

EVALUATION OF WISCONSIN'S PUBLIC BENEFITS RENEWABLE ENERGY PILOT

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ABSTRACT

The \$1 million “market transformation” Demand-Side Applications of Renewable Energy (DSARE) pilot program supports renewable energy and daylighting applications with two separate components (Wichert, 2000). We evaluated it looking for *overall, initial indications of market effects* by surveying “suppliers” before and after the 15-month pilot program. Early findings confirm renewable suppliers are mostly small firms needing support developing management and marketing plans; and potential customers lack awareness and knowledge of renewables and daylighting. The pilot did not produce measurable changes in suppliers’ businesses. The daylighting training, tightly focused on office and school applications, increased participants’ knowledge. The broad approach of the renewables program supports any renewable technology or application. Consumers in the pilot area report a general increase in awareness of renewable technologies. Most renewable suppliers receiving grants needed contract extensions. Their evaluation continues. Support for renewables will continue as public benefits charge programs expand statewide. Experience and evaluation findings from the pilot are supporting design of the statewide program.

1. PROGRAM THEORY AND ACTIVITIES

1.1 Market Transformation

Market transformation attempts to identify barriers to adoption that are more fundamental than just “high first costs.” These barriers may include *performance uncertainties, information/search costs, transaction costs, organizational practices/customs, service unavailability, and other market failures.*

By identifying such barriers and the market actors (customers, contractors, distributors, lenders, etc.) who are most affected by each barrier, it is possible to design program activities that target specific actors and barriers. These program activities generally do not include monetary incentives (rebates) and are designed to transform the market so that desired energy features (efficiency / renewables) achieve equal consideration over time.

1.2 DSARE Program Theory

Program managers believed that the program needed to create “critical mass” of both customer interest and industry capabilities in order to increase renewable energy adoption. Efforts were needed to increase public awareness, and to provide potential customers with independent information on technologies and applications. Suppliers needed support for developing business and marketing plans. And, local demonstrations of successful applications of renewables were needed to show off suppliers’ capabilities to potential customers. Thus DSARE was designed to employ a “multi-faceted approach” in providing support for both potential customers and renewable suppliers through the types of activities shown in Table 1.

TABLE 1: DSARE PROGRAM ACTIVITIES

Program Support Activities	Renewables	Daylighting
Training	●	●
Information and Education	●	●
Business / Marketing Assistance	●	
Technical / Design Assistance	●	●
Financing	●	
Demonstration	●	●
Publicity and Marketing	●	●

1.3 Program Activity Budgets

The activity-level budgets for the first phase of the pilot program provide a clear picture of the relative magnitude of each effort. As shown in Table 2, the budget covered implementation from April 1999 through June 2000. Note that this budget does not include the costs of overall Focus or DSARE program advertising, marketing, or evaluation.

TABLE 2: DSARE ACTIVITY BUDGETS

Program Activity	April 1999 - June 2000 Budget
Training	\$90,000
Information and Education	\$60,000
Business / Marketing Assistance	\$155,000
Technical / Design Assistance	\$195,000
Financing and Demonstration	\$360,000
Publicity, Marketing, Prog. Delivery	\$110,000
Total	\$970,000

2. KEY PROGRAM HYPOTHESES SUPPORTED

The initial market effects, evaluation findings, conclusions, and recommendations generally support three key program hypotheses.

2.1 Support Needed for Renewable Suppliers

DSARE hypothesizes that renewable energy businesses are mostly small firms that need help developing business management and marketing plans, as well as marketing/sales materials and skills.

Findings: Results from baseline and follow-up surveys of 150 renewable and daylighting suppliers confirmed these are typically small firms: the median number of employees in Wisconsin is two for renewable suppliers and 12 for daylighting designers. Renewable products / services comprise one-half of renewable suppliers revenues and employee time. Projects involving daylighting comprise one-quarter of all projects for designers. Renewable suppliers rated their ability to assist customers obtain financing lowest (mean 4.4), their marketing / sales capabilities lower (mean of 6.8) than their technical capabilities (mean 8.6) or their business management capabilities (mean 7.6, all on a 10-point scale, 10 highest). However, many architectural / building design firms have business development teams experienced in selling their firm's expertise and services to potential clients.

Conclusions: The evaluation supports this hypothesis, especially for renewable suppliers. However, renewable suppliers' ratings of the helpfulness of several DSARE support activities declined significantly between October 1999 and August 2000.

Building designers' ratings of the helpfulness of most Daylighting Collaborative activities increased slightly, with two notable decreases between October 1999 and August 2000. Participants in the "How-To" technical courses on Cool Daylighting™ report applying daylighting techniques in 25 percent more of their lighting work since attending.

Table 3 shows the percentage of respondents rating each activity as "helpful," (an 8, 9, or 10 on a 10-point scale, 10 highest). The right hand column shows the baseline to follow-up change in the percent rating each service as helpful.

TABLE 3: PRE- AND POST-PROGRAM RATINGS

Support Services and Training	Percent rating 'Helpful' (8, 9, 10 on a 10-point scale)		
	Oct. 1999 Baseline	Aug. 2000 Follow-up	Change Baseline / Follow-up
RENEWABLES	(n=66)	(n=83)	
Business assistance	14%	18%	4%
Marketing assistance	32%	29%	-3%
Project facilitation assistance	42%	36%	-6%
Local technology applications training	30%	23%	-7%
Financing assistance	44%	31%	-13%
Demonstrations	41%	28%	-13%
Communications materials	47%	24%	-23%
General advertising	52%	16%	-36%
DAYLIGHTING	(n=66)	(n=67)	
Copy Rooms	30%	40%	10%
Why-Do decision-makers training	27%	37%	10%
How-To technical courses	50%	51%	1%
Second-Look Design Assistance	41%	42%	1%
Key Case Studies	47%	43%	-4%
Design Guidelines	61%	52%	-9%
Marketing to debunk myths and publicize successes	39%	15%	-24%

Recommendations: Program administrators should explore suppliers' needs more fully, and might consider concentrating support on the services with the highest helpfulness ratings. Administrators should also realize that pre-program, baseline ratings might reflect some unrealistic expectations of what some services—such as general advertising, marketing, and general communications materials—may do for respondents' businesses.

2.2 Customers Lack Awareness and Knowledge

DSARE hypothesizes that customers lack awareness and knowledge of current renewable energy/daylighting technologies, and the benefits of these technologies.

Findings: Renewable energy suppliers and daylighting designers report their clients' most important concerns clearly identify *performance uncertainties* as the most important market transformation barrier facing potential customers. Further, suppliers and designers ratings of clients' awareness of today's renewable energy technologies and knowledge of energy cost savings from renewable applications are quite low. Mean ratings for awareness are three to five, and for knowledge are three and one-half to five (both on a 10-point scale, 10 highest).

Conclusions: The evaluation supports this hypothesis. In turn, this lack of awareness and knowledge imposes high information (search) costs and high hassle (transaction costs) on consumers, as well as high transaction costs on suppliers when potential customers explore the use of renewables. In fact, some suppliers have estimated that marketing and transaction costs are *one-third of the cost* of a residential solar domestic water heating system. Respondents (including suppliers, designers, and potential customers) gave the renewable energy and daylighting information sources, workshops, and training programs high ratings for information provided and customer service.

Recommendations: Program administrators should continually monitor target audiences' needs and adjust materials and course content as appropriate. Audiences want current information on renewable energy technologies / applications, and available program / other support. Attendees also requested that workshops provide greater opportunities for informal contacts with other suppliers and potential customers.

2.3 Cost-Sharing Grants to Build 'Infrastructure'

DSARE hypothesizes that cost-sharing grants would be an effective way to provide renewable energy businesses with marketing and technical assistance, and support demonstrations of renewable technology. DSARE managers

received and evaluated 55 proposals and awarded 33 grants between April and December 1999. Four additional grants were awarded in May 2000, bringing the total funds granted to \$490,000.

However, the majority of grant recipients received no-cost extensions and we could not complete the evaluations at the end of the original DSARE pilot program, on June 30, 2000.¹ *Thus, only preliminary process evaluation findings are presented* here. The final evaluation will address this hypothesis and the market effects of cost-sharing grants.

Findings: We interviewed samples of both applicants (who did not receive grants) and recipients (who did). Both applicants for and recipients of market development grants noted the need for improvements to grant application, award notification, and reimbursement procedures.

Conclusions: Grant applicants and recipients want clear, specific requirements and directions, someone to call with questions (via an 800 number), and more time to prepare proposals. They want quick notice of awards and faster issuance of contracts. They also want longer periods to perform the work supported by grants, and easier invoicing and reimbursement.

Recommendations: Procedural improvements could increase participation and results from the grant program.

3. OTHER EVALUATION RESULTS

The following subsections review key market effects issues and related evaluation findings, conclusions, and recommendations.

3.1 Changes to Market Characteristics

The most important market effects question is, "Have the characteristics of the renewable energy and daylighting markets changed over the first program year?"

Findings: Few of the informational activities targeting suppliers / designers and customers have produced measurable results during the brief duration of the pilot.

Over the short span of 15 months, we were unable to identify any significant changes in the characteristics of renewable energy system suppliers' firms. The size of the Wisconsin market for renewable energy products has grown from 1998 to 2000, but marketing and sales practices, and their self-rated business practices have not changed.

Building design firms show a continuing growth in the number of employees since 1998; however, the portion of

their design work involving daylighting is not changing significantly. About one half of the architectural designers and most of the other designers say the overall Wisconsin market for daylighting increased over both comparison periods, from 1997 to 1999 and from 1998 to 2000.

We were also unable to measure increases in suppliers' perception of their clients' awareness and knowledge of renewable energy or daylighting. Again, the 15-month pilot period was too short to measure such changes in the renewables and daylighting markets.

The daylighting training appears to have increased designers' and building owners'/managers' knowledge by an average of 20 percent. We produced these measured results by comparing participants' pre- and post-training survey responses. Further, How-To (technical training) participants report applying daylighting techniques in 25 percent more of their lighting work since attending the course. Owners/managers gave Why-Do (decision-makers) training and visits to a demonstration daylit building overall grades of "A-." Almost all participants are "enthusiastic about using daylighting on their next building project."

Consumers' responses to surveys following each of two waves of advertising promoting renewables in October-November 1999 and April-May 2000, show an overall increase in awareness of the Focus on Energy program and in "non-specific awareness" of the renewables concept. However, customers' responses fail to show any direct connection between specific TV and radio advertising and awareness of renewables or between advertising content and awareness of the Focus program. Further, results suggest that respondents are not incorporating the information into any deeper understanding of renewables or attitudes toward the Focus program concepts.

Conclusions: While suppliers report continuing growth in markets for renewable energy products and for daylighting, their firms have not changed significantly. The suppliers' views of customers' awareness, knowledge, and concerns have not changed. However, participants rate the daylighting training highly, report they have learned from this training, and are applying what they learned. Surveys following two waves of advertising show increases in consumers' awareness of the Focus program and of the general renewables concept.

Recommendations: Future programs should apply selected activities appropriate to the time frame for implementation and evaluation. One goal of the DSARE pilot was to "try many things" and then continue the successful ones. However, the short duration of the pilot program, and the lack of clearly defined goals for specific activities prevented identifying differences in success.

3.2 Coordination in the "Multi-Faceted Approach"

The multi-faceted program approach, employing a large number of separate activities, requires coordination across activities within this program and across other Focus residential and non-residential efforts. This is especially critical under the market transformation paradigm.

Findings: Coordination of the delivery of services to identified customers was not a problem, because of the small number of customers moving through the program from interest to construction. However, coordination between the renewables program and the daylighting program, and between DSARE and other Focus program components was minimal. The lack of coordination limits the program information and services that reach all potential customers as the Focus program continues.

Conclusions: Almost all renewable suppliers and DSARE program staff members appear to have been involved with (or at least aware of) almost every customer moving ahead with project design and construction. However, given the short time available during the Focus pilot, most other Focus program administrators and staff appear to have concentrated on their own programs. There was very little coordination between DSARE and the other Focus programs, such as the residential and C&I programs. Improved communications and coordination among DSARE program activities, other Focus on Energy programs, and with other parts of state government are needed.

Recommendations: Discussions should be conducted at several levels within Focus to determine policies, implementation strategies, and tactics for coordinating the information that will be presented across programs.

3.3 Program Planning and Targeting

We observed indications that thorough program planning and development, plus narrower target marketing contributed to the success of the daylighting program. In this section we compare some of the key differences in planning the daylighting and the "other" renewables program.

Findings: Two very different processes were used to develop the daylighting program and the renewable energy program elements within DSARE.

The Daylighting Collaborative benefited from an exceptionally thorough scoping, planning, and program development process. The involvement of key stakeholders helped produce program activities that received high approval ratings from participants. Importantly, the narrow

program and market focus—on one set of technical features targeting commercial office buildings and school buildings—allowed thorough, detailed preparation of training and design support materials.

Also, an 18-month long scoping and planning process laid a solid foundation for the Daylighting Collaborative. A review of the process ordered by the Wisconsin Public Service Commission reveals eight key elements in thorough program planning:

- (1) commitment by involved parties,
- (2) sufficient budget,
- (3) sufficient time,
- (4) access to regional and national expertise,
- (5) successful efforts to involve local stakeholders,
- (6) research into market conditions,
- (7) an organizational “home” for planning, and
- (8) a planning project manager with sufficient resources to complete the project on schedule (Energy Center of Wisconsin, 1997).

As the DSARE pilot program plans were developed it was possible to provide significant additional funding to enhance the statewide Daylighting Collaborative effort in the Focus pilot area. This situation was unique among all Focus components: a well-planned, fully developed program element was due to roll out just as Focus was to begin implementation.

The renewable energy portion of the DSARE program was developed with a goal of *addressing as many of the barriers facing the “renewables industry” in Wisconsin as possible*. The DOA staff relied on their expertise and more than 18 years of experience in supporting renewable energy development in Wisconsin when they chose to offer a large number of activities. Some barriers, such as a lack of independent consumer information on current renewable technologies, had not been addressed adequately in several years.

Given this goal, the plan necessarily reflects the tremendous diversity of the technologies, applications, and markets the “renewable energy industry” serves. (In fact, as this industry develops, it may be expected to split into several distinct industries, each with more homogeneous markets. These would be easier to support with separate program components.) Further, the plan reflects the wide range of views of the members of the Advisory Committee.

Finally, two key principles underlying planning were unusual in the twenty-year history of energy programs. (1) Staff would not attempt to pre-select “winning” technologies or applications and target them to the exclusion

of other technologies and applications. (They called this the “diverse portfolio approach.”)

(2) The pilot program would be used to test a lot of program activities. The Division of Energy staff was willing to try many things, even if some were to fail.

However, identifying the resulting market effects of so many activities over such a short time frame was nearly impossible. Thus, conclusive evaluation findings are not yet available to determine the degree to which individual activities succeeded.

Conclusions: Program planners should develop more thorough and more detailed plans. More complete market information and expert opinion on renewables and daylighting is needed to support program planning and evaluation. More involvement with key stakeholders is critical. Addressing a limited number of program activities to selected targets may produce program interventions whose effectiveness can be determined within the available time horizon. Specific, measurable goals provide both program implementers and evaluators with a greater likelihood of measurable success.

Recommendations: To be more effective, program plans should employ principles proven effective here and in other programs. Program plans should . . .

- (1) be based upon market characterization information,
- (2) incorporate advice from regional and national experts,
- (3) include consultation with key stakeholders;
- (4) focus program efforts on carefully selected targets within promising markets;
- (5) state specific, measurable goals; and
- (6) be designed “for evaluation,” so that information on successes may be available to inform decisions on subsequent program directions.

3.4 Market Tracking and Planning Tools

An initial step that is needed by both program and evaluation staff is a system for tracking the numbers and energy production of renewable systems in place and being installed. Such tracking information will clarify program accomplishments and remaining challenges.

Additionally, it is important to create a vision of what a “vibrant renewables market in Wisconsin” will look like in the years 2002, 2005, and 2010. This vision would not require creating a highly detailed “forecasting model.” Rather, a set of descriptions documenting the number of active Wisconsin and regional suppliers, the number of installations anticipated, and the total energy capacity in place could provide a much better basis for planning. Such

“scenarios” could bridge the gap between descriptions of current installations and “desirable” numbers of installations and total capacity at specific future dates. Each scenario could describe the trajectory of renewable installations that might result from certain program efforts and conventional energy prices.

3.5 Short “Window” to Plan / Implement a New Program

The preceding discussion suggests improvements to planning. However, most significant constraint facing program planners, implementers, and evaluators was the short pilot program timeline. Planning began in 1998 with implementation beginning in April 1999 and completion scheduled for June 30, 2000.

4. NEXT STEPS

Program and evaluation staff identified five areas to be addressed in phase two of the DSARE pilot program:

(1) *Complete the evaluation of the effects of the cost-sharing grants for business / marketing, technical assistance, and demonstrations.* One-half of the total DSARE budget was invested in projects supporting three critical areas:

(a) renewable suppliers developing their business / marketing capabilities, (b) customers completing technical feasibility assessments, and (c) suppliers and customers enhancing new installations for use as active, local demonstrations of successful applications of renewables and daylighting. Evaluations are being completed as each project is completed.

(2) *Improve access to low-interest financing*—has been addressed in the second phase of the DSARE pilot program by a several financing programs offering a variety of customers and projects below-market-rate financing.

(3) *Develop certification for renewable energy auditors and equipment installers*—is being addressed by initial efforts to develop a certification program for auditors. Additional efforts to certify equipment installers are being planned.

(4) *Improve utility interconnection rules*—is being addressed by discussions with utilities. The goals are to ensure that rules reflect Wisconsin statutory requirements for net metering and billing and the provisions of the electrical code. Meeting these minimums and improving consistency will reduce barriers to planning, installing, and operating more cost-effective systems that sell some energy back to local utilities.

(5) *Improve communications and coordination among DSARE activities, Focus on Energy programs, and other parts of state government*—has been identified as a means to make many existing efforts provide better support to renewable suppliers and potential customers. A fundamental step will be to develop ways to improved “contact management” so requests for assistance may be shared widely. Two issues are being addressed: (a) protecting the potential customer’s privacy and proprietary interests, and (b) ensuring fair distribution of such “leads” to all interested suppliers. Wide distribution of inquiries to the staff of all Focus programs and to all renewable suppliers should provide broader, timelier responses giving potential customers greater choices. Further, these efforts will improve access to the many types of support available from DSARE, Focus, utility, state, and federal programs.

5. PROGRAM FUTURE

While requests for proposals are being issued for the statewide Focus on Energy program (in January 2000), some directions are clear for future support of demand-side applications of renewable energy and daylighting in Wisconsin. A program administrator charged with supporting demand-side renewable applications *that produce electricity* will control approximately 4.5 percent of the total public benefits funds. In three years, when funding levels are reached, these funds will total about \$3 million per year. In addition, the residential and major markets (C&I) program administrators will split about another \$2 million for renewable applications *that do not produce electricity*.

Further, the residential, major markets, and renewables administrators will produce a memorandum of understanding defining common goals for their results.

6. REFERENCES

(1) Wichert, Don, Including Renewables in Wisconsin’s Public Benefits Pilot. Conference Proceedings, American Solar Energy Society, June 2000

(2) Energy Center of Wisconsin, “Daylighting in Wisconsin: a Program Study, June 1997

ⁱ Almost all grant projects were completed in December and final reports will be completed by the end of February 2001. Three projects involving construction at the UW—Green Bay and two involving a new anaerobic digestion process have been extended to the end of 2001.