

# State of Wisconsin Department of Administration Division of Energy

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Focus on Energy I Pilot Study

*Final Report:*

***Final Evaluation of Demand Side  
Applications of Renewable Energy Program***

August 9, 2001

Evaluation Administrator: PA Consulting Group

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# State of Wisconsin Department of Administration Division of Energy

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*Final Report:  
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Applications of Renewable Energy Program*

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## **I. EXECUTIVE SUMMARY**

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### **A. INTRODUCTION**

This evaluation covers two important components of the Demand-Side Applications of Renewable Energy (DSARE) program: the cost-sharing grants awarded to support 33 projects, and the Midwest Renewable Energy Association (MREA) workshops. This report is a supplement to the second interim report completed in October 2000. At that time neither of the two program components evaluated here had been completed.

Data collection for this evaluation included reviewing most of the final reports submitted by grant recipients, interviewing 15 people who had received a total of 18 grants, and completing telephone surveys with 52 individuals who had attended MREA workshops.

This report presents findings in some detail to support Division of Energy managers, MREA staff, and renewable vendors in understanding the accomplishments and possible improvements of these program components.

### **B. COST-SHARING GRANTS**

The Wisconsin Energy Bureau<sup>1</sup> had long experience supporting the renewable energy industry in Wisconsin, including operating the Renewable Energy Assistance Program (REAP) for several years. Cost-sharing grants require people seeking assistance with renewable energy projects to invest a substantial portion of the total costs themselves. Energy staff believe this mechanism creates greater commitment to the success of projects among grant recipients.

In planning and delivering DSARE, the cost-sharing grants were tasked with overcoming three key barriers: 1) many renewable energy businesses need to create or update their business and marketing plans; 2) business customers are unlikely to invest in renewables without the results of a thorough technical assessment to support their decisions; and 3) many customers in all market sectors are unfamiliar with successful applications of renewable energy technology in Wisconsin.

Thus, grants were intended to provide three types of support: 1) assist renewable energy businesses in developing business plans and gaining market recognition; 2) increase the ability of businesses to make informed decisions about renewable energy by decreasing the technical uncertainties; and 3) increase the opportunities for the public to learn about and visit practical and repeatable renewable energy projects.

The total budget in the Focus on Energy I Pilot Program for DSARE was \$970,000, of which \$490,000 was originally allocated to the cost-sharing grant program. The original allocations included: Business and Marketing \$150,000, Technical Assistance \$170,000, and Demonstration Projects \$170,000.

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<sup>1</sup> Wisconsin Energy Bureau (WEB) is the long-standing name of the Department of Administration unit that became the Division of Energy. We use the term "Energy" to refer to both the WEB and Division of Energy.

## I. Executive Summary

A total of \$473,947 was awarded. To show the wide variety of types of projects funded, the recipients, the project titles, and the amount each received are shown first in the following sections discussing the results of each of the three types of grants. Then a summary of findings and recommendations are presented.

As of July 2001, 31 projects funded by the cost-sharing grants have been completed and two are still pending.

### 1. Business and Marketing Grants

*Grants Awarded:* Business and Marketing awarded a total of \$109,813, including projects such as: Wisconsin Geothermal Association, Geoexchange Marketing and Information Resources, \$10,475; Fiber Recovery, Inc., Marketing of Fiberfuel, \$15,000; Gimme Shelter Construction, Gimme Marketing, \$5,193; Marth Wood Shavings Supply, Pellet Fuel Marketing and Consumer Incentive Program, \$15,000; Lake Michigan Wind & Sun, Marketing Through Web Site, Local and National Advertising, \$4,920; North Central Hearth Products Association, Great Stove Change Out—Assessment, Marketing and Training Program, \$15,000; Sun Research & Marketing, Solarwall for the New Millenium, \$15,000; MSB Energy Associates, Photovoltaic Market Transformation: Business and Marketing Assistance, \$12,000; Community Builders, Newspaper Columns, \$2,225; Media Science, Wisconsin Solar Homeworks Video, \$15,000.

*Summary of Findings:* These 11 grants resulted in a wide range of results, from highly successful projects to learning that the recipient's concept would not succeed at all. Individual entrepreneurs and small companies could benefit from more active project management and the availability of guidance from business / marketing consultants. Some of the most successful projects resulted from recipients' use of some of their grant funds to characterize the market for their renewable products and services. Some of the less successful projects took shotgun approaches or selected approaches without identifying their best markets and considering the best means of reaching these markets. Other recipients underestimated the costs of obtaining assistance from qualified marketing and advertising consultants.

*Recommendations:* The Division of Energy should contract with marketing consultants to assist in reviewing proposals and negotiating contracts with selected recipients. This assistance would help recipients define and target markets more effectively. The consultants should continue to review recipients' progress and offer additional support as needed. The Marketing Coordinator selected to provide marketing assistance for all Focus on Energy activities, or another set of marketing consultant may be used. The consultants assigned to review and assist with the grants should have experience working with small businesses or specialized industries, as appropriate.

More grants should require recipients to conduct market characterization studies to identify their best potential customers. Recipients who most successfully performed market characterizations in DSARE 1 used market research or marketing consultants to provide expertise or resources they did not have. The use of professional assistance should be encouraged, as appropriate for each project.

### 2. Technical Assistance

*Grants Awarded:* Technical Assistance awarded \$202,902 (of which one project was withdrawn by the recipient, leaving \$194,202) including projects such as: Gimme Shelter

## I. Executive Summary

Construction, Commercial Renovation Project, \$4,225; SCS Engineers, Feasibility Study: Using Landfill Gas to Provide Electric Power and Heat for the Hilbert, WI School System, \$10,000; Sun Research & Marketing, Solarwall Feasibility Studies for the New Millennium, \$20,000; Fiber Recovery, Landfill Gas to Energy Feasibility Study, \$16,800; Division of Facilities Development, Solarwall Demonstration Project at the University of Wisconsin at Green Bay, \$20,000; Joel Goodman, Wood Photovoltaic Overhead Linear Tracker (PVOLT), \$8,000; Outagamie County Division of Solid Waste, Landfill Gas Feasibility Study, \$20,000; Passive Solar Industries Council, Designing Low-Energy Buildings with Energy-10 Workshops; CDH Energy Corporation, Feasibility Studies for Wisconsin Ground Source heat Pump Partners for Schools, \$18,910; Larry Krom, Wisconsin PV 2000, \$20,000; Oneida Environmental Resources Board, Oneida Solar Energy Project, \$25,000.

*Summary of Findings:* Recipients of these 11 grants also experienced a mixture of notable success, lack of interest, and rejections of projects analyzed. Their experience indicates that the market for commercial, institutional, and industrial applications of renewable energy is limited by a lack of awareness of proven possibilities.

Site owners completed some of the most successful projects. One employed a technical advisory committee to guide product selection, to develop operations and maintenance manuals, and to train local contractors' staff. For a large state building project, consultants assessed a technology, gave it a favorable report, and it was included in the project.

The support of expert consultants, who have greater experience in applying renewable energy technologies than most local consultants, met with reasonable success. This approach takes a key decision—selecting a consultant—out of the hands of the site owner. It also requires the supported expert with the additional task of developing a working relationship with a new client. One of the expert consultants found relatively little interest in PV among local governments. Those needing assistance wanted more than the program funding would allow, so little was accomplished.

A grant to an out-of-state group to develop additional support for two training workshops on a building design software package was partially successful: they delivered one workshop. However, they acknowledged that in the Focus Pilot area they could not develop enough support for another workshop.

Other factors delayed or doomed some projects. These included turnover among site owner's staff, unavailability of software tools that were integral to the proposed assistance, and results showing projects were technically but not economically feasible.

*Recommendations* The Division of Energy staff should consider including on proposal review boards a few individuals representing potential clients that grant recipients would be serving. They would better reflect potential customers' acceptance of proposed consultants, trainers, and approaches. In addition, grants designed to provide more general technical support should allow the recipients to provide different types and levels of support to customers as they move through the several steps in their exploration, evaluation, decision, design, and construction processes.

### 3. Demonstration Grants

*Grants Awarded:* Demonstration Projects awarded \$196,422 (of which two projects were withdrawn by recipients, leaving \$169,932) included projects such as: Ritger Law Office,

## I. Executive Summary

Renewable Energy Systems at the Ritger Law Office Building, \$20,391; Division of Facilities Development, Commissioning of Renewable Energy Systems at the University of Wisconsin-Green Bay, \$9,565; Vans Refrigeration, Inc., Geothermal Heat Pump Demonstration for Residential and Commercial Buildings, \$8,000; Northern Lights Master Gardeners Association, Wind-Powered Water Pump, \$1,305; Microgy Cogeneration Systems, Green Energy and Pollution Program for Wisconsin's Dairy Industry, \$50,000; Midwest Renewable Energy Association, Installation of Solar Systems at the ReNew the Earth Institute, \$8,497; Wisconsin Department of Administration, Division of Facilities Development, Building Integrated Photovoltaics on the New UW -Green Bay Classroom Building, \$45,672; Enstar, Solar Demonstration Home for Northeastern Wisconsin, \$3,901; Midwest Renewable Energy Association, Wind Generator Demonstration and Installation Training Seminar, \$16,945.

*Summary of Findings:* Demonstrations pose the most risk, especially for concepts where there are no existing projects or vendors experienced in working in the area. However, the Division of Energy had considerable experience in selecting and awarding grants for installation / demonstration projects (from the Renewable Energy Assistance Program). Thus, with minor exceptions, Energy successfully awarded grants and supported recipients in completing installations and demonstrating technologies.

The only continuing difficulty, which limits many demonstrations, is the site owner's tolerance for ongoing demonstration tours. Energy is preparing written documentation of several demonstrations for use as case studies. They are also experimenting with the creation of "virtual tours" using Internet tools to provide much larger audiences with greater exposure to current and past demonstrations.

*Recommendations:* The Division of Energy should continue existing efforts to support a range of "market ready," practical examples of renewable technologies. This requires the allocation of sufficient funds to provide quality installations and explanatory materials to fulfill their potential as demonstrations.

### 4. Other Issues

*Summary of Findings:* A variety of other issues were raised during interviews with grant recipients and program staff. These include a need for a greater variety of types and levels of support for potential customers; a need for increased sharing of customer / project leads; and greater clarity in describing, and flexibility in administering grant processes.

*Recommendations:* The Division of Energy managers and staff need to support a greater variety of types and levels of customer support meeting customers specific needs as they move through the process from exploring renewable applications; to addressing technical and economic feasibility; finding architects, engineers and other consultants; and designing and completing renewable projects. Energy and facilitator staff should emphasize and support the sharing of leads and coordination of adequate responses to meet potential customer / project needs.

In addition, Energy staff should continue efforts to simplify and clarify program requirements and to communicate them ever more clearly.

### C. MIDWEST RENEWABLE ENERGY ASSOCIATION TRAINING WORKSHOPS

Between June 1999 and November 2000 the Midwest Renewable Energy Association (MREA) ran 22 workshops covering a variety of renewable energy and technologies and applications. The Division of Energy supported improvements to these workshops including the development of new handout materials and the provision of "scholarships" for residents of the Focus on Energy pilot territory.

This evaluation investigated the workshop results in terms of what participants learned and what they thought of the topics covered during the workshop(s) they attended. The total participation in 22 workshops was over 248 people. This included many who attended more than one workshop. Participation in the workshops ranged from five to 20 people, with from zero to 15 participants taking advantage of the Focus on Energy scholarships. We interviewed from one to nine participants in each of 18 of the 22 workshops, averaging four respondents for each of those workshops.

*Summary of Findings:* MREA has a solid market presence providing workshop-based training to homeowners interested in specific types of renewable energy.

Most of the people who attend their workshops hear about them from an MREA mailing (57 percent), or at the Midwest Renewable Energy Fair (19 percent). Almost nine of ten respondents attended as a homeowner interested in using renewable energy at their home.

More than one-third of respondents wanted to learn about a specific type of renewable energy (primarily solar, wind, and PV), one-quarter wanted to learn about living in a home with renewable energy, one-fifth wanted to learn about specific applications (primarily space heating, generating electricity, and water heating).

*Recommendations:* MREA should continue to serve its core constituency – homeowners – with training delivered through workshops. MREA should also aggressively expand its efforts to serve the needs of renewable energy vendors for staff training. By monitoring interest in the topics it covers and by asking members, attendees at the Fair, and workshop participants what else they should cover, MREA should be able to keep filling its workshops.

*Summary of Findings:* MREA is serving the needs of its audience very well. It appears that by using active renewable energy contractors, and by conducting internal workshop evaluations, MREA is presenting topics of interest and covering them well.

The majority of people attending MREA workshops had very little knowledge of renewables before attending the workshop. Three-fourths of respondents feel that the workshops cover topics of interest to them "well" or "extremely well." One-half to three-fourths feel most topics covered were "very useful" to them. In addition, they feel contacts they made are also useful.

*Recommendations:* By continuing its "close to the customer and vendor" approach, MREA should be able to identify new interests as they emerge and include them in their training.

*Summary of Findings:* The workshops influenced almost three-fourths of participants to continue learning more about renewables, although most respondents rated the information received from the MREA workshop as more useful than that obtained from other sources. And, well over one-half of the respondents have "taken action to use renewable energy themselves."

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Most respondents have read books (37 percent), gone on the Internet (37 percent), read [other] magazines (32 percent), or read Home Power magazine (16 percent). By comparing the types of sources of information respondents report using before and since attending the workshop, it appears that respondents learned enough to seek information directly from more technically oriented sources.

*Recommendations:* MREA workshops are preparing participants to continue learning about renewable energy on their own. More importantly, the workshops are stimulating many participants to turn their growing knowledge into actions to benefit themselves and society. MREA should continue to stay close to its members, Fair-goers, and workshop participants to best meet their needs.

*Summary of Findings:* More than one-half of respondents suggested topics that would be useful to them at future workshops and ways to promote those workshops. Six topics that would be useful to more than ten percent of respondents include: wind, hands-on opportunities, passive solar, grid-tied systems, solar panels, and PV systems.

Of the one-half of respondents offering suggestions for publicizing its activities, one of the largest groups said MREA is "doing fine now." Others suggested flyers, radio ads, and conducting workshops around the state.

*Recommendations:* It appears that while more than one-half of respondents suggest additional topics and means of publicizing workshops, a significant group does not want MREA to grow too fast. We recommend that MREA explore what its members feel about growth and limit enrollment in each workshop to a moderate number of participants.

## ***II. INTRODUCTION***

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This evaluation explored the results of two important components of the Demand-Side Applications of Renewable Energy (DSARE) program: the cost-sharing grants awarded to support the completion of 33 projects, and the renewable energy training workshops delivered by the Midwest Renewable Energy Association. This report is a supplement to the second interim report completed in October 2000. At that time neither of these components of DSARE was completed. Additional renewable energy workshops were offered through November 19. Recipients of grants from DSARE I had until December 31 to complete their work and until March 1, 2001 to deliver final reports and invoices to the Division of Energy.

Data collection for the evaluation of the cost-sharing grants included reviewing most of the final reports submitted by grant recipients and interviewing 15 people who had received a total of 18 grants.

Data collection for the evaluation for the MREA renewable energy workshops consisted of completing telephone surveys with 52 individuals who had participated in one or more of the MREA renewable energy workshops.

We have presented the findings from this data collection in some detail to fully inform the Department of Administration management, the program managers at the Division of Energy, grant recipients who may read this report, and MREA managers. We also summarize the findings and suggest a small number of recommendations at the end of the report.

### **III. COST-SHARING GRANTS**

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#### **A. BACKGROUND, THEORY AND INTENT OF COST-SHARING GRANTS**

The Wisconsin Energy Bureau had many years experience supporting and working with members of the renewable energy industry in Wisconsin. The Bureau had operated the Renewable Energy Assistance Program (REAP) for several years by the time it began planning the Wisconsin Focus on Energy Program pilot. REAP was a "cost-sharing grant" program requiring people seeking assistance with projects to invest a substantial portion of the total costs themselves. Energy Bureau staff believe this mechanism creates greater commitment to the success of projects among grant recipients.

This cost-sharing approach was built into the Demand-Side Applications of Renewable Energy (DSARE) program for Focus on Energy from the beginning. When DSARE was rolled out, the cost-sharing grant component was allocated one-half of the total budget and was planned to overcome many key barriers.

The program staff identified the following barriers:

- Many renewable energy businesses need to create or update their business and marketing plans.
- Business customers would be unlikely to invest in renewable energy projects without the results of a thorough technical assessment to support their decisions.
- Many residential, commercial, institutional, and industrial customers are unfamiliar with applications of renewable energy technology.

The program managers hypothesized that grants supplementing renewable energy businesses' and customers' own funds would enable them to undertake projects they could otherwise not attempt. The intent of each type of grant project is described below:

- Business and Marketing grants assist renewable energy businesses in developing business plans and gaining market recognition;
- Technical Assistance grants support assessments of commercial and industrial renewable energy technologies and projects. Their intent is to increase the ability of businesses to make informed decisions about renewable energy by decreasing the technical uncertainties; and
- Demonstrations of commercially available renewable energy technologies and projects increase opportunities for the public to learn about and visit practical and repeatable renewable energy projects. Demonstrations also can be used by vendors and marketers to showcase well thought out renewable energy demand-side applications. These projects will be highly publicized examples of renewable energy.

The budget for DSARE in the Focus on Energy I Pilot Program included \$490,000 for cost-sharing grants. We summarize how this money was spent in the next section. The following sections describe the evaluation methods and findings for the cost-sharing grants.

### III. Cost-Sharing Grants

#### B. SUMMARY OF COST-SHARING GRANT AWARDS

The Wisconsin Energy Bureau staff conducted three grant cycles during the nine months from April through December 1999. Each cycle included three-steps: soliciting proposals, evaluating proposals, and awarding cost-sharing grants.

Energy Bureau staff awarded a total of 32 grants through those three grant cycles. And, during May 2000 four additional grants were awarded with remaining budgeted funds. Following each grant award a project manager was assigned to monitor the grant.

The Energy Bureau staff originally had planned the first phase of the Wisconsin Focus on Energy Program, including the grant projects, to end on June 30, 2000. However, it became possible to extend DSARE grant contracts six months, until December 31, 2000.

- Of 11 Business and Marketing grants, six received contract extensions.
- Of 12 Technical Assistance grants, one recipient had withdrawn earlier, and nine received contract extensions.
- Of 13 Demonstration grants, two recipients had withdrawn earlier and nine received extensions. Two grants involving planning and permitting delays have still not been completed.<sup>2</sup>

The grant awards included: Business and Marketing \$109,813, Technical Assistance \$202,902 (of which one project was withdrawn by the recipient, leaving \$194,202), and Demonstration Projects \$196,422 (of which two projects were withdrawn by recipients, leaving \$169,932), for a total of \$473,947.

As of July 2001, 31 projects funded by the cost-sharing grants have been completed and two are still pending.

For this evaluation we have monitored status and budget reports, reviewed 19 final project reports of 25 available at the Division of Energy, and completed interviews with 15 individuals responsible for 18 of the grant projects and the program managers. These sources provide information for evaluating individual projects and the overall cost-sharing grant program component.

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<sup>2</sup> These projects involve digesting manure at very large dairy operations to produce methane. The methane is then used to power engines or turbines to drive generators. In fact, these projects are now planned to have such large generating capacities that all the electricity will be contracted for sale to a local utility. If these plans become reality, these projects will be ineligible for the demand-side applications grants.

### C. REVIEWING PROJECT REPORTS AND INTERVIEWING RECIPIENTS

Program managers expected (and contract language required) grant recipients to file periodic reports and invoices at the completion of each phase of their projects. Recipients were to file a final report and invoice when the last phase of a project was completed.

Discussions with project managers and early process interviews with grant recipients showed that many projects were experiencing delays. Grant recipients not reaching milestones or needing reimbursement were not filing reports or invoices for long periods.<sup>3</sup> The interim evaluations disclosed few concerns other than the fact that many projects were understandably falling behind the aggressive timelines, with all projects originally scheduled to conclude by June 30, 2000.

Contract extensions were granted in May 2000 as it became clear that the majority of contracts would not be completed by June 30. Extensions were issued for 24 of 33 active projects. From July through September program managers and evaluators were occupied with planning DSARE II and evaluating completed components of DSARE I, respectively.

In December 2000 the program managers communicated that all work and expenditures on grant-supported projects must be completed by January 1, 2001. On February 26, 2001, the program Director reminded grant recipients that the Energy Bureau could only pay for work done under the DSARE I contracts if the Bureau had received final invoices and reports by Thursday, March 31.

In early April 2001 the evaluator began reviewing the reports that the Division of Energy had received. Program managers were reviewing some reports and we did not obtain a clear picture of how many reports had been received. As of April 2 we had identified 17 reports in the files. In June we returned and reviewed additional reports. On June 11 we sent a listing of reports we had found and reviewed (16), found but not yet reviewed (4), and projects for which we had not found reports (13). On July 13 the evaluator received confirmation that two additional hard copy reports were in the Division of Energy files. In addition, the program staff provided three additional reports in electronic format.

Thus, for this evaluation we have reviewed 19 of 25 available reports, have not seen reports for five projects, know one project only filed a final invoice with a brief memo, and expect two pending projects will likely withdraw from their grants as ineligible. We also completed interviews with 15 individuals representing organizations that received a total of 18 of the 33 grants (55 percent).

The following sections present findings, conclusions, and recommendations based upon these report reviews and interviews with grant recipients.

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3 Some delays were related to unexpected good weather. The mild fall weather in 1999 stretched well into December and few people involved in construction – such as renewable energy contractors – had the luxury of closing out the construction season much before the Holidays. Many grant recipients had planned to do much of the planning and assessment work on their projects during the customary winter lull in construction.

## D. FINDINGS

We present findings from our report reviews and recipient interviews, followed by comments from the program manager and staff who managed these projects.

### 1. Report Reviews and Recipient Interviews

The quality of reports ranged from very thorough, professional, and complete to barely acceptable. The best reports succinctly described what their goals were, what was done, how it was done, what had not gone as anticipated, and what results were achieved. Some reports described the next steps suggested, or made possible, by the grant-supported activities.

Accomplishments ranged from exceeding plans and expectations to learning that a proposed approach would not work. The most successful projects were conducted by a variety of organizations, including: large corporations, consulting firms, associations, educational organizations, individual proprietorships, and small voluntary organizations.

#### A. BUSINESS AND MARKETING GRANTS

Business and marketing projects resulted in the greatest range of results, from highly successful projects to learning that the recipient's concept would not succeed at all. It appears that individual entrepreneurs and small companies could benefit from more active project management and offers of additional assistance. It also appears that some business and marketing grant recipients would have benefited from guidance by business / marketing consultants. The direction taken in some projects were not as likely to produce desired results as approaches that business / marketing consultants would have advised. Examples include the five projects proposing to provide newspaper columns on a variety of topics, to produce a video on solar homes for broadcast TV, to develop and implement marketing for pellet stoves, and to try developing with a modest budget a website, local and national advertising, all at once. In these projects a great deal of hard work and considerable amounts of the recipients' own money, in addition to the grant money, were spent on efforts that expert advice may have made more successful. Or, in some cases, the advice may have been to try something else entirely.

- The Wisconsin Solar Use Network (WisconSUN) was created to coordinate and promote the use of solar energy systems in Wisconsin, with a focus on PV systems. DSARE I supported WisconSUN efforts to: 1) identify and contact supply chain members, 2) identify architectural and engineering firms to join the PV supply chain, 3) coordinate with other Focus on Energy activities, 4) identify interested site owners, 5) help members of the supply chain improve business strategies, 6) support site owners with linkages to PV supply chain members, 7) support site owners with business strategies, 8) coordinate funding and marketing activities, and 9) develop strategies for onsite champions. WisconSUN exceeded all goals for the number of market actors it was to contact and support, often by one and one half to more than four times. Notable is Work Element Four—Identify five interested site owners. WisconSUN supported 7 sites with funding, 5 with site visits (technical assessments and advice), 17 with information, and nine with strategies. And, nine sites completed installations. Overall, the manager of this statewide program reports spending at least twice as much time and effort working with suppliers and site owners in the Focus on Energy pilot area as they did with those in other areas of the state.

- The North Central Hearth Products Association developed Wisconsin-specific features for a regional promotional campaign called, "The Great Woodstove and Fireplace Changeout." The Association first conducted a market characterization study identifying homeowners' use of wood to heat their homes and the types and ages of wood stoves, fireplace inserts, and fireplaces being used. They also identified homeowners' plans to replace wood burning appliances, including intentions to buy different types of appliances, and motives for buying a new appliance. This information was communicated to the Association's members, who sell wood burning appliances, with announcements of the changeout campaign. The Association also provided survey results to the media to support the need for the changeout campaign. The Federal EPA provided information on the benefits of replacing stoves and fireplaces and the Wisconsin DNR provided \$200 incentives. During the second changeout campaign, in 2001 (actually part of DSARE II) the Division of Energy provided low interest loans with a four percent interest rate and a simple application procedure. The Executive Director of the Association said they learned a lot in the first changeout and the grant was very helpful. Further, she stressed that the four percent financing in the second changeout was even more effective than the \$200 incentives.<sup>4</sup>
- The Wisconsin Geothermal Association developed a Wisconsin-specific marketing package to create brand recognition among heating and cooling contractors and their customers. They "greatly underestimated the consulting costs for developing marketing resources," and completed only part of the planned package. However, they believe the new brochure "laid the groundwork for their new association."
- Two projects offered information on renewables to media companies without success. The first developed and promoted a series of newspaper columns covering renewable energy topics to be sold to daily and weekly newspapers for a modest cost. None of the newspapers approached would buy this service. The second created a videotape and accompanying informational brochure and approached TV stations to show the tape. Eventually one cable TV system carried the tape each Tuesday in May 2000. Local papers declined to print an article about promoting the broadcast. Libraries then responded positively and 20 copies were distributed.
- A siding and roofing contractor developed a marketing campaign for a new transpired solar collector – SolarWall – that preheats building make-up air.<sup>5</sup> The campaign included business-to-business print advertising, a direct mailing campaign, telemarketing to follow up with nonrespondents to the direct mailing, publicity to newspapers, business publications and radio and TV stations, an updated website on the Internet, and an exhibit at the Midwest Renewable Energy Fair in Madison in

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<sup>4</sup> Such a large percentage of the Renewable Energy Loans were for wood burning appliances during DSARE II, that in DSARE III the interest rate for wood burning appliances was increased from four percent to five percent. Few loans were obtained for other types of renewable technologies, so the interest rate for other technologies was reduced to three percent.

<sup>5</sup> This siding is a "building-integrated, air heating solar collector." The dark colored metal siding acts as the solar energy absorber. The siding has many small holes through which air is drawn – or "transpired" – heating the air. There is no glass cover over the siding. This greatly reduces the cost of this solar collector.

### III. Cost-Sharing Grants

June 2000. The most successful marketing approach was the Renewable Energy Fair. Because the product is useful for healthcare and retirement / nursing facilities, many interested parties had complex procedures for the vendor to follow in order to gain access to assess their facilities. The contractor feels that none of the efforts was better than the others, but that they complemented each other in raising awareness. The contractor plans to continue these efforts with some modifications.

- Fiber Recovery, Inc. (FRI) used their grant to complete their marketing strategy and have their pelletized fuel made from non-recyclable paper waste certified by the Public Service Commission as a renewable resource. They interviewed 28 customers within a reasonable distance from their plant and determined customers' hierarchy of criteria in selecting fuels. Then they worked with a marketing consultant to develop a direct contact sales presentation, a video, and a brochure. FRI expected to increase sales by 50 percent within three months of completing their marketing effort.
- Marth Wood Shavings Supply, Inc. used a grant to market pellet stoves to retailers at trade shows. They also felt that delays in receiving their contract caused them to miss valuable time at the beginning of the heating season when they could have been helping retailers sell stoves to customers at shows. Later, a shortage of wood pellets caused them to spend some of the grant funds investigating the market availability of wood wastes suitable for use in making pellets.
- Lake Michigan Wind & Sun, Ltd. developed a website with a marketing grant. However, only a few calls come from people who have been to the website or used Internet renewable energy guides. They were averaging 10 calls per day by December 2000. Most are from across the U.S. and Canada. About 25 percent of the calls are from Wisconsin, although less than five percent are from NE Wisconsin. No more than six callers had seen ads in the local paper. They get about 10 percent of all calls from people who see ads in Home Power Magazine. They believe this is because Home Power readers are mostly do-it-yourselfers, who don't need LWS for design or installation.

#### B. TECHNICAL ASSISTANCE GRANTS

Grant recipients experienced a mixture of notable successes, lack of interest, and rejections of projects they had analyzed. There are clear indications that the market for commercial, institutional, and industrial applications of renewable energy in the Focus on Energy pilot area is limited by a lack of awareness of proven possibilities.

- One technical assistance grant supported a project with the Oneida Reservation that made excellent use of renewable vendors' experience by having several of them serve on a technical advisory committee. The committee selected which equipment manufacturers and system designs to use, analyzed full life-cycle costs, and developed maintenance plans and operations manuals. Experienced contractors then conducted PV and solar water heating training for tribal contractors and their employees. Eight hot water systems were installed and five refurbished / repaired. Four PV systems were installed and five repaired. In addition, a solar trailer with solar hot water and PV systems was designed, built, and demonstrated at nine events in 2000. This comprehensive approach, guided at critical stages by experts, produced solid results.

### III. Cost-Sharing Grants

- The Wisconsin Department of Administration - Division of Facilities Development completed a feasibility study of using SolarWall on the new classroom building at the University of Wisconsin—Green Bay. The study was favorable and the project has moved ahead. Without the grant this application of a transpired air-heating solar collector would not have been included in this project.
- A technical assistance grant supported schools potentially interested in installing geothermal heat pumps and their local engineers in determining the feasibility of installing GHPs. Asking local mechanical engineers to conduct site-specific feasibility assessments is difficult because they face a steep learning curve. This situation leads to higher costs or negative attitudes about adopting a new technology. The grant supported an engineering firm with expertise and experience in designing GHP systems for schools. The goal was to install three GHP systems in schools across Wisconsin before the winter of 2000. Two evaluations were completed in the Focus on Energy territory, and one school went ahead with a GHP system. The other school chose not to invest an additional \$2/square foot or be the first in their area to use a new technology.
- Another technical assistance grant funded the design and preparation of cost estimate for a wood structure to provide stationary support or one-axis tracking capabilities for PV modules. The goals were to maximize the use of wood (a renewable material); minimize the fossil fuel energy embodied in other materials and production processes; and develop a design that could be fabricated in small workshops with uncomplicated methods. The recipient completed the design, including structural analysis, and a review of appropriate metal fasteners for use with preservative treated wood members.
- A technical assistance study of the methane production potential from an existing landfill provided a lot of information. The decision to expand the generation capacity at the site has been delayed. As soon as better electricity purchase prices are found, the project to expand existing generating capacity will move ahead.
- A technical assistance project provided a local training workshop on the use of Energy-10 software for designing low energy buildings. Two workshops were planned but the recipient could not find sufficient additional, local funding (beyond the DSARE I grant) for the second workshop. The recipient realized they needed to have done additional work to generate local partners to sponsor two courses.
- Another technical assistance project was designed to market a technical facilitation service to the many local government entities in the Focus on Energy 23 county area. The recipient expected that other organizations and individuals supported by and involved with Focus on Energy and DSARE would provide reasonable numbers of leads to local government officials needing technical facilitation services. The grant would then provide a modest amount of facilitation and support to move projects along. In the event, few customers were attracted and others provided very few leads. Further, those who were interested needed more extensive technical assistance than envisioned in the workplan. They needed detailed information to back up decisions to move ahead with projects. The grant recipient was not given permission to perform more extensive feasibility studies for a few customers, but was asked to keep marketing the lower level of service to all eligible customers.

### III. Cost-Sharing Grants

- A technical assistance grant supported a feasibility study of using landfill gas (LFG) to meet the electric power and heating needs of some potential customers in the Village of Hilbert. The study concluded that the landfill would have growing capacity to collect, dry, and distribute LFG over the next 17 years. Not only could the landfill meet the needs of the nearby Hilbert High School / Middle School by 2003, it would be able to meet the needs of the Hilbert Elementary School by 2005, the needs of Sargento Foods facility, the Village of Hilbert Well #2 and the Village Hall and Community Center by 2007. By 2017 it would have five times the energy required to provide all of the heat and electric power required by all of the potential users evaluated in this study. Unfortunately, the study indicates the proposed project is probably not financially viable at the present time.
- The technical assistance grant for SolarWall was to support feasibility studies using SWIFT software of six government / institutional facilities, three commercial, and three industrial facilities. However, the firm found it very difficult to enter the institutional facilities and, to date, have not been granted approval to do feasibility studies. In addition, the SWIFT software is not available. They have used the Energy Savings Analysis Program (ESAP) for 12 studies feasibility studies of commercial / industrial facilities.

#### C. DEMONSTRATION GRANTS

Several demonstration projects successfully completed equipment installations. Most projects have also conducted extensive demonstrations.

- The Midwest Renewable Energy Association, a non-profit educational group, completed combined system installation and training courses for a solar hot water system and a wind electric system. Internal evaluations found that 56 percent of participants rated workshop quality "excellent," and the other 44 percent rated it "very good." In each case the renewable energy systems were installed with monitoring systems that measure, display, and record both the renewable energy available at the site and the energy produced by the renewable equipment. Over 420 people visited the facility in the six months following system installation and the demonstrations are one of the educational highlights of the facility.
- The St. Mary Central High School, in Neenah, moved, re-established, and augmented an environmental / energy education center. Students have been involved in developing lesson plans to use for visitors to the center. Existing semester courses titled Solar Energy Science and Technology and Solar Energy Seminar are offered to high school students.
- A couple constructed a solar demonstration home using five solar technologies (passive solar heating, solar water heating, passive cooling, a small off-grid PV power supply, and daylighting). The home's energy use and sources are monitored and seven tours of the home have been conducted (during and after the grant period). A total of 85 individuals toured the home and 198 others heard presentations describing the home and its energy systems. The Division of Energy used this home as the setting for a TV commercial and is using it as a case study.

### III. Cost-Sharing Grants

- A heating and cooling contractor installed a geothermal heat pump with a vertical loop for a home and conducted a demonstration of the system. The grant was used for TV advertising to promote a one-day open house. During the open house, 150 people toured the home and learned about geothermal heat pumps. The publicity and demonstration, plus higher energy costs have increased contracts for geothermal heat pump installations significantly.
- Edward Ritger included a geothermal heat pump, PV, and Cool Daylighting features in his new office building. A grant from WisconSun helped with PV equipment costs and the DSARE grant helped with other equipment and demonstration costs. Mr. Ritger said that, while some of the technologies would pay for themselves in a reasonable time, the grants made a difference in going ahead with the PV installation. Monitoring equipment is being set up and will have real time display and data logging capabilities. Demonstrations are given to anyone who visits the office on business or out of curiosity. The building is on a main highway and is seen by many passersby. Excellent coverage was obtained from area newspapers. In addition, the local electrical contractor received training from a representative of the Canadian manufacturer of the daylighting control equipment. This was coordinated through a major electrical supplier who was also unfamiliar with the product. The owner included the building on the National Tour of Solar Homes and will continue to do so. The owner has duplicated articles on the building and distributes those and the handouts several of the contractors prepared. The Division of Energy is preparing a case study on this project.
- The State of Wisconsin Department of Administration / Division of Facilities Development (DFD) received two demonstration grants, one for Building Integrated Photovoltaics and one for commissioning the installed renewable energy features of the new University of Wisconsin—Green Bay classroom building. The DFD manager said the grants "Definitely allowed us to do more. Even though this was a big project, the energy features took the budget right to the wire." However, the process of obtaining grants was cumbersome. If consultants had not done the extra work of dealing with the grants they would not be able to do it.
- The Northern Lights Master Gardeners Association obtained a grant to demonstrate a wind electric powered water pumping system at their demonstration gardens. They installed the windmill, pump, tank, and piping themselves. They created an interpretive sign and a brochure explaining the project, obtained local press coverage and have hosted meetings of county government committees and taken committee members on tours of the wind pumping installation. Visitors to the garden continue to learn about the installation from the sign and brochures.
- Lake Michigan Wind & Sun, Ltd. received a demonstration grant to install and compare the performance of two PV trackers (tracking systems) and three PV panel technologies. The output of the systems is being monitored and then analyzed on a quarterly basis. Demonstration efforts appear limited and no explanation of the information that will be available to visitors is provided.
- Microgy Cogeneration Systems was awarded a grant to demonstrate its integrated bio-waste to energy process. Manure from dairy cattle is processed in a digester and the resulting methane gas is then used to fuel a reciprocating engine or turbine. The resulting shaft power spins an electricity generator. In the original plan the generator output would have been used for on-farm electricity needs and excess electricity

would be sold to the utility. However, the current plans call for much larger generation capacity, whose output will only be sold to a utility. (Installing electrical switchgear to provide service to the host farm from the on-site generator is not cost-effective.) Microgy has not yet taken the grant monies and is unlikely to use either of the grants.

D. OTHER RECIPIENT COMMENTS

Recipients made a variety of other comments about specific aspects of the DSARE I program. In all instances the recipients intended their comments to be constructive and to contribute to better programs in the future.

Recipients identified the necessity of providing the right support to customers with different needs:

- Grant recipients want a better means of guiding potential customers to the appropriate type and level of support. Some felt customers needing more detailed analyses and feasibility assessments were not always able to find the help they needed. Several program and grant-supported activities were designed to provide general information in response to initial inquiries. Other activities were designed to provide limited support, or facilitation, to many customers. However, with two exceptions – geothermal heat pump and landfill gas feasibility studies – there was little assistance beyond "facilitation." During DSARE I there was no "initial" or "on-site" consulting available from any program-supported experts.<sup>6</sup>
- Some grant recipients believe customers need changing types and levels of support as they move through several steps in their decision process.
- Recipients also pointed out that "members of the general public," need more help than the "innovators" they often work with. "Innovators" tend to be more risk tolerant, more able to understand technical information, and have often learned a lot on their own. The technical assistance grants could fund services appropriate to customers in the next levels—"early adopters" and "early majority." These services would help those less comfortable with risk, and with moderate resources.<sup>7</sup>

Grant recipients identified needs for better coordination of leads:

- Many needed efforts were coordinated across grant recipients, program staff, and contract facilitators. This coordination was achieved largely because few renewable energy projects required support beyond that provided by individual vendors, and almost all the renewable suppliers know each other and work together when needed.
- However, few leads were shared effectively among those involved with DSARE I. Very few leads were posted on the DSARE list server. Apparently, it was not clear that sharing leads widely was important. Some grant recipients stated that they had

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<sup>6</sup> This specific service was added in DSARE II.

<sup>7</sup> Characteristics of different adopters categories are summarized from Rogers, *Diffusion of Innovation*, 1995, Chapter 7 Innovativeness and Adopter Categories, pp. 252 to 280.

### III. Cost-Sharing Grants

expected many more leads would be shared, but they did not raise this issue with program managers or at the three DSARE meetings.<sup>8</sup>

- Some grant recipients were looking forward to expanding from the pilot's 23 northeastern counties to the statewide program. They believed the statewide customer base would provide greater demand for their services. Others, who support members of the renewable supply chain, also expected that the larger numbers of distributors, vendors, and contractors involved would keep them busier.

Recipients made variety of suggestions related to procedures and program requirements:

- Grant recipients with little experience in obtaining funds from government agencies had some problems with procedures. For some, the invoicing requirements posed significant problems. For others the reporting requirements were unclear and frustrating. Some found program management inflexible on shifting from approaches that were not working to others that promised better success.
- Some grant recipients would not apply for additional grants because the procedures were too time-consuming and some requirements were not explained clearly enough. In addition, several recipients noted that they had not been given clear guidelines for what to put in their reports. Recipients who do not deal with state agencies often would like DOA to provide clear samples of what is expected in a report.
- Grant recipients from non-profit organizations felt that the cost-sharing requirement is fine for businesses or individuals in business. They may have money that can be used for their cost-share. Non-profit organizations have to go out and raise the money specifically for the project. Some non-profit educational organizations felt the matching funds requirement on demonstration projects should be reduced for them. Because their mission is to bring people to their facilities specifically for information, training, and education, they believe they will provide greater exposure than a homeowner or business.
- Some grant recipients felt the information sharing requirements were too cut and dried. They recommended allowing greater flexibility for sensitive parties. There should be some prior review by participants before reports are released so nothing demeaning becomes public.
- Some recipients noted that the negotiations after a grant had been "awarded" were confusing. If DOA had clear ideas of what they wanted done, and those ideas were significantly different than what was in the proposal, there needed to be a clearer process for determining the direction the project would take.
- Some recipients also indicated that they wanted to know more clearly what the evaluator would need from them much earlier in the process. If the evaluator would

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<sup>8</sup> DSARE program managers and facilitators organized two meetings during DSARE I. Announcements invited all program participants, renewable vendors, and other interested parties to attend. These were held in September 1999 and April 2000. Another meeting was held early in DSARE II, in October 2000.

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need to contact the people they worked with, they needed to know so they could mention that up front.

- Several recipients praised their contract managers. They understood the contract manager was there to "protect the state's money." They appreciated the time the manager spent with them discussing their project and offering his or her experience and contacts. Many noted that DOA staff were flexible about delays and they could adjust schedules for their projects. However, when the contract management responsibilities were handed off from one person in DOA to another, some expressed concern about the time it took the new contract managers to get caught up.

Recipients had a variety of opinions about DSARE meetings and fact sheets:

- Grant recipients varied in whether they attended the DSARE meetings in September 1999, April 2000, and October 2000. Some attended all three meetings and found them worthwhile. Others did not see the benefits of the meetings. Many who attended one or more meetings want more time for networking. They want to be able to meet other contractors and customers to learn about opportunities.
- Several grant recipients had used the Division of Energy fact sheets. They expressed a great range of opinions about the fact sheets, especially about the format. Some vaguely recalled the fact sheets in the "little brochure." A few said the design should be "more professional," on glossy stock with color illustrations. One said they were fine for answering specific questions and felt that making them more attractive might cost more than it was worth. Still, that grant recipient wondered if the plain format would really attract people who are not already serious about renewable energy.

## 2. Program Manager and Staff Interviews

DSARE was the only Focus on Energy component administered within the Department of Administration. During DSARE I the management staff included one program manager, one DOA renewable energy engineer, one contract renewable energy engineer, and several other DOA employees providing administrative and specialized support.

Program staff felt that the administration of the proposal solicitation and grant management improved over the three initial grant cycles. Among the achievements were aligning the proposal requirements with the reporting / invoicing formats. This provided a better "template" the grant recipients could work from when preparing reports and invoices.

While the DSARE program director was proud of DOA's low administrative costs for managing DSARE, this was achieved by relying heavily on a few individuals putting in considerable efforts on their own time. In fact, during most of DSARE I the only individual with significant time dedicated to ongoing management of DSARE was the contract renewable energy engineer. The contract engineer provided evaluators with the most organized reviews of project status. And, interviews with grant recipients confirmed that the most consistent communications and support came from the contract engineer.

In addition the program director and staff developed estimates of the conventional energy that was—or would be—displaced (saved) by the equipment sold through business and marketing grant results, recommended as feasible by technical assistance, or supported directly or

### III. Cost-Sharing Grants

influenced by demonstration grants. The total electricity savings were estimated to be 20 million kilowatt-hours (kWh). The total heat savings were estimated to be 618,000 therms.

The evaluators find one reason to now greatly reduce these estimates. The initial Microgy manure-to-biogas-to electricity project was estimated as producing 8 million kWh and 3,000 therms. As a demonstration project it was estimated to influence four additional projects, however the estimate also only gave future projects a 25 percent probability of being realized. Thus another 8 million kWh and 3,000 therms were included in the total estimates. The fact that this type of system will probably not qualify as a "demand-side" project means that these production estimates should "technically" not be included in the results of this program. This reduces the estimated electrical production by 80 percent. Several similar projects are proceeding, and they will provide supply-side contributions.

The other calculations include some probably overly optimistic estimates of the numbers of other customers who might be influenced by the projects supported with these grants. However, reasonable per project savings estimates and only giving 25 percent credit for "future" projects keep the overall numbers from being outrageously high.

## E. SUMMARY AND RECOMMENDATIONS

*Summary of Findings:* The Wisconsin Energy Bureau designed the Demand-Side Applications of Renewable Energy (DSARE) Program relying on their proven approach: *cost-sharing grants to fund projects*. They relied upon these grants to supplement the recipients' own funds and make possible efforts and projects that the recipients would otherwise not be able to undertake. These included grants supporting business and marketing plan development and execution, technical assistance grants to enable site owners to learn the technical and economic feasibility of potential renewable energy projects, and demonstration grants providing support for purchasing equipment and – most importantly – for demonstrating installations to the public.

Through three grant solicitation cycles and one set of additional awards, the Energy Bureau funded 36 grants. Of these, three recipients (eight percent) withdrew, 31 projects (86 percent) have been completed, and two projects (six percent) are pending final arrangements for the sale of all or part of their electrical output.

*Recommendations:* Cost-sharing grants—a successful approach for supporting renewable energy market development—should remain a key aspect of the DSARE program. The fact that some projects were highly successful, some moderately successful, and some completely failed to meet their goals does not detract from the usefulness of the grant approach. In fact, if there were no "only" moderate successes and no failures, we would be more critical of the process of selecting grant recipients. We would then criticize the program for not producing any significant progress in moving the market for renewables ahead.

### 1. Business and Marketing

*Summary of Findings:* Business and marketing projects resulted in the greatest range of results, from highly successful projects to learning that the recipient's concept would not succeed at all. It appears that individual entrepreneurs and small companies could benefit from more active project management and provision of professional assistance, specifically,

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guidance by business / marketing consultants. Some directions taken in their projects were not as likely to produce desired results as approaches that consultants would have advised.

This conclusion is not derived just from the fact that some projects failed. Rather it is that many of the less successful projects failed in very predictable ways. Ways that professionals in business and marketing planning and in market characterization and marketing could have identified early on in most of these projects. Supporting the grant recipients with some outside expertise could have identified fixable problems and set them on a course that would have been more likely to succeed.

Some of the most successful projects resulted from recipients' use of some of the funds to characterize the market for their products or services. For example, the North Central Hearth Products Association surveyed homeowners to determine their use of wood and pellet stoves and fireplaces, ages of their existing equipment, and motives relating to replacing equipment. These results were shared with the Association's members and used to plan a marketing campaign fielded in conjunction with the US EPA and Great Lakes states' natural resource agencies. A second example is the completion by Fiber Recovery, Inc. of in-person interviews with 28 potential customers. They determined customers' fuel selection criteria and developed – with a marketing consultant – sales presentations and materials addressing those criteria.

Some of the less successful projects took shotgun approaches or selected approaches without identifying their best markets and considering the best means of reaching these markets. Other recipients proposed ambitious projects but underestimated the time their efforts would require or the costs of working with qualified marketing and advertising consultants. For example, one recipient tried a website, local and national advertising with little overall increase in the number of calls coming in every week. Another recipient set out to market residential heating products and continued with that idea even though the grant was delayed well into the heating season. Finally, an example of adapting to difficulties is seen in another firm that encountered difficulty gaining the access they needed to institutional facilities to complete feasibility studies. They adapted and shifted their feasibility studies to the commercial sector and completed 12 studies showing reasonable payback and return on investment results.

*Recommendations:* The Renewable Administrator should contract with a small group of business and marketing consultants providing expertise covering all customer sectors. The Administrator should have these consultants review business and marketing grant proposals and comment on the methods proposed, assumptions regarding costs, and other key factors. During grant award and negotiation, consultants should assist in refining the original proposals. During project implementation, consultants would review progress, offer advice, and support recipients as needed. We believe that this involvement of marketing consultants could significantly improve the success of the Business and Marketing grants.

We also specifically recommend that more grants require recipients to conduct market characterization studies to identify their best potential customers. Such characterizations could consist of interviews with potential customers done by the grant recipient (or their staff), as was done by Fiber Recovery in preparing to market Fiberfuel. They could also be contracted to a market research firm, as was done by the North Central Hearth Products Association.

## 2. Technical Assistance

*Summary of Findings:* Technical assistance grant recipients experienced a mixture of notable successes, lack of interest, and rejections of projects they had analyzed. There are indications that the market for commercial, institutional, and industrial applications of renewable energy is limited by a lack of awareness of proven possibilities. One example is the decision by one school district to proceed with and another to refuse to proceed with ground source heat pump projects.

Successful technical assistance projects by site owners included the use of a technical advisory committee and a project conducted by consultants for a large state building project. In each case these owners' representatives used their grant funds to obtain timely professional advice.

Another approach was to support selected consultants, who have greater experience in applying renewable technologies than most local consultants. By selecting an experienced consultant, the Division of Energy takes a key choice out of the hands of the site owners needing the advice. Introducing new consultants to site owners adds an extra step – the development of a solid working relationship – to the usual owners / consultant interaction. The geothermal heat pump consultant completed two feasibility studies in the Focus on Energy pilot area and helped one project move ahead, but was turned down by the other school district. A solar consultant was hired to market a moderate level of facilitation and assistance to a large number of local governments. The consultant believed that delivering a greater level of service to interested customers would have achieved greater results than continuing to market less service to many potential customers.

An approach to technical training selected an out of state group to recruit local partners to help support their training workshop on their building design software. When the out of state group could not find sufficient partners they were only able to offer one workshop instead of two.

Other technical assistance grant recipients had unexpected difficulties. One vendor was not able to get a software package he believed would be available to complete feasibility studies. Consultants completed studies that showed projects were technically, but not economically feasible. Others completed studies that show great potential, but site owner's staff turnover delays decisions. These specific challenges may have been unexpected, but the occurrence of difficulties is certainly commonplace. These are not project failures. They might be better accommodated in the future by giving project management more flexibility to provide assistance, to facilitate efforts to work around obstacles, or to extend grant deadlines.

*Recommendations:* The Division of Energy staff could improve the judging of technical assistance proposals. A group comprised of a few individuals representing the potential clients / targets that grant recipients would be serving may be very useful. They would better reflect customer acceptance of proposed consultants, trainers, and approaches.

## 3. Demonstration Grants

*Summary of Findings:* Demonstrations are potentially the most risky arena for grants, especially for new concepts or approaches where there are no example projects functioning or vendors experienced in working in the area. However, the Division of Energy had considerable experience in selecting and awarding grants for installation / demonstration

### III. Cost-Sharing Grants

projects (through the Renewable Energy Assistance Program). Thus, with minor exceptions, Energy successfully awarded grants and supported recipients in completing installations and demonstrating technologies. Two perennial problems for demonstrations are the limited number of interested people who can visit a site and the limited time most site owners will keep a demonstration available for tours.

*Recommendations:* The Division of Energy should continue existing efforts to support a range of "market ready," practical examples of renewable technologies with sufficient funds to provide quality installations and demonstrations that reach sizable numbers of potential customers. To overcome the limitations on the numbers of people who can complete a physical tour, the Energy staff should continue their efforts to develop "virtual tours" and case studies of as many demonstration projects as possible.

#### 4. Other Issues

*Summary of Findings:* A variety of issues were raised during interviews with grant recipients and program staff. These included a need for a greater variety of support for potential customers, a need for increased sharing of leads, and greater clarity in describing, and flexibility in administering the grant processes.

Grant recipients believe that customers need different types and levels of technical and financing support depending on the customer's background and the stage of the process in which they are involved. The less background a potential customer has with renewables, the more those providing support should address concerns about the risks of using renewables and the demand on the customers' resources that using renewables may pose.

Few leads to potential customers and projects were shared among participants in DSARE I. For some renewable vendors sharing leads is not seen as beneficial, and some potential customers may not want suppliers or other sources of information to share their interest in renewables. While challenging, sharing the names and needs of potential customers with a broader group of renewable vendors and consultants should provide additional stimulation to the relatively small renewables market in Wisconsin.

Recipients also noted several instances where grant program policies and procedures need to be clarified and administered more flexibly. Overall, many of their issues could have been addressed in many cases if program / contract managers had additional time to answer questions and address emerging issues.

Recipients expressed a variety of opinions of the usefulness of the periodic DSARE meetings and the fact sheets that DSARE produced during the first few months.

*Recommendations:* The Division of Energy managers and staff should support a greater variety of types and levels of technical support meeting specific customer needs. In DSARE II support is provided for some renewable consultants and vendors to provide initial on-site needs assessment and consultation with customers. It may be useful to expand these services.

The Energy and facilitator staff and grant recipients should emphasize and directly support the creation and use of mechanisms to improve the coordination of leads identifying potential customers and projects. This is particularly applicable within the context of the technical assistance grants and the project and financial "facilitators." The development of these

### *III. Cost-Sharing Grants*

mechanisms must consider potential customers' privacy issues and renewable vendors' "rights" to leads they have generated and are pursuing.

Continuing efforts to simplify and clarify program requirements and to communicate them ever more clearly should be made.

The periodic DSARE meetings should be formalized as regularly recurring events with some consistent features and activities. Making these meetings the occasions for important program announcements could boost attendance, as could providing – and publicizing – more time for networking.

#### **IV. MIDWEST RENEWABLE ENERGY ASSOCIATION TRAINING WORKSHOPS**

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##### **A. BACKGROUND: WORKSHOPS OFFERED**

Between June 1999 and November 2000 the Midwest Renewable Energy Association (MREA) ran 22 workshops covering a variety of renewable energy technologies and applications. The Division of Energy supported improvements to these workshops including the development of new handout materials with a \$35,650 grant to the MREA. Some of the grant funds were also used to reduce workshop fees for individuals living in the 23 counties included in the Wisconsin Focus on Energy Pilot Territory. These workshops were taught primarily by dealers / contractors with significant experience with renewable energy in Wisconsin.<sup>9</sup>

This evaluation investigated the workshop results in terms of what participants learned and what they thought of the topics covered during the workshop(s) they attended. The total participation in these 22 workshops was over 248 people.<sup>10</sup> This included a relatively large percentage of people who attended more than one workshop. We asked those who had attended more than one workshop to base their responses on their most recent workshop experience.

This evaluation obtained feedback on twelve types of information about respondents' participation in a workshop they attended, other sources of information, actions taken since the workshop, possible improvements, and if they would recommend similar workshops. Specifically, we asked respondents about:

1. Their role as a consumer, business customer, or a professional learning to install systems.
2. Their goals.
3. Their level of knowledge upon entry.
4. How well the workshop covered the topics they wanted to learn about.
5. How useful the major topics covered by the workshop were to them.
6. Examples of how the information and contacts made at workshops were useful.
7. Other sources of information they have used since the workshop.
8. How useful the information obtained from the MREA workshop was in comparison to information obtained from other sources.
9. Why other sources or MREA workshops were more useful?
10. What actions they have taken to use renewable energy themselves or to install systems for others since the workshop.
11. What improvements they would suggest for future MREA workshops?
12. Whether they would recommend similar MREA workshops to others?

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9 Instructors for whom MREA listed experience averaged 15 years working with renewables.

10 Total attendance for workshops taught at the 2000 American Solar Energy Society Conference in Madison were not included.

Table 1 lists the 22 workshops offered from June 1999 through November 2000.

- Ten workshops covered a variety of topics in the areas of photovoltaic (PV) equipment, system design, construction, troubleshooting and PV / wind hybrid installations.
- Four workshops covered solar water heating system equipment, design, and installation.
- Four workshops covered a variety of space heating approaches including active solar space heating, masonry (wood burning) heaters, and infloor radiant heating systems. These workshops covered equipment, systems, design, and installation.
- Three workshops covered wind systems installation, utility intertied wind systems, and wind / PV hybrid systems.
- Two introductory level workshops covered the "solar lifestyle: an introduction to renewable energy."
- A series of workshops was offered over three days in conjunction with the 2000 American Solar Energy Conference in Madison, Wisconsin. We have counted this as "one workshop," but many topics were covered.

## B. PARTICIPATION AND SURVEY RESPONDENTS

Table 1 also shows the participation in these 22 workshops ranged from five to 20 people in each workshop (not counting the ASES conference workshops). From zero to 15 participants in each workshop took advantage of Focus on Energy scholarships to reduce the fee they paid for attending workshops.

We obtained broad evaluation coverage of the workshops that had been offered by completing interviews with participants who had attended all except four of the workshop sessions. The right hand column in Table 1 shows we interviewed from one to nine of the participants in each of the eighteen sessions our respondents had attended, averaging almost four participants from each of those workshops.

Our 52 respondents had attended a total of 74 workshops, averaging 1.4 workshops apiece. We asked respondents who had attended multiple workshops to provide answers for the *most recent workshop*. This approach was designed to aid recall and anchor responses regarding topics covered to one event. It also anchored questions about what have you done since the workshop to a specific time period.

**Table 1. MREA Workshop Summary <sup>1</sup>**

<b>Workshop Topic</b>	<b>Dates</b>	<b>Days</b>	<b>DSARE Scholarships</b>	<b>Total Attendance</b>	<b>Respondents Attending</b>
Utility Intertie Wind	June 4-6, 1999	3	1	8	0
PV Installation	June 12-16, 1999	5	4	20	6
Basic/Intermediate PV	October 2-3, 1999	2	5	5	0
Solar Hot Water	October 9, 1999	1	7	12	3
Active Solar Space Heat	October 10, 1999	1	8	12	2
Masonry Stoves	October 16, 1999	1	4	13	1
Solar Lifestyle	March 18, 2000	1	5	7	1
Basic PV	March 25, 2000	1	11	15	5
Intermediate PV	March 26, 2000	1	13	19	8
Solar Hot Water Install	April 7-9, 2000	3	7	17	6
Stand Alone PV Install	May 6-7, 2000	2	4	8	5
Wind System Install	May 15-26, 2000	12	1	8	0
ASES Workshops	June 16-18, 2000	3	6	na	0
Solar Lifestyle	September 9, 2000	1	15	15	5
Infloor Radiant Heat	September 23, 2000	1	0	8	1
PV Troubleshooting	September 16-17, 2000	2	4	8	1
Solar Hot Water	September 30, 2000	1	3	8	4
Basic PV	October 21, 2000	1	3	20	9
Intermediate PV	October 22, 2000	1	3	15	5
Masonry Stoves	November 4, 2000	1	5	9	4
Solar Hot Water	November 11, 2000	1	7	14	5
Wind/PV Hybrids	November 18-19, 2000	2	3	7	3
	Totals	47	119	248	74

<sup>1</sup> The 52 respondents had attended 74 workshops.

**C. FINDINGS**

**1. How Respondents Learned of Workshop**

As shown in Table 2, the largest portion of the respondents (57 percent) reported learning about the workshop they attended via a direct mailing from the MREA (these mailings are sent to MREA members and anyone who inquires of the MREA for information about renewable energy). Nineteen percent of respondents heard about the workshop at the Midwest Renewable Energy Fair. Tied for next most often reported source were MREA members and the Internet, at 11 percent. The workshops were listed on both the Focus on Energy and MREA websites. Other sources were cited by less than 10 percent of respondents.

**Table 2. How Respondents Learned of Workshop <sup>1</sup>**

<b>How Learned of Workshop</b>	<b>Percent of Responses</b>	<b>Percent of Respondents</b>
Direct mailing from MREA	47%	57%
At the Midwest Renewable Energy Fair	16%	19%
MREA member	9%	11%
On Internet ("web")	9%	11%
Flyer	5%	6%
From a friend	7%	8%
Magazines	3%	4%
From a renewable energy business	2%	2%
From a renewable energy user	0	0
Called Focus on Energy 800 number	0	0
From the DSARE program	0	0
Don't Know	3%	4%
	101% <sup>2</sup>	122%
	(n=58)	(n=47)

<sup>1</sup> For this multiple response question, 47 respondents provided 58 responses.

<sup>2</sup> Does not total to 100% due to rounding.

**2. Respondent's Role Attending Workshop**

Many of the workshops are suitable for individuals who are interested in using renewable energy at their home or business, and for people who design, supply, and install renewable energy equipment and systems.

Our next question asked respondents in which role they attended a workshop. We received an average of 1.4 responses to this question from each respondent. The largest group (86 percent) was those attending as a homeowner interested in using renewable energy at their home (see Table 3). Two groups tied for a distant second place, businesspeople interested in using renewable energy at their facility (23 percent) and people interested in making renewable energy installation their business (21 percent). Finally, 15 percent attended from an educational standpoint or to acquire new skills.

**Table 3. Respondent's Role When Attending Workshop<sup>1</sup>**

<b>Role</b>	<b>Percent of Responses</b>	<b>Percent of Respondents</b>
Homeowner interested in using renewable energy at your home	59%	86%
Businessperson interested in using renewable energy at your facility	16%	23%
One interested in making renewable energy installation your business	15%	21%
Educational standpoint / new skills	10%	15%
	100%	145%
	(n=76)	(n=52)

<sup>1</sup> For this multiple response question, 52 respondents provided 76 responses.

### 3. Respondents' Interests and Plans

As shown in Table 4, one-third of respondents attended a workshop to learn about a specific type of renewable energy. One-quarter attended to learn what living with renewable energy would be like. One-fifth attended to learn how to install a renewable energy system.

Only one in ten, or less, gave other interests. These included learning about a specific application of renewable energy (11 percent), about renewable energy – in general (9 percent). Only four percent were interested in building a home using renewable energy or in applying it to other specific types of buildings. Finally, only two percent were interested in using renewable energy in a business.

**Table 4. What Respondents Wanted to Learn <sup>1</sup>**

<b>Attended workshop to learn about . . .</b>	<b>Percent of Responses</b>	<b>Percent of Respondents</b>
A specific type of renewable energy	32%	36%
Living in a home with renewable energy	22%	24%
How to install renewable energy systems	18%	20%
Specific applications of renewable energy	10%	11%
Renewable energy (general)	8%	9%
Building a home using renewable energy	4%	4%
Applying renewables to specific types of buildings	4%	4%
Using renewable energy in a business	2%	2%
	100%	110%
	(n=50)	(n=45)

<sup>1</sup> For this multiple response question, 45 respondents provided 50 responses.

The three largest groups of respondents were interested in solar (53 percent), wind (43 percent), or photovoltaics (31 percent), as shown in Table 5. Far fewer respondents expressed interest in geothermal, hydro, wood, or all renewable sources (six percent each). Finally, very few respondents were interested in passive solar (four percent), fuel cells (four percent), or biomass (two percent).

**Table 5. Interest in Specific Renewable Energy Sources <sup>1</sup>**

<b>Renewable Sources of Interest</b>	<b>Percent of Responses</b>	<b>Percent of Respondents</b>
Solar	33%	53%
Wind	27%	43%
Photovoltaics	19%	31%
Geothermal / Ground Source	4%	6%
Hydro	4%	6%
Wood	4%	6%
All	4%	6%
Passive solar	2%	4%
Fuel cells	2%	4%
Biomass	1%	2%
	100%	161%
	(n=79)	(n=49)

<sup>1</sup> For this multiple response question, 49 respondents provided 79 responses.

As shown in Table 6, workshop participants' planned uses of renewable energy reflect the topics that were offered by the workshops.<sup>11</sup> Most respondents were interested in three major uses: space heating (47 percent), producing their own electricity (42 percent), and water heating (40 percent). Only seven percent, or less, of the respondents mentioned planning other uses of renewable energy.

**Table 6. Planned Uses of Renewable Energy**<sup>1</sup>

<b>Planned Uses</b>	<b>Percent of Responses</b>	<b>Percent of Respondents</b>
Space heating	30%	47%
Electricity	27%	42%
Water heating	26%	40%
Daylighting	4%	7%
Home uses	3%	4%
Sell it	3%	4%
Project / building	3%	4%
Other	4%	4%
	100%	152%
	(n=70)	(n=45)

<sup>1</sup> For this multiple response question, 45 respondents provided 70 responses.

Of the nineteen (of 45 respondents) planning to use renewable sources to provide electricity, 15 plan to produce electricity only for use on their site, and one plans to produce some for sale to their utility.

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<sup>11</sup> It is interesting to note that most of the workshops focus on a range of topics identified by both a renewable energy source and a use of energy. An examination of the data by cross-tabulating data from the last two questions might find a good match to all respondents' interests – if we had a larger group of respondents better reflecting participants in all the workshops. Given the small number of respondents and the fact we have none representing two of the wind workshops, one of the PV workshops, and none of the ASES workshops we did not explore these relationships. The point of this digression is that while we can discuss relatively small numbers of renewable energy sources and uses, people are interested in the much larger numbers of combinations of sources serving specific uses. The "renewable market" is really a complex set of market sectors.

Eighty-four percent of respondents planned residential applications of renewable energy. Just ten percent planned agricultural applications and only eight percent planned commercial applications (see Table 7).

**Table 7. Planned Types of Applications** <sup>1, 2</sup>

<b>Planned Applications</b>	<b>Percent of Responses</b>	<b>Percent of Respondents</b>
Residential	66%	84%
Agricultural	8%	10%
Commercial	6%	8%
Other	5%	8%
Institutional / Schools	5%	6%
Any / all types	5%	6%
Governmental	3%	4%
Industrial	2%	2%
	100%	128%
	(n=65)	(n=51)

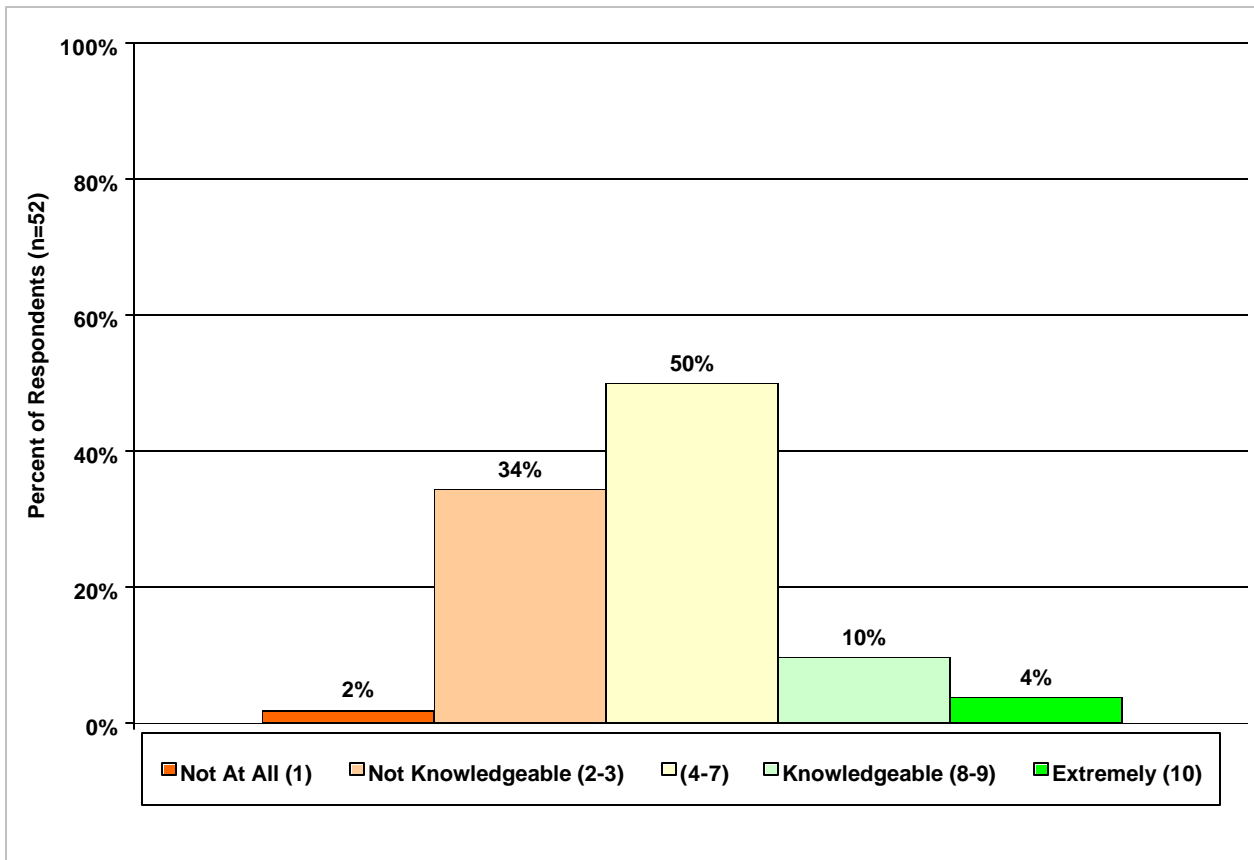
<sup>1</sup> "Applications" refers to the building type / market sector in which renewables would be applied.

<sup>2</sup> For this multiple response question, 51 respondents provided 65 responses.

#### 4. Prior Knowledge and Sources of Information

Eighty-six percent of respondents report they had little knowledge of renewable energy sources, uses, and applications prior to attending the workshop (Figure 1). Ten percent report being "knowledgeable" (8 or 9 on a 1 to 10 scale), and four percent report being extremely knowledgeable. These courses are designed for and marketed to people who may already be interested in renewables, but do not yet know the basic, intermediate, or advanced material that will be covered in the workshops they attended. And, as shown on the next page, respondents had consulted a variety of information sources before attending an MREA workshop.

**Figure 1. Level of Knowledge Before MREA Workshop**



Respondents had consulted a wide variety of other sources of information about renewable energy prior to attending the MREA workshop. As shown in Table 8, books were most popular, with 43 percent using them. The next most often used source of information was the Midwest Renewable Energy Fair. It was used by 29 percent of all respondents, or just two-thirds as many as read books. The Fair was followed in popularity by "all" magazines, used by 26 percent of all respondents. Home Power Magazine (by itself) was mentioned by one-fifth of the respondents, as was the Internet.

Another twelve sources of information were mentioned by from only ten percent to two percent of respondents.

**Table 8. Prior Sources of Information <sup>1</sup>**

<b>Other Sources</b>	<b>Percent of Responses</b>	<b>Percent of Respondents</b>
Books on Renewable Energy	21%	43%
Midwest Renewable Energy Fair	14%	29%
Magazines, other	13%	26%
Home Power Magazine	10%	20%
Internet	10%	20%
Other MREA Workshops	5%	10%
Television	4%	8%
On the Job	4%	8%
School	4%	8%
Personal Contacts	4%	8%
Other Renewable Energy Workshops	3%	6%
Home Energy Magazine	2%	4%
Newsletters	2%	4%
Newspapers	2%	4%
Conferences	1%	2%
Wisconsin Energy Bureau (Div. of Energy)	1%	2%
Videos	1%	2%
	101% <sup>2</sup>	204%
	(n=101)	(n=49)

<sup>1</sup> For this multiple response question, 49 respondents provided 101 responses.

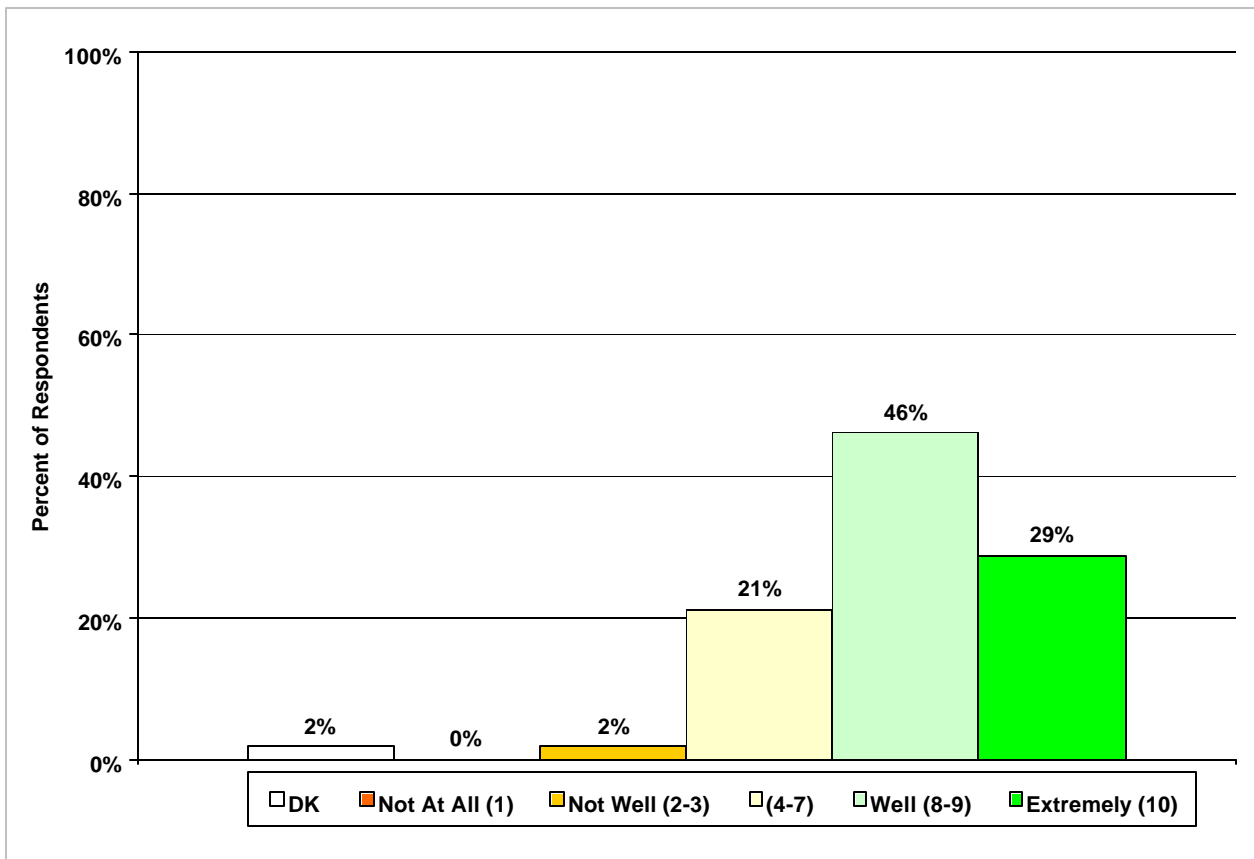
<sup>2</sup> Does not total to 100% due to rounding.

### 5. MREA Workshop Coverage of Topics

Respondents give MREA workshops high marks for covering topics of interest quite well. As shown in Figure 2, a total of 75 percent of all respondents rate the workshops as covering topics "well" (8, 9, or 10 on a 1 to 10 scale). And, fully 29 percent of all respondents rate the workshops as covering topics "very well" (10).

Of the remaining one-quarter of the respondents, fully 21 percent give a neutral rating (of 4 to 7 on the 1 to 10 scale). Only two percent say the workshops do not cover topics well (ratings of 2 or 3).

**Figure 2. How Well the MREA Workshop Covered Topics of Interest**



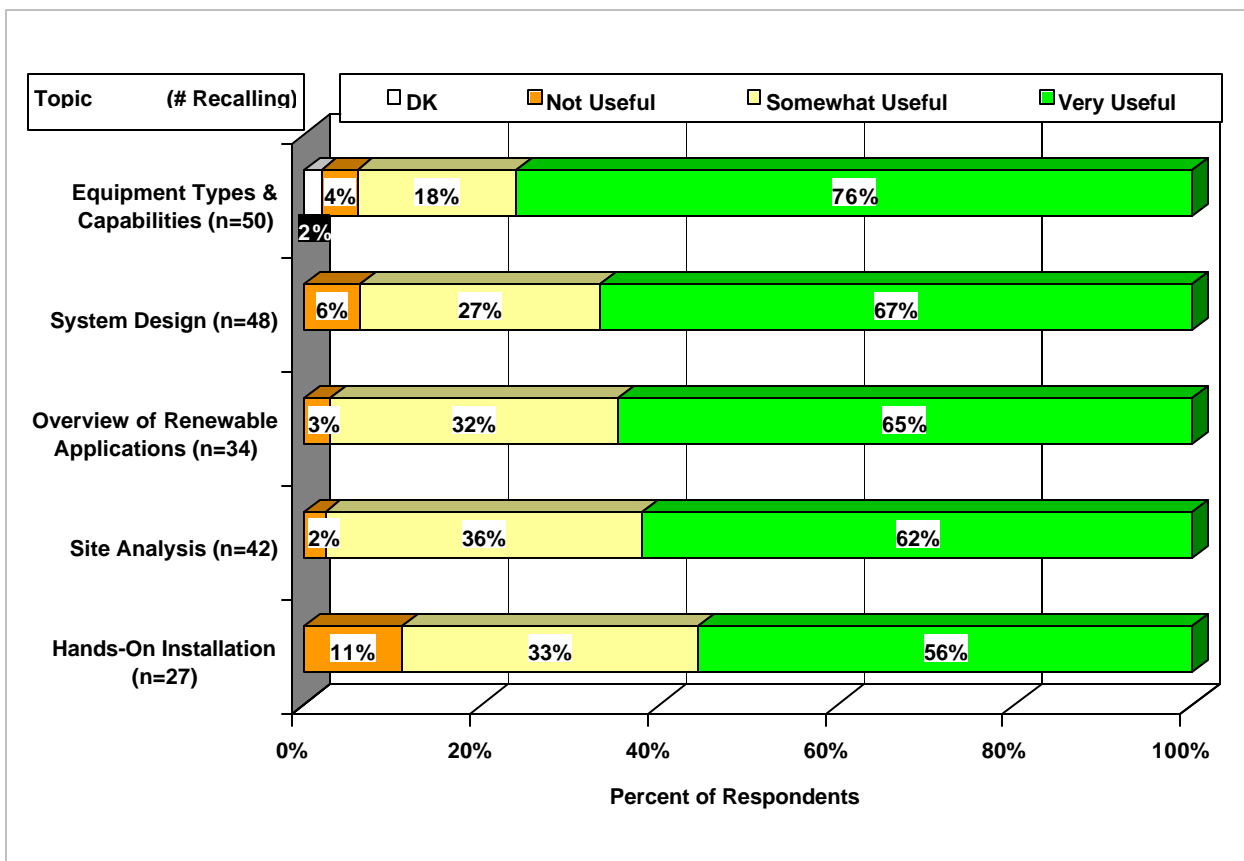
### 6. Usefulness of Information / Contacts from Workshop

Overall, nine tenths of respondents who recalled major topics covered in workshops rated each topic "very" or "somewhat" useful. We first asked respondents if they recalled each of five topics that may have been covered in the workshop they were evaluating.<sup>12</sup> We then asked those who recalled each topic to rate how useful they found the topic.

As shown in Figure 3, the largest number of respondents (50 of 52, or 96 percent) recalled the description of equipment types and capabilities. Seventy-six percent of those who recalled this topic rated it "very useful." In addition 18 percent rated it "somewhat useful," four percent rated it "not useful," and two percent did not know how useful it was.

From 92 percent down to 42 percent of respondents recalled each of the other four topics. Of those respondents, 56 percent to 67 percent rated these topics "very useful," with an additional third (27 to 36 percent) rating these topics "somewhat useful."

**Figure 3. Usefulness of Topics Covered**



<sup>12</sup> Some of these topics were not discussed in each of the workshops. Notably "Hands-On Installation" was covered only in several of the longer workshops.

Next, we asked respondents for a specific example of how the information from the workshop was useful. As shown in Table 9, they gave a broad range of answers, with six quite different examples being mentioned by between eight and 15 percent of respondents. Included among these examples respondents recognized the usefulness of technical information, their familiarity with different systems, their ability to install their own system, and the fact they had progressed to planning their design for new construction.

**Table 9. Examples of How Workshop Information Was Useful**

<b>Example</b>	<b>Percent of Respondents</b>
Technical information	15%
Good source for wood heat	14%
Familiar with different systems	14%
Installed own system	12%
Planning design for new construction	8%
How to go about it in the future	6%
Can use a wind generator	4%
Raised awareness	4%
Other	4%
Safety information	2%
Proposals	2%
Not useful yet	2%
Don' Know / Don't Recall	15%
	102% <sup>1</sup>
	(n=52)

<sup>1</sup> Does not total to 100% due to rounding.

As shown in Table 10 when asked to provide examples of how contacts made at workshops were useful, 12 to 15 percent mentioned three examples: meeting knowledgeable people, hiring their instructor to do work for them, and having a better understanding of renewables. Smaller numbers gave examples such as having bought equipment from a workshop contact, developing a continuing relationship with a contact, having opportunities to talk to people who already use renewables, receiving information on future events, and hoping to generate business from contacts.

Clearly, the opportunities to "network" are a valuable benefit of attending workshops.

**Table 10. Examples of How Contacts Made at Workshop Were Useful**

<b>Example</b>	<b>Percent of Respondents</b>
Met knowledgeable people	15%
Hired instructor to do work	12%
Have a better understanding	12%
Not useful yet	10%
Bought equipment from contact	4%
On-going relationship with contact	4%
Talk to people who use renewables	4%
Receive information on future events	4%
Hope to generate business	4%
Other	2%
Don' Know / Don't Recall	31%
	102% <sup>1</sup>
	(n=52)

<sup>1</sup> Does not total to 100% due to rounding.

**7. Sources of Information Since Workshop**

As shown in Table 11, the largest proportion of respondents obtained information from books and the Internet since they attended the MREA workshop. Other sources used by many respondents include magazines (in general), Home Power Magazine, Home Energy Magazine, and installers. None of the other sources of information have been used by more than five percent of the respondents.

**Table 11. Sources of Information Since Attending MREA Workshop <sup>1</sup>**

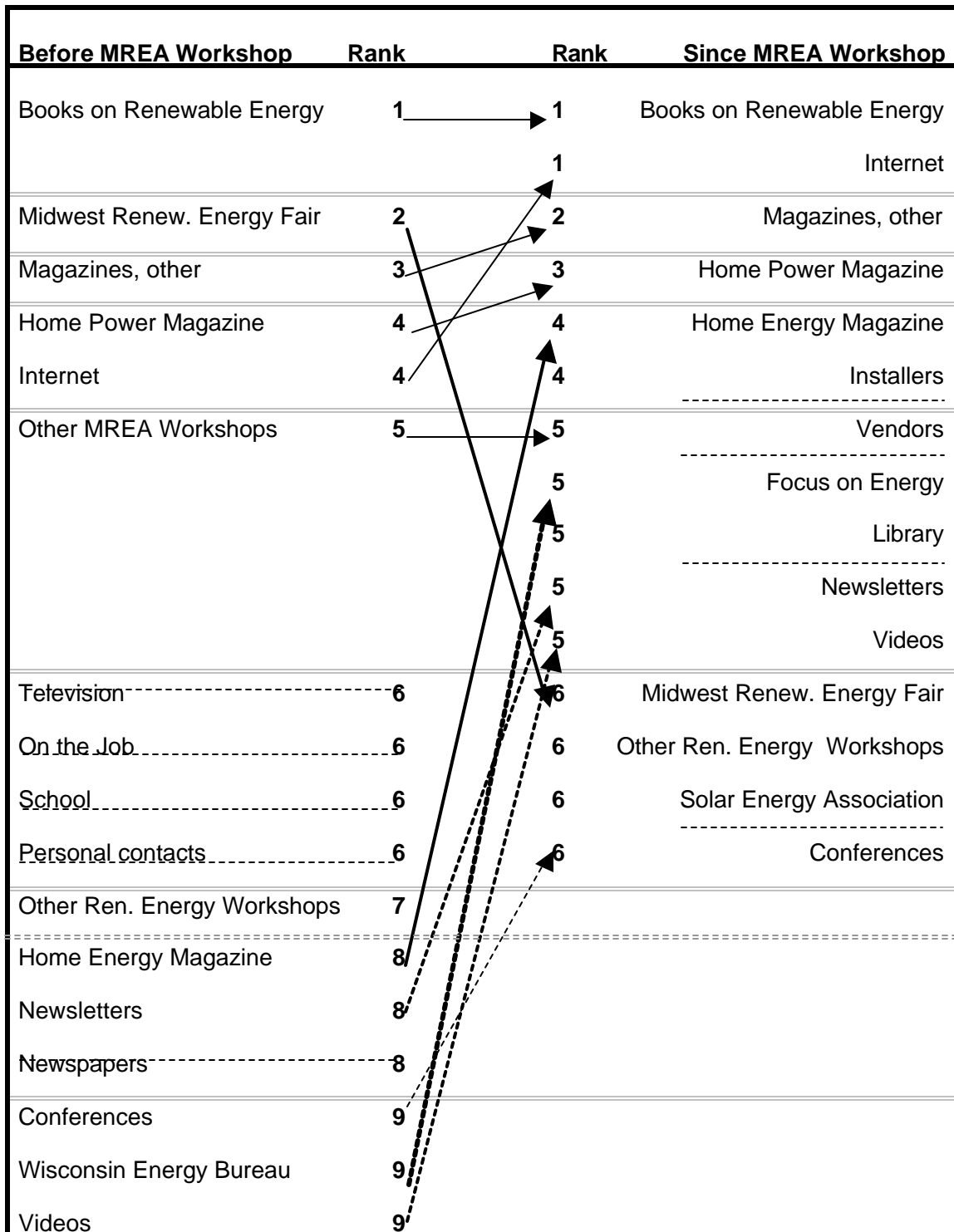
Source	Percent of Responses	Percent of Respondents
Books on Renewable Energy	21%	37%
Internet	21%	37%
Magazines, other	18%	32%
Home Power Magazine	9%	16%
Home Energy Magazine	4%	8%
Installers	4%	8%
Vendors	3%	5%
Focus on Energy	3%	5%
Library	3%	5%
Newsletters	3%	5%
Videos	3%	5%
Midwest Renewable Energy Fair	2%	3%
Other Renewable Energy Workshops	2%	3%
Solar Energy Association	2%	3%
Conferences	2%	3%
	100%	175%
	(n=66)	(n=38)

<sup>1</sup> For this multiple response question, 38 respondents provided 66 responses.

Figure 4 compares the sources of information respondents used prior to and after attending the MREA workshop. Respondents report increases in use of the Internet, Home Energy Magazine, installers, vendors, Focus on Energy (compared to the Wisconsin Energy Bureau), libraries, newsletters, videos, conferences, and the Solar Energy Association. The only significant decrease is in use of the Midwest Renewable Energy Fair.

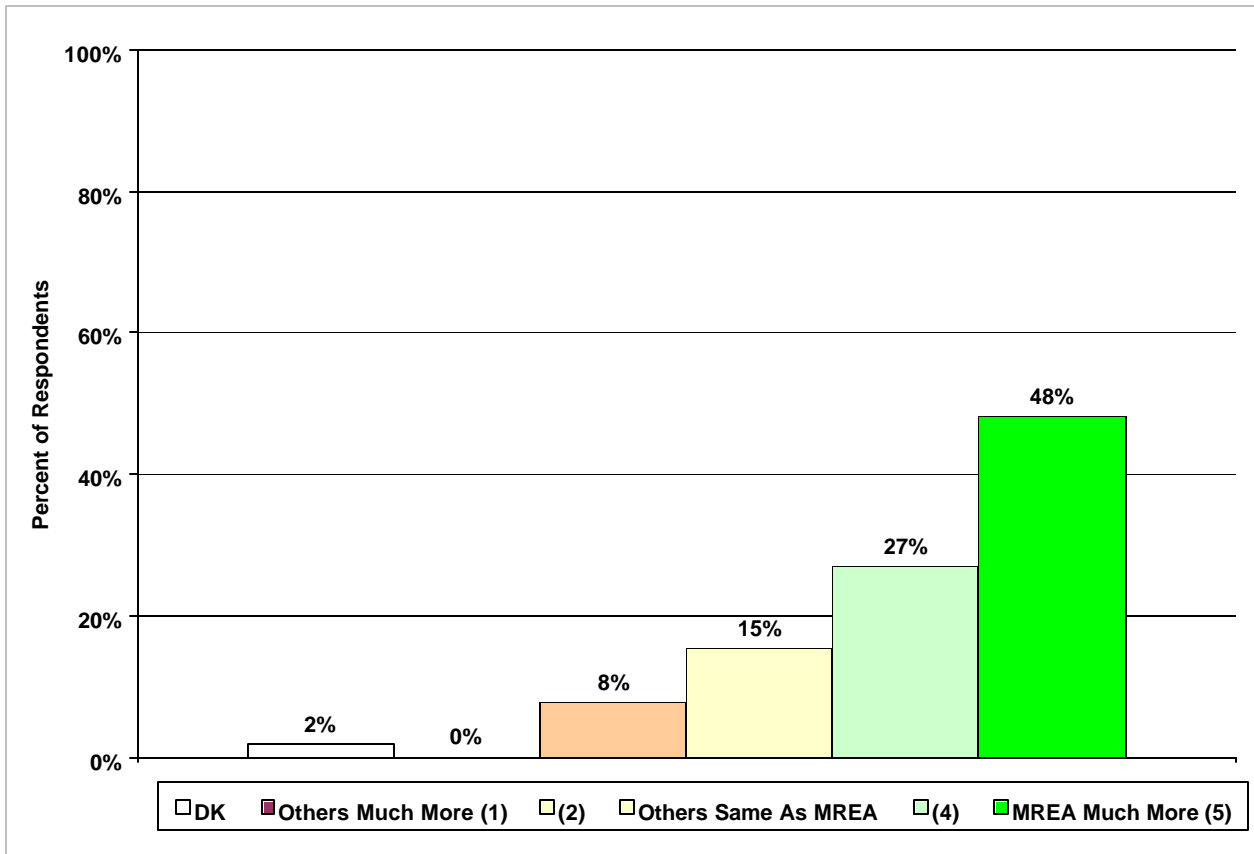
A plausible hypothesis that supports these changes is that respondents learned enough from the MREA workshop to seek information directly from these more technically oriented sources. Also, they may not have had time to attend another Fair since their workshop.

Figure 4. Changes in Rank of Information Sources



Three-fourths of all respondents rated the information they received from the MREA workshop as more useful or much more useful than the information they received from other sources (as shown in Figure 5). Almost one half of all respondents rated the information from MREA as much more useful.

**Figure 5. Usefulness of MREA Workshop Compared to Other Sources of Information**



One-quarter of the respondents, who said that the information from the MREA workshop was more useful than that from other sources of information, also said the MREA workshop had more knowledgeable instructor and was more informative. Other respondents mentioned five additional reasons more than once, as shown in Table 12.

**Table 12. Reasons MREA Workshop More Useful <sup>1</sup>**

<b>More . . .</b>	<b>Percent of Respondents</b>
Knowledgeable Instructor	27%
Informative	24%
Hands On	16%
In-Depth	11%
Able to Ask Questions	11%
Face-to-Face	5%
Specific Topics	3%
Other	5%
	102%
	(n=38)

<sup>1</sup> Because 37 respondents provided only 38 responses, we have shown only the percentage of respondents.

Only four respondents said other sources of information were more useful than the MREA workshop they had attended. The reasons they gave included "more practical," "more in-depth," "more useful information," and "were equal."

**8. Actions to Use Renewable Energy Since Workshop**

Fifty-eight percent of respondents answered, "Yes" to the question, "Have you taken any actions to use renewable energy yourself?" Of the 30 respondents who said they had taken such actions, 26 listed the following actions (see Table 13).

**Table 13. Actions Taken to Use Renewable Energy <sup>1</sup>**

Action	Percent of Respondents
Installed solar	27%
Purchased equipment	19%
Install PV system	15%
House design	15%
Using wood heat	12%
Energy conservation	8%
Contacted different companies	8%
	104%
	(n=26)

<sup>1</sup> Because 26 respondents provided only 27 responses, we have shown only the percentage of respondents.

In addition, seven of 11 respondents (who were "interested in making renewable energy their business") identified eight ways they used things they learned in the workshop in their business. These included installing domestic solar hot water systems, planning, fixed solar systems, and other actions.

**9. Suggestions for Future Workshops**

Asked what topics would be useful for them, the largest groups of respondents suggested more on wind, more hands-on, more on passive solar, more on grid-tied systems, more on solar panels, more on PV systems, and more on converters / inverters (see Table 14).

A small number of respondents (only three percent) also suggested each of nine more technologies. However, this is insufficient interest for use in planning.

**Table 14. Topics Useful to Respondents in Future Workshops <sup>1</sup>**

<b>Useful topics</b>	<b>Percent of Responses</b>
More on wind	15%
More hands-on	12%
More passive solar information	12%
More on grid[-tied] systems	9%
More on solar panels	9%
PV systems	9%
Converters / inverters	6%
Domestic water	3%
Electric cars	3%
Hot water	3%
More basic information	3%
More detailed information	3%
More experienced people attending	3%
More frequent workshops	3%
More types of renewables	3%
Woodstoves	3%
	99% <sup>2</sup>
	(n=34)

<sup>1</sup> For this multiple response question, 29 respondents provided 34 responses.

<sup>2</sup> Does not total to 100% due to rounding.

While one of the largest groups of respondents feel that MREA is doing fine now in making its activities known, other large groups suggest using flyers, radio ads, and offering workshops around the state (see Table 15). Still others suggest using newspaper ads, making more use of the Internet / website, and of mailings.

**Table 15. Ways MREA Might Make Its Activities Better Known <sup>1</sup>**

<b>Ways</b>	<b>Percent of Respondents</b>
Doing fine now	15%
Flyers	15%
Radio ads	15%
Workshops around the state	12%
[News]paper ads	8%
More use of Internet / website	8%
Mailings	8%
Ads in environmental publications	4%
Communicate with supply companies	4%
Notices to libraries	4%
Other	8%
	101% <sup>1</sup>
	(n=26)

<sup>1</sup> Does not total to 100% due to rounding.

Finally, when we asked respondents if they would recommend similar MREA workshops to others, 98 percent (all except one) said "Yes."

#### D. SUMMARY AND RECOMMENDATIONS

*Summary of Findings:* MREA has a solid market presence providing workshop-based training to homeowners interested in specific types of renewable energy. Most of the people who attend their workshops hear about them from an MREA mailing or at the Midwest Renewable Energy Fair.

- The largest portion of respondents (57 percent) learned about the workshop they attended via a direct mailing from the MREA. The next largest portion (19 percent) recalled hearing about the workshop at the Midwest Renewable Energy Fair.
- Almost nine of ten respondents attended as a homeowner interested in using renewable energy at their home. And, in line with their reported role in attending, more than four-fifths of those attending planned to apply renewables to residential buildings.
- More than one-third of respondents wanted to learn about a specific type of renewable energy, one-quarter wanted to learn about living in a home with renewable energy, one-fifth wanted to learn how to install renewable energy systems, and one-tenth wanted to learn about specific applications of renewable energy.
- The largest groups were interested in solar energy (53 percent), wind energy (43 percent), and photovoltaics (31 percent). The largest groups were interested in three major uses / applications: space heating (47 percent), generating electricity (42 percent), and water heating (40 percent).

*Recommendations:* MREA should continue to serve its core constituency – homeowners – with training delivered through workshops. By monitoring interest in the topics it covers and asking members, attendees at the Fair, and workshop participants what else they should cover, MREA should be able to keep filling its workshops.

MREA should also aggressively expand its efforts to serve the needs of renewable energy vendors for staff training.

*Summary of Findings:* MREA is serving the needs of its audience very well. It appears that by using active renewable energy contractors, and by conducting internal evaluations, MREA is presenting topics of most interest and covering them well.

The majority of people attending MREA workshops had very little knowledge of renewables before attending the workshop. Three-fourths of respondents feel the MREA workshops cover topics of interest to them well or extremely well, and they feel most topics covered and contacts they made were useful to them.

- Only 14 percent of respondents were "knowledgeable" or "extremely knowledgeable" before they attended the MREA workshop. Forty-three percent had read books on renewable energy before attending the workshop. Twenty-nine percent had attended the Midwest Renewable Energy Fair.
- Three-fourths of respondents feel the MREA workshop covered topics of interest to them "well" or "extremely well." Between 56 percent and 76 percent of the

respondents who recalled each of five major topics being covered at their workshop, said the topics were "very useful" to them.<sup>13</sup>

- Eight to 15 percent of respondents provided specific reasons that information was useful to them, including: they needed "technical information," they became "familiar with different systems," they learned of a "good source of wood heat," they learned to "install [their] own system" or to "plan for new construction." Similarly, 12 to 15 percent of respondents provided specific reasons the contacts they made at the workshop were useful, including: they "met knowledgeable people," "hired instructor to do work," or "have a better understanding."

*Recommendations:* By continuing its "close to the customer and vendor" approach, MREA should be able to identify new interests as they emerge and include them in their training.

*Summary of Findings:* The workshops influenced almost three-fourths of participants to continue learning more about renewables, although most respondents rated the information received from the MREA workshop as more useful than that obtained from other sources. And, well over one-half of respondents have "taken action to use renewable energy themselves."

- Since the workshop the largest groups of respondents have read books (37 percent), gone on the Internet (37 percent), read [other] magazines (32 percent), or read Home Power magazine (16 percent). It appears that respondents learned enough about renewable energy at the workshop to seek information directly from more technically oriented sources.
- Three-fourths of all respondents rated the information they received from the MREA workshop as "much more useful" or "more useful" than that obtained from other sources. One quarter of these respondents also said the MREA workshop was more useful because it had a "more knowledgeable instructor," and was "more informative" than other sources of information they had used.
- Fifty-eight percent of all respondents said they "had taken actions to use renewable energy themselves." Of these, 27 percent had installed solar, 19 percent had purchased equipment, 15 percent had installed a PV system or designed a house, 12 percent were using wood heat, and eight percent were conserving energy or had contacted different [renewable equipment] companies.

*Recommendations:* MREA workshops are preparing participants to continue learning about renewable energy on their own. Most importantly, the workshops are stimulating many participants to turn their growing knowledge into actions to benefit themselves and society. Once again, MREA should continue staying close to its members, Fair-goers, and workshop participants to best meet their needs.

*Summary of Findings:* Finally, more than one-half of respondents suggested topics useful to them at future workshops and ways to promote the workshops.

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<sup>13</sup> From 96 percent down to 42 percent of respondents recalled four of the topics being covered. Hands-On Installation was only covered at some workshops and was recalled by 36 percent of respondents.

#### IV. Midwest Renewable Energy Association Training Workshops

- More than one-half of respondents offered suggestions for topics that would be useful to them at future MREA workshops. More than ten percent of these respondents said offer more on six topics: wind, hands-on, passive solar, grid-tied systems, solar panels, and PV systems.
- One-half of the respondents offered suggestions to MREA for making its activities better known. One of the largest groups of respondents said no suggestions were needed, MREA is "doing fine now." Those making suggestions included three methods: flyers, radio ads, and conducting workshops around the state.

*Recommendations:* It appears that while more 15 percent suggest making MREA's activities better known by using flyers or radio ads and 12 percent suggest offering workshops around the state, just as many say MREA is "doing fine now." We recommend that MREA explore how its members feel about growth and continue to limit enrollment in each workshop to a moderate number of participants.

***APPENDIX A: REFERENCES***

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***References***

Rogers, Everett M., *Diffusion of Innovations*, 4<sup>th</sup> Edition, 1995, The Free Press.