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Technical Memo

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ARGONNE NATIONAL LABORATORY
Energy and Environmental Systems Division

prepared for
U. S. DEPARTMENT OF ENERGY
under Contract W-31-109-Eng-38

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This informal report presents preliminary results of ongoing work or work that is more limited in scope and depth than that described in formal reports issued by the Energy and Environmental Systems Division.

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ANL/CNSV-TM-51

SUMMARY REPORT OF
STATE INDUSTRIAL ENERGY-CONSERVATION WORKSHOPS

by

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January 1981

work sponsored by

U.S. DEPARTMENT OF ENERGY
Assistant Secretary for Conservation and Solar Energy
Office of Industrial Programs

*R.W. Anderson and Associates, consultant to Argonne under ANL
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FOREWORD

We are grateful to the state energy office and regional office personnel who shared their experiences with us. We are grateful to Terrence Alston and Donald Newsom of Argonne for many helpful comments on drafts of this report.

The work was sponsored by the U.S. Department of Energy (DOE), Office of Industrial Programs. We gratefully acknowledge the constructive review by Richard Brancato, Melvin Chiogioji, Thomas Gross, Douglas Harvey, and Timothy Lankton, staff members of the DOE Office of Conservation and Solar Energy.

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1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

In September and October, 1980, four workshops were held under the auspices of DOE's Office of Industrial Programs (OIP) in cooperation with the Office of State and Local Assistance Programs (SLAP). The purpose of these workshops was to establish better communication between state energy office personnel and DOE representatives from OIP, SLAP, and the regional offices. The focus of the workshops was on the industrial programs included in the State Energy Conservation Program (SECP).

1.2 FORMAT OF WORKSHOPS

Each workshop consisted of three sessions: (1) presentations by representatives of OIP and SLAP discussing relevant federal programs -- including RD&D projects; (2) presentations by representatives of state energy offices describing their industrial conservation programs; and (3) a discussion, involving only state energy office personnel, of their needs and problems and their suggestions for improving the effectiveness of the industrial conservation measures in their energy conservation programs. The conclusions reached by the state representatives were discussed in a final, plenary meeting.

1.3 ORGANIZATION OF THIS REPORT

The objectives, background, and format of the workshops are described in Section 2. A summary of state industrial programs in Section 3 includes a program measure matrix and a discussion of elements in program design. Section 4 describes factors affecting the development, implementation, and evaluation of state industrial conservation programs. In Section 5 state needs, as perceived by the state representatives, are presented and discussed. Section 6 summarizes the states' suggestions as developed in the third session of each workshop.

1.4 FINDINGS AND RECOMMENDATIONS

The state representatives found that they shared many of the same problems and needs. To meet these needs, the state personnel suggested the following actions or changes:

- A clearer definition of the roles of the regional offices and their relationship with state energy offices,
- More technical assistance provided by regional offices to state offices,
- Improved communication and information sharing among states and between state and regional offices,
- More meetings for states (similar to these workshops); both for information sharing and for technical assistance,

- Faster and more flexible federal funding procedures to adapt to the problems generated by state legislature schedules,
- Simpler and more efficient forms and procedures for grant applications and reports,
- Development of standardized, uniform methodologies for evaluation and needs assessment,
- Technical assistance for state office personnel on topics such as needs assessment and evaluation,
- Development of composite manuals incorporating the best of existing manuals and available to state offices as camera-ready copy, and
- A catalog of existing manuals and other programs materials to facilitate exchange of such materials among states and reduce duplication of effort.

The workshops achieved the objectives for which they were planned. State representatives indicated that they had received an attentive, supportive, and responsive hearing from the DOE representatives in a position to help them, both from DOE headquarters and from regional offices. State representatives commented that the opportunity to listen to and compare accomplishments and problems with other state energy personnel had been a valuable opportunity. The exchange of program materials was valuable to all participants.

2 INTRODUCTION: SCOPE AND OBJECTIVES OF THE WORKSHOPS

2.1 OBJECTIVES OF THE WORKSHOPS

The Department of Energy's Office of Industrial Programs, in cooperation with the Office of State and Local Programs, sponsored a series of four workshops on state industrial energy conservation programs in September and October, 1980. The objective of these workshops was to provide a forum in which federal and state officials could discuss:

- Federal programs supporting the development and implementation of industrial energy conservation technology,
- Federal assistance available for state and local energy conservation programs,
- States' programs and policy efforts to encourage industrial energy conservation, and
- Identification of states' needs and recommendations for actions to meet the states' needs more effectively.

The basic focus of the workshops was on industrial programs developed by the states through funding by the State Energy Conservation Program. Some states combined industrial programs with other programs in areas such as commerce, agriculture, and mining.

2.2 BACKGROUND

As part of its participation in state industrial energy programs, Argonne National Laboratory published a report* investigating:

- The degree to which various industry segments are being served by state industrial energy conservation programs,
- The needs perceived by state energy offices regarding industrial energy conservation, and
- Problem areas common to state programs that could be addressed at the federal level.

The survey identified several needs, among them a perceived need for:

- More information, more systematically presented, on federal programs and projects that affect state energy-related activities,
- A forum for communication and coordination among the states and for interchange of program information and materials,
- An opportunity to discuss with DOE their needs for more technical assistance and more coordination of intra-state energy-related activities.

*Anderson, R., A. Evans, and P. Grogan, A Summary of Current State Industrial Energy Conservation Programs, ANL/CNSV-TM-41 (1980).

In response to the findings of this survey, the workshops were held to initiate a more comprehensive interaction between states and the Office of Industrial Programs to identify common problems, and to define a framework for coordination, information transfer, and cooperation. The four workshops were held at the following locations:

Arlington, Virginia	September 18 and 19, 1980
New Orleans, Louisiana	October 7 and 8, 1980
Salt Lake City, Utah	October 9 and 10, 1980
Chicago, Illinois	October 22 and 23, 1980

Each workshop was 1-1/2 days in length and divided into three parts of one half day each. The workshops were planned to provide state representatives with maximum information and to encourage active participation and interchange of ideas. Representatives of regional offices and DOE headquarters were included. Fifty-two state representatives from 39 states and one territory attended the workshops (see Appendix A).

2.3 FORMAT OF THE WORKSHOPS

The first section of each workshop was designed to provide the states with information on federal projects in progress within the Office of Industrial Programs and an overview of DOE's State and Local Assistance Programs.

The second part of the program featured states' presentations of their own industrial conservation programs. The purpose was to give a representative of each state an opportunity to discuss that state's successes and failures and to allow each state to learn from the experience of the other states. States were strongly encouraged to bring program materials (especially manuals) for display and sharing of ideas.

In the third part of the program the state representatives discussed, among themselves, the problems they experienced, with emphasis on common problems and problems that could be addressed by DOE. These problems, and relevant suggestions and recommendations, were then presented and discussed with DOE attendees. Recommendations for possible solutions were discussed and recorded.

3 SUMMARY OF STATES' PROGRAMS

3.1 OVERVIEW

None of the mandatory program measures established by the Energy Policy and Conservation Act of 1975 affected the industrial sector directly. Only one of the program measures added as a voluntary supplement, and required only to obtain supplementary funding under the Energy Conservation and Production Act of 1976, is related to industry. Consequently, the states' industrial conservation programs are voluntary. DOE encouraged each state to develop its own program to fit its individual state needs and policies. The 39 states' presentations at the four workshops were varied with respect to objectives, program measures, target audiences, methods of implementation and program management, and utilization of available resources. Consequently, just as no two states are identical in terms of industrial profile, resources, or energy policies, no two states have perceived their conservation needs or designed conservation programs in the same pattern.

Also, differences in the definition of "industrial" as applied to energy conservation programs make generalizations on states' programs difficult. Approximately one-half of the states have combined the commercial and industrial programs as a single program area. One rationale for this approach is that many of the space conditioning and lighting considerations are similar for such facilities in both sectors and therefore should be addressed together. Other areas sometimes included with the industrial programs are agriculture and mining. Similarly, differences in the intra- and inter-agency departmental structures within states have resulted in apparent differences in the scope and magnitude of a given state industrial energy conservation program. For example, additional programs related to industrial conservation may be under the jurisdiction of such entities as an agricultural extension service or the Small Business Administration.

Although state programs differ in scope and magnitude, a number of clearly identified benefits have been realized. The prime benefit, of course, is the successful promotion of conservation technologies and management strategies to reduce energy consumption. Although it is difficult to quantify energy savings accurately, it is clear that savings have been achieved as a result of states' programs. Along with the value of the resulting conservation to the economies of the states and of the nation, successful states' programs have provided additional benefits to the private sector and to the federal government:

Benefits to the private sector:

- Direct financial savings,
- Increased output per Btu,
- Reduced dependence on potentially scarce energy sources, and
- Creation of new industries, based on new or changed technologies.

Benefits to the federal government:

- Delivery systems (through states) for newly developed or underutilized conservation technologies,
- Identification of needs or problem areas to be addressed at the federal level,
- Information from states regarding conservation goals and successes/failures of specific projects, technologies, or conservation strategies.

Although all states' programs have undoubtedly provided some level of benefit to the industries within their states, some states have been more successful than others, and some individual projects within a state have been more successful than others. Also, some projects that have been successful in one state have been less successful in another. A summary of the states' programs, areas of common interest, and highlights of specific projects are profiled in the following section.

3.2 SUMMARY PROGRAM MATRIX

Because of the diversity of program measures within the states' programs, the following generalized categories have been defined to include most of the program elements. Then, using these generalized categories, the states' programs have been summarized in tabular form in Table 3.1. Included in the matrix are both current projects and projects planned or being planned for future implementation. It should be noted that within any given category, a wide range of projects can be accommodated. For example, under "cogeneration" may be classified a feasibility study, a demonstration project, or a fully implemented cogeneration system.

The matrix includes only those measures discussed at the workshops. Therefore, it is incomplete since at least some states may not have included every one of their program measures in their presentation. The matrix is meant to illustrate only the range of program measures and the diversity of states' combinations.

Examples of Program Measures within Each Category in the Matrix

Agricultural Programs: insulation of tobacco curing barns; minimum tillage, variations in planting cycles, and/or selection of new hybrid seed types to minimize fuel use per acre and increase productivity; heat recovery from dairy barns.

Alternative Fuels: use of new fuels such as gasohol, methane; use of waste as fuel; conversion to renewable fuels such as wood or biomass; conversion to coal. (Solar is a separate category.)

Assessments of Program Needs: efforts to identify program needs of industry and state/local governments by using, for example, contacts with industry/trade associations or surveys.

Table 3.1 Program Elements by State^a

State	Agricultural Programs	Alternative Fuels	Assessment of Program Needs	Audits			Boiler Efficiency	Cogeneration	Conferences, ^b Seminars	District Heating	Energy Management Programs	Information, Educational Programs	Regulations or Standards (Code)	Solar Programs	Tax Incentives	Technical Assistance, Services	Waste Heat Resource Recovery	Waste Oil Recycling	Workshops ^b
				Class A	Other or Not Specified	Awards													
Alaska			P									X					X		
Arkansas					X							X							
California	X			X			X					X	X						X
Colorado							P				X	X							
Connecticut					X	X			X		X	X			X	P	X		
Delaware					X				X			X						X	X
Florida		P	X		X		X					X						X	X
Georgia		X		X			X		X			X				X			X
Idaho	X		X		X		X	P	X			X		X			P		
Illinois				X ^c			X		X		X	X				X	X	X	X
Indiana	X						P		X		X	X ^d				X		X	
Kansas	X						P	X				X					P	P	
Kentucky		X		X					X			X		X		X			X
Louisiana		X			X		X		X		X	X			X	X			X
Maine		X				X	X	X		X	P	X						X	X
Massachusetts		X			X	X	X				P							X	X
Michigan	X		P		X ^c		X	X	X	P		X					X	X	X
Minnesota	X		P		X	X	X		X		X	X				X	X		X
Mississippi			P		X						P	X				X			X
Missouri	X	X	P	X ^c					X			X		X		X	X		
Montana	P	P	P	P															
Nevada		P					P	X				X					P	P	
New Hampshire		X			P	X	X	P			X						X	X	X
New Jersey					P		X		X			X	X			X		X	X
New Mexico					P		X		X		X	X		X			X	X	X
New York				X	X		X		X			X				X			
North Carolina	X				X ^c				X		X	X		X	X	X		X	X
Ohio	X	X			X		X	X	P	X	P	X		X			X		
Oregon		X	X				X	X	X		P	X ^d	X	X	X	X			P
Pennsylvania						X	X				X					X		X	X
South Carolina					X			X	X			X				X		X	
Tennessee	X				X		X	X		X	X	X				X		X	X
Texas		X			X ^c			X	X		X	X				X		X	X
Utah					X		X				X	X				X		X	X
Virginia				X ^c	X		X		X			X					P		X
Washington		X	X		X			X				X	P			X			X
West Virginia			X		X							X						X	X
Wisconsin	X				X		X		P	P		X				X			X
Wyoming		P			X				X		X	X							

^aX = existing program. P = planned program. Note: States not attending the workshops are not included in the matrix.

^bThese categories occasionally overlap with each other.

^cThese state programs include auditor training programs.

^dThis information service utilizes a computer data base.

Audits: Class A audits are classified in a separate column, all other types of audits (e.g., Class C, or class not specified in the presentation) were classified under "other." Includes audits, development of audit manuals, training auditors or publishing lists of qualified auditors.

Awards: acknowledgment of company programs recognized as meeting minimum standards, or showing innovative approaches to industrial energy conservation, or achieving outstanding performance.

Boiler Efficiency: on-site evaluations, workshops, training sessions for operators and/or management, operations and maintenance manuals.

Cogeneration: feasibility studies, in-place facilities or demonstrations, changes in regulations, financial incentives.

Conferences, Seminars: meetings that could not be classified as workshops on the basis of information in the presentation; includes information exchanges, sharing of experiences and solutions to problems, planning, etc.

District Heating: facilities either in the planning stage or already functioning; e.g., demonstration projects, feasibility studies.

Energy Management Programs: includes seminars and/or manuals on energy management, plant visits that emphasize energy management.

Information Services, Educational Programs: distribution of available information, "hot-lines," clearinghouses, energy fairs, or publications intended for the general public; educational outreach including curricular development.

Regulations or Standards: approaches to energy conservation that use regulations, municipal or state codes, or mandatory standards.

Solar Programs: participation in any solar energy program (active or passive), demonstrations, provisions of incentives to private sector to utilize solar energy.

Tax Incentives: state income and/or investment tax credits for use of energy conservation measures.

Technical Assistance, Services: provision of technical assistance by state energy personnel, university personnel, or contractors; or provision of technical data resources.

Waste Heat/Resource Recovery: feasibility and evaluation studies, in-place facilities or demonstration projects, literature and manuals, workshops.

Waste Oil Recycling: established facility for recovery, processing, and marketing of used oil; or feasibility, planning studies with possible intent to establish a facility.

Workshops: training sessions including hands-on training, manual, specific discussions of conservation methods as contrasted to seminars.

3.3 FACTORS AFFECTING PROGRAM DESIGN

The states were influenced by many factors and constraints in their choice of program objectives and program design. The discussions at the workshops clearly indicated that no single approach or program design could, or should, be adopted by all states. Programs should be periodically evaluated and changed when necessary. Changes in program design were generally prompted by:

- Evidence that a program measure was not effective,
- Changes in the needs of industries being served,
- Change in energy office's perception of industry needs,
- Access to new information and/or program concepts,
- Changes in governmental policies,
- Changes in funding, or
- Changes in personnel that changed the technical capacity of the state energy office.

Several states expressed clearly their need for technical assistance in the techniques of needs assessment and program design. The factors that most frequently affect programming are discussed below.

3.3.1 Management

A large number of states retain the tasks of management, implementation, planning, and evaluation within their own energy offices. Other states contract with outside organizations such as universities, other state agencies, or private contractors to perform one or more of these functions. For example Texas, which has one of the larger programs but contracts out most of the program measures, requires only a small staff of energy office personnel for contract management. However Illinois, also with an extensive program, does most work in-house, utilizing its own professional and technical staff.

3.3.2 Program Funding

A large majority of the state programs are heavily dependent on federal funding, although a few states have elected not to accept direct federal funds, e.g., SECP funds. Some state programs receive a part of their funds as direct state support; and most state programs receive some indirect financial backing, at least in-kind. A number of states provide their programs at no cost to the clients they serve. However, other states supplement their budgets by charging fees for certain services; for example, registration fees for workshops and seminars, or charges for training manuals and on-site audits. Typically such services are provided at below cost. Some states feel that the clients value the same service more highly if they are charged a fee.

There is some cost-sharing of development and demonstration projects between states and industry.

3.3.3 Program Targets

Many states have directed their major efforts towards servicing small- and medium-size firms (for reasons discussed below). As a result, many of their program measures and information services tend to be generic or process-specific rather than industry-specific, and less technology-oriented. Other states direct large portions of their projects toward large, specific industries and, as a result, at least some of their services and information tend to be more industry-specific and more technologically sophisticated.

3.3.4 Extension of Resources

Some states have effectively extended their technical and outreach capabilities through cooperative programs with other state agencies and other organizations such as universities, vocational institutes, agricultural extension services. In other states, close working relationships have been established with private sector organizations, such as trade associations, to gain their active support and participation as well as access to technical personnel. In many cases, the states depend on the endorsement and support of such organizations to bring added credibility to the program and to promote increased attendance and participation in their programs.

3.3.5 State Policy

The overall directions and priorities in the programs are undoubtedly influenced by the formal and informal policies of the respective states. It was evident that some states place greater emphasis on energy conservation than do others. Also, even though a state may be dedicated to the overall concept of energy conservation, the specific area of industrial energy conservation may receive a different level of support. For example, a state may place great emphasis on residential conservation but feel that the state has a limited role in industrial conservation.

In addition, the positioning of the state energy office in the state organizational hierarchy is a major factor determining the independence, political "clout," and access to resources of the state energy office. Some state offices are effectively weakened by lack of state interest and/or lack of inter-agency cooperation within the state's organizational structure. The state energy office's access to resources and the degree of cooperation and encouragement received in establishing its programs can vitally affect the degree of success of the state energy program.

3.3.6 Program Delivery Systems

In most cases, the states' approaches to service delivery to target audiences can be placed on a continuum between two extremes. The first includes those states that are fully identified with their programs; that is,

they explicitly state that a given program is being sponsored by the state energy office. Within this group, there are marked differences in the apparent level of success of similar programs. For example, some states are successful in their workshops programs, whereas other states reported disappointing results or failures. Many states find, or perceive, a stigma associated with any governmental body; this stigma is believed to be founded on the fear that any governmental activity or service might ultimately lead to increased regulation. This negative attitude among prospective clients can impair program acceptance. States in this group that are successful generally have a technically oriented staff that work closely with members of the private sector and are successful in establishing their own credibility.

At the other end of the continuum, some states deliver their programs through, or with the strong support of, other organizations such as universities, trade associations, or quasi-governmental groups. By so doing, they utilize not only the resources of these organizations, but also their credibility with the private sector. The range of the states' transference of program identity is from slight to complete (in some cases the state's involvement or sponsorship is not displayed at all).

As indicated by many states, the development of effective and credible delivery systems for continuing programs is a subject that requires much staff effort. Since the continuing success of such efforts is dependent to a large degree on the continuity of staff personnel, the rapid turnover of staff personnel experienced by many states hampers and frustrates this effort. State civil service regulations, low salaries, and scarcity of experienced and trained personnel in a new field exacerbate the problem.

3.4 AREAS OF PROGRAM COMMONALITY

Some program measures were included in a majority of states' programs and although the individual states may not select identical target clientele, there is a high degree of commonality in terms of technology, materials, and delivery systems.

Although it is not possible to discuss every state program, it seems worthwhile to summarize common elements. Approximate frequencies with which specific measures were used (to the extent that they were discussed in the workshops) are shown in Table 3.2.

Some program measures had been included in a particular state program but were dropped because they seemed ineffective. Other measures are still in the planning stages in several states. The states appear to be monitoring and considering changes in their programs in a continuous effort to improve them and to meet the current needs of their industrial constituents.

There appears to be a high degree of commonality, and it was generally recognized that cooperative interstate efforts in these areas would decrease duplication of effort and promote greater efficiency and program quality. It was also generally recognized that, because of the common interests at the state level, these areas should be considered for possible DOE assistance in project development, evaluation and dissemination of materials.

Table 3.2 Frequency with which Each Program Measure was Mentioned by States' Representatives Discussing Their State Programs

Measure	Existing Programs Reported	Planned Programs
Agricultural Programs	11	1
Alternative Fuels	11	4
Assessment of Program Needs	5	6
Energy Audits (state reporting one or more types)	27	4
Awards	6	-
Boiler Efficiency	21	4
Cogeneration	10	2
Conference, Seminars	20	3
District Heating	3	2
Energy Management Programs	14	5
Information/Educational Programs	36	-
Regulations/Standards	3	1
Solar Programs	7	-
Tax Incentives	4	-
Technical Assistance/Services	19	1
Waste Heat, Resource Recovery/Use	9	4
Waste Oil Recycling	15	2
Workshops	24	1

In addition to the more common project areas, there appear to be several other project areas that are currently being addressed by relatively few states, but might be adopted by more states in the future if their effectiveness can be documented. The states so involved could also benefit through cooperative interstate action. As the states' programs mature, the number of states involved in these cooperative projects could very well increase, particularly if the states spearheading these projects have demonstrated successes.

As can be seen, the project areas of most common interest were:

- Audits, both general and industry specific, both Class A and walk-through,
- Boiler/combustion efficiency,
- Information services, educational programs,

- Technical assistance and related services,
- Waste oil recycling, and
- Workshops, conferences and seminars.

Other areas of common interest included:

- Agriculture,
- Alternative fuels,
- Cogeneration,
- Energy management, and
- Waste heat recovery/utilization.

Information provided at the workshops highlighted the need for cooperative interstate programming and information exchange, and a federal role in providing increased technical assistance and facilitation of sharing among the states. For example, for waste oil recycling:

- Some states are contemplating initiation of a project,
- Other states are performing feasibility studies,
- Other states are conducting on-going recovery/recycle projects,
- One state has received DOE funding to build and demonstrate an advanced oil recycling facility,
- Several states have developed regulations or incentives for waste oil recovery and recycling,
- Some states have already tried and abandoned oil recovery/recycling programs because of various technical and institutional problems, and
- DOE is conducting extensive R&D in advanced waste oil recycling technologies, including their economic and environmental effectiveness. Not all states are fully aware of the extent of R&D in progress.

Similar examples were noted for several other project areas, such as audits, boiler efficiency, and cogeneration. Some states were just starting to explore a project area, other states were involved in feasibility/evaluation studies, and still others were developing project materials (e.g., manuals), while some states had successful programs in operation. There has been much duplication of effort.

Although a more detailed listing of each state's project status, materials and evaluations would undoubtedly be of value, such information is beyond the scope of this summary report. A complete catalog and discussion of state programs would require a comprehensive review of each state's projects to assure that they are fairly and accurately presented. The collection and promulgation of more information on what has already been done, with analysis and evaluation of results, was part of the needs and recommendations offered by the states at the workshops.

4 FACTORS AFFECTING THE DEVELOPMENT, IMPLEMENTATION, AND EVALUATION OF STATE INDUSTRIAL ENERGY CONSERVATION PROGRAMS

4.1 OVERVIEW OF MAJOR ELEMENTS AFFECTING STATE PROGRAMS

State industrial energy conservation programs span a wide range of activities and levels of program development. In the workshops, factors affecting state industrial energy conservation programs were discussed during states' presentations and in the discussion periods that followed. Listed below are several categories of elements identified at the meetings:

- Organizational structure and relationships,
- Coordination and information dissemination,
- Program development and delivery, and
- Evaluation of programs.

There has been no attempt to rank these categories as to their relative importance.

4.2 ORGANIZATIONAL STRUCTURE AND RELATIONSHIPS

Organizational, management, and institutional relationships affecting state energy offices were major problems addressed during the workshops. The states often referred to:

- The relationships between the state energy office and the business and industrial community,
- The institutional relationships between the energy office, educational institutions, other state offices, and other organizations; and
- The organization and management of the energy office, including financial and staffing problems.

All of these factors have played significant roles in the effectiveness of state energy conservation programs.

4.2.1 Relationships with Business and Industry

The general context of relations between state energy offices and their industries, when mentioned by state representatives, was sometimes negative. When relationships with industry were discussed, they were frequently in terms of the state's lack of credibility with industry and the need to arouse increased interest and participation in conservation programs. Some states pointed to their successes in working with industry and the means used to establish credibility and achieve a higher level of participation by industry.

As one state mentioned, there is a fear that if an employee of the state comes in today to conduct an energy survey or audit, a regulatory agent

of the state will arrive the next day to do an inspection. At the Salt Lake City workshop, many of the states commented on the strong dislike of government and the difficulty in promoting energy conservation given this negative attitude.

Despite the negative context in which industry-state relationships were discussed, representatives from at least 25% of the states attending the workshops mentioned the success they have had in working with industry in their states. In some cases an industry trade or business group participated with the state energy office in promoting and advertising a program. In many of these cases, these groups also helped the state office in establishment of a cooperative relationship with industry and participated in actual delivery of services. Industry or business groups also assisted in promotion of information sharing between companies and in the development of case studies and manuals. This participation by a business or commercial group or university increased the credibility and acceptance of the program.

Thus, although there is a credibility problem between government and industry, a number of successful efforts have been undertaken by the states to develop effective rapport with their industries.

4.2.2 Institutional Relationships with Other State Agencies, Educational Institutions, and Other Organizations

State representatives discussed institutional relationships with other state agencies, state legislatures, and the governors. The nature of relationships with educational institutions was addressed frequently because this constitutes an important factor in the programs of many states. Educational institutions have been major sources of expertise and technical personnel for many states.

On the issue of the relationships between the energy office and other state agencies, a program presented by Ohio demonstrates some of the opportunities in working with other state agencies. Courses in boiler operator training are being taught in 11 educational institutions in various locations within Ohio chosen to reach most of the target audience. The state energy office is working with the Department of Industrial Relations (the operator licensing agency in Ohio) to allow credit toward a license when the attendee completes the course and passes a written test. This would encourage the educational institutions to offer the course regularly as part of their continuing education program.

Approximately 40% of the states discussed industrial energy conservation programs which were developed, managed, and/or operated by universities or vocational education institutions within the state. This included conducting courses on subjects such as boiler efficiency; developing materials on self-audits and case studies on industrial energy conservation; and providing energy audits, workshop services, and technical assistance services to industry.

Major factors in successful collaboration with an educational institution were a pre-existing program in the educational institution directly relevant to the industrial conservation program and prior commitment to public

service by the institution. Several states commented that they did not use educational institutions because the academic schedule did not allow for sufficient full-time commitment to their programs or the necessary continuity of personnel.

A number of states such as Georgia and North Carolina have had their educational institutions working with industry through an industrial extension service for a number of years; thus, incorporation of industrial energy conservation was easily accomplished. Several interesting programs with educational institutions were presented. A few among those programs included the Georgia Office of Energy Resources' program with Georgia Institute of Technology, the Kentucky Department of Energy's program with the Kentucky University System, and the Idaho Energy Office's program with the Idaho Department of Vocational Education.

4.2.3 Organization and Management of the Energy Office

A discussion on the organization and management of the state energy office frequently prefaced the presentation by each state. These remarks covered the organizational structure of the energy office, the management approach to its activities, and the hiring and personnel turnover problems of the offices.

Of the 39 states that sent representatives to the workshops, the title of the state energy conservation office was as follows:

	Number of States
Energy Department or Agency	10
Governor's Office of Energy	6
Energy Office	15
Department of Natural Resources	4
Department of Commerce	2
Energy Commission	1
Advisory Council	1

The diversity of names illustrates the lack of unanimity in concepts of how the state energy office should be characterized as well as where it should be located in the state governmental hierarchy (e.g., an independent agency, part of the Department of Commerce, or an office reporting directly to the governor).

The management approach to energy conservation was just as diverse. Texas noted that:

We are not an implementation agency; we contract out all of our activities. We do not have a staff to actually go out and do a workshop, so our office deals mainly with contract management. Most of our work is contracted to other state agencies.

The Illinois Institute of Natural Resources, on the other hand, conducts most of its activities in-house. To provide audits, seminars, workshops, and other services, the Institute has developed a professional staff including engineers and architects.

While states such as Illinois have centralized industrial energy conservation activities, other states have moved to decentralize the energy conservation function. One state's approach was described as follows:

Our regional management is not in state offices. We tend to house these regional management offices at institutions which have a significant bearing in the industrial community. These management offices are located at manufacturers' associations, the mechanical engineering departments of some universities, community colleges which train refrigeration mechanics or have an energy auditor program. What we try to do is appeal to a management segment that is already working in the industrial community.

In the development of their management and program approach to industry, three states, New Jersey, Florida and Idaho, commented on the use of a business and industry task force. One state noted the rationale and direction provided by their advisory committee, which had been effective:

We thought the most logical approach to planning a program would be to establish an Industrial Energy Task Force designed to give us a better handle on what industry is actually doing, to gather information from industry, and compile it so we can use it as a base for future programs. We did not want to just create programs for the sake of creating programs.

The problem of high rate of turnover in personnel was mentioned by representatives of several states at the meetings and was recently reaffirmed in an article by Eric Hirst and John Armstrong, "Managing State Energy Conservation Programs: The Minnesota Experience."* One state mentioned, during the workshops, that they had 100% turnover in personnel in one year. Recruiting technically qualified people for the state energy office was another serious problem. These problems, exacerbated by low salaries and civil service employment regulations, can seriously hamper a state's industrial energy conservation program.

4.3 COORDINATION AND COMMUNICATION

One of the basic purposes of the workshops was to investigate problems in coordination and information dissemination. The discussions in this area included the need for improvements in:

- Flow of technical information between DOE's Office of Industrial Programs and state energy offices,
- Interaction and coordination among DOE's State and Local Assistance Programs and between its regional offices and the states, and
- Communication and interaction among the states themselves.

*Science, 210:740-744 (Nov. 14, 1980).

Many of the discussions and suggestions by the states in this area are mirrored in Section 6, the recommendations of the states.

4.3.1 Flow of Technical Information

Two problems related to technical information flow were discussed by the states. First, the states did not always know what industrial technology development projects sponsored by DOE were underway in their states. The need to know what activities are being conducted in the state stems from three motivations:

- The state's desire to participate in the development of the technology or, by coordination with their own program, to use it to strengthen their state program if appropriate,
- The state's desire to use the information developed by the project for training programs, workshops, and seminars, and
- The simple fact that it is good politics to know what is going on in the state with regard to energy conservation.

Second, the states need to get information about other DOE projects and programs in order to use it in their programs. As one state mentioned in the Washington workshop:

What we see from the newspapers is that DOE's Office of Industrial Programs is doing all sorts of interesting things. A large amount of useful information is being generated, but it is on a hit or miss basis as to whether we are able to tie into that information.

This same view was reaffirmed at the Salt Lake workshop:

Our big fear is that we are not going to have good access to federal channels of technical information. ... I cannot stress enough how important technical information is toward aiding us in showing some credibility to the industries in our state.

4.3.2 Interaction and Coordination Among State and Local Assistance Programs

DOE's Office of State and Local Assistance Programs, especially the regional offices of the programs, drew both praise and criticism on the issues of interaction and coordination with the states. This varied in different workshops. Reaction varied from state to state even in the same region. However, it did appear that regional offices did vary in the quality of their relationships with the states. The tone of one workshop might be typified by this comment:

We have had very good luck, especially with our regional office in getting someone in the regional office working on specific programs to come into our state and work with us in putting these things together. ... I think it is incumbent upon DOE headquarters to use the regional offices more. These people have been working with us since the program began.

In contrast, another state representative commented:

There has not been much of a partnership between the states and the regional offices. ... The regional offices do not reflect much confidence in state capabilities. ... Often this lack of confidence is reflected in overly detailed rules, lack of flexibility, and not placing full responsibility at the state level.

4.3.3 Communication and Interaction Among the States

One of the needs discussed by the states was better coordination and less duplication of state efforts. As one state representative stated:

Everyone that I have heard from today has some kind of boiler program which they each developed separately. I know we are guilty of it too.

Many of the states have developed their own manuals on topics such as boiler efficiency, waste heat recovery, or energy auditing and have not shared these materials with other states. An example of a significant effort to address this problem was presented by Maine:

We decided that we ought to have regional meetings regularly and get together with states to talk about programs. Our experience up to that time had been that DOE would call a meeting and discuss with us the program regulations. We wanted to talk about programs. We wanted to talk to people in other states who have good programs. We started these meetings off when my counterpart in New Hampshire went back to his office and organized the first meeting. ... Now we usually have a quarterly meeting where one of the states will play host. We will spend one day on a topic which is mutually agreed to by the states. The second day is spent by DOE bringing us up-to-date on SECP, EMPA, IBGT, and other programs. This gives us a chance to exchange our success stories.

A number of state representatives pointed out that the regional offices could play an invaluable role with the states by assisting in the coordination of efforts such as the one described above.

4.4 PROGRAM DEVELOPMENT AND DELIVERY

Discussions on program development and the delivery of services constituted a major portion of presentations by the states at the workshops. Some of the areas addressed included:

- The philosophy of the program, e.g., decisions on which target audiences to serve,
- Assessment of needs and development of client interest,
- Design of programs to meet existing needs, and
- Development of service delivery mechanisms.

The discussions at the workshops emphasized that no single approach could or should be adopted by all states.

4.4.1 Philosophy of the Programs

In determining the philosophy of their industrial programs, the states approached three questions: to whom should services be provided, what should be the extent and nature of these services, and how should they be provided? In answering the first question, the majority stated that they had focused their attention on small- and medium-sized businesses and industrial firms. These states, in analyzing the need for their services, concluded that large corporations had sufficient in-house expertise to match or exceed the assistance available from the state energy office. The large corporations had the resources available, they recognized the need, and were highly motivated by rising energy prices. The smaller firm, in contrast, did not have adequate resources or sufficient need to hire full time experts in, for example, energy management. The smaller firms could not afford the same degree of specialization. Therefore, the small- and medium-sized firms need assistance from state energy offices. On the other hand, several states noted that they did not discriminate by size in deciding who should receive services. Virginia, for example, took this approach and gave its rationale.

The point I would argue with is that big industry does not need any help. We do not believe that. What we find, even with your Fortune 500 companies, is that their operations are so diverse, they have so many different types of plants that even if they have an energy saving program, they have individual plants which are missing energy conservation opportunities.

4.4.2 Assessment of Needs and Development of Client Interest

Recognition of the appropriate needs to be met by a state's industrial energy conservation program was a concern expressed by many states. As one individual pointed out, there was a feeling that many of the measures in industrial programs were undertaken on a hit-or-miss basis. One approach to the determination of industry needs was establishment of an advisory committee to the state energy offices. Three states, Florida, Idaho, and New Jersey, discussed their advisory committees and the assistance they have provided

those state energy offices in targeting industrial conservation opportunities and planning programs. New Jersey also mentioned how its advisory group had also been of assistance in service delivery.

States still question whether they are meeting the appropriate needs and how effective their programs are.

Among other concerns, states question whether there are some problems in the actual decision-making process which industries use to evaluate and determine what investments to make, and if industrial firms look at energy conservation the same way as other capital investments. If this is the case, perhaps state energy offices need to be dealing with the decision-making process and the management system when designing programs.

Developing client interest in state industrial energy conservation programs was accomplished by several states through the use of high visibility public relations programs. These included awards programs, which had mixed success in the states, and conferences for executive officers of companies. Minnesota and Oregon both described their conferences as a successful mechanism in getting business to make a commitment to energy conservation as well as giving the program visibility. Minnesota commented on the help they received from large industry and the University of Minnesota in cosponsoring conferences. A representative from Minnesota described this as "a real shot in the arm for the program." In several states, developing client interest has not been a problem because the institutions with which they have been working already had long-term credibility and visibility in the state, which facilitated establishment of credibility and acceptance for these programs.

4.4.3 Program Design

Many state energy offices have increased their effective resources by working with other state agencies, universities, vocational institutes, trade associations, chambers of commerce, gas and electric utilities, or professional societies. These organizations assisted either in providing technical service staff whom the energy office would not normally be able to hire, or in establishing the credibility of the program by association with these organizations, or by cost sharing programs sponsored jointly.

Several participants made the point that programs developed by the states had, for the most part, been on a short-term, ad hoc basis. This was partially the result of uncertainty about permanence of funding for the programs, the future levels of funding and/or the possibility of a state-matching requirement.

A large majority of the programs initiated by the states have a very short time frame. Only a few states have looked into long-term programs. In some cases, this is the responsibility of the state, but in large measure this problem has been created by institutional constraints. Since the states do not have long-term commitments of funds, it is difficult for them to plan long-term efforts. The orientation of federal programs to the states has been immediate energy savings rather than long-term institutionalization of an industrial energy conservation effort. Finally, many states do not have institutions which have made or will make a long-term commitment to assisting industry.

4.4.4 Delivery of Services

Two basic approaches taken by the states in the delivery of services are the direct delivery of service by the state energy offices and the use of other institutions and organizations in the delivery of services. The direct approach, using state employees to deliver the service, was used by several states, but the more common approach was the use of the institution or organization which helped develop the program in the delivery of services.

One of the basic questions of how to deliver service to the client was discussed in relation to evaluation of programs. This question involves the need to decide whether to opt for quantity of contact or quality of contact with the client. This issue is significant for most states because of the cost of delivering services and the uncertainty of the effectiveness of the delivery system, and ability to measure program impact accurately. The most common example described was the decision whether to deliver service through workshops or audits. While the cost of the workshop is relatively low there is high uncertainty as to its effectiveness. The cost of audits is much higher but evidence* suggests that the impact on energy consumption may be more effective. Deciding which services or which mix of services to implement was very difficult for several states.

4.5 EVALUATION OF STATE INDUSTRIAL ENERGY CONSERVATION PROGRAMS

The problem of evaluating energy savings attributable to state energy conservation programs has been difficult to solve; one reason for the difficulties is differences in expectations between Congress, DOE, and the state energy offices as to the purposes and value of evaluation. There has been confusion concerning:

- Objectives of evaluation;
- Problems of measurement, estimation, and attribution;
- The role of evaluation in program planning; and
- The nature of evaluation.

There does seem to be agreement on the need for a uniform, standardized methodology that the states can use.

4.5.1 The Objectives of Evaluation

From the point of view of Congress, the objective is a quantitative answer to the questions: "How much energy is conserved as a result of this program?" and "How well is the program meeting national energy goals?" The answer is also important to the client since energy saved means dollars saved. If the dollar value of the energy conservation attributable to the program

*An Evaluation of the State Energy Conservation Program for Program Initiation to September 1978: Final Report, U.S. Department of Energy report DOE/CS/1697-01 (March 1980).

exceeds the cost of the program, then the program has been shown to be cost-effective, thereby justifying its continuance and serving as one guide to the state energy offices program selection process.

Other objectives can be realized by qualitative evaluation. Programs may achieve other goals in addition to energy conserved. One goal of state offices is to learn why a program was or was not successful in their state. Each state would like to profit by other states' experience; this requires a capacity to assess other states' programs accurately.

As one attendee stated:

What would be helpful for us would be an in-depth survey of how programs are actually working in the field. For example, compare Texas' on-site audit program to New York's or whether New Jersey's workshop program is more effective than Battelle's. Tell us how these programs are structured; how well they are working, what are some of the problems they ran into. For those of us that want to start a program from scratch it will let us know what really works best.

In actual practice, the states feel the evaluations they conduct serve the purposes of federal energy conservation effort, not the purposes of the states. Further, there is a lack of confidence in the accuracy of the results. This feeling is mirrored by a comment from the New Orleans workshop:

I know we are spending a large sum of money on evaluation, and I know that other states are probably doing the same. It adds up to a lot of bucks which could be put to much more productive work in programs rather than generating numbers.

4.5.2 Problems of Measurement, Estimation, and Attribution

The participants at the workshops noted the difficulty in obtaining accurate figures on energy savings resulting from the activities of their state energy programs. Most participants are certain that they are using less energy and/or using energy more efficiently but are unable to document this with "hard data." One of the problems in obtaining accurate data on energy savings is the difficulty, especially with small firms, of keeping energy records accurately and over a sufficient time period. One of the representatives also noted this problem:

We had a contractor perform an evaluation of our energy savings. When they were evaluating the workshops we held, they would call an attendee of the workshop. The attendee would state his company had saved 10% of their energy costs. When asked how much energy they used, they would answer that they did not know.

The fact that the companies who have received services from state energy offices to help them save energy have not been able to determine energy savings by their company is only one facet of the problem. A more serious

problem is attribution: determining whether those energy savings can be directly attributed to audit services or workshop programs conducted by the state. Two states noted some of their evaluation techniques which have dealt with this problem of attribution. Georgia Institute of Technology, which operates the industrial energy conservation program for the Georgia State Energy Office, described their efforts to develop accurate figures on energy savings attributed to their program.

All of the plants which we audit or to whom we provide technical assistance are recontacted to help them out if they have any problems and to find out how much money they have actually saved. (Note: Audits can provide both before and after results.) For workshops participants that is a little more difficult. We take a sampling of the workshop participants and call them up to find out what they saved as a result of attending the workshop. ... We also have a control group of people that we have not been in contact with for either audits or workshop activities.

Although this technique appears to assist in reducing attribution error, they were still looking for more reliable ways to conduct program evaluation.

The Louisiana representative related one technique that the state was using not only to evaluate energy savings attributable to its boiler workshops, but also to provide the participants with accurate information on the payback figures for investments in improved boiler efficiency.

Two professors go out to each of the participants that are registered for a boiler workshop. They go out before the workshop to test the boiler and two weeks to two months later, they test it again. That provides us with the Btu savings from the modifications of the boiler and its operations.

Although many states are basically using similar techniques to evaluate their industrial energy conservation programs, there is a widespread recognition of the accuracy and attribution problems of these techniques.

4.5.3 The Role of Evaluation in Program Planning

Several comments were made on the use of quantitative evaluation techniques as a means of determining future program choices by the state energy offices. In several states these Btu savings figures are being used in the decision-making process as a basis to continue or kill various program measures. There is a need for states to project, as previously stated, the size, impacts, and probability of energy savings from programs and to estimate actual savings that can be attributed to a given program measure. But, overreliance on unreliable or invalid quantitative evaluation with little or no qualitative evaluation is likely to lead to less than optimal choices.

4.5.4 The Need for a Standard Evaluation Methodology

At three of the workshops, recommendations were made to standardize the method of reporting energy savings for state conservation programs. This need for uniform evaluation stems from the fact that evaluation procedures have been changed for the SECP program and different programs require different evaluation techniques. The recommendation was put forth most strongly at the New Orleans workshop:

Right now we have a different evaluation methodology for every program. It would make life much easier if they were standardized. We feel that EES has come out with the best one. ... On the SECP program the evaluation procedure has changed each year. We had to contract the University of North Carolina to do some sampling and and statistical work for us to help provide the documentation which has been required of us in the past 15-18 months. All I can say is tell us what you want in the beginning of a program and do not change it.

DOE, in response, stated that it was working to consolidate, simplify, and make more uniform procedures for application, reporting, and record-keeping of the SECP and Energy Extension Service programs. Proposals to that effect were published in the Federal Register on October 28, 1980.

The statement above also recognizes the need for evaluation while a program measure is in progress, so that performance below expectations can be recognized and attempts made to improve the program, while it is still in progress.

5 STATE NEEDS AS DEFINED IN WORKSHOPS

5.1 INTRODUCTION

In the third section of each workshop, state representatives presented and discussed their problems and needs in all phases of their industrial energy conservation programs. Each workshop developed a different list. However, no item in any list was unique to that workshop; there was much overlap. Relative emphasis on problems differed among workshops also, so that the list below is not in order of priority. It is as inclusive as possible in the sense that an attempt has been made to include each suggestion, although with some rewording and reorganization of closely related areas. Because of the degree of overlap, it is more practical to present a single list containing suggestions from all four workshops.

5.2 LIST OF NEEDS

The state representatives expressed the following needs:

1. A clear definition of the roles of the regional offices and the state energy offices and their relationship.
 - A. Specifically the regional office were requested to do the following (and be supplied with the resources required to do them):
 - Take a more active role in interstate communication and information/material sharing,
 - Be more aware of states' activities,
 - Have available, as needed, more technically qualified personnel with specialized training for major industrial program areas, and
 - Act more effectively as conduits for information and materials from DOE to the states.
 - B. The fact that some regional offices were already doing an excellent job and that initiative to respond to the above does not lie solely with the regional offices was recognized in the workshops. Some states have attempted to by-pass their regional office, giving them no opportunity to serve the state.
2. A more effective mechanism for information flow and communication, DOE-to-region-to-state and state-to-state. Specifically, state energy offices request:

- A. More information from DOE on projects operating or planned within their state, and within their region if relevant. The states want to know about technology demonstration projects outside the state's own region if relevant to the state's own industries; this increases the state's credibility with industry.
 - B. Improved mechanisms for information sharing among states to avoid duplication of effort, (e.g., ten states producing manuals on the same subject), to coordinate efforts, and to exchange ideas that are already successful in other states,
 - C. More meetings like this workshop in which there is interaction and two-way communication between DOE and state personnel,
 - D. More systematic flow of technical information from DOE to state to industry, organized to keep states aware but not overwhelmed by sheer bulk, and
 - E. Means for state personnel to identify and contact the appropriate person with the expertise needed for the state's current problem.
3. Improvements in funding, grant application procedures, and financial arrangements. Specifically states request that DOE and/or regional offices:
- A. Speed up the grant application and review process.
 - B. Allow states to appeal regional office decisions to the federal level.
 - C. Increase funding for technical support.
 - D. Provide more stability of funding to permit states to develop long-range, more effective program plans.
 - E. Provide investment capital for state programs and more funds for demonstration projects and workshops.
 - F. Improve the format of grant application and reporting forms; plan them to be more consistent.
4. Technical assistance to state personnel in the areas of needs assessment and evaluation. Specifically, states feel they need technical training or help in the following areas:

A. Needs assessment:

- Identification of industries in the state and their energy usage and conservation potential so that programs can be targeted more accurately in terms of state resource allocation to achieve greater cost-effectiveness,
- Identification of the needs and wants of the targeted industrial sectors to aid in program design, and
- Ability to recognize which programs are more likely to succeed under their local conditions to aid in program selection. (This capability requires program evaluation).

B. Evaluation:

- Uniform data collection methods throughout the life cycle of the program to permit improvement in the effectiveness of programs in progress, to quantify energy savings and cost effectiveness, to facilitate comparisons among programs (affecting decisions on inclusion or exclusion of program measures), and to allow aggregation and comparison of data across states and regions;
- Establishment of a uniform evaluation methodology that states can be trained to use, that will not be changed often, and that will permit valid comparisons of program evaluation results among programs and across states. The states expressed a need for quantitative evaluation of energy savings to report to DOE, to allow cost-effectiveness comparisons among program measures, and to act as motivation to attract industry's participation in programs (i.e., documented dollar savings for the firm);
- Methodology for qualitative evaluation of program measures, identification of essential factors contributing to success (e.g., why it worked in state X and not in state Y), identification of non-quantifiable benefits or costs, identification of possible improvements, if any, that would increase the energy savings and/or the probability of success (while the program is in operation);
- Development of index numbers such as Btu per unit of output or Btu per dollar value of output that will enable comparisons of cost-effectiveness of conservation programs across industries and sectors;
- Technical assistance, training, and manuals as required to enable future incoming personnel to acquire and use these skills and methodologies; and

- Training of state personnel to use the above methodologies as an integrated, logical and uniform approach to program design, continuous program measure evaluation, program measure justification, and decision-making.
5. Evaluation and standardization of different types of industrial energy audits (which requires a valid and reliable evaluation methodology):
 - A. To determine which types of audits are cost-effective.
 - B. To provide a standardized method and a manual for auditor training and use, for each class of energy audit found to be cost-effective.
 6. Technical training workshops for state office personnel as needed in topics such as evaluation methodology and industrial technology.
 7. Standardization of the more commonly used manuals (such as Waste Heat Recovery, Boiler Efficiency, etc.).
 - A. To combine best features of existing manuals into composite manuals at one or more levels of sophistication as needed.
 - B. To provide camera-ready copy to states as needed and requested.
 - C. To provide a catalog of these manuals with sufficient information to facilitate selection.

6 SUGGESTIONS AND RECOMMENDATIONS PROPOSED BY THE STATES

As the state representatives discussed their needs and problems, they suggested possible solutions and improvements.

6.1 TECHNICAL ASSISTANCE

The states requested increased access to technical assistance (qualified technical personnel and other resources). They saw DOE as one source -- provided either through the regional offices or out of DOE headquarters -- and requested efficient means of locating the appropriate source of the expertise needed. They saw the national laboratories as another source.*

6.2 PROGRAM MATERIALS

The states suggested:

- Preparation by DOE of composite manuals on subjects of wide common interest (such as waste heat recovery) incorporating the best of existing manuals on each such subject and available to the states as camera-ready copy (on request).
- Development of a (briefly descriptive) catalog or annotated bibliography of state program materials (such as manuals) so that states would know what was already available and duplication of effort would be reduced. This would need some mechanisms for frequent, periodical updating.

6.3 COMMUNICATION

Workshop participants requested that:

- Regional office personnel maintain closer contact with their states. This would include more frequent contacts with the state energy offices; increased familiarity with state program activities; a more active role in organizing interstate communication and sharing of information and materials; and more efficient transfer of information from DOE to the state offices.
- Regional offices have more available personnel with technical expertise in major industrial program areas appropriate to regional needs. (Not necessarily as full time employees but as an available resource.)
- State personnel initiate interstate conferences for the purpose of discussing mutual problems and sharing program ideas, materials, and experiences.

*See Appendix B for details about the Federal Laboratory Consortium and how to utilize its services.

- State office and regional office personnel cooperate in improving communications and rapport.
- States be kept informed about DOE projects and other contracts within states and notified of RFPs on which they might bid.
- Mechanisms be developed for improving interstate and DOE-state communication; facilitating coordination and information sharing. One means suggested was planning of future meetings similar to these workshops.

6.4 EVALUATION

The state representatives discussed their problems with the processes of needs assessment, evaluation, and program design. They suggested that methodologies and algorithms be developed for:

- Needs assessment.
- Targeting of appropriate industrial groups with large conservation potential.
- Quantitative estimation of energy savings and cost-effectiveness, to aid in both program design and in justification of and decision-making about program measures.
- Qualitative analysis to understand why a program measure works in one location and not in another to (1) facilitate predictions as basis for using that program measure in another state or (2) understanding how to alter program measures and/or conditions to increase program effectiveness.
- Development of energy indices such as Btu per unit output that will facilitate comparison of program effectiveness across program measures or across states.

6.5 FUNDING

State representatives suggested:

- Revised procedures and application forms to speed up and simplify the grant application process; a single application for related programs.
- Faster turn-around for grant applications, longer lead times, and more flexibility to accommodate state legislative authorization/funding schedules.
- An appeal process from regional office decisions to the federal level.

6.6 ENERGY AUDITS

The state representatives requested that the procedures for industrial energy audits be standardized, quantitatively evaluated to establish which ones are cost-effective, and qualitatively evaluated to help states decide if, when, and how to use them.

APPENDIX A: LIST OF ATTENDEES AT STATE
INDUSTRIAL ENERGY CONSERVATION WORKSHOPS

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IDAHO

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APPENDIX B: THE FEDERAL LABORATORY CONSORTIUM (FLC)

FLC is an informal organization made up of more than 200 federal RD&D laboratories and centers. Each member or group of members has a technology transfer coordinator who maintains contact with the coordinators in other laboratories and other federal agencies across the nation.

The objectives of FLC are to:

- Make RD&D resources funded by the public widely available on a cost-effective and timely basis.
- Emphasize the use of federal laboratories and centers by state and local governments.
- Establish person-to-person contact between the problem and the solution.
- Promote the temporary exchange of personnel between federal agencies and state and local governments for work of mutual concern and benefit.

State offices should contact the appropriate regional coordinator (see next page).

FLC Regional Coordinators at Participating DOE National Laboratories