

# annual report

2001



energy center of wisconsin

a year in review of restructuring,  
renewing our mission, and results



ready.

that's right.

we're ready to

tackle energy issues

in a whole new way.

get ready to

**react.**



Energy Center of Wisconsin

# mission

To sponsor and conduct research in efficient use and management of energy, and to develop, demonstrate, and transfer the results of that research to Wisconsin's energy service consumers and providers.



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## annual report 2001

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remarks from the president

"The Energy Center is the premiere organization in providing energy efficiency education, information, and demonstration."

It always helps to plan for the future, whether you're an individual or an organization. And with all the changes going on in the energy industry, now is a wise time for the Energy Center of Wisconsin to be planning its future.

As we in the energy industry are all well aware, restructuring to a more competitive environment has resulted in a number of changes. Chief among them is the switch from utilities providing energy efficiency services to the public benefits model. Wisconsin recognized the necessity of safeguarding these services by having them provided by the state. This has been a welcome change, and in response the Energy Center Board has taken a number of actions.

The first is a shift in the governance of ECW. The Board will have two utility slots instead of five, and the number of public slots will be increased. This reflects a strategic change: less reliance on utilities and more reliance on getting funding from those who directly use ECW's products and services.

The second is a focus on keeping ECW fiscally solid. We finished the last fiscal year with a small surplus, and we have a two-year goal to develop a financial reserve. This cushion will help ECW deal with shifting funding sources in its future activities.

Third, we've focused on new leadership. As we sought to fill the position of executive director, we

were looking for someone who was familiar with the energy industry, prepared to assume an aggressive role in fund raising, and willing to represent ECW in policy issues with the state. We've found that person in Susan Stratton, and we're working together to create a longer term 3- to 5-year strategic plan.

We need a long-term strategic plan because the shift to public benefits is just one of the changes that the Wisconsin utility industry is undergoing. In response to reliability concerns, we're seeing changes in the transmission and distribution network and a new role for renewables and energy efficiency as well. In addition, we're going to see continuing activity in the deregulation and restructuring of the utility industry in Wisconsin.

The Energy Center is the premiere organization in providing energy efficiency education, information, and demonstration. Given its expertise and prestige, we can expect ECW to have a strong voice in the changes that are reshaping the energy industry. That's a good reason to plan—strategically—for our common energy future.

John Wilson, Xcel Energy  
President, Board of Directors

black and white can be  
**refreshing.**

add a little red for zip

and always use clear,

convincing language and you've got

something that gets noticed.

that's what we do.

Energy Center of Wisconsin Communication Services

your new strategic partner.





remarks from the executive director

“As we begin to think more broadly about energy reliability as a key component of the success of Wisconsin’s business climate and the security of its residents, I hope to lead ECW to participate in a wider variety of energy reliability and quality issues and projects that more fully support the wise use of our valuable energy resources.”

This year has been one of significant change for the Energy Center of Wisconsin. In addition to the hiring of a new management team, one of the most dramatic changes has been our three-year shift in primary funding from utility dollars to a more diverse mix of utility dollars, ratepayer dollars via public benefits, and independent grants and projects. This is a real shift in the responsibility of providing energy efficiency services from the utilities, to independent providers via state government, and eventually to a competitive marketplace.

The Wisconsin state legislature was the first in the U.S. to recognize the importance of investing in energy efficiency as a key component of energy reliability, regardless of the status of retail competition. Wisconsin was also first to implement a public benefits program incorporating energy efficiency without first taking the more drastic step of initiating retail competition in the electric market.

ECW’s partnership with the state public benefits program, operating under the Wisconsin Focus on Energy brand, draws on our experience and focus on efficient use and management of energy. ECW is contributing its technical expertise and its education, training, and outreach services to the industrial,

commercial, residential, and government markets through the Focus on Energy sector administrators. We are also the administrator for the environmental research program and participate in the renewable resource program as a board member. We have committed to an initial 3-year contract to provide these services to citizens and businesses to support our mission and commitment to the energy future of Wisconsin.

The Energy Center’s original public interest mission is still alive and well through our transition period. As we begin to think more broadly about energy reliability as a key component of the success of Wisconsin’s business climate and the security of its residents, I hope to lead ECW to participate in a wider variety of energy reliability and quality issues and projects that more fully support the wise use of our valuable energy resources.

Susan Stratton  
Executive Director



wherever you want.

don't hesitate to check out the ECW

Information Clearinghouse whenever you

want. investigate just about any energy-

related topic you can think of.

**it's not a secret anymore.**

[www.ecw.org](http://www.ecw.org)



**RESIDENTIAL AND RENEWABLE**

Our desire to match industry needs for competitiveness and productivity with energy efficiency led us to organize the Water-Wastewater Roundtable.

The Affordable Comfort Conference showcased our REEhouse, a home in inner-city Milwaukee being constructed out of recycled building materials.

Our geothermal experts developed the Geothermal Showcase at Fond du Lac High School—the first school in the state to make use of a geothermal heating and cooling system—exposing over 50 design professionals and school officials to this technology.

ECW evaluators monitored the Tinedale Biogas project and open house. Tinedale Farms in Wrightstown is the first farm in the state with a manure digester; the digester forms methane gas, which is burned to produce electricity.

Our evaluators monitored the Moisture Management Protocol case study project to assess how moisture affects the durability, thermal performance, and structural integrity of selected residential wall systems.

To provide funding for student research projects we managed the Energy Services, Education, and Research Committee (ESERC) at the University of Wisconsin.

Our analysis of Wisconsin ENERGY STAR® Homes versus new, non-ENERGY STAR homes found that ENERGY STAR homes use 10 percent less natural gas.

Our study of pressure diagnostics for low-income weatherization crews developed advanced diagnostic procedures for air sealing and a better way of applying them in the field.



Renewables program and participation in the Photovoltaics Working Group.

The Environmental Research Program—sponsored by Wisconsin Focus on Energy—will recommend and fund research projects on the environmental effects of electrical generation.



We established and strengthened our relationship with the renewable energy community through the new Wisconsin Focus on Energy

Renewables program and participation in the

**EVALUATION AND MARKET RESEARCH**

Based on a literature review of what is known about the various energy markets served by Wisconsin Focus on Energy we developed a searchable database of market research literature.

We continued to provide analytical support to the Wisconsin Department of Administration's Energy Services Bureau.

Through the Consortium for Energy Efficiency we participated in a national study of awareness and recognition of the ENERGY STAR label and generated Wisconsin-specific data.

We evaluated the potential for energy-savings from partnerships with non-energy organizations, such as the Wisconsin Manufacturing Extension Partnership, which helps small-and medium-sized manufacturers become more competitive.

Our evaluation of ECW Lifelong Learning programs found that 97 percent of participants would recommend an ECW training to a colleague.

### OUTREACH SERVICES

We launched the Information Clearinghouse [www.ecw.org](http://www.ecw.org) in July 2001. The Information Clearinghouse is the main website for ECW and currently averages more than 4,100 visits per month.

Our Library Services and website received more than 200 information requests in the last six months.

Our writing and design experts helped develop hundreds of business tools like the Roadmap for the Wisconsin Pulp and Paper Industry, which describes long-term competitive needs on energy, environmental, and production issues.

With more than 50 libraries now participating we continue the Wisconsin Focus on Energy public library program, which provides funding to update



energy materials and watt meters to measure home appliance energy usage.



Under contract with E Source, ECW Library Services provided information for the Industrial Mid-Market Series. These industry snapshots give utility representatives and energy service providers background information on the industries they serve.

The e<sup>2</sup> electronic newsletter—a collaboration between ECW writers, designers, project managers, and energy experts—reached over 7,000 subscribers.

As the education and training lead for Wisconsin Focus on Energy statewide professional education

efforts we managed professional education for commercial, industrial, agricultural, residential, and multi-family sectors, with a budget of over \$1 million.

Our educators fully integrated ECW's education and training efforts into energy efficiency market transformation programs. The results have been measured by outside evaluators and found to have long-term market effects.

We sponsored over 60 educational events, workshops, and industry roundtables and trained over 3,500 people. Here's a sampling:

**Wisconsin ENERGY STAR® Homes training series:** This series is comprised of a total of 13 skill-based, hands-on training events to teach participants how to build safe, durable, comfortable, and energy efficient homes.

**Cure for the Common Callback:** This training developed by the Energy and Environmental Building Association provides builders with the information they need to prevent problems before they start, thereby reducing or eliminating the need for callbacks.

**Building Expectations:** This two-day conference teaches building owners, design professionals, and operations and maintenance staff how energy efficiency and high-performance buildings go hand in hand.

**Building Operator Certification:** This 7-session series aims to improve energy and resource efficiency in commercial and industrial buildings and shows how preventive maintenance practices reduce energy consumption and lower energy costs. Certified operators save an average of 28,600 kWh per year.

**Lighting Design in Today's World:** This seminar teaches techniques for high-quality, energy-effective lighting designs.

**Industrial Refrigeration:** This one-day workshop shows participants how to operate refrigeration systems more efficiently and identify best practices to reduce operating costs.

## SUPPORTING OUR MISSION

*Member* organizations provide some of the Energy Center's financial support. *Representatives* from both member and participant organizations serve on committees and on the Board of Directors.

### members

Alliant Energy\*  
Madison Gas & Electric Company\*  
Marshfield Electric and Water Department  
Stora Enso North America  
Superior Water, Light and Power  
We Energies\*  
Wisconsin Public Power Incorporated  
Wisconsin Public Service Corporation\*  
Xcel Energy\*

### participants

Badger Safe Energy Alliance  
Community Builders  
Conserv Products, Inc.†  
Department of Administration's Division of Energy  
Earth Energy Systems  
Kohler Company†  
Milwaukee School of Engineering\*  
Municipal Electric Utilities of Wisconsin\*  
National Association for the Advancement of Colored People  
Northern Thunder  
Opportunities Industrialization Center of Greater Milwaukee  
PRO-TEL, Inc.†  
Public Service Commission of Wisconsin\*  
RENEW Wisconsin  
Terminal-Andrae Inc.\*†  
University of Wisconsin Extension  
University of Wisconsin-Madison\*  
University of Wisconsin-Stevens Point  
Wisconsin Community Action Program Association  
Wisconsin's Environmental Decade  
Wisconsin Manufacturers & Commerce

\*Representative serves on the Board of Directors

†Trade ally representative

financial report 2001



review

# board of directors 2002



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*Xcel Energy*



**ROMAN DRABA**  
Vice President  
*We Energies*



**LAURA WILLIAMS**  
Secretary  
*Madison Gas & Electric  
Company*



**PAUL LIEGEOIS**  
Treasurer  
*Wisconsin Public Service  
Corporation*

## ENERGY CENTER FINANCIAL PERFORMANCE

### STATEMENTS OF FINANCIAL POSITION—JUNE 30, 2001 AND 2000

ASSETS	2001	2000
<b>Current assets</b>		
Cash	\$ 707,603	\$ 594,567
Grants receivable	1,583,390	704,348
Prepaid expenses	41,219	12,872
<b>Total current assets</b>	<b>2,332,212</b>	<b>1,311,787</b>
<b>Furniture and equipment</b>		
Construction in process	—	79,535
Furniture	149,187	149,187
Equipment	312,460	196,316
Furniture and equipment	461,647	425,038
Less accumulated depreciation	339,619	303,119
Furniture and equipment—net	122,028	121,919
<b>Total assets</b>	<b>\$ 2,454,240</b>	<b>\$ 1,433,706</b>
<b>LIABILITIES AND NET ASSETS</b>		
<b>Current liabilities</b>		
Accounts payable	\$ 454,844	\$ 733,024
Accrued payroll and payroll taxes	132,136	28,253
Deferred revenue	1,853,281	641,430
<b>Total liabilities</b>	<b>2,440,261</b>	<b>1,402,707</b>
<b>NET ASSETS</b>		
Unrestricted	13,979	30,999
<b>Total liabilities and net assets</b>	<b>\$ 2,454,240</b>	<b>\$ 1,433,706</b>

### STATEMENTS OF ACTIVITIES—JUNE 30, 2001 AND 2000

UNRESTRICTED NET ASSETS	2001	2000
<b>Support and revenue</b>		
Utility revenue	\$ 1,954,086	\$ 3,129,210
Grants	2,048,855	2,379,285
Project income	640,080	138,457
Interest income	48,648	38,237
Miscellaneous income	127,002	19,150
<b>Total unrestricted support and revenue</b>	<b>4,818,671</b>	<b>5,704,339</b>
<b>EXPENSES</b>		
<b>Program services</b>		
Research programs	131,171	698,178
Evaluations	611,579	94,123
Demonstrations	1,239,485	1,394,647
UW Madison	104,335	151,011
Member services	675,687	572,983
Education	1,000,845	1,193,096
<b>Total program services</b>	<b>3,763,102</b>	<b>4,104,038</b>
<b>Support services</b>		
Management and general	1,072,589	981,583
<b>Total expenses</b>	<b>4,835,691</b>	<b>5,085,621</b>
<b>Increase (decrease) in net assets</b>	<b>(17,020)</b>	<b>618,718</b>
<b>Net assets (deficit)—beginning of year</b>	<b>30,999</b>	<b>(587,719)</b>
<b>Net assets—end of year</b>	<b>\$ 13,979</b>	<b>\$ 30,999</b>



**DAVID BENFORADO**  
Municipal Electric Utilities  
of Wisconsin



**JOHN FARROW**  
Milwaukee School of  
Engineering



**GERALD KULCINSKI**  
University of Wisconsin-  
Madison



**JOSEPH LOFTUS**  
Terminal-Andrae Inc.



**TERRY NICOLAI**  
Alliant Energy



**SCOTT SMITH**  
Public Service Commission  
of Wisconsin

Sources of revenue—fiscal year 2001	Total	Expenditures by sector—fiscal year 2001	Total	Expenditures by activity—fiscal year 2001	Total
	\$4,818,671		\$4,818,671		\$4,818,671
Wisconsin utilities	40%	Commercial	31%	Education and outreach	48%
State of Wisconsin (DOA)	23%	Residential	29%	Program	27%
Other states and private organizations	25%	Industrial	22%	Research	25%
Federal government (DOE, EPA)	8%	Multiple sectors	18%		
Miscellaneous	4%				

## in appreciation

The Energy Center would like to extend our gratitude to the following outgoing board members for their years of service. Their guidance and expertise has helped bring ECW forward through changing times, and their contributions have strengthened the collaboration that is one of the key values of our organization.

(left to right) **Joan Braun**, Plumbing and Mechanical Contractors Association, 01/95–01/02; **Phyllis Dube**, Wisconsin Electric Power Company, 01/95–01/02; **Steve Hiniker**, Citizens' Utility Board, 09/00–09/01; **Lynn Hobbie**, Madison Gas & Electric, 09/94–04/01; **Jack Huddleston**, University of Wisconsin–Madison, 03/99–08/01; **Anthony Maggiore**, National Center for Appropriate Technology—Public Member, 09/94–01/02





Discussions with a handful of ECW participants **reveal**

energy and environmental improvements in industry, schools, and homes.

These three composites offer a **replay** of ECW's impact in the past

12 months. As we **recall** some of our accomplishments note how

you too can benefit from participation and collaboration.

**re**veal in



# refresh industry

## WISCONSIN INDUSTRIES OF THE FUTURE PROMOTES NEW TECHNOLOGIES

Sometimes change—even change for the good—can be a risky endeavor.

Take industry, for example. You might be a business owner who has heard of a brand-new technology that could increase productivity and decrease energy consumption in your industry. But do you really want to be the first to try it? Where will you get the resources and the money? What if you need technical support? With all there is to consider, are you better off not trying at all?

Your industry will likely still be around in 20 or 30 years. And Wisconsin Industries of the Future is helping industries prepare for future changes, improvements, and competition—starting right now. To that end, the program works directly with industry in an unprecedented way—by finding out what will help industry groups do what they need to do to be competitive and energy-conscious, and by

giving them the tools they need to achieve these goals, while minimizing risks.

The Energy Center of Wisconsin is working together with the Wisconsin Division of Energy to make Wisconsin Industries of the Future a reality. “It’s the partnership that makes this possible,” says Preston Schutt, Industrial and Agricultural Programs Manager at the Wisconsin Division of Energy. “The Energy Center of Wisconsin is our most valuable partner. If it weren’t for them, this wouldn’t be happening.”

### EXPANDING PROGRAM ASSISTS INDUSTRY

ECW’s Kevin Grabner is the new program manager for Wisconsin Focus on Energy—Industries of the Future program. He led the design of the statewide program, handles day-to-day implementation, and coordinates the activities of the lead contacts for each of the seven Wisconsin industry sectors.

Grabner says the fact that ECW was involved in the first two Wisconsin Industries of the Future projects—metalcasting and pulp and paper—made it a natural choice for leadership when the program expanded to include plastics, biotech, glass, food processing, and printing.

“The program is very targeted at specific industry groups that we think had the biggest potential and that are important to our state economically,” says Schutt.

And the program continues to grow. “We identified areas we thought were important, and may expand yet again if we are successful,” says Schutt. In October 2001, Wisconsin Governor Scott McCallum and the U.S. Department of Energy’s Office of Industrial Technologies Deputy Assistant Secretary, Denise Swink, signed a memorandum of understanding, signifying a formal commitment between

the state and the Department of Energy to the Industries of the Future program.

#### A STEP AHEAD OF MANDATES

Industries of the Future presents new ways to solve old problems. “Environmental mandates can be inflexible and expensive,” says Grabner. Industries of the Future helps industries meet the mandates while the industry stays competitive on a global scale. This helps Wisconsin as a whole. Our state “has the second highest percentage of manufacturing jobs,” he says. “Without them, our economy would collapse.” Industries of the Future seeks out win-win solutions that are good for industry and the environment.

One way in which Industries of the Future helps industry, Grabner says, is by breaking that Catch-22 that happens when an individual business may want to try a new technique but can’t afford the risk. “There are many great innovations proven in the lab, but then they get stuck. Inventors need a lot of time and resources to move an idea from the lab to commercialization. Before taking the risk, inventors need to know there are manufacturers who will buy the new product. But if it’s not already on the market, no manufacturer wants to be first to try it out.”

#### ASKING INDUSTRY WHAT IT NEEDS

Industries of the Future asks industries what they need to be competitive through Industry Roundtables, where there is one-on-one communication from people in industry. The results of the Roundtable are summarized in a Roadmap, which documents opportunities to help industry and guides actions on industry priorities. Advanced energy effi-

ciency, renewable energy, and pollution prevention technologies will be supported, especially for many smaller businesses and manufacturers.

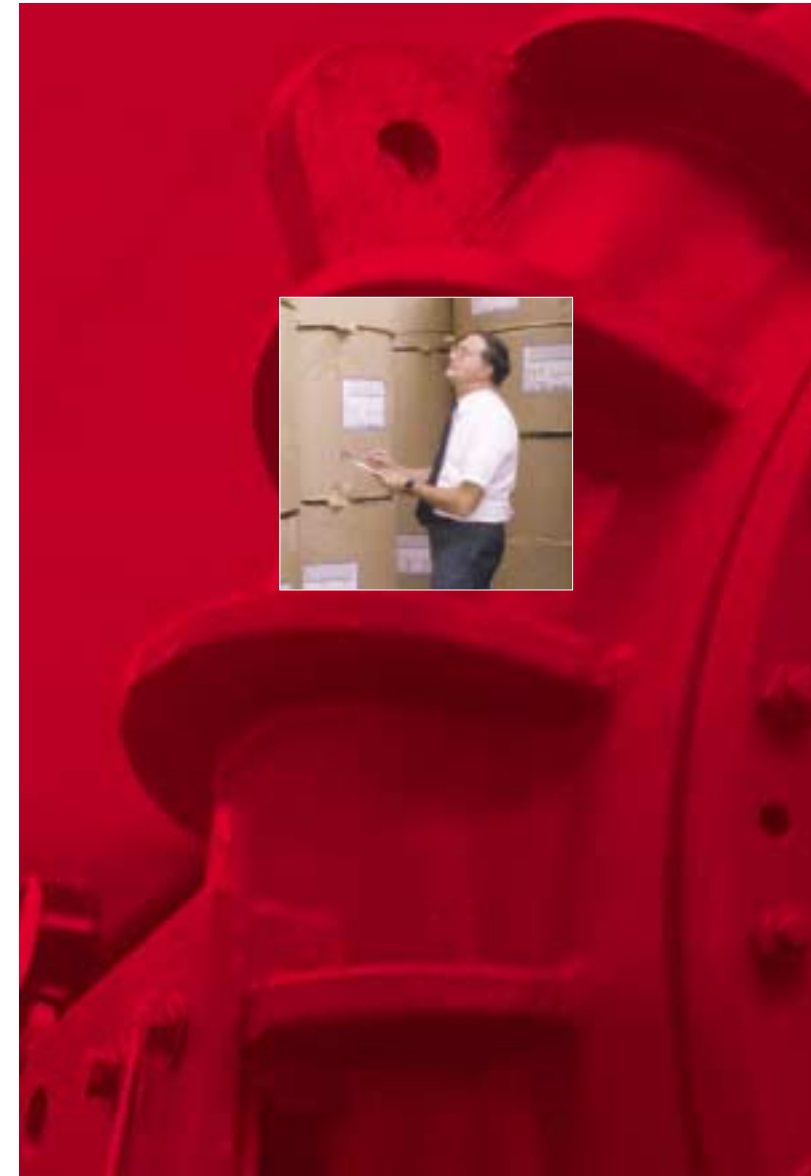
Services available through Industries of the Future include technical assistance, project scoping, project grants, and facilitation of action teams to address industry priorities. Industries of the Future builds partnerships among the “major players”—government research institutions, industry, universities, suppliers, “all focused on the needs of the industry,” says Schutt. All but 15 percent of utility customers in the state can currently participate in this Wisconsin Focus on Energy program. The remainder are customers of certain municipal utilities and rural electric co-ops that are not participating in Wisconsin Focus on Energy programming.

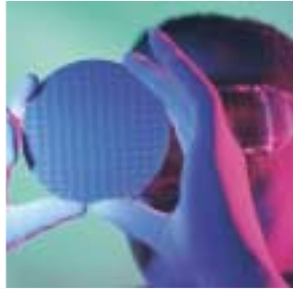
#### NON-ENERGY BENEFITS

Another ingredient in Industries of the Future is the emphasis on “non-energy” benefits. Plenty of procedures and technologies are helpful to industries in and of themselves—and in addition, they happen to save energy. These non-energy benefits can sometimes be easier to sell. Waste reduction, an emphasis on products that are made in Wisconsin rather than shipped in from afar, and improvements in product quality and worker safety are among these practices that offer opportunities to save energy but have other benefits as well.

Whether they are meant to save energy or improve other conditions, as a result of financial limitations and other barriers, “changes in industry are often adopted at a snail’s pace,” says Schutt. “Industries of the Future exists to improve product

and productivity, to help small companies turn into the next Hewlett-Packard.” He says that existing state programs are there to help them with small improvements—baby steps. “Industries of the Future is there to help them make the leaps.”





## RECREATING MANUFACTURING SYSTEMS WITH BESTPRACTICES

Running parallel to Industries of the Future, BestPractices deals with support systems in manufacturing—compressed air, steam, and lighting, among others. The Energy Center of Wisconsin supports this program of the United States Department of Energy's Office of Industrial Technologies that helps industries identify opportunities for energy savings and increased productivity. ECW contributes to the BestPractices activities of the Wisconsin Focus on Energy industrial program.

The savings are no small change. Most companies have saved at least \$1 million from just one BestPractices assessment—and it takes them less than 18 months to see payback. BestPractices provides teams of energy management experts who provide hands-on assessments, assistance with new technologies, and information. Often, companies apply the information they received in their plant assessment to other facilities within the company, expanding the benefits.

The Energy Center of Wisconsin has been involved in a number of BestPractices areas, including motors, steam, compressed air, refrigeration, controls, and energy management, among many others. Every year, ECW presents a menu of BestPractices learning opportunities. For most of the year "it's hard to find a week when we don't have an industrial event taking place somewhere in Wisconsin," says ECW Project Manager Kevin Grabner.

ECW is working to make BestPractices information available on its website ([www.ecw.org](http://www.ecw.org)). "We want to make it the first place to look for industries that want to be more efficient," he says. The website offers resources such as software, databases, a publications library, and a clearinghouse to help companies manage their energy needs.



# rejuvenate building

EDUCATING BUILDERS ON THE BENEFITS OF Wisconsin ENERGY STAR® Homes

You've probably been told at some time or another that if you want to affect change you should go straight to the source—be it the high school principal, the local neighborhood association, or your congressperson or senator. Wisconsin ENERGY STAR® Homes and ECW Lifelong Learning took that to heart when they put ideas for building safe, durable, comfortable, energy efficient houses right in front of home builders.

Now a series of monthly trainings sponsored by Wisconsin Focus on Energy continually exposes builders and consultants to key building components of Wisconsin ENERGY STAR Homes.

## HOOKED ON QUALITY

"Every month," says Lifelong Learning Project Manager Renee Abel-Collinge, "a training conquers one important aspect of a Wisconsin ENERGY STAR

home—oftentimes an area that has been giving builders and consultants difficulty."

This problem-solving approach worked for Edward Schmidt, of Schmidt Brothers Custom Homes in Appleton, who was having trouble with callbacks from homeowners. Schmidt was so impressed after attending just one of ECW's Wisconsin ENERGY STAR trainings that he immediately brought all of his housing plans to a Wisconsin ENERGY STAR consultant. Today, Schmidt says, all of the homes he builds are Wisconsin ENERGY STAR Homes. "This year," he says, "I'll build 65 of them."

## CERTIFIED HOMES IN DEMAND

Thanks to Schmidt and builders like him, people are starting to ask for the strict standards of certified Wisconsin ENERGY STAR Homes. Not only are energy costs lower for Wisconsin ENERGY STAR Homes, but

these houses are more comfortable and more durable than other homes.

Another big plus, says Greg Nahn, technical support manager of Wisconsin ENERGY STAR Homes, is that they don't necessarily cost more to build, but they do cost less to maintain. So far, Nahn says, about 900 have been built in Wisconsin, with thousands more planned over the next few years.

## STRAIGHT TO THE SOURCE

This is ECW's third, and biggest, year working with the Wisconsin ENERGY STAR Homes program. ECW Lifelong Learning is offering more training sessions than ever before, teaching a wide variety of building techniques. Classes are kept small—to about 25 people—for a more intimate learning environment where specific questions can be asked and answered. Each session is repeated three times a month during

the winter and spring so the maximum number of participants can attend.

With new subject matter each month, local and national experts delve into the details that builders need to build high-efficiency, high-quality homes. For example, the sales training for consultants explains how to present the Wisconsin ENERGY STAR Homes program to builders and homeowners. And the hearth product options training explores different fireplace and stove options for new construction.

ECW launched the series with Cure for the Common Callback, a training developed by the Energy and Environmental Building Association. More than 200 people attended the December 2011 training, which taught the causes for common residential building problems and how to avoid them.

"This program pulls people in from the general building community and helps them get acquainted with Wisconsin ENERGY STAR Homes," says Abel-Collinge. Once enrolled in the Wisconsin ENERGY STAR Homes program, she explains, consultants commit to recruit builders, provide technical assistance, and conduct site visits; and builders vow to build at least three certified Wisconsin ENERGY STAR Homes.

"These trainings are for deeply committed professionals," says Abel-Collinge. "They give people involved in Wisconsin ENERGY STAR Homes skills they need to build durable housing that ensures occupant safety and comfort."

#### QUALITY SELLS

To Nahn, the Wisconsin ENERGY STAR home is an idea

whose time has come. The great thing about Wisconsin ENERGY STAR homes, he says, is that they have all the qualities anyone would want in a home. Nahn says the fact that they are also energy efficient might not sell the home by itself. "But if you look at all the details—the things that make a home safe, durable, and comfortable—they happen to be the same details that bring energy efficiency," he says.

#### FROM RESEARCH TO RESIDENCE

A new report by the Energy Center of Wisconsin shows that Wisconsin ENERGY STAR® Homes use about 10 percent less natural gas than the typical new Wisconsin home.

These promising results derive from one of the many residential research projects ECW conducts each year. ECW researchers and outreach specialists then translate findings like these into ways for consumers, businesses, utilities, and state and federal agencies to save energy.

For instance, a recent study of Zone Pressure Diagnostics is helping to standardize the way low-income weatherization crews measure air leaks in homes. And to help improve the general durability of housing, the Moisture Management Protocol project examined the effects of moisture on durability, thermal performance, and structural integrity in residential wall systems.

In the end, ECW wants to make sure the findings of projects like Moisture Management reach beyond the binding of the completed research report. That's why ECW works to ultimately connect energy efficiency technologies of all kinds to their intended users.





# reinvent lighting

## COPYROOMS IN APPLETON SCHOOL DISTRICT DEMONSTRATE DAYLIGHTING

According to change theorists, innovations proceed along a well-defined path. First, people learn about the innovation. Next, some people have to try it out. Finally, other people see and talk to them and want to try the innovation themselves. In this simple way, new products and services enter the marketplace.

This formula for change—learning, trying, sharing—has not been lost on the Energy Center of Wisconsin's Daylighting Collaborative. The way to get daylighting into buildings is to train people, demonstrate the concept, and get others talking about it. And in a couple of Wisconsin schools, that's exactly what's happening.

### SCHOOL SYSTEM TRIES ON DAYLIGHTING

Daylighting in the Appleton, Wisconsin school district began with a burglary. Someone had broken into a classroom at the Richmond Elementary

School and the windows needed to be replaced. That job fell to Bob Zuehlsdorf, Director of Facilities and Operations for the Appleton School District. He had recently attended one of the Energy Center of Wisconsin's Daylighting Collaborative trainings, and he wanted to try the daylighting techniques he had learned there.

One reason Zuehlsdorf was interested in daylighting was energy savings. "We have a two million dollar energy budget," he says, "so it's a big part of our controllable costs."

But Zuehlsdorf was also concerned about glare. In other retrofits he had noticed that when clear windows were installed the first thing teachers asked for was blinds.

At the trainings Zuehlsdorf learned that daylighting techniques can cut energy costs 50 percent with little or no additional costs—and without caus-

ing glare problems. As a start, the Collaborative suggested that the school district develop "copyrooms," which are examples of daylighting that can be easily implemented elsewhere.

### COPYROOMS PRAISED

With the help of the Cooperative Educational Service Administration and engineer Ted Wilinski of Wilinski and Associates, and with financial assistance from Wisconsin Focus on Energy, three classrooms were selected as copyrooms—two at Foster Elementary School and one at Richmond Elementary School.

All three rooms use a two-tiered glass system. The upper glass lets light come in high, where it can bounce off the ceiling and bathe the room in an even glow. The lower glass filters out more light to prevent glare (blinds are available if needed). Fluorescent lights tied to sensors supplement the

natural light and are automatically dimmed or turned off when not needed.

By eliminating glare, this system allows more useful light to enter the rooms, which means less energy use by electric lighting. It also creates a more comfortable environment for learning.

"I feel myself relaxing when I walk into this room," says Sheila Omholt, Principal of Richmond Elementary School. "It's a calming, soothing environment." Terri Schultz, the 6th grade teacher at Richmond Elementary School, says her copyroom is "more invigorating and makes the environment a lot more open."

Daylighting Program Director Abby Vogen says this first-hand experience is crucial. "The biggest benefit of the copyrooms is that owners can test out daylighting," she says. "People can become familiar with the new light fixtures and the darker tint of the windows. Once people are convinced, you start getting advocates in your own district."

#### DAYLIGHTING COULD SAVE SCHOOLS MILLIONS

According to ECW estimates, each classroom retrofitted according to the principles of the copyrooms would save about \$400 per year in energy savings and shave peak demand by about one kilowatt. The Collaborative estimates that Wisconsin could save at least \$93 million in utility bills over 10 years by adding daylighting to schools in need of major renovations—a payback of about four years.

Facility Director Zuehlsdorf is already expanding daylighting in the district. At Foster Elementary School, two other rooms have been retrofitted with daylighting windows. He plans to follow with high-

performance lights and controls later. "We have three million dollars in window replacement in the next five to 10 years and hopefully we can do that with the same design criteria," he says.



#### PREPARING TOMORROW'S CHANGE AGENTS

Besides the energy and comfort aspects, another aspect of daylighting is raising

awareness about energy efficiency in general—an important goal for schools, who are educating tomorrow's engineers and architects.

Pat Marinac is the Appleton School District's science program leader. She recently visited the daylighting copyroom at Richmond Elementary School with a group of teachers who had taken KEEP—the K-12 Energy Education Program developed by the Energy Center of Wisconsin. She's been encouraging the KEEP teachers to hold their classes in the copyroom.

"Our students need to be aware of the opportunities to use energy more wisely," she says. "We can't just share with them traditional ways of doing things. They're going to have to make a significant change—not just a little here and little there—but changing the way we are putting buildings together."

#### COPYROOMS REPRODUCED

In addition to the Appleton copyrooms, the Daylighting Collaborative has arranged nine other copyrooms around the state:

- Affiliated Engineers in Madison, Wisconsin
- Alliant Energy in Madison, Wisconsin
- Andersen Windows in Menominee, Wisconsin
- The Department of Administration in Madison, Wisconsin
- The ENCAP Office Building in Green Bay, Wisconsin
- Hoffman Corporation in Appleton, Wisconsin
- Milwaukee Public School District in Milwaukee, Wisconsin
- University of Wisconsin-La Crosse in La Crosse, Wisconsin
- John J. Flynn Elementary School in Eau Claire, Wisconsin

A daylighting copyroom is also planned in the Fort Plain, New York school district as part of the New York State Energy Research and Development Authority (NYSERDA) daylighting program. The Energy Center is administering the NYSERDA daylighting program, which focuses specifically on daylighting schools.

our way of giving people tools

they can use is unique.

3,500 people can now

**relate**

to cutting-edge energy

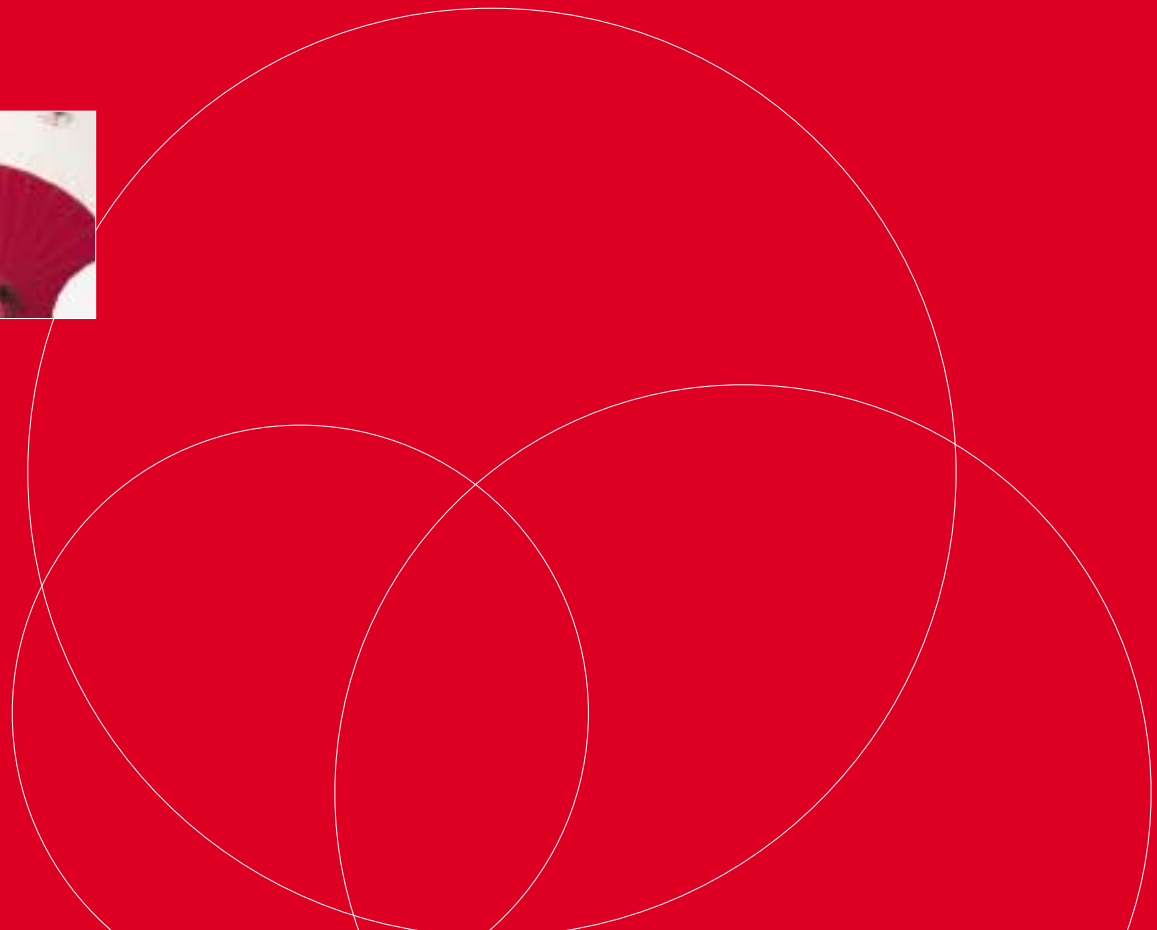
techniques that have

an impact.

really powerful.



Energy Center of Wisconsin Lifelong Learning



## recreate A+ buildings

The building code is a standard that our state maintains as the minimum in design and operation for all buildings. In other words, it is the worst building you can legally build.

Yet, for some reason over the past few decades, we as owners and designers have become satisfied with, even proud of, a building built to code (example: "...all of my designs meet the state energy code!"). Some very conscientious owners and operators go the extra steps to "fix" our buildings to improve energy efficiency, air quality, and so forth. This is great, but has it ever occurred to us that we shouldn't have to do this?

One of the largest investments we make is buildings, whether we buy or rent. They affect our operating budget. We have to plan for regular maintenance. And the light and air quality and thermal comfort directly affects the health, welfare, and productivity of our employees and our family. So why aren't we more involved in how our buildings operate and in how our designers and contractors spend our money?

I believe we need to start looking at our buildings like a chief financial officer does. We need to look at our energy bills as a potential source of net operating income rather than a standard monthly expense. We need to start asking for A+ buildings.

A+ buildings don't have a certain look or a green roof. They result from asking your designer to

consider your goals—both aesthetically and operationally. It's the footprint and orientation of the building that optimizes daylighting, the properly sized HVAC system that's been commissioned to ensure proper function, an energy efficient lighting system, the use of locally available materials when possible, and natural products to improve indoor air quality. It's all this and anything else that enhances the functionality of your building while increasing energy efficiency.

Getting a good building for your investment means taking the time you put into other major decisions and putting it into your building planning. Set goals to ensure proper operation of all systems, goals that will increase the functionality of the space for your needs. When selecting a designer or contractor tell them your goals. Ask them questions about operations and maintenance. Ask them if they are familiar with high-performance design and building practices. Most, if not all, of these professions require continuing education to keep them on top of current advances in energy efficient design and systems. Make sure they are up to current practice.

Buildings are not simply shells to house us and protect us from the elements. They are a reflection of our standards of quality, business acumen, financial success, and pride in ownership—and a legacy we pass on to future generations. It's your building,

it's your home, and it's your money. Let's start expecting A+ buildings.



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