DEVELOPMENT OF A STATE-LEVEL COLLABORATIVE DSM RESEARCH CENTER

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In recent years, collaborative efforts to research, design, plan, and evaluate DSM programs have evolved in a number of states and regions across the U.S., including California, Illinois, Minnesota, North Carolina, the Northeast, and New England. This paper reviews the development of one of the newest of these collaborative efforts, the Wisconsin Center for Demand-Side Research (WCDSR).

Developed cooperatively over a two-year period by the Wisconsin energy utilities, Public Service Commission of Wisconsin, and the University of Wisconsin, the WCDSR has the following characteristics: a board and supporting technical committees including representatives from all participating organizations; five major research programs, including public policy, planning and forecasting, pricing, technology, and customer and market research; a comprehensive, long-term research agenda designed to provide focus for Center activities; and a commitment to the performance of both basic and applied research, pursued in-house, by University of Wisconsin faculty, and by private contractors.

In reviewing the development of the WCDSR, this paper highlights the following issues:

- 1. Lessons learned from background research into the structure and functioning of other collaborative regional DSM research efforts.
- 2. The process used to build consensus on the need for, and desirable structure of, a state-level DSM research center in Wisconsin.
- 3. The process used to develop the long-term research agenda noted above.
- 4. The organizational structure of the WCDSR.
- 5. The applicability of Wisconsin's experience in establishing the WCDSR to other collaborative DSM efforts.

INTRODUCTION

In recent years, collaborative efforts to research, design, plan, and evaluate DSM programs have evolved in a number of states and regions across the U.S., including California, Illinois, Minnesota, North Carolina, the Northeast, and New England. This paper describes the development and structure of one of the newest of these collaborative efforts, the Wisconsin Center for Demand-Side Research (WCDSR).

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The remainder of this paper is divided into four sections. The first section provides background relating to the development of the WCDSR, including discussions of the general condition of the DSM industry in Wisconsin, reasons for initial interest in a state-level research center, and the federal grant program under which the effort to establish the Center was initiated. The second section describes the processes, both political and analytical, that were used to establish the WCDSR and determine its structure. The third section describes the WCDSR as it now stands, including discussions of corporate organization, funding, structure of the board and supporting technical committees, and the long-term research agenda. Finally, the last section discusses some of the implications of the Wisconsin experience for other attempts at state- or regionallevel DSM collaboration.

BACKGROUND

Between 1985 and 1987 the combined DSM budgets of Wisconsin's 10 class A gas and electric utilities increased from \$35 million to approximately \$130 million. In the same period, these utilities made major efforts to increase both the quantity and the quality of their supporting DSM research efforts. Significant increases in funding were dedicated to program evaluation, market research, technology assessment, development and demonstration projects, and the development of improved planning and forecasting methods.

Despite this extra effort, by 1987, the Public Service Commission of Wisconsin (PSCW) had become concerned about the adequacy of DSM research efforts in Wisconsin. Three concerns were paramount. First, despite the best efforts of all concerned, the level of DSM program activity appeared to be rapidly outstripping the capacity of regulated utilities to conduct needed supporting research. Second, increasing levels of duplication of effort were becoming evident. Finally, data, project reports, and other end-products of research were proliferating, but often were not being compared, compiled, or reconciled with one another.

All three of these concerns led the PSCW and its then chairperson, Mary Lou Munts, to become interested in the possibility of a collaborative statelevel research center. Reports from other states in which such centers had been developed, notably Kansas and North Carolina, suggested that a collaborative effort might help to reduce duplication of effort, leverage the research capabilities of Wisconsin organizations, and act as a central repository of all the data being produced by disparate organizations.

Despite the PSCW's interest in the possibility of developing a collaborative research center, staffing limitations initially prevented the agency from taking any action. Then, in early 1987, the PSCW was notified of a competitive grant opportunity being offered under the U.S. Department of Energy's Least-Cost Utility Planning Program. The agency responded with a proposal to analyze the feasibility of a state-level research center. In July, 1987, this proposal was accepted, and the effort to develop the WCDSR was underway.

THE PROCESS

The development of the Wisconsin Center for Demand-Side Research was a protracted process involving contributions from a bewildering array of stakeholders. Any attempt to summarize this process is therefore doomed to incompleteness. In the exposition that follows, the guiding assumption is that the facts most worth recounting are those which are most likely to be useful to others attempting to build collaborative DSM processes. Major issues to be discussed include the background research that was conducted to shed light on the theoretical issues involved in collaborative research; the composition and functioning of the two state-wide committees that were responsible for developing the WCDSR; and approaches followed to solve the numerous practical obstacles to the development of a collaborative research center.

Background Research

The PSCW began its analysis of the potential for a collaborative research center by conducting background research into a number of related issues. Two of the most critical of these issues are reviewed here. First, what other regional DSM research centers had been developed, and what could be learned from their experiences? And second, what inferences could be drawn from the experiences of national energy research organizations, both in the general organization of their research efforts and from their interactions with Wisconsin organizations?

In conducting background research into the experiences of other states, we were surprised twice. The first surprise was the large number of states and regions which had already developed cooperative energy research centers. In the course of our research we forged connections with the Kansas Electric Utilities Research Program, the North Carolina Alternative Energy Corporation, the California Institute for Energy Efficiency, the Minnesota Cold Climate Building Research Center, the New Jersey Energy Conservation Laboratory, the New York State Energy Research and Development Authority, the Northeast Demand-Side Data Exchange (NORDAX), and the Northern Illinois Alliance for Least-Cost Planning. All of these organizations had something useful to tell us about collaborative R&D, ranging from the importance of diverse technical committees, to the difficulty of mandating cooperation, to the need to strike a balance between basic and applied research.

Our second surprise was the number of states that were acutely interested in the potential for collaborative research. As word of the Wisconsin effort spread, the PSCW began to receive calls from other states contemplating similar efforts. Along with the track record of the existing centers, these reinforced our belief that we were dealing with an idea whose time had come.

In studying national energy research organizations, primarily the Electric Power Research Institute (EPRI) and Gas Research Institute (GRI), we focussed on the way in which these organizations interacted with the potential sponsors of a Wisconsin research center. We quickly discovered that, while Wisconsin organizations were generally quite satisfied with the work done by EPRI and GRI, there was a sense that there remained many research questions which were either too regionally specific, too applied, or too much of a departure from the national research agenda to be addressed at a national level. We also discovered that EPRI was aware of these limitations, and as a result was generally supportive of collaborative regional research efforts. Finally, we discovered that the flow of funds out of Wisconsin, in the form of contributions to EPRI and GRI, was less than the flow of funds into Wisconsin, in the form of research contracts. As in the case of our communications with other states, these findings convinced the PSCW that a state-level research center offered sufficient potential benefits to justify broadening the scope of the inquiry.

One result of this background research was two discussion papers, one describing existing research centers and the other attempting to establish a framework for assessing what issues could profitably be researched at the state level, given the experience of other states (Prahl 1988a, 1988b.)

The Energy Utility Research Working Group (EURWG)

The next step in assessing the potential for a statelevel research center was to develop a forum where potential stakeholders could discuss and analyze relevant issues. For this purpose, the PSCW enlisted the aid of the Wisconsin Public Utilities Institute (PUI), a research and education center affiliated with the University of Wisconsin. In December, 1987, the PSCW and the PUI established the Energy Utility Research Working Group (EURWG), a large committee consisting of both senior and midlevel executives from Wisconsin utilities, energy researchers from the University of Wisconsin, several intervenors, and staff and one commissioner from the PSCW. The EURWG was to become the focus for all the remaining stages in the development of the WCDSR.

With the establishment of the EURWG, what had heretofore been essentially a regulatory project became a truly collaborative one. While at first there was little agreement regarding basic issues such as the adequacy of existing DSM research efforts or the viability of a state-level effort, the spirit of the committee was from the start highly cooperative and constructive. EURWG participants committed themselves to a lengthy, detailed analysis of the issues involved despite the initial reservations of some committee members.

Early meetings were dedicated to exchanging basic information, including review of the discussion papers discussed above, reports on research being conducted by participants, and presentations by EPRI and GRI. The focus then turned to more complex issues, including: the relative need in Wisconsin for supply- versus demand-side research, as well as for long-term versus short-term research; the potential contributions to be made by the utilities, university system, and state agencies; and the types of research which could best be approached collectively rather than individually.

Gradually, as committee members shared both information and perspectives on these issues, a consensus arose that some sort of jointly funded research mechanism offered substantial potential to help improve the effectiveness of the state's DSM efforts. There was, however, little agreement on how such a mechanism should be structured, whether it should be formal or informal, how large it should be, or what specific types of research it should conduct. At its meeting on May 10, 1988, the EURWG agreed to proceed with a more specific analysis of these issues.

The Agenda and Structure Committees

At this point it was agreed that the EURWG should divide into two subcommittees. The first of these, the Agenda Committee, was charged with developing a detailed research agenda for a new state-level research center. The second, the Structure Committee, was to use the work produced by the Agenda Committee to decide whether or not to proceed with the development of a state-level research center and, if so, to establish its organizational structure. With the exception of the University participants, the composition of the Structure and Agenda committees reflected the hierarchical structures of the participating organizations; many Agenda Committee members were mid-level managers responsible for DSM efforts within their organizations, while most Structure Committee members were senior executives with a broader scope of responsibilities. In essence, then, DSM practitioners were provided with a collective opportunity to make the case for a state-level research center to their managements.

The Agenda Committee met throughout the Summer of 1988, in an atmosphere as collegial as that of the EURWG. The following process was followed:

- 1. Developing a mission statement and a corresponding set of overall research objectives for the state-level mechanism.
- 2. Brainstorming to develop specific researchable questions addressing the mission statement.
- 3. Categorizing researchable issues into research programs.
- 4. Selecting and prioritizing specific initial research projects.
- 5. Developing base-level activities to be conducted continuously by the state-level mechanism.
- 6. Developing and prioritizing criteria for the selection of future research projects addressing the specified researchable questions.
- 7. Assessing the issue of who--contractors, in-house staff, or university faculty--could best do the research specified.
- 8. Analyzing the costs and benefits associated with the proposed research agenda represented by (1) through (7).

The resulting research agenda was presented to the Structure Committee. At its meeting on September 26, 1988, the Structure Committee reviewed the agenda, and reached an agreement to proceed with development of the center.

Establishing the Mechanism

The next year was spent in constructing an organizational structure that could address the agenda produced by the Agenda Committee. A host of issues needed to be addressed, including: legal status of the research mechanism, by-laws, funding methods, budgets, staffing, policy oversight, supporting technical committees, finding office space, recruiting a director, and hiring staff. With few exceptions, these issues turned out to be more time-consuming than they were problematic. Some responsibilities were delegated to the Agenda Committee, while others were carried out by small, ad-hoc sub-committees.

One issue which did cause controversy was the necessity of developing a structure appropriate to the performance of both basic and highly applied research. A number of options were considered, including developing two separate but tightly linked mechanisms; specifying the relative emphases and funding methods for each type of research in the mechanism's charter; and having the mechanism led by co-directors, one from the corporate and the other from the academic world. In the end it was agreed that the bulk of research to be conducted would be applied, and that the approach to basic research should thus be incorporated into the overall structure of the mechanism.

In approaching this and other structural issues, the diverse composition of the EURWG offered two advantages. First, because committee members varied widely in their organizational backgrounds and areas of expertise, it was always possible to find someone with the special resources needed to do specific tasks, whether these involved scoping the market for office space, planning the campaign to recruit an Executive Director, or preparing by-laws in a legally acceptable format. Second, through the experience of working together on such concrete, highly defined tasks, linkages were established between several groups that had hitherto been relatively isolated from one another.

By the Fall of 1989 most of the needed tasks had been completed, and the new mechanism, named the Wisconsin Center for Demand-Side Research (WCDSR), was ready for action.

THE RESULT

After two years of intensive planning involving most organizations involved in DSM activities in Wisconsin, the WCDSR finally began operating in January of 1990. This section provides a discussion of the Center's most important characteristics, focussing first on the research agenda discussed above, and then on organizational structure. A more detailed review of these issues can be found in a summary book produced by the EURWG (EURWG 1989.)

Research Agenda

The research agenda developed to help provide long term guidance and direction to the WCDSR has the following components: an overall mission statement and four corresponding major research objectives; a list of base-level activities; a list of initial research projects; five long-term research programs; and a list of criteria for the selection of future research projects.

Mission and Research Objectives. The overall mission of the WCDSR is to help increase the efficiency with which energy resources are used in Wisconsin. The four major research objectives which correspond with this mission are: to undertake those activities that are reasonable and appropriate for meeting DSM research needs in Wisconsin; to foster improved communication among the various groups concerned with DSM issues; to enhance the continuing growth in knowledge and skills of individuals involved with DSM issues; and to make better and more effective use of the technical and financial resources available to conduct demand-side research in Wisconsin.

Base-Level Activities. Base-level activities are those which must be conducted continuously in order to meet the goals of the WCDSR. Examples of baselevel activities called for in the WCDSR's charter are: maintaining a database and library of DSM programs and technologies with emphasis on their usefulness for Wisconsin; maintaining a directory of research being conducted by Wisconsin organizations; publishing periodic summary reports of completed research, along with evaluations of their applicability to Wisconsin; and holding an annual conference to facilitate the exchange of technical information between Center sponsors.

Initial Projects. Initial projects are those which the Agenda Committee regarded as sufficiently important that they should be conducted before the rest of the research agenda was addressed. Examples of initial projects called for in the WCDSR's charter are: assessing the market penetration, technological, economic, and marketable potential of selected enduse technologies; analyzing regulatory incentives to stimulate utility pursuit of energy efficiency; and developing and extending useful approaches to segmenting the market for energy improvements at the state level.

Research Programs. In addition to specific baselevel activities and initial projects, the WCDSR's agenda delineates five general research programs around which the Center's activities are intended to be organized. These are: public policy, planning and forecasting, demand-side pricing, demand-side technologies, and customer and market research. Within each of these programs, numerous specific researchable issues were developed. Examples of these researchable issues include: evaluation of state-wide fuel selection issues; evaluation of planning and forecasting tools; analysis of the development of norms and values relating to energy use; and assessment of pricing issues relating to service reliability and service quality.

Criteria for the Selection of Research Projects. The final component of the WCDSR's agenda is a set of criteria for the selection of specific research projects responsive to the researchable questions noted above. These criteria were ranked using a balloting procedure. Examples of resulting criteria are: the magnitude, timing and distribution of costs and benefits resulting from the project; the appropriateness of a state-level approach to the project; and the difficulty of obtaining the desired information from studies already completed elsewhere.

Structure

Corporate Organization. There was general agreement within the EURWG that the research agenda developed by the Agenda Committee could best be

addressed by a private, non-profit corporation. Among the advantages promised by this form of organization were flexibility, ease of funding, a reduction in the amount of paperwork needed to maintain the organization, and the possibility of obtaining tax-exempt status. However, it was quickly learned that, while it would be easy to incorporate, attaining recognition from the Internal Revenue Service as a non-profit organization was another matter. Several of the other collaborative organizations canvassed had spent much of their infancy in this effort. Thus it was decided that the WCDSR would initially be housed legally within an existing non-profit corporation dedicated to the incubation of new research consortia, known as Wisconsin for Research, Inc. Then, after non-profit status had been attained, the WCDSR would become fully independent. This arrangement offered several additional advantages, including administrative support, the availability of appropriate office space, and expert assistance in the minutiae of establishing a new non-profit corporation.

Staffing. The initial charter of the WCDSR allows for an Executive Director, several permanent professional and technical support positions, and project positions to conduct short term work. In addition, in order to encourage linkages between Center sponsors, the charter calls for the establishment of visiting fellowships, under which employees of sponsoring organizations would spend several months at a time working at the Center, and graduate student fellowships, under which students would work on Center projects as part of their educational career.

Board of Directors. Policy direction is provided by the Board of Directors, which consists of 11 members distributed as follows: one member appointed by the CEO of each of the six major participating utilities; two members appointed by the Chancellor of the University of Wisconsin-Madison; one member appointed by the Executive Director of the Municipal Electric Utilities of Wisconsin; one member representing the PSCW, appointed by the Chairperson of the PSCW; and one member representing the public at large, also appointed by the PSCW Chairperson. Initial appointees to the board consisted primarily of members of the Structure Committee. Research Advisory Council. In addition to the Board, a Research Advisory Council (RAC) provides technical assistance and advice to the Executive Director of the WCDSR in executing policy. It does so in three ways: first, by providing direct input regarding Center actions; second, by referring the Center director to other existing sources of expertise; and third, by assisting the Center director in establishing new ad hoc committees to provide guidance and advice on specific projects or programs. Like the board, the RAC consists of 11 members, with each member of the board nominating one member to the RAC. As in the case of the board, the initial composition of the RAC evolved largely from that of the Agenda Committee.

Funding. The bulk of WCDSR funding is to be provided by participating utilities, with specific allocations based on a slight modification of a longstanding formula for joint efforts conducted by members of the Wisconsin Utilities Association. In addition, the State of Wisconsin provided a \$260,000 grant to help the Center in its first year of operation. All told, the first year budget of the Center is \$1 million, slated to increased to approximately \$1.8 million in later years.

Research Process. Research projects are to be conducted in-house, by Center staff; by outside contractors, recruited through competitive Requests for Proposals; and by faculty and students at the University of Wisconsin, recruited through a competitive, peer review-based funding process.

Lifespan. A central tenet of the EURWG in its deliberations was that the WCDSR's continued existence should be dependent on its demonstrated worth, but that it should be given sufficient time to demonstrate this worth. Toward this end, it was agreed that the WCDSR should have an initial life-span of five years. At the end of the third year an evaluation of the Center's cost-effectiveness is to be conducted, and a decision made on whether or not to renew its existence for an additional five years.

IMPLICATIONS

As we have already noted, attempts at state and regional DSM collaboration have been rife in recent years. However, with few exceptions (Collins 1988;

Camera et al. 1989), the experiences of these efforts at collaboration have not been formally disseminated to the DSM community. In this section, we attempt to crystallize some of the lessons learned in the process of developing the WCDSR, with emphasis on their applicability for other would-be collaborators.

- 1. Collaboration cannot easily be mandated. As a regulatory agency, the PSCW probably could, if it had so chosen, have mandated the establishment of a state-level research center. However, both common sense and communications with other states which had undertaken similar efforts suggested that such an approach would have doomed the center to internecine conflict and an uncertain future. The cooperative approach chosen resulted in a good deal of enthusiasm among the participants in the process, as well as a mutual commitment to the goals of the Center once it had been developed. Whether the cooperative approach will enhance the effectiveness of the WCDSR as it develops remains to be demonstrated; however, the enthusiasm of its sponsoring organizations, born of cooperation, appears to bode well.
- 2. An important side-effect of the collaborative process, beyond the stated goal of the collaboration, is the nurturing of informal inter-organizational linkages. In the case of the development of the WCDSR, the two-year process of establishing a formal collaborative mechanism created informal ties between a number of groups that had previously been relatively isolated from one another. Not the least of these linkages was that between the University of Wisconsin on one hand, and the utilities and state government on the other. DSM practitioners have become more aware of the technical resources of the University, and several university faculty members appear to have increased their interest in current issues relating to DSM. These ties show signs of extending beyond the limits of the collaborative process represented by the WCDSR.
- 3. To be successful, collaborative processes require the participation both of a wide array of stakeholding organizations, and of a wide range of individuals within these organizations. The first part of this

assertion is a commonplace; the second, somewhat less obvious. One of the apparent strengths of the framework in which the WCDSR was developed was the involvement of both senior and mid-level members of participating organizations. Mid-level representatives provided the technical direction, while senior representatives had the authority to make policy and to commit their organizations to agreedupon courses of action. Participation of policymakers alone would probably have resulted in too shaky a technical framework, while participation of DSM specialists alone could have resulted in an insufficient institutional commitment on the part of participating organizations. Collaborative DSM processes between organizations, then, may need to encompass the hierarchical structures of participating organizations within their own, usually non-hierarchical structures.

4. To be successful, collaborative DSM research efforts require a clear vision of what research is to be conducted. When the effort to establish the WCDSR was initiated, Wisconsin had only a sense that its level of DSM activity was increasing too rapidly for needed research efforts to keep pace. Gradually, through the collaborative process, a much clearer vision has developed. The WCDSR is now seen as a mechanism for sharing and centralizing data produced by participating organizations; a means of bringing the University of Wisconsin into the DSM planning process; a resource to conduct research that is too expensive or broad in scope for one utility to undertake, but too regionally specific for national research organizations to pursue; and a means of approaching contentious analytical issues outside the adversarial arenas of rate cases and other regulatory proceedings. Further, a highly specific, long-term research agenda is in place to guide the WCDSR through its formative years.

5. Conditions are ripe for collaborative DSM efforts in many parts of the country. This is evidenced first, by the large number of other states where such efforts have been initiated, roughly simultaneously; second, by the widespread interest taken in the Wisconsin effort by organizations outside of the state; and third, by the fact that many of the conditions which led to the development of the WCDSR, including rapidly expanding levels of DSM investment, widespread duplication of research efforts, and an established framework for least-cost planning, are becoming increasingly common.

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