment of milestones and goals; however, because of the lack of program measure cost data (see p. 46) and program measure energy savings (see p. 36), the cost effectiveness of these measures cannot be ascertained.

The Maryland Energy Policy Office has not implemented a system to monitor the status of their conservation program. The State's plan was not an effective basis for assessing program progress, however, the State was in the process of correcting these program weaknesses. The State conservation plan provides only general objectives for the energy conservation program, but no specific steps to meet the planned objectives. Without such steps, milestones are of questionable value, and the State cannot evaluate progress of the program. To attain better management control over program operations, the Maryland Energy Policy Office was in the process of implementing the grants management and planning system designed by DOE.

The Washington Office of Energy had not implemented a system to monitor the progress in achieving the goal of the program measures. Program files showed and State representatives agreed that monitoring was being done only on a fragmented basis.

#### IMPROVEMENTS NEEDED IN DOE PROGRAM MONITORING

Until DOE requires more accurate and detailed financial and program progress information, it cannot adequately monitor the progress of the SECP. Until the final quarter of fiscal year 1978, all States were not asked to submit financial data in a format which would allow for comparing program results with expenditures, and, as noted in the previous section, the accuracy of this data is questionable. In addition, the format used by the States in their narrative progress reports and the content of the reports varied considerably by State, making progress difficult to assess. Monitoring activities in the regional offices we visited have also been hampered by insufficient staff.

#### Grants management

Three of the four DOE regional offices included in our review maintained grants management systems which allow DOE to determine grant amounts available to the States, grant funds withdrawn from the United States Treasury, expenditures reported by the States, and remaining grant balances. The financial records and grant files in the remaining regional office--Seattle--were poorly organized and incomplete; consequently, we found it difficult to determine the total amount of funds withdrawn from the Treasury and the remaining balances of the States' grants.

The grants management systems in the DOE regional offices are based on documents, such as quarterly financial status reports, which by themselves, do not provide assurances that program funds are being spent in accordance with DOE's regulations and that the States are maintaining financial management systems which meet the requirements of OMB Circular A-102. Such assurances, in our opinion, must be obtained through required audits and periodic compliance monitoring reviews at the State level performed by DOE and/or State personnel.

Expenditure and progress reports  
inadequate for monitoring

In our first report on the SECP we concluded that the information DOE required the States to submit during fiscal year 1977 was not in a form to allow DOE to adequately monitor the SECP. We recommended that DOE require all States to implement the DOE-developed State monitoring system or a State developed system of equal or better requirements. DOE replied that it was implementing such a system. However, our review of the SECP for 1978 indicates that an adequate monitoring system has not yet been implemented.

In the previous section (see p. 46), we noted that State reporting of expenditures was inadequate because many States did not report expenditures by program measure, and for those that did, the accuracy of the reports was questionable. Without accurate cost information by program measure, neither DOE nor the States can measure program cost effectiveness.

We also noted that the States' progress reports were often inaccurate or not sufficiently detailed to adequately assess program measure progress. For example, DOE region X had not been able to compare program progress with expenditures to determine which programs are the most cost-effective, because, in addition to the lack of expenditures by program, the States' quarterly progress reports were not sufficiently detailed. Idaho's report on its Industry and Commerce program measure for the period ended September 30, 1978, for example, shows that all of the significant milestones had been accomplished. However, our audit work revealed that few of the significant milestones had been achieved as of the date of that report. Neither Alaska nor Washington followed the proposed DOE format for the quarterly progress reports. Alaska's reports only addressed rescheduled milestones, and did not address program accomplishments. Washington's reports followed no specific format. Program assessment was very difficult and in some cases impossible with these reports.

The quarterly progress reports submitted to DOE Region VI by Louisiana did not contain enough information to keep regional officials up to date on program progress. Louisiana's progress reports generally did not fully describe progress and the lack of progress in relation to program milestones. This condition caused the region to request program status information from Louisiana which should have been included in the quarterly

progress reports. Before the region could approve Louisiana's 1978 application for base grant funds, it was necessary to obtain details on the implementation status of each program measure in relation to work accomplished using 1977 grant funds.

In its official response to our report, DOE stated that it has developed a reporting and monitoring system and has submitted it to the Office of Management and Budget for approval. If approved, the system will be required to be implemented in all States in fiscal year 1981.

### Regional staffing

Adequate monitoring was also hampered by lack of sufficient staff. The regional staffing for managing the SECP ranged from three in Boston to only one in Philadelphia.

Program monitoring in region I (Boston) was accomplished by three program staff who each were responsible for two States. One of the three (program manager) coordinates all program activity. The majority of monitoring was accomplished through desk audits of quarterly progress and financial reports in conjunction with telephone follow-up. Additionally, the regional staff made on-site visits to inquire about report deficiencies, to discuss proposed catch-up activities, or to obtain clarification on issues. The program manager commented that while the staff does make an average of one or two trips to each State per quarter, this is one area where monitoring could be improved given additional staffing.

In region III (Philadelphia) there was one person--an energy conservation specialist--who was responsible for administering and monitoring the SECP for five States and the District of Columbia. The conservation specialist received some supporting services from the regional office staff in administering the SECP.

In a January 1978 report on SECP management in region III, the DOE Inspector General concluded that more than one individual was needed to accomplish effectively the requirements of the assigned workload. <sup>1/</sup> In reply to the Inspector General's findings, the region advised that the weatherization assistance program had been reassigned to another conservation staff member. ~~The region agreed that the SECP was understaffed in the region and additional positions were needed immediately to~~

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<sup>1/</sup>Report of Office of the Inspector General, DOE, on "Region III's Grants Management," dated Jan. 27, 1978.



" \* \* \* accomplish effectively the requirements of the assigned workload." At the time of our review, no additional positions were provided to the regional office for the management and monitoring of the SECP.

In region VI (Dallas) two program managers were responsible for monitoring the programs implemented by the five States in the region. The progress, problems, and status plans were monitored by (1) reviewing quarterly progress reports, (2) visiting the State energy offices, and (3) conducting quarterly program meetings. The program managers, according to a regional official had not been able to devote enough time to visiting the States and otherwise monitoring the programs because of understaffing.

In March 1978 the DOE Inspector General reported that region X had inadequate procedures for monitoring the SECP. <sup>1/</sup> There were no procedures which provided for: (1) analyzing and correlating financial and progress reports, (2) evaluating grantee administration and records, and (3) coordinating between regional program and financial management offices. The Inspector General reported the development of monitoring procedures was hampered by a lack of guidance from the national program offices.

We also found that region X lacks an adequate monitoring system. According to the DOE program manager, region X has concentrated on obtaining agreements with the States on their plans, and on their reporting and administrative requirements, but has not had time to implement an adequate monitoring program.

In late October 1978, region X requested staff assistance from DOE headquarters to conduct an evaluation of the State's progress in reaching the energy savings goals of the approved energy conservation programs. Region X proposed that the team evaluate the implementation of the program measures, the quality of financial management, the cost/benefit relationships for program measures, the effect of slippages on achieving savings, the methodologies used to calculate energy savings, and the " \* \* \* real, measurable program results \* \* \* ." We believe that this type of evaluation should have been done by region X as part of its monitoring function.

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<sup>1/</sup>Report of Office of the Inspector General, DOE, on "Region X Grants Management," dated June 21, 1978.



## CONCLUSIONS

In the previous two chapters of this report we outlined the problems being encountered in implementing State energy conservation programs, including (1) significant delays in meeting goals and milestones, (2) reductions in scope of measures, and (3) overstated or unsupported energy savings. A principal means of becoming aware of these problems in order to take corrective measures is an adequate State and DOE monitoring system. However, we identified deficiencies in the financial and progress reporting systems used in the SECP which need improvement before DOE and the States can effectively monitor and manage the program.

Although accounting systems at the State level were generally adequate to control and report on total grant funds, problems were encountered in some States in accruing and reporting costs by program measure (which are needed to measure individual program cost effectiveness). Although six of the eight States we reviewed had adequate monitoring systems in terms of program progress and attaining milestones, the lack of accurate costs by program measure prevents the measuring of program cost effectiveness. Moreover, DOE's ability to monitor the States and assess the effectiveness of program measures has been limited by (1) the lack of accurate costs by program measure, (2) the lack of sufficiently detailed progress reports from the States, and (3) a lack of sufficient staffing in the regions.

In its official response to our report, DOE stated that it has developed a reporting and monitoring system and has submitted it to the Office of Management and Budget for approval.

## RECOMMENDATIONS

We recommend that, when the DOE monitoring system is approved by the Office of Management and Budget, the Secretary of Energy should assure its implementation by the States. The system should contain provisions to provide DOE with the following assurances:

- Financial systems at the State level are sufficient to provide DOE with accurate cost information by program measure.
- Progress reporting by the States is in sufficient detail to provide DOE with accurate and complete information on the status of each program measure.

We also recommend that the Secretary of Energy review with the States the Federal requirements concerning the use of Federal funds, focusing on letter of credit procedures.

#### AGENCY COMMENTS AND OUR RESPONSE

DOE agrees with our findings that there have been deficiencies in the program regarding financial management and program progress monitoring and our recommendations in this chapter. In this area of financial management, DOE stated that it has undertaken several major projects during the past year to improve the administration of its financial assistance programs. An "Accounting Policy Procedures Manual for Federal Assistance Programs" is being developed for use by DOE staff in awarding and managing DOE grants and cooperative agreements. Parts of this manual are available and in use now; other sections are under development. Training sessions on the use of this manual will be initiated nationwide early in fiscal year 1981. In addition, a manual concerning accounting policies and procedures is being developed for grant recipients.

In the area of program progress monitoring, DOE replied that it has developed a reporting system for use by all DOE grantees. This system, which requires Office of Management and Budget approval, includes forms for reporting planned and actual expenditures and milestone accomplishment. In fiscal year 1981, if approved, this reporting will be required quarterly from all SECP grant recipients. A major feature of the system is the plotting of budget against milestones so that both State project managers and Federal program monitors can track program costs versus outputs or milestones achieved.

Since these changes are not fully developed, we cannot come to any conclusions as to their adequacy in satisfying our recommendations.

OBLIGATION GUARANTEES AND EXISTING DWELLING  
UNITS DEMONSTRATION PROGRAMS NOT IMPLEMENTED

The Energy Conservation and Production Act (ECPA) established two programs offering financial incentives to encourage conservation and the use of renewable resources-- the energy conservation and renewable-resources obligation guarantees program, and the energy conservation and renewable-resources demonstration program for existing dwelling units. At the time of our first report, neither program was implemented, and we recommended that DOE implement them. The legislative authority for these programs has since expired. Legislation has been enacted <sup>1/</sup> that would to a great extent carry on nationwide the type of initiatives intended by these two programs. Because of this, we no longer believe that our prior recommendation to proceed with the programs is relevant. However, we believe that DOE missed an opportunity to test, in these two programs, some of the enacted and proposed programs.

OBLIGATION GUARANTEES PROGRAM

The obligation guarantees program was intended to stimulate energy conservation investment in existing buildings and industrial plants by means of financial incentives. ECPA and DOE regulations authorized DOE to guarantee and issue commitments to guarantee the payment of the outstanding principal amount of any loan, note, bond, or other obligation evidencing indebtedness if its purpose was to finance the installation or implementation of any energy conservation or renewable-resource energy measure in any building or industrial plant that was in existence before August 14, 1976.

Implementation of the program was discretionary, and no guarantee or commitment to guarantee could be issued after September 30, 1979. A contractor's report to DOE concluded that the program would induce very little additional energy savings over either the short- or the long-term. DOE officials

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<sup>1/</sup>National Energy Conservation Policy Act (NECPA), Public Law 95-619, and Energy Security Act, Public Law 96-294.

stated that they had considered conducting a pilot demonstration to test the program but decided against doing so because (1) the indications they were receiving from the contractors' studies were that the obligation guarantees program would probably not be successful, and (2) even a small scale test would commit DOE's resources for the term of the loan--probably 15 to 20 years. DOE was reluctant to commit resources to a program it believed would not be successful. Because of the negative results of the studies and the short time remaining before the legislative authority expired, DOE did not attempt to implement the program.

#### DEMONSTRATION FOR EXISTING DWELLING UNITS PROGRAM

The energy conservation and renewable-resource demonstration program for existing dwelling units was intended to provide an incentive to encourage the installation of conservation and renewable-resource measures. As of January 1980, the program had accomplished very little beyond one pilot demonstration program and some studies and analyses. In addition, a final report containing findings and recommendations for the national program had not been submitted to the Congress.

ECPA authorized the Department of Housing and Urban Development to establish a 2-year national demonstration program to test the feasibility and effectiveness of various forms of financial assistance for encouraging the installation or implementation of energy conservation and renewable-resource measures in existing dwellings. At the conclusion of the program, a report is required to be issued to the Congress which is to contain findings and legislative recommendations for a national program or programs designed to reduce significantly the consumption of energy in existing dwelling units.

Because the Department of Housing and Urban Development expected the program to be transferred to the proposed DOE and because of a request from the White House to delay action subject to the development of the National Energy Plan, the agency did not proceed with the program. DOE assumed responsibility for the program on October 1, 1977.

DOE has made some efforts to achieve the objectives of the demonstration program. However, DOE has made no grants under this program, and the one pilot demonstration

program was less than successful. Most of DOE's efforts have involved developing base-case information and conducting studies of incentives and barriers to specific measures and technologies.

DOE developed one demonstration program for financing energy efficiency. The objective of the program was to encourage purchasers of existing houses to invest in energy efficient products, such as insulation, storm windows, and heat pumps, at the time of purchase by providing an additional line of credit to be extended by the mortgage lender. The additional line of credit was to be included in the first mortgage, thus significantly reducing the financial burden up front for the home buyer and stretching the repayment of the home retrofit over a much longer period of time.

The financing energy efficiency program was originally to be demonstrated in nine cities. However, in all but one city--Minneapolis--the planned programs met with extensive resistance from lending institutions and, as a result, were not implemented. The Minneapolis program was changed from extending an additional line of first mortgage credit to home buyers to offering low-interest loans for home improvements. At least 50 percent of the financial improvement's cost had to be selected from a list of energy conserving items.

The results of the Minneapolis demonstration program were, for the most part, "disappointing" according to the contractor who evaluated the program for DOE. The contractor concluded that (1) the response by the lending community was extremely limited, (2) consumer response was not significant, and (3) the program was too restrictive in requiring that at least 50 percent of the loan amount had to be for one of the approved energy conserving items.

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In our first report (see p. 1) we recommended that the Secretary of Energy test the energy conservation and renewable resources obligation guarantee program and proceed with the national energy conservation and renewable-resource demonstration for existing dwelling units program. At that time, these programs were two of the few legislated programs to encourage the application of renewable-resource

energy measures and the demonstration program provided an opportunity to test and evaluate which types of financial incentives encourage conservation and the use of renewable resource.

However, since the issuance of our previous report, NECPA and the Energy Security Act have been enacted to authorize programs that would to a great extent carry on nationwide initiatives of the type intended by the two ECPA programs.

Several programs were established by NECPA to encourage a greater level of energy conservation and use of renewable-resources, including the utility residential conservation service program, secondary financing and loan insurance for energy conserving improvements, and energy conservation grants for schools, hospitals, local government and public care institutions. The Energy Security Act establishes new programs in this area such as the solar energy and energy conservation bank, and State energy conservation plans for commercial buildings and multi-family dwellings, and expands and makes other changes to the residential conservation service program.

We do not believe that our past recommendation is relevant now because of these events. However, we continue to be concerned over the lack of a comprehensive national energy conservation program. New initiatives continue to be enacted by the Congress while DOE has not clearly specified an energy conservation goal and how the numerous energy conservation programs are to contribute to that goal.

In a report on developing a national energy conservation program, 1/ we discussed a framework which could be used to facilitate making the decisions on specific energy conservation policies and programs. The framework discussed providing for selecting specific policies or programs for implementation based upon an evaluation of expected energy savings and costs; and environmental, economic and social impacts. We pointed out, however, that it was important for the administration to develop its own framework for considering alternative programs to be included in a comprehensive energy conservation plan. Using such a framework would put DOE in a position to provide the Congress with clear and specific guidance on the need for additional energy conservation programs.

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1/"A Framework for Developing a National Energy Conservation Program," EMD-79-76, July 31, 1979. 73

In response to our expression of concern in our draft report over the lack of a comprehensive national energy conservation program, DOE replied (see app. VII) that in January 1980 the Secretary of Energy issued a draft of "DOE's Policy and Fiscal Guidance for FY 1982-1986," containing DOE's objectives for reducing energy consumption and enhancing the use of renewable resources. DOE believes that this constitutes a policy framework through which to measure accomplishment of conservation goals. Although this may constitute a policy framework, it does not constitute a comprehensive national energy conservation program that specifies energy conservation goal and how the numerous energy conservation programs are to contribute to that goal.

We recently completed a review of DOE's efforts to establish overall long-term energy conservation goals and develop a comprehensive national plan to meet those goals. Our review included the planning document cited in DOE's above response. In a report to the Secretary of Energy on this review, 1/ we concluded that DOE has yet to develop a comprehensive plan which details how the Nation can be moved to greater energy efficiency. Rather than describe how a national energy conservation strategy will be implemented, DOE planning documents identify existing or proposed conservation program activities. In our view, what is missing is an explanation of how separate DOE programs will reinforce or complement each other, and what overall contribution is expected to be made by the combination of all programs and activities. Furthermore, since DOE has not established milestones for its programs in the context of achieving long-term conservation goals, it is not clear how the effectiveness of existing programs can be measured and the need for new programs determined.

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1/"Energy Conservation: An Expanding Program Needing More Direction," EMD-80-82, July 24, 1980.



GRANTS AWARDED THE EIGHT STATES

REVIEWED BY GAO - FY 1976 THROUGH FY 1978

	FY 1976 Planning grants	FY 1977 grants		FY 1978 grants		Total grants
		Base program	Supplemental program	Base program	Supplemental program	
<b>Region I</b>						
Connecticut	\$ 80,726	\$ 346,000	\$ 183,000	\$ 632,900	\$ 359,000	\$ 1,601,626
Massachusetts	112,891	363,000	294,000	1,156,700	576,900	2,703,491
<b>Region III</b>						
Maryland	92,386	425,000	226,000	818,000	442,100	2,003,486
Pennsylvania	184,259	1,065,000	545,000	2,185,000	1,066,600	5,025,859
<b>Region VI</b>						
Louisiana	88,796	401,000	213,000	1,196,600	417,600	2,316,996
Texas	182,991	1,037,000	570,000	2,837,500	1,117,200	5,744,691
<b>Region X</b>						
Idaho	53,675	163,000	89,000	335,900	174,100	815,675
Washington	84,867	374,000	204,000	754,500	399,100	1,816,467
<b>Total</b>	<u>\$880,591</u>	<u>\$4,354,000</u>	<u>\$2,324,000</u>	<u>\$9,917,100</u>	<u>\$4,552,600</u>	<u>\$22,020,291</u>

LIST OF DOE REGIONS  
AND STATES INCLUDED IN GAO'S REVIEW

<u>DOE regional offices</u>	<u>States in the regions</u>	<u>States reviewed</u>
Region I - Boston	Connecticut Maine Massachusetts New Hampshire Rhode Island Vermont	Connecticut Massachusetts
Region III - Philadelphia	Delaware District of Columbia Maryland Pennsylvania Virginia West Virginia	Maryland Pennsylvania
Region VI - Dallas	Arkansas Louisiana New Mexico Oklahoma Texas	Louisiana Texas
Region X - Seattle	Alaska Idaho Oregon Washington	Idaho Washington

PLANNED NATIONWIDE SECP 1980 ENERGY SAVINGS FOR MANDATORY  
AND OPTIONAL PROGRAM MEASURES 1/

<u>Mandatory measures (by type)</u>	<u>1980 Savings (trillion Btu's)</u>	<u>Percent of total 1980 savings</u>
Lighting and thermal standards	595	10
Transportation	119	2
Right-turn-on-red	3	--
State procurement standards	41	1
Energy audit	790	14
Public education	122	2
Coordination	6	--
Total mandatory	<u>1,676</u>	<u>29</u>
 <u>Optional measures (by sector)</u>		
Agricultural	97	2
Industrial	1,674	29
Transportation	244	4
Utility	405	7
Buildings	1,395	24
Government	144	2
Other	<u>184</u>	<u>3</u>
Total optional	<u>4,143</u>	<u>71</u>
Total mandatory and optional	<u>5,819</u>	<u>100</u>

1/This information was taken from DOE published data. During our review of energy savings data reported by the eight States, we noted several instances where program measure savings were included in the incorrect program measure type or sector in the published data. Appropriate adjustments were made by GAO to the DOE published data for the errors noted.

**PLANNED SECP 1980 ENERGY SAVINGS FOR MANDATORY AND  
OPTIONAL PROGRAM MEASURES FOR THE EIGHT STATES REVIEWED BY GAO 1/**

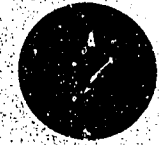
Planned 1980 energy savings in trillion Btu's and as a percent of total 1980 State savings

Mandatory measures (by type)	Conn.	Mass.	Md.	Pa.	La.	Tex.	Idaho	Wash.	Total
Lighting and thermal	16.3 (33)	31.2 (52)	10.3 (12)	23.5 (8)	4.8 (2)	7.9 (2)	1.9 (9)	5.2 (6)	101.4 (7)
Transportation	5.0 (10)	5.1 (3)	4.6 (6)	5.2 (2)	3.5 (2)	0.4 -	0.2 (1)	0.6 (1)	24.6 (2)
Right turn-on-red	0.1	0.0 -	0.1 -	0.3 -	0.1 -	0.0 -	0.0 -	0.0 0	0.6 -
State procurement	0.1	0.3 -	0.7 (1)	0.1 -	0.0 -	1.0 -	0.5 (3)	0.8 (1)	3.5 -
Energy audit	0.8 (2)	6.8 (5)	0.0 -	0.2 -	0.7 -	0.0 -	4.0 (20)	4.7 (5)	17.2 (1)
Public education	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	1.5 (2)	1.5 -
Coordination	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	-0-
<b>Total mandatory</b>	<b>22.3 (45)</b>	<b>43.4 (30)</b>	<b>15.7 (19)</b>	<b>29.3 (10)</b>	<b>9.1 (4)</b>	<b>9.3 (2)</b>	<b>6.6 (33)</b>	<b>13.1 (15)</b>	<b>148.8 (10)</b>
<b>Optional measures (by sector)</b>									
Agriculture	0.0	0.0 -	0.0 -	4.5 (2)	0.0	10.9 (2)	4.4 (22)	3.6 (4)	23. (2)
Industry	5.7 (11)	0.0 -	26.2 (32)	157.2 (52)	148.2 (87)	283.8 (53)	5.4 (27)	28.3 (32)	690.8 (48)
Transportation	7.0 (14)	0.3 -	13.3 (16)	35.0 (12)	0.0 -	0.0 -	0.1 (1)	8.9 (10)	64.6 (5)
Utility	0.0 -	0.0 -	4.4 (5)	0.0	11.0 (5)	0.0 -	0.0 -	0.0 -	15.4 (1)
Buildings	7.0 (14)	36.0 (25)	22.2 (27)	60.8 (20)	7.7 (4)	218.9 (41)	0.7 (3)	25.0 (28)	378.3 (26)
Government	6.1 (12)	0.0 -	0.9 (1)	11.0 (4)	0.0 -	12.0 (2)	1.7 (8)	4.9 (6)	36.6 (3)
Other	2.0 (4)	65.2 (45)	0.0 -	1.3 -	0.0 -	0.0 -	1.3 (6)	4.3 (5)	74.1 (5)
<b>Total optional</b>	<b>27.8 (55)</b>	<b>101.5 (70)</b>	<b>67.0 (81)</b>	<b>269.8 (90)</b>	<b>202.9 (96)</b>	<b>525.6 (98)</b>	<b>13.6 (67)</b>	<b>75.0 (85)</b>	<b>1,283.2 (90)</b>
<b>Total mandatory and optional</b>	<b>50.1 (100)</b>	<b>144.9 (100)</b>	<b>82.7 (100)</b>	<b>299.1 (100)</b>	<b>212.0 (100)</b>	<b>534.9 (100)</b>	<b>20.2 (100)</b>	<b>88.1 (100)</b>	<b>1,432.0 (100)</b>

1/See note in Appendix IV

SECP ENERGY SAVINGS REPORTED FOR 1978 and  
PLANNED FOR 1980 FOR STATES IN  
THE FOUR DOE REGIONS REVIEWED BY GAO

	<u>Reported 1978 energy savings (trillion Btu's)</u>	<u>Planned 1980 energy savings (trillion Btu's)</u>
Region I		
Connecticut	7.95	50.10
Maine	5.62	20.63
Massachusetts	40.65	144.92
New Hampshire	5.68	18.73
Rhode Island	18.73	17.60
Vermont	3.29	10.73
Region III		
Delaware	1.05	17.98
District of Columbia	6.16	25.91
Maryland	6.95	82.69
Pennsylvania	28.08	299.10
Virginia	16.83	90.07
West Virginia	9.99	50.75
Region VI		
Arkansas	7.82	65.69
Louisiana	17.27	211.98
New Mexico	3.42	80.79
Oklahoma	35.34	145.22
Texas	1.94	534.92
Region X		
Alaska	6.93	21.95
Idaho	4.51	20.21
Oregon	20.30	56.59
Washington	3.05	88.08
Total	<u>251.56</u>	<u>2,054.64</u>



Department of Energy  
Washington, D.C. 20585

JUL 7 1980

Mr. J. Dexter Peach  
Energy and Minerals Division  
U.S. General Accounting Office  
Washington, D.C. 20548

Dear Mr. Peach:

The Department of Energy (DOE) appreciates the opportunity to review and comment on the draft report which is concerned with the State Energy Conservation Program (SECP) in fiscal year 1978. DOE believes that sound Federal programs to promote energy conservation and to reduce the growth rate of energy demand are needed to achieve national energy goals, and we appreciate your suggestions for improving the SECP.

The following comments on the draft GAO report concern the SECP, as the other two programs (Obligation Guarantee Program and Existing Dwelling Units Demonstration Program), cited in the draft report were not implemented.

General comments on the draft report are provided first, followed by comments on each of the aspects of the SECP addressed by GAO in the draft report: program effectiveness, energy savings, and financial management and program monitoring. Finally, comments are provided on DOE's national energy conservation strategy.

#### General Comments

The draft GAO report highlights the unsatisfactory aspects of the SECP as it existed in FY 1978. DOE believes that a more balanced report might include some of the positive aspects of the program. We discuss some of these positive developments in the sections below.

DOE has conducted an evaluation of the SECP from program initiation through FY 1978, and many of the conclusions and recommendations were similar to those pointed out in the draft GAO report. We basically agree with the general points and recommendations made in the draft report. The major corrective actions that have been taken to date are cited in the sections which follow.

### Program Effectiveness

The draft report measures SECP effectiveness in terms of the States' achievement of their energy savings goals and effective implementation of all planned energy conservation measures. We believe that program effectiveness should also be assessed in terms of (1) the development of State capability to manage energy conservation programs, (2) the innovativeness or resourcefulness applied by the States to program development and implementation, and (3) program cost-effectiveness.

In regard to State capability, it should be noted that some States supported no energy conservation activities prior to the initiation of the SECP. In the case of other States, the SECP caused the strengthening and further development of existing programs that may have lacked emphasis and direction before the SECP. Innovativeness and resourcefulness are evident in many of the optional program measures developed by the States. Some of these are discussed in DOE's "Annual Report to the President and the Congress on the State Energy Conservation Program for Calendar Year 1979" (DOE/CS-0160) and the evaluation report mentioned above. In respect to program cost-effectiveness, we are assessing the SECP on this basis, and the results to date look positive though they are tentative and further analysis is required.

Moreover, one of the conclusions of the evaluation conducted by DOE mentioned above was that program effectiveness appears to depend most upon the resourcefulness and power of the State energy office personnel and the attitude of the State's Governor and legislators.

The draft report notes delays in implementation of mandatory program measures selected by GAO for review. However, it does not recognize the difficulties in implementing some program measures, such as lighting and thermal efficiency standards and State energy efficient procurement standards, which have been a factor in the delays observed. For example, the mandatory thermal and lighting efficiency standards provisions of SECP require that such standards be under implementation throughout all political subdivisions of the State. However, not all political subdivisions of a State have the power to adopt and enforce codes. Home rule States are a case in point, for in such States numerous powers, including local adoption and enforcement of energy codes are reserved for the general purpose units of local governments. This means that home rule States, generally,



are not empowered to enforce such standards in areas beyond the jurisdiction of their local governments. In contrast, other States can adopt mandatory statewide legislation and then seek, more or less successfully, to administer and enforce it statewide with or without substantial local government involvement. Furthermore, to implement thermal and lighting standards, the State energy office, as the SECP grant recipient, has to (1) coordinate with other State agencies and often with many local jurisdictions, (2) arrange for and provide proper training for code officials, and (3) establish appropriate administrative mechanisms to determine compliance with the adopted standards. Since 1978, most States have improved upon their implementation of the mandatory measures as they gained experience with the complexity of issues involved in each type of measure.

DOE is following up on GAO's recommendation that a reassessment be made of State compliance with the mandatory program measures. We are presently reassessing State compliance with the lighting and thermal efficiency standards and are developing schedules for reviewing compliance with the other required measures during fiscal year 1981. Based on these reassessments, we will determine the best approach to take with States which are not in compliance.

#### Energy Savings

With respect to the 1980 energy savings goals discussed in the draft report, the distinction needs to be drawn between the legislated SECP goal of 5 percent of 1980 projected energy consumption, which is 4.1 quadrillion British thermal units (quads) and the sum of the individual State goals or projections for 1980, which is 5.8 quads. It is unlikely the SECP will meet its legislated goal as early as 1980 due to significant budget cuts in FY 1979 and FY 1980, as well as the State milestones slippages noted by GAO.

We recognize that States have been overly optimistic in their 1980 energy savings projections of 5.8 quads. However, it is important to keep in mind that the SECP was the first State grant program in energy conservation funded by DOE. Many of the start-up problems encountered in the first years of the program were associated with the ground-breaking nature of the SECP and the consequent lack of experience on the part of State and Federal administrators, particularly in the area of estimating energy savings.

As recommended by GAO, DOE has provided assistance in the past year to States to help them evaluate their SECP programs and thus improve their methodologies for projecting and

measuring energy savings. We believe this effort will help to alleviate the problem that GAO addressed concerning the lack of a consistent and adequately supported basis for measuring energy savings by the States. We plan to continue these efforts in FY 1981.

#### Financial Management and Program Monitoring

DOE agrees with GAO's findings that there have been deficiencies in the program regarding financial management and program progress monitoring. In the area of financial management, DOE has undertaken several major projects during the past year to improve the administration of its financial assistance programs. An "Accounting Policy Procedures Manual for Federal Assistance Programs" is being developed for use by DOE staff in awarding and managing DOE grants and cooperative agreements. Parts of this manual are available and in use now; other sections are under development. Training sessions on the use of this manual will be initiated nationwide early in FY 1981. In addition, a manual concerning accounting policies and procedures is being developed for grant recipients. This manual will include sections on letter of credit payment policy, cash management, cost reporting, controlling obligations, accounting closeout, and audit resolution.

In the area of program progress monitoring, DOE has developed a reporting system (Uniform Reporting System for Federal Assistance) for use by all DOE grantees. This system, which requires Office of Management and Budget (OMB) clearance, includes forms for reporting planned and actual expenditures and milestone accomplishment. In FY 1981, if approved by OMB, this reporting will be required quarterly from all SECP grant recipients. A major feature of the system is the plotting of budgets against milestones so that both State project managers and Federal program monitors can track program costs versus outputs or milestones achieved.


#### Comprehensive National Energy Program

The conclusion of the draft report expresses GAO's continuing concern "over the lack of a comprehensive national energy conservation program" (page 58 of this report). If this statement is considered in the context of the situation in FY 1978, DOE agrees that there was a need for such a comprehensive program. However, in January of this year, Secretary Duncan issued a draft of DOE's Policy and Fiscal Guidance for FY 1982-1986. This guidance contains the Department's objectives for reducing energy consumption and

enhancing the use of renewable resources. A minimum goal of reducing energy consumption by 25 percent nationwide by 1990 is established, to be achieved through a mix of grant and regulatory programs, price deregulation, investment subsidies and market research to optimize consumer participation. DOE acknowledges the need for greater national consensus on conservation goals, and believes that it now has a policy framework through which to measure accomplishment of these goals.

We appreciate the opportunity to comment on this draft report and trust you will consider our comments in preparing the final report.

Sincerely,

*to n*  
  
Jack E. Hopbs  
Controller

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