Managing State Energy Conservation Programs: The Minnesota Experience

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Summary. In fiscal year 1980, the Department of Energy awarded grants for state energy conservation programs that totaled more than $400 million; the proposed figure for fiscal year 1981 is almost $600 million. Many states provide additional funds to implement conservation programs. This suggests that state governments play a major role in delivering conservation services to their citizens and are key agents in the nation's conservation efforts. This article discusses the energy conservation activities and responsibilities of one state energy office, the Minnesota Energy Agency, and the obstacles and constraints it faces in delivering its services. Suggestions are presented for resolving these difficulties and for improving the efficiency with which the agency manages its programs.

During recent years, energy conservation has been recognized as an essential element in the resolution of our energy problems. To a large extent, the burden of implementing government conservation programs falls on the states through the state energy offices (SEO's). This responsibility arose in two ways. First, federal legislation (beginning in 1975) authorized state governments to implement conservation programs. Second, many state legislatures created SEO's and assigned them responsibilities and mandates related to energy conservation.

This article discusses the development and operation of energy conservation programs in one state energy office, the Minnesota Energy Agency (MEA). Our purpose is to analyze the operations and effectiveness of MEA as a critical link in achieving state and national energy conservation goals. In particular, we compare MEA's responsibilities with the obstacles and constraints it faces in implementing these programs. First, we trace the evolution and operation of MEA's Conservation Division (as of early 1980) in terms of its activities, staffing, and budget. Second, we discuss the various problems that the division faces: those that are internally generated, those that are related to Minnesota state government, and those that arise from the federal programs assigned to states. Finally, we present suggestions for resolving these difficulties. Our discussions with staff in other SEO's and in the Department of Energy (DOE) suggest considerable similarity among SEO's with respect to the issues discussed here.

MEA's Conservation Division

Evolution. The MEA was created by the Minnesota state legislature in March 1974 (*1*). The initial legislation gave MEA broad responsibilities, with a strong emphasis on conservation through voluntary efforts, primarily information and education programs. Beginning in 1976, MEA began to receive more regulatory responsibility with respect to the energy efficiency of end-use devices. In 1979 large state and federal grants programs were established to audit and retrofit public buildings.

At present, MEA has 51 state legislative mandates related to conservation (*1, 2*) (Table 1). These responsibilities range from the broad (develop a state plan for energy conservation) to the specific (operate a telephone center for information on energy conservation). The education and information responsibilities include working with the Department of Education on educational programs for all levels, preparing publications, developing radio and television messages, and operating the information center.

The MEA's regulatory responsibilities include development and implementation of standards for materials and installation of insulation, rules limiting outdoor display lighting, minimum efficiency standards for air conditioners, a ban on pilot lights for some gas appliances, coordination with the State Department of Administration on the energy code for new buildings, lighting standards for existing public buildings, and standards for existing residences.

The MEA is also responsible for managing two large federal and state grant programs that provide funds for energy audits and retrofitting schools, hospitals, buildings owned by local governments, and public care institutions. Recent legislation requires MEA to administer a community energy planning grants program. Finally, MEA is expected to work with various state agencies to help them incorporate energy conservation into their plans and programs.

During the past few years, Congress passed several laws to establish and shape the role of states in achieving the nation's conservation goals. Although federal funding for state energy activities was initially used to administer the Mandatory Petroleum Allocation Act of 1973, federal funding was shifted to conservation with passage of the 1975 Energy Policy and Conservation Act (*3, 4*). This act established the State Energy Conservation Program to require state conservation planning, goal setting (to reduce state energy use by 5 percent in 1980), and implementation of mandatory and voluntary programs to achieve state goals.

Programmatic responsibilities were expanded into the areas of education, energy audits, and community outreach with passage of the 1976 Energy Conservation and Production Act and the 1977 National Energy Extension Service Act. The 1978 National Energy Conservation Policy Act (part of the National Energy Act) brought a new role to most states with its large Residential Conservation Service and the Institutional Buildings Grants Program. Thus, federal legislation followed a pattern similar to that at the Minnesota level—from an initial voluntary approach to regulation to large grants programs (Table 2).

The conservation program in Minnesota evolved in several important ways between 1974 and 1980. The initial programs consisted of loosely organized

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projects that bore little relation to each other. In many cases, MEA funded university and consultant projects that did not fit into any overall theme. However, as MEA gained experience and confidence, the state plan changed. The 1980 plan contained far fewer projects than the earlier plans; it focused on a few major conservation issues such as new buildings, audits and retrofits of existing buildings, and community outreach. Also, in the 1980 plan a much larger share of the budget was allocated to in-house activities; a smaller share went to subcontracts (*5*).

Passage of the National Energy Act (*6*) in November 1978 encouraged a major change in MEA's Conservation Division from diffuse, voluntary programs toward larger, more focused efforts. The act includes two major programs that affect MEA. The first is the Institutional Buildings Grants Program, which provides grants to conduct energy audits and to retrofit institutional buildings. The Minnesota share of these federal grants will be about $25 million over a 3-year period. (Total funding is actually twice that amount because federal funds must be matched by state or local funds.)

The second major program to significantly affect MEA is the Residential Conservation Service, which requires gas and electric utilities to offer certain services to their residential customers, including an on-site home energy audit plus assistance in obtaining a contractor and in financing conservation measures. The MEA developed the plan under which the Minnesota utilities will operate this program. Because the Residential Conservation Service will offer substantial services to households, it is likely to have large effects on household energy use. Because the services are so comprehensive, they will provide a strong focal point within MEA for all programs aimed at the residential sector.

Organization and activities. The percentage of MEA's budget allocated to conservation has increased in recent years, primarily because federal conservation funding has increased. The Conservation Division's budget for fiscal year 1980 is about $1.8 million (*7*), or more than 40 percent of the total MEA budget (*8*). Roughly 70 percent of this $1.8 million is from the federal government; the remaining 30 percent is state funds (Table 3). As of January 1980, the Conservation Division's staff totaled 43 persons (Table 3). The division's share of the MEA's staff (40 percent) is almost the same as the division's share of MEA's budget (42 percent).

Community and Special Services has two subactivities. Community Services staff work with communities to organize and operate local energy awareness committees. The committees, in turn, encourage local conservation activities. Special Services includes people responsible for transportation, enforcement of energy conservation laws (*9*), procurement standards for state and local governments, agriculture and land use, and the Residential Conservation Service.

Conservation Research and Development deals primarily with the Institutional Buildings Grants Program. It developed the manuals and training courses related to energy audits, technical assistance, and grant applications. It is responsible for developing retrofit standards for residential units and audit programs for commercial buildings.

Technical Services deals with energy efficiency standards for new buildings (administered by the Department of Administration), analysis of and preparation for the forthcoming federal Buildings Energy Performance Standards, development of workshops and seminars related to energy use in commercial and industrial organizations, and implementation of an education and inspection program for the federal Emergency Building Temperature Restrictions.

Information and Education includes MEA's library, telephone information center, and publications office. The education staff work with the Minnesota Department of Education and the higher education boards to develop curriculums and teacher training programs for all levels.

Conservation Support includes policy analysis, program planning and coordination, and program evaluation. Originally, the focus of this activity was on preparation of state plans for federal programs, such as the state energy conservation plan and the energy extension service plan (*5*). During the past year or two, the scope of their activities has expanded to include analysis of conservation issues (*10*) and evaluation of MEA conservation programs.

Table 1. Energy conservation responsibilities of MEA: state mandates (*1*, *2*).

Responsibility	Year legislated
Information and education phase	
Biennial state energy policy and conservation report	1974
Energy conservation information center	1976
Energy conservation publicity	1977
Regulatory phase	
Outdoor display lighting	1977
Ban on decorative gas lamps	1977
Air conditioner efficiency standards	1977
Ban on pilot lights for some gas appliances	1977
Illumination standards for public buildings	1977
Energy code for new buildings	1977
Collection of energy use data and completion of energy audits at public schools and local government buildings	1977
Energy conservation standards for existing homes and mandatory retrofitting of rental property	1978
Standards for manufacture, labeling, and installation of insulation	1978
Grants phase	
Grants to public schools and local governments for energy audits	1979
Community energy planning grants	1980

Table 2. Energy conservation responsibilities of MEA: federal mandates (*3*, *4*).

Responsibility	Year legislated
State Energy Conservation Plan (five mandatory measures plus state initiatives)*	1975
Supplemental State Energy Conservation Plan (three mandatory measures plus state initiatives)	1976
Residential Conservation Service	1978
Institutional Buildings Grants Program	1978
Emergency Building Temperature Restrictions	1979
Energy Extension Service†	1977

*This program, together with the Supplemental State Energy Conservation Plan, was intended to achieve a reduction in state energy use of at least 5 percent in 1980. †The Energy Extension Service began a set of pilot programs in ten states in 1977. Planning for the national program began in late 1979.

Obstacles to Implementing Programs in the Conservation Division

The preceding section described the broad array of programs administered by the Conservation Division. Although the potential for saving energy in a cost-effective fashion with these programs is large, we are concerned that actual practice falls short of the potential. The purpose of this section is to discuss the problems facing MEA as it tries to carry out its responsibilities.

Problems related to DOE (*11*). As indicated earlier, much of the Conservation Division's budget and many of its responsibilities are derived from federal legislation, as administered by DOE. Each year, MEA prepares a plan for each federal program. The plan is submitted to DOE (usually to the Region 5 office in Chicago), DOE staff review the plan, MEA revises it, and funds are provided by DOE for MEA to implement the plan.

Before this process can begin, however, DOE prepares rules governing the program. These represent DOE's interpretation of the legislation; they are published in the *Federal Register*, first as proposed rules and then as final rules. The time between publication of the proposed rules and the final rules is used to collect comments (obtained through public hearings and from written testimony) that DOE uses to prepare the final rules. Typically, at least a year passes between passage of federal legislation and publication of the final rule.

From the perspective of an SEO, these delays are expensive. The state must provide its own funds to participate in the rule-making process and to prepare its state plan. The Institutional Buildings Grants Program required both an application and a plan (which required a great deal of the division's time and effort). Federal funding for the program did not include the costs of preparing either the application or the plan. Thus, participation in these federal programs requires the state to make "up-front" investments that are not repaid by federal grants.

A second problem related to participation in federal programs concerns technical assistance (*12*). In principle, DOE should (and would like to) assist the states in running these programs. Such assistance would eliminate the need for each state to develop its own workshop, manual, computer program, and so forth. For example, staff involved in the Institutional Buildings Grants Program in Minnesota prepared detailed manuals on energy audits, engineering audits, and grant applications. A set of three workshops corresponding to the three manuals was also developed. Similar activities were undertaken in other states. Surely, development of a "model" set of manuals and workshops would have been much more cost-effective and would have enabled each state to implement its program more quickly and more competently. Unfortunately, DOE did not provide such technical assistance (*13*). On the other hand, DOE recently developed a model audit for the Residential Conservation Service that the states can use, modify, or ignore (*14*). This technical assistance will be very useful to the states.

The states also face problems associated with the complexity, detail, and prescriptive nature of the rules for these federal programs. The final rules for a typical DOE program occupy dozens of pages of small type in the *Federal Register*. An extreme example is the Residential Conservation Service, for which the final rules required 124 pages in the *Federal Register*. Staff of SEO's must read, understand, and comply with a bewildering array of regulations. As an example, consider this excerpt from the rules for the Institutional Buildings Grants Program (*15*).

> Subject to the approval of the Secretary, a State shall develop procedures for establishing the qualifications of auditors who will conduct energy audits in accordance with Subpart B of 10 CFR Part 455 which—(a) Ascertain that a person conducting the audits [is] qualified by virtue of successful completion of an approved training program or demonstration of equivalent skills gained by prior training and experience, together with familiarity of the systems and operations of the types of buildings being audited. . . .

It is unlikely that DOE intentionally complicates the rules for its programs. The complications occur, we believe, because DOE staff do not understand the realities of implementing conservation programs at the state level (*16*). For example, applications for the technical assistance phase (detailed engineering audits) under the Institutional Buildings Grants Program require each applicant (school, district, hospital) to comply with nine different sets of federal regulations concerning cost standards, procurement practices, environmental impacts, and civil rights. The amount of paperwork is staggering.

Our final concern with respect to federal influence on state conservation programs is the multiplicity of state plans required. Because of the way programs were created by Congress, SEO's are required to complete separate plans each year for the State Energy Conservation Plan, Supplemental State Energy Conservation Plan, Energy Extension Service, Institutional Buildings Grants Program, and Residential Conservation Service. In addition, another state agency (generally the Office of Economic Opportunity) prepares a plan for the federal low-income Weatherization Assistance Program. Each of these plans is submitted to the DOE Office of State and Local Programs, which is considering ways to simplify the process and reduce the number of plans that each state must submit. In addition, Congress is considering legislation—Energy Management Partnership Act—that would consolidate these programs. Until then, however, states are burdened with duplicative planning efforts. In addition, these plans and programs require separate budgets and accounts, which further complicates their implementation by the SEO's.

Problems related to Minnesota state government. Being part of state government introduces additional obstacles to efficient implementation of MEA's conservation programs. Perhaps the most important relates to crisis management. The MEA receives a steady stream of phone calls, mail, and visits from Minnesota citizens, businesses, and the legislature. Responding to these requests (which is important) takes a great deal of staff time, time that cannot be devoted to planning and managing conservation activities. The problem is particularly acute with requests from the legislature, which must be answered promptly. Under these conditions, it is difficult for the staff to pay attention to long-term commitments (*17*).

Another problem is the reluctance of state government to provide additional staff positions and funds to any state agency, including MEA. This is undoubtedly a reflection of increasing public dissatisfaction with taxes and government inefficiency. Thus MEA, with a staff of 130, is subject to the same constraints as is the Minnesota Department of Transportation, which has a staff of 4500.

The MEA is also subject to state rules related to personnel—hiring policies, position descriptions, and salary levels. These practices limit the flexibility and speed with which MEA can hire, promote, or fire staff. Therefore, it is difficult for MEA to attract capable people, pay them adequately, and retain them (the average age of the professional staff in MEA's Conservation Division is 34 years; the average length of time with

MEA is 1.5 years; and the average salary, $17,700). For example, the division wanted to hire an engineer who worked for a private company in Minneapolis; the maximum allowable salary was $10,000 less than the person was earning.

The combination of low salaries and inertia in the state personnel system leads to rapid turnover, which, in turn, negatively affects program continuity and institutional memory, important elements of effective program implementation. (On the other hand, these factors yield a staff at MEA which is highly motivated and which works quite hard.)

Problems within MEA. Certain conditions within MEA add to the problems already discussed. Many of these problems derive from the crisis atmosphere, the youth of the staff, and the high turnover. The Conservation Division is not able to devote sufficient attention to long-term issues such as documentation of ongoing program activities, careful planning and coordination of new programs, and evaluation of past and present programs. Because there is so little time to spend on these activities, programs are developed in a disorganized fashion. For example, division staff have never found time to carefully estimate the energy (and other) benefits of their ongoing and planned programs and to compare these benefits with the costs of running each program. This kind of analysis could be used to develop priorities among programs that compete for MEA staff and funds.

As another example, until early 1979 the effects of MEA's conservation programs had never been evaluated. During 1979, a considerable effort was made to develop and apply methods to evaluate several MEA conservation programs (*18*, *19*). Similarly, until early 1980 very little attention was devoted to analysis of energy conservation issues in Minnesota. However, MEA now has a full-time senior energy analyst responsible for these policy issues.

Cooperation and coordination between the Conservation Division and other divisions are inadequate. For example, encouragement of passive and active solar systems in buildings should be coordinated between the Conservation and Alternative Energy divisions. Similarly, the development and use of energy forecasting models should be coordinated between the Conservation Division and the Data and Analysis Division. Unfortunately, heavy work loads, different priorities, and diverse professional backgrounds inhibit such interactions.

Perhaps because MEA staff are so busy (and relatively inexperienced), there is a tendency to ignore related work under way in other states and in the federal government. Devoting more attention to related projects outside MEA would enhance program performance.

Table 3. Organization, staffing, and budgets for MEA's Conservation Division in early 1980.

Activity	Staff*	FY 1980 budget (millions of dollars)
Community and Special Services	10	0.36
Conservation Research and Development	9	0.40†
Technical Services	5	0.33
Information and Education	13	0.48
Conservation Support	6	0.27
Total	43‡	1.84

*Full-time equivalents. †This figure does not include $5 million in state grant funds for audits of public schools and local government buildings. Nor does it include federal grant funds (most of which are provided directly from DOE to the institutions) for audits and retrofit measures. ‡In addition, there were 12 vacancies in the division in January 1980.

Possible Solutions

The previous section presents a discouraging list of problems that inhibit implementation of effective state conservation programs in Minnesota (and surely in other states as well) (*12*). A key issue is whether these problems can be resolved, and if so, how. We believe that government actions are needed to spur implementation of conservation measures in the private sector. Therefore, it is important that government programs be intelligently chosen and efficiently operated.

Solutions related to DOE. There are a number of steps that DOE and Congress can take to reduce the burdens imposed on the states by program planning, funding, and management responsibilities. The proposed Energy Management Partnership Act is a step in the right direction, because it would consolidate several existing state conservation programs. This would allow the states to prepare a single plan each year that included an integrated set of programs and a single budget.

Congress and DOE should place much greater emphasis on careful planning and evaluation of conservation programs. A key element here is the use of pilot programs, as was done with the Energy Extension Service. Operating a program for a year or two in a few states allows time to "debug" the program and to share information on results with other states.

In addition, DOE should provide more technical assistance that is prompt and sharply focused on issues of concern to the states. We think that many of DOE's technical assistance activities have been largely irrelevant to state needs and interests because there was insufficient prior consultation with SEO staff. Typically, the work statement for such a project is developed by DOE headquarters staff and the project is conducted by a consulting firm, often located in the Washington, D.C., area, with little experience working for state governments. To improve the quality of interaction between DOE and the states, we urge DOE headquarters staff to spend more time in the field visiting states; we also encourage temporary exchanges of staff (as through the Intergovernmental Personnel Act).

Finally, DOE should strive to maximize the flexibility and discretion allowed the states as DOE staff prepare the rules for implementing each conservation program. Where the congressional mandate (as expressed in the original legislation) complicates implementation, DOE should seek congressional support to modify the legislation.

Solutions related to state government in Minnesota. Key issues here are the size and budget of MEA compared to other state agencies and the different levels of importance of the problems dealt with by these agencies. Because of the considerable inertia in state government, changes occur incrementally. Unfortunately, most social problems do not appear in such a gradual fashion. The governor and legislature need to assess the importance of different programs across agencies as well as within agencies.

The problems associated with hiring staff and paying competitive salaries are tougher to deal with. People with energy-related expertise are very much in demand and command higher salaries than they would with the same educational and work backgrounds in other areas. However, state personnel systems that deal with all state agencies are generally unable to make exceptions.

Solutions within MEA. Recent actions to hire two professionals responsible for policy analysis and program evaluation will help resolve some of the difficulties created by MEA. Meanwhile, the staff continues to gain experience and will learn to deal with frequent crises in a way that does not disrupt day-to-day operations.

Additional efforts must be made to improve interaction between the Conservation Division and the Data and Analysis Division. Outputs from evaluations of conservation programs should be used in developing improved models that project future energy uses. Also, the quantitative analytical tools developed by the Data and Analysis Division should be used within the Conservation Division to plan and target conservation programs more carefully.

Conclusions

The conservation-related responsibilities assigned to SEO's by state legislatures and the federal government have greatly increased in recent years. It is likely that this trend will continue, since the importance of energy conservation is becoming more recognized and since state governments are well positioned to carry out conservation programs.

Our concern is that state conservation programs are achieving far less than their potential. To some extent, of course, this is due to growing pains. Most SEO's have only been in existence for a few years (MEA, one of the oldest, was created in 1974). As the SEO's gain experience in running these programs, in dealing with DOE (which is also experiencing growing pains), and in working with other state agencies, many of these problems will be alleviated.

Development and implementation of energy conservation programs (indeed, of any government program) takes several years (*12*). Federal and state legislation (and DOE rules for federal programs) must recognize these institutional delays and provide long-term, stable program guidance and funding. Programs launched with high expectations have suffered because they were not supported by adequate budgets. For example, the federal Institutional Buildings Grants Program was created with only a 3-year lifetime and a budget sufficient to retrofit only a small number of the nation's institutional buildings. Beginning the program with a 1- or 2-year pilot effort in a few states would have provided the experience needed to improve the program. This pilot effort could have been followed by a 5- or 10-year national program to audit and retrofit most of the eligible buildings.

Because of the inevitable delays and inefficiencies in government programs, much more attention must be devoted to policy analysis, program planning, and program evaluation (*12*). These activities can provide reliable information on which programs work well and why and on likely targets for future programs. Without such efforts, programs will continue to develop in an ad hoc, intuitive fashion, with insufficient attention given to the lessons from past programs.

Government efforts must be directed toward conservation issues (such as retrofitting rental housing) that are clearly not being acted on adequately by the private sector. This requires sophisticated market analysis by government agencies to ensure that programs are designed to meet the needs of specific groups (for example, the concerns of small industrial firms are very different from those of large manufacturers; government programs should not treat the industrial sector as a homogeneous entity). We cannot assume that all government programs improve operation of the market system.

Finally, the different types of government activities (education, regulation, information) need to be combined into mutually reinforcing programs. A good example is the federal Emergency Building Temperature Restrictions (*20*). The DOE established the program in such a way that compliance inspections (to determine whether buildings met the temperature limits) were used primarily to educate building managers on efficient operation of their building. This approach built goodwill, provided on-site education, and ensured that buildings complied with the regulations.

References and Notes

1. "Minnesota Energy Agency," Minnesota Statutes, chap. 116H (1974) and subsequent annual revisions.
2. T. Bøck, *Analysis of Staffing Needs at the Minnesota Energy Agency* (Minnesota Department of Administration, St. Paul, 1980).
3. Assistant Secretary for Conservation and Solar Energy, *Energy Conservation Program Summary Document FY 1981* (Department of Energy, Washington, D.C., 1980).
4. Assistant Secretary for Conservation and Solar Applications, *State and Local Programs Multi-Year Plan FY 1980-84* (Department of Energy, Washington, D.C., 1979).
5. Minnesota Energy Agency, "State Energy Conservation Plan 1980," submitted to the Department of Energy (1980); see also earlier annual plans.
6. *National Energy Conservation Policy Act* (PL 95-619, 95th Congress, 1978).
7. More than half of MEA's FY 1980 budget is for grants to institutional buildings. Because the funds are part of a temporary program, we exclude them from the present discussion.
8. The other units within MEA are: Office of the Director, Office of Policy Information, Data and Analysis Division, Alternative Energy Division, and Administration Division.
9. Although the state legislature passed several laws that mandate certain energy conservation actions (Table 1), MEA has not pursued its enforcement responsibilities.
10. Minnesota Energy Agency, "Energy Policy and Conservation Report" (January 1978).
11. Several of these issues are covered in greater detail in Office of Technology Assessment, *Conservation and Solar Energy Programs: A Critique* (U.S. Congress, Washington, D.C., 1980).
12. Energy and Environmental Analysis, Inc., "An Evaluation of the State Energy Conservation Program from Program Initiation to September 1978," prepared for the Department of Energy under contract DOE/CS/1697-01 (1980).
13. Inadequate technical assistance is due to a combination of factors: lack of time, lack of funds, and a cumbersome procurement process in DOE.
14. Office of the Assistant Secretary for Conservation and Solar Energy, *Residential Conservation Service Model Audit* (Department of Energy, Washington, D.C., 1980).
15. Department of Energy, *Fed. Regist.* **44**, 64 (1979).
16. During 1979, no one from DOE's Office of State and Local Programs visited MEA. This supports the notion that DOE headquarters staff do not understand the environment, responsibilities, and constraints faced by SEO staff.
17. For example, MEA's biennial report (*10*) (a legislative mandate contained in the original 1974 state law) was due in January 1980. As of June 1980, the report was not finished.
18. E. Hirst, *Minn. Energy Rev.* **2**, 3 (1979).
19. _____ and P. Lazare, *Evaluation of a Computerized Home Energy Audit in Minnesota* (Oak Ridge National Laboratory, Oak Ridge, Tenn., 1980).
20. Department of Energy, *Fed. Regist.* **44**, 130 (1979).

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