

ENHANCEMENT OF A RENEWABLE ENERGY PUBLIC BENEFITS PROGRAM IN WISCONSIN

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ABSTRACT

The State of Wisconsin has developed and administered a renewable energy public benefit pilot since April 1999 for a population of about a million people in northeast Wisconsin. The first phase of the program stressed market preparation while the second phase added a short-term resource acquisition component. Small cost shared funds are being provided to many activities that reduce market barriers to renewable energy adoption. The program's goal is to enhance a small but maturing renewable energy market in Northeast Wisconsin.

The second phase of the renewable energy program started in September 2000. A resource acquisition component was added to market preparation activities to immediately increase the number of projects implemented. A marketing campaign, project development and financing assistance, and four financing options served identified markets. The resource acquisition component applied typical product marketing activities used by mature firms including advertising campaigns, product information, service infrastructure training and short term special financing. Project financing uses and builds upon existing financial mechanisms and institutions to reduce transaction and start-up costs. It is too early to determine how successful this enhanced program is in increasing renewable energy adoption rates and consumer satisfaction.

As Wisconsin begins implementation of a statewide public benefit program, the successful program elements of this renewable energy pilot are likely to be incorporated.

1.0 INTRODUCTION

The Wisconsin Focus on Energy pilot program (Focus) was one of the first energy public benefit pilot programs to be implemented in the country. In June of 1998 an energy public benefits pilot concept was agreed on by Wisconsin

Public Service Corporation (WPSC), the Public Service Commission of Wisconsin (PSCW) and the Wisconsin Department of Administration-Energy Division (DOA). A regulated utility, WPSC, contracted with DOA to deliver energy efficiency programs mandated by the PSCW. The pilot was to test the concept of state government administering these programs. Approximately \$17 million or 80 percent of the WPSC's energy efficiency funds for 1998 and 1999 were contracted to DOA to administer in 23 counties in northeast Wisconsin, an area with about one million residents (Figure 1).

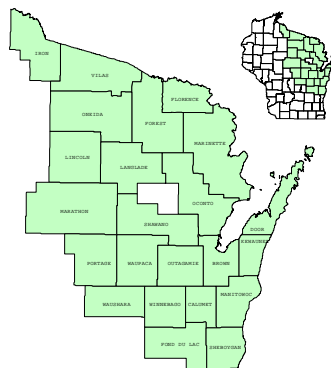


Fig. 1: Wisconsin Focus on Energy Counties

Programs were developed for renewable energy, performance contracting, the commercial and industrial sector, the multi family and residential sector, training and education, marketing, evaluation and research. In addition, about 10 percent of the funds were allocated to administration and WPSC's dues for the Energy Center of Wisconsin.

1.1 Demand Side Applications of Renewable Energy

The renewable energy program targeted demand side applications of renewable energy (DSARE), which means using renewable energy on-site to reduce energy demand. Demand side applications were targeted because the Focus

funds were allocated from rate based energy efficiency utility fees approved by the PSCW. Demand side use of renewable energy is similar to energy efficiency in that it reduces the need for external energy supplies. In addition to energy savings and environmental improvement, demand side projects provide the public benefits of reducing energy transmission and supply losses while increasing energy reliability for the end user.

DSARE eligible technologies included:

- **Biomass:** Local heating, on-site electricity and process energy uses.
- **Geothermal:** Ground source heat pump applications
- **Hydro:** On-site electricity or mechanical energy production and use
- **Solar:** Passive heating and daylighting, active space and water heating and on-site use of electricity production
- **Wind:** On-site electricity or mechanical energy production and use

1.2 Initial Renewable Energy Program

In April 1999, a \$1 million core renewable energy market preparation program commenced. DSARE 1 promoted marketing, information & education, training, business development, technical & financial assistance and demonstrations. This initial phase culminated in 41 contracts to subprograms and projects by June of 2000 with a completion date of December 31, 2000. DSARE 1 was supported by another \$200,000 for marketing and \$125,000 for renewable energy research allocated from other Focus programs¹. By the end of this time period, 36 of the projects were completed and 85 percent of the allocated funds had been spent.

1.2 Enhanced Renewable Energy Program

In July of 2000, the Focus program was extended (Focus 2) with an additional \$8.7 million of WPSC's rate based energy efficiency funds. The funds were divided among the same program activities as Focus 1, but with different priorities. The allocation for the second renewable program (DSARE 2) was \$800,000 with a program end date of December 31, 2002. The DSARE 2 program expanded the definition of "demand side applications of renewable energy" as that used "primarily" (50 percent or more) on-site or locally. Allowing a fraction of the energy to be put into the supply system increased project flexibility.

2.0 PROGRAM DESIGN

The renewable energy program sought to increase the amount of demand side renewable energy used in the Focus counties by mitigating the market barriers to renewable

energy adoption. The barriers include the renewable energy industry being relatively new, small and without a strong service infrastructure. In addition, customer costs tend to be up-front and high while both consumer and societal public benefits tend to accrue over a longer term.

The DSARE 1 approach was primarily a market preparation program, emphasizing longer-term marketing and service industry development rather than resource acquisition goals. Even so, the long-term annual renewable energy production in the Focus counties from DSARE 1 projects has been initially estimated at 618 thousand therms (65.2 billion kJ) and 50 million kWh of electricity².

DSARE 2 added a resource acquisition component as an added short term public benefit objective, while continuing to build upon the longer term market preparation activities started in DSARE 1.

The barriers to adoption, activities and budgets of DSARE 2 are shown in Table 1.

TABLE 1: BARRIERS, ACTIVITIES, BUDGETS

Barrier	Program Activities	Program Budget*
Poor public awareness	Mass marketing	\$110,000 **
Lack of detailed knowledge	Training & education	\$80,000
Small immature firms	Business marketing assistance	\$50,000
Lack of feasibility knowledge	Technical assistance	\$50,000
Lack of local experience	Demonstrations	\$50,000
Lack of knowledge & experience	Daylighting facilitation	\$120,000
High transaction costs	Facilitation & financing technical assistance	\$80,000
High first cost, inertia	Project Financing	\$470,000 ***

* A \$52,500 daylighting evaluation effort (not shown) was also funded out of the Focus 2 research and development budget.

** Allocated from the marketing portion of Focus 2.

***Includes \$100,000 allocation from the EEP Program.

The resource acquisition component in DSARE 2 was added to:

- “kick start” the still immature renewable energy market by stimulating the initial flow of goods and services
- show immediate renewable energy project “results” to policy makers and constituents who may be more interested in immediate, rather than long-term results.

3.0 PROGRAM ADMINISTRATION

The DSARE program sought to contract as many of the activities to other organizations as possible as a way to reduce Energy Division administrative costs. For instance, a key program support area is Cool Daylighting. All daylighting activities are contracted through the Energy Center of Wisconsin (ECW). The ECW has been developing and implementing a statewide daylighting program for several years and has an existing, functioning program. The DSARE 2 funds are used to "enhance" these activities in the Focus counties. Similarly, training activities are primarily carried out by the Midwest Renewable Energy Association (MREA) and education activities by the Wisconsin Environmental Education Board (WEEB).

Existing staff at DOA’s Energy Division administer the remaining program activities more closely. The core administrative staff consists of a program director, a program engineer and manager, a part time consultant, a program assistant, and contract and finance accountants. All Energy Division staff, except the consultant, include administration activities into their pre-program existing daily activities, with a total estimated DOA-Energy Division staff effort of 1.7 FTE positions.

4.0 PROGRAM IMPLEMENTATION

Beginning in September of 2000, DSARE 2 launched a second series of program opportunities in the Focus counties. The program elements include:

1. Market Preparation
 - Training and Education
 - Cool Daylighting
 - Market Development
 - Business marketing
 - Technical assistance
 - Demonstration
2. Resource Acquisition
 - Mass marketing
 - Project facilitation and financing technical assistance

- Financing
 - Low interest residential loans
 - Interest rate buy down loans
 - Installation rewards
 - Performance contracting.

The remainder of this paper will describe initial DSARE 2 activities through the time of paper submission in January 2001, about four months after start-up.

4.1 Market Preparation

Activities assist in increasing consumer awareness and renewable energy supply and service infrastructure development. Twenty-three new contracts support this effort in three major areas. These projects build upon the 41 projects supported in DSARE 1.

4.1.1 Training and Education

A training grant with MREA focuses on residential uses of renewable energy. The DSARE 2 contract sponsored the solar tour of homes in October, 2000, offers \$50 scholarships to Focus residents attending ten MREA workshops, provides advertising support for the workshops, cost shares the development and production of three renewable energy public service announcements and begins a renewable energy auditing certification program. MREA offers a unique partnership because of their long-term commitment to and experience with renewable energy training and promotion. The project builds upon the DSARE 1 training program, which assisted in developing professional materials for MREA training sessions.

Commercial and industrial renewable energy training are incorporated into a separate Focus 2 training program administered by ECW.

Education activities are subcontracted to WEEB and consist of two long-term educational enhancement projects:

1. Renewable energy curriculum training for K-12 teachers in the Focus area.
2. A solicitation for two to five targeted education projects that will be evaluated competitively.

4.1.2 Cool Daylighting

The ECW "Cool Daylighting" partnership offers specialized support in the area of administration, technical assistance, marketing, demonstration and strategic assessment. ECW emphasizes no added initial costs, simplified prescriptive approaches for easy adoption and extra human performance benefits from daylight buildings. The program targets commercial offices and educational facilities. This effort

builds upon four years of planning and implementing a statewide program supported primarily by the state's regulated utilities. The DSARE 2 Cool Daylighting contract more than doubles the ECW's daylighting budget in the Focus counties.

4.1.3 Market Development

Small, cost share grant opportunities (\$10,000 to \$15,000) were announced in mid September, with project proposals due by October 30, 2000. Thirty-one proposals were submitted and 17 were selected and announced on November 30, 2000. The projects supported are shown in Table 2:

TABLE 2: DSARE 2 MARKET DEVELOPMENT PROJECTS

Market Development Activity	Solar	Biomass	Hydro	Geothermal	Multi-resources
Business marketing	3	2	0	1	1
Technical Assistance	2	2	1	1	0
Demonstration	2	1	0	1	0

Although project implementation has just begun, the process produced a good response and the administrative effort to solicit, evaluate and contract projects was done quickly and fairly by using a previously developed multi-attribute evaluation technique³. The Energy Division's 20 years of experience with similar program solicitations allowed this effort to be done efficiently, with minimal administrative cost.

4.2 Resource Acquisition

Resource acquisition means having the program play a key role in the installation of projects producing renewable energy. This effort consists of a marketing campaign, project development and special financing.

4.2.1 Marketing

A three-week marketing wave began in November of 2000 immediately after the national elections. The marketing wave consisted of:

- TV: Nine stations ran 345 ads
- Radio: Fifteen stations ran 836 ads

- Print advertisements: Five newspapers ran fifteen Sunday edition ads.

The marketing wave's major theme was special project financing. This approach followed similar appliance or product sales campaigns, which offer "special" deals for a limited time. The TV ad consisted of a 30-second piece that was produced for DSARE 1. It featured a young professional couple living in a house that included passive solar features, solar water heating, photovoltaic panels and a modern wood stove. The ad included a new ending line describing the new financing. The 60-second radio ad also emphasized special financing. The renewable energy radio theme presented was: "imagine a well that never ran dry, a car that never ran out of gas,..." Background music was a rhythmic acoustic guitar. The print ads featured an "endlessly perfect meal" and an allusion to a special "feast of financing assistance". All the ads ended with an 800 number and the Focus web site address⁴.

Two weeks after the media wave ended, a "media kit" was sent to 78 newspapers in the Focus area. The kit consisted of a press release, a map of projects supported in the Focus area and four factsheets that summarized program activities. Follow up telephone calls were made after one week and 39 of the 78 newspapers contacted (50 percent) indicated that they were interested in doing a story on renewable energy in the future.

4.2.2 Project Facilitation and Financing Assistance

Contracts were extended from DSARE 1 with two private companies, Franklin Energy Services (FES) for facilitation and Asset Renewal Services (ARS) for financing, to provide one-on-one service to both business and customers. Both these efforts sought to reduce the transaction cost of renewable energy adoption by having DSARE 2 assist with business leads, contact tracking, and technical and financial assistance. In addition, the facilitation also provided cost shared technical assistance by contractors offering on-site renewable energy assessments to potential customers. Sub contracts were based on a monthly stipend plus performance incentives. In the first three months, 275 contacts and 14 site visits were made by the facilitator. In addition, the financing consultant made 63 contacts and assisted nine potential projects, although none have received financing to date.

4.2.3 Project Financing

Four financing options were designed to accelerate the short-term installation of renewable energy technologies in the Focus counties by using existing financing mechanisms as much as possible. The financing alternatives were created to stimulate unique markets in response to

stakeholder suggestions at open meetings. Customers are eligible to receive only one financing benefit per project.

The four financing options consist of:

1. Low interest renewable energy loans made available through a \$100,000 contract with the Wisconsin Energy Conservation Corporation’s Energy Loan Solutions (ELS) program. ELS was modified to include installation of renewable energy technologies on existing homes. Three, five and seven year, four- percent loans, up to \$20,000 were made available to customers using Fannie Mae principal and eligibility procedures. The Energy Division developed technology eligibility standards and certified contractors marketed the loans to customers with minimal transaction cost. The loan was sent directly to the contractor at the completion of the job, which reduced final payment problems. The benefit level to consumers was estimated at 19 percent based on the interest saved on 35 forecasted conventional loans.

Results: After three months of program operation, 14 loans (11 wood heating systems⁵, two geothermal energy systems and a solar water heater) have been made and 30 loans are being finalized. This rate of adoption suggests that about 140 projects will benefit over a nine-month period from the \$100,000 allocated.

2. A four- percent interest rate buy-down program reduces interest on loans between \$20,000 and \$500,000. Customers or contractors can use the reduction after they negotiate their best project loan from conventional financing institutions. The present value of the loan reduction is to be paid to the financial institution by DOA after the project has a technical and financial review approved by the Energy Division. The targeted market assists commercial and industrial projects or aggregated residential projects. Contractors, the facilitator and the financing consultant market the projects to customers.

Results: This is a new financing strategy suggested by the facilitator and financing sub-contractors. Although a number of projects appear promising, no loans have yet been made.

3. Renewable energy production rewards provide \$20,000 to \$50,000 to customer or contractor projects based on the annual renewable energy that would likely be produced, the cost of energy displaced and technology adjustment factors. Rewards are based on the formulas in Table 3.

TABLE 3: DSARE 2 REWARD FORMULAS

Resource/Technology	Reward Formula
PV	\$1 per kWh per year

Solar Thermal, Geothermal	\$6.5 * MMBtu per year * Fuel Cost Displaced
Wind, Hydro, Biomass	\$5000 * (MMBTU/hour * Annual Capacity Factor) E 0.65 * Fuel Cost Displaced

This program calculates rewards similar to the Renewable Energy Assistance Program, which the Energy Division had administered since 1991. The Energy Division requires a Professional Engineer’s stamp on the application and makes two equal payments; when equipment is ordered and when the project is finalized.

Results: As of January 15, four applications had been submitted for wind, PV, solar thermal and geothermal projects and were under review.

4. The Energy Efficiency Performance Program (EPPP) is a financing program administered by a separate Focus program, but includes a special renewable energy opportunity. The program rewards contractors that install eligible energy equipment, and to guarantee savings, in existing commercial or industrial applications. The EPPP reduces project risk by offering contractors an incentive of 75 percent of the annual cost savings for a project or one and one half year’s cost savings if the contractor guarantees the savings for three years. The marketing of this program was primarily performed by the DSARE 2 facilitator (FES) and to contractors working in the Focus counties.

Results: Thus far, this incentive has produced one new renewable energy project. Due to the new innovations and large projects typically supported by EPPP, it may take additional training and mentoring before renewable energy contractors are able to take full advantage of the program’s offerings.

TABLE 4: SUMMARY DSARE 2 FINANCING OPTIONS

Option	Program Funds	Benefit (%) *	Likely Projects
Low Interest	\$100,000	19	140
Interest Buy-down	\$135,000	10	5-10
Production Rewards	\$135,000	5-20	5-10
Performance Contract	\$100,000	20	2-5

* Portion of project cost supported by DSARE.

5.0 CONCLUSIONS

The State of Wisconsin has developed and administered a renewable energy public benefit pilot over the past two years for a population of about a million people in NE Wisconsin. The first phase of the program stressed market preparation while the second phase added a short-term resource acquisition component. The effort provides small amounts of cost shared funds to multiple activities to reduce market barriers to renewable energy adoption. The program provides one model of using energy public benefit funds to reinvigorate and grow a small, but maturing renewable energy market in Wisconsin.

The enhanced renewable energy program added a resource acquisition component to increase the number of projects that are actually being implemented. The four financing options offer flexibility in stimulating identified markets. However, it is too early to determine how successful these options are in increasing adoption rates and consumer satisfaction.

The program utilized typical product marketing activities, used by mature firms, to enhance renewable energy adoption. Advertising campaigns, product information, trade and financing infrastructure training and development, and short term special financing involves complex interrelationships that can create synergies under the right conditions.

The most successful financing option thus far has been the low interest loan program. It's popularity is likely based on the ease of obtaining loans and the existence of previously certified contractors. The other three financing options have only produced one installed projects to date, but their ultimate success in stimulating the commercial and industrial renewable energy markets can not yet be determined.

6.0 THE FUTURE OF RENEWABLE ENERGY PROGRAMS IN WISCONSIN

The DOA is currently implementing a \$62 million per year statewide energy efficiency public benefits program. The program will eventually include a \$5 million per year renewable energy component. It is likely that many parts of the DSARE pilot program will be expanded statewide by a third party renewable energy administrator currently being solicited.

The DSARE pilot has promoted both market preparation and resource acquisition activities. The Energy Division and their contractors have gained valuable experience in both areas. This experience can be built upon in the future to provide high quality renewable energy public benefits to the State of Wisconsin.

¹ Wichert, Don, "Including Renewables in Wisconsin's Public Benefit Pilot", Proceedings of the American Solar Energy Society, Madison, WI, (June 2000).

² These estimates are based on 33 market development projects and do not include energy for other activities. The initial estimates are subject to interpretation and may be modified after further peer review. For a copy of the spreadsheet and methodology used, contact the author.

³ A copy of the scoring sheet and explanation is available from the author.

⁴ Program descriptions, fact sheets, case studies and application forms can be accessed from: <http://www.wifocusonenergy.com/renewable>.

⁵ Only EPA approved wood heating appliances are eligible.