

ANNUAL REPORT ISSUE  
WINTER 2000  
VOL 5 NO 1

# e2 2020

## LOOK INTO THE FUTURE

focusing on tomorrow's energy needs through research and education today



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OF WISCONSIN**

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



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**business**

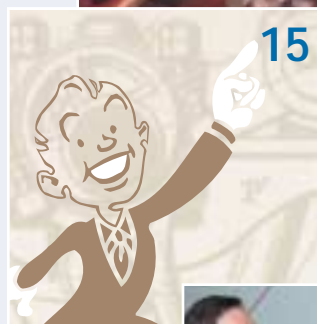
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The future is always difficult to predict—especially in the constantly changing energy industry—but that doesn't mean we shouldn't make plans. And when we're planning for the future, we need to focus on two things: our mission and how we intend to accomplish it.

From the beginning the Energy Center has had a strong mission statement: to do research in energy efficiency and transfer the results of that research to Wisconsin's energy consumers and providers. The need for that mission is as sure as ever. The recent passage of public benefits legislation has confirmed that energy efficiency will be a priority for Wisconsin well into the 21st century. And although it's too early to know exactly how the Center will participate, it's safe to say that new opportunities for research and education will be on the horizon.

As industry changes continue to unfold, the challenge for us in the next year will be to prepare the Center to move in a different direction. We've already done that in part by developing strategic directions that take into consideration both industry uncertainties and the strengths of the Center as an organization. Now we need to ensure that the Center has the right processes, programs, and tools to fulfill its vision. This process is already underway, and I'm confident that in the next year we'll make still more progress in readying ourselves

to take advantage of the opportunities.

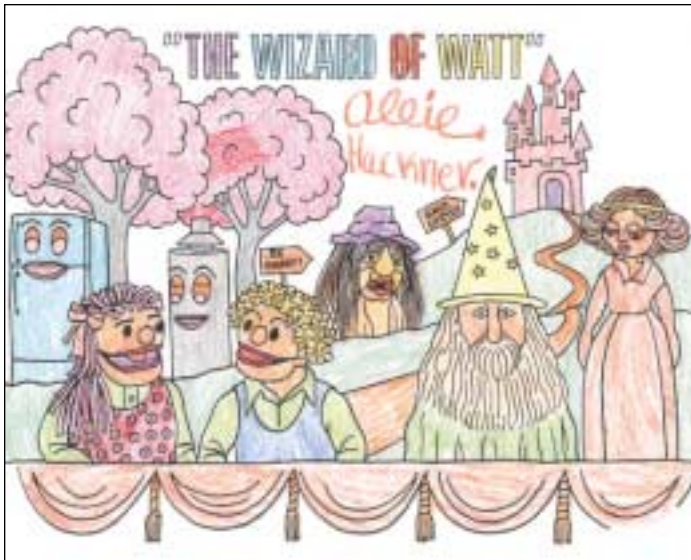
One thing is certain: Wisconsin can benefit from increased energy efficiency. And increasing the energy efficiency of Wisconsin homes and businesses is what the Center is all about. With its dedication to member participation



**Lynn Hobbie**  
*Board President*

and its focus on Wisconsin customers, the Center is committed to bringing a variety of energy consumers and providers to the table and meeting the needs of their constituents. We will continue our tradition of participation as we plan for the future.

A handwritten signature in black ink that reads "Lynn Hobbie". To the right of the signature is a small, solid orange square.



Puppet Power's "The Wizard of Watt" teaches kids about saving energy. A coloring sheet (above) features the characters.

## 'Check out' this energy efficiency program

It helps to have important information within easy reach.

People seeking information about energy efficiency might not have the best luck at their local library, because there's a dearth of energy efficiency materials to borrow. In fact, if you check there, you might find the energy efficiency information dates from the 1970's!

That's where Focus on Energy (FOE) comes to the rescue. The pilot energy efficiency program for northeastern Wisconsin funds the FOE Public Libraries Program, which is offering funding to 23

counties so libraries can purchase books and other materials that promote energy efficiency. Andrea Minniear of the Energy Center is facilitating the program to get these materials into the libraries.

"We let the library do the picking and the choosing, because they know their readers better than we do," says Minniear. Book titles include "Homemade Money: How to Save Energy and Dollars in Your Home," "Saving Water in Home and Garden," and "The Independent Home: Living

Well with Power from the Sun, Wind and Water."

In addition to books, the program also pays for nifty portable energy meters that can be checked out and plugged in to measure energy consumption of appliances, and puppeteer performances for children by "The Wizard of Watt," a creation of Puppet Power.

"The amount of information available varies from library to library, but funding in the past has been tight," says Minniear. "There hasn't been a real focus on the need for energy conservation. This is a great program because they're donating funds to libraries to beef up their energy collections."



FOR MORE INFORMATION on the Focus on Energy Public Libraries Program, contact Andrea Minniear at (608) 238-8276 x126, [aminniear@ecw.org](mailto:aminniear@ecw.org).

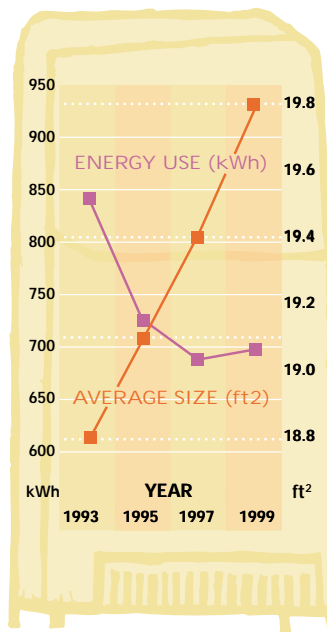
—Teresa Paprock



## More stuff, less energy

Wisconsin consumers are buying more appliances than ever, but energy efficiency isn't the motivator it once was. That's one of the conclusions of the Energy Center's 1999 appliance sales tracking project, which has been taking the pulse of Wisconsin appliance consumers every two years since 1993. Last year 3,000 households were asked about the appliances they have purchased and what role efficiency played in their decision.

Compared to 1993, consumers are purchasing twice as many central air conditioners and four times as many room units. People are also buying more refrigerators than in previous years, and the units are bigger and have more features.



Bigger but more efficient: size and energy use of Wisconsin refrigerators 1993-1999 (Energy Center data).

Bigger doesn't necessarily mean more energy usage, however. "Refrigerators, for instance, are subject to federal minimum standards for efficiency," says Energy Center project manager Richard Hasselman. Thanks to such standards—and voluntary efforts by manufacturers—the appliances people shop for are more efficient than ever.

Nevertheless, efficiency is not on the top of shoppers' minds. In 1999 only three percent cited energy efficiency as a reason to buy a new refrigerator, compared to 25 percent in 1993. Energy as a factor in purchasing furnaces and water heaters has also declined.

Why is there so little interest in energy efficiency today? Center project manager Dan York says it's mainly due to low and stable energy prices. He also notes that utility spending on energy efficiency programs has fallen off since 1993. As the electric utility industry restructures, new awareness-raising information and education programs—like Energy Star, Wisconsin Focus on Energy, and the Efficiency Connection—are just now getting off the ground. Future appliance sales tracking surveys could help evaluate their impact.



FOR MORE INFORMATION about 1999 appliance sales tracking results, contact Richard Hasselman at (608) 238-8276 x136, [rhasselman@ecw.org](mailto:rhasselman@ecw.org).

—Eric Nelson



## from the director

PRESENT TENSE

Wisconsin is facing a short and medium term threat to reliable electric power supply. This threat is the byproduct of a robust economy and constraints on new generation and transmission, energy efficiency, and distributed generation. While last year's Reliability 2000 legislation is a strong response to this threat, the highly publicized difficulties in moving forward with new generation and transmission demonstrate that these alone will not meet our electricity needs.

My conclusion is that electric power reliability is a three-legged stool. The three legs are investments in generation and transmission, energy efficiency, and distributed generation. People, however, are apt to go for a unicycle, picking any one of these legs as the solution to reliability. Distributed generation is a current favorite for some. But having tried a unicycle let me recommend the stool if stability and safety are desired!

Now we must get used to using the three-legged stool. The complicating feature of building the stool is that there is some uncertainty in building each leg. The relative certainty in building new generation and transmission facilities is disappearing under restructuring and changing public attitudes. There are also uncertainties in how quickly advances in energy efficiency and distributed generation become part of the reliability pic-

ture because their adoption is largely determined by the marketplace.

Part of managing uncertainty involves measuring progress, a task the Energy Center is already doing, and one that can help Wisconsin as energy related public benefits get under-



**Mark Hanson**  
*Executive Director*

way this year. We are already providing market baselines and tracking many residential, industrial, and commercial markets—and we are well situated to fill in the gaps. The Center will also continue to serve as a broad based forum for programs to transform and complement energy markets toward the twin goals of reliability and sustainability. These goals are essential to Wisconsin's future, and we look forward to working toward them.



# 2020 FOCUS

## METALCASTING JOINS EIGHT OTHER INDUSTRIES IN IMPROVING EFFICIENCY TODAY WITH THE FUTURE IN MIND

By Teresa Paprock

They say “the future is now.” No place is that more true than in energy efficiency and natural resource conservation.

Since we might not feel the effects of today’s consumption for years or even decades, what we do today has a direct impact on tomorrow—even if we don’t realize it. With eyes set on the year 2020, the U.S. Department of Energy’s Office of Industrial Technologies (OIT) has developed a strategy called Industries of the Future.

Under this program, the nine most energy-intensive industries in the United States are working together to boost profits and use energy more efficiently. Each of the industry sectors is developing a “Roadmap,” a strategic vision of the future that will help the industry achieve its goals for economic performance and energy efficiency.

The Energy Center has made a commitment to work with the metalcasting industry, currently one of Wisconsin’s most significant energy consumers, on how to improve efficiency and productivity over the next two decades. Besides metalcasting, the Industries of the Future initiative includes agriculture, forest products, mining, aluminum, glass, petroleum, chemicals, and steel.

These are the industries that keep the United States competitive in the world economy and employ millions of people. But they also use massive amounts of energy.



**“As much power as a small town”**

“These electrical furnaces can use almost as much power as a small town,” says Thomas Davies, Executive Vice President of Carpenter Brothers in Milwaukee, Wisconsin. He’s describing the furnaces used for melting metal that will be poured into molds to make anything, he says, from “a bathtub to a break pedal.” Iron, for example, must be heated to 2,700 or 2,800 degrees Fahrenheit to melt or liquefy. “It takes a tremendous amount of power,” he says.

Davies is a member of the Executive Committee of Cast Metals Coalition, a national commission of industry leaders working with the Department of Energy to fund research for energy savings. His Milwaukee firm provides equipment and materials to the metalcasting industry in nine states in the Midwest. “We provide molding and core equipment, as well as consumable supplies,” he says. Major consumers of cast products are motor vehicles and other transportation equipment, piping, industrial machinery, and construction materials.

Through his job and his position with the coalition, he communicates with many people in the metalcasting field. Their concern about energy consumption and savings is “across the board—all metalcasters are interested in this,” says Davies. “To reduce energy use will result in a very big cost savings for them.”

Luckily, there are plenty of ways to manage energy in metalcasting. “One thing they’re already doing is melting at off-peak hours, such as in the evening,” he said. “The power company gives them better rates.” Another option is the ongoing development of energy

efficient equipment. They can also use computer technology to save energy.

**A major impact on the future**

Imagine the future environmental impact that each individual metalcasting plant can make by instituting energy saving measures. Then imagine the impact that will be made when the entire industry makes those changes. Wisconsin has 258 metalcasting plants, explains Charlie Fafard, former industrial project manager with the Center.

The industry provides 9,000 Wisconsinites with employment and has annual sales of \$2.962 billion. It also consumes one-eighth of the industrial energy used in Wisconsin.

Metalcasting is already seen as the largest recycler in North America and maybe even the world. Each year it prevents 15 to 20 million tons of scrap iron, aluminum, steel, copper, and other metals from being disposed in landfills and junk yards. But the metalcasting process still consumes a great deal of energy. Nationwide, according to the OIT, energy

accounts for nearly 25 percent of the value of shipments for diecast products.

With help from the Industries of the Future, the metalcasting industry will be far more environmentally friendly in the year 2020—and will be even more successful economically. According to the OIT, the metalcasting industry aims to reduce its energy consumption by 20 percent.

**“Wisconsinizing” the federal Roadmap**

Saving energy is a concept that makes sense, but can be hard to put into practice. That’s where the Roadmaps come in. The Industries of the Future’s Roadmaps explain the specific steps, including research and demonstrations, needed to achieve the desired result by the year 2020 (and beyond). They provide a blueprint of the technology milestones needed to achieve the goals of the industry over the next two decades. The Center is helping to “Wisconsinize” this document. “We are capitalizing on the work at the federal level, to make it beneficial to the metalcasting industry in Wisconsin,” says Fafard.

In cooperation with the Wisconsin Energy Bureau, the Center, WEB’s Focus on Energy, and the U.S. Department of Energy’s OIT are funding a project using materials developed through the Industries of the Future. The Cen-







ter is working with Dr. Pradeep Rohatgi , the director of the Foundry and Solidification Processing Research Laboratory of the University of Wisconsin-Milwaukee, on the project. Rohatgi worked on the national Roadmap and will help tailor the Roadmap to the specific needs of Wisconsin's metalcasters.

The project's goal is to build and begin implementing a Roadmap which Wisconsin's metalcasting industry can follow to be more competitive, profitable, energy efficient, and innovative while reducing waste emissions.

As part of the project, business and technology issues in Wisconsin will be assessed, and the OIT and other Wisconsin organizations will build industry awareness as well as accessibility to available technology and financial resources. The organizations will work together to facilitate the changes necessary to ensure the metalcasting industry will be viable into the year 2020 and beyond.

**Decisions to be made by "insiders"**

The core team of the Center, the Wisconsin Energy Bureau, and Rohatgi will partner with other key public and private stakeholders to improve efficiency and profitability of the metalcasting industry. The stakeholders will include Wisconsin metalcasting industries, suppliers, key customers, economic development agencies, university researchers, utilities, industry associations, and government leaders.

A unique aspect of the Industries of the Future program is that the industries and the associations themselves are developing the Roadmap. "The program gives individuals within industries a chance to think about the future of their industry and take part in identifying important issues and concerns for the industry," says Fafard.

Karen Meadows, Associate Director of the Center, agrees that the industry's input is an essential ingredient. "Sometimes, when others develop the plans for the industries, it turns out not to be their priorities or their interests," she says. "So, let's look at their needs. For example, industries are competing in an increasingly global economy. They will need to be innovative and efficient to be successful in the future. Let's go out and find their hot issues and help identify energy efficient solutions to those problems."

Working directly with industry, says Fafard, "will allow the Center to develop a relationship with professional associations within sectors and to work closely with them on their issues and concerns. Industries of the Future is a door opener for the Center to work with the metal-

casters, and the Center plans similar efforts in other sectors." Once the Center's efforts with metalcasting are well underway, says Fafard, the Center is planning to expand its work to the forest products industry.

The project will identify areas within the metalcasting industry that require research and demonstration and will help the industry take steps in these directions. "The Center hopes to build on this project, and to be able to bring additional federal dollars into Wisconsin to support research and demonstration," Fafard says.

Twenty years from now, today's toddlers will be in college, and Generation Xers will be entering middle age. There's no telling what will have happened in the world; there's plenty of optimism as well as pessimism surrounding the next few decades. With strategies like Industries for the Future, both energy and the environment have increased potential for a bright tomorrow. ☘

FOR MORE INFORMATION on the Industries of the Future, contact Doug Presny at (608)238-8276 x147, dpresny@ecw.org.

# SUSTAINABILITY

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For more information contact  
Abby Vogen at (608)238-8276 x122, avogen@ecw.org

# Energy efficient residential windows

By Eric Nelson

Windows used to be simple: a single pane of glass and a frame. They kept out wind and gave people a view. The problem was energy—single paned windows had the same insulating power as a sheet of steel (about R-1). As people became more concerned about energy, various innovations were added to make windows more efficient.

The first innovation was storm windows, which kept out wind and created an insulating layer of air. Dual paned windows were based on this idea and they first became popular in the 1970's. Later, gas fills between the panes added still more insulation. Finally, special coatings were put on the glass to reflect heat back into the room. Thanks to these innovations, typical energy efficient windows are three times more efficient—and much more comfortable—than single paned windows of old.

## Dual panes

Dual window panes help keep a house warm by creating a buffer between the cold air outside and the warm air inside, much the way a coat protects you from winter winds. For this buffer to work, it's important that the trapped air doesn't convect. Convection happens when warm air rises and cold air sinks, setting up a circulation that moves heat between the inner and outer panes. This transfers heat out of the house and impairs efficiency.

To prevent convection, it's essential to have the right size air gap. "A narrow air gap—around half an inch—is optimal," says Ross DePaola, owner of WESTLab in Madison, Wisconsin, which tests the energy performance of windows. "If the gap is narrower, you don't have enough of a buffer. If it's any wider, you get air movement."

## Gas filled

Gas fills help prevent convection because they are heavier than air and therefore less likely to move. Gases such as argon and krypton also conduct heat less quickly than air, further slowing down heat loss.

## Low-emittance

Low-emittance, or low-e, coatings save energy by reflecting infrared heat back into the room. "Imagine putting aluminum foil on a window,"

says DePaola. "Only you make it so thin you can't see it." These coatings, which are invisible, are often made of silver.

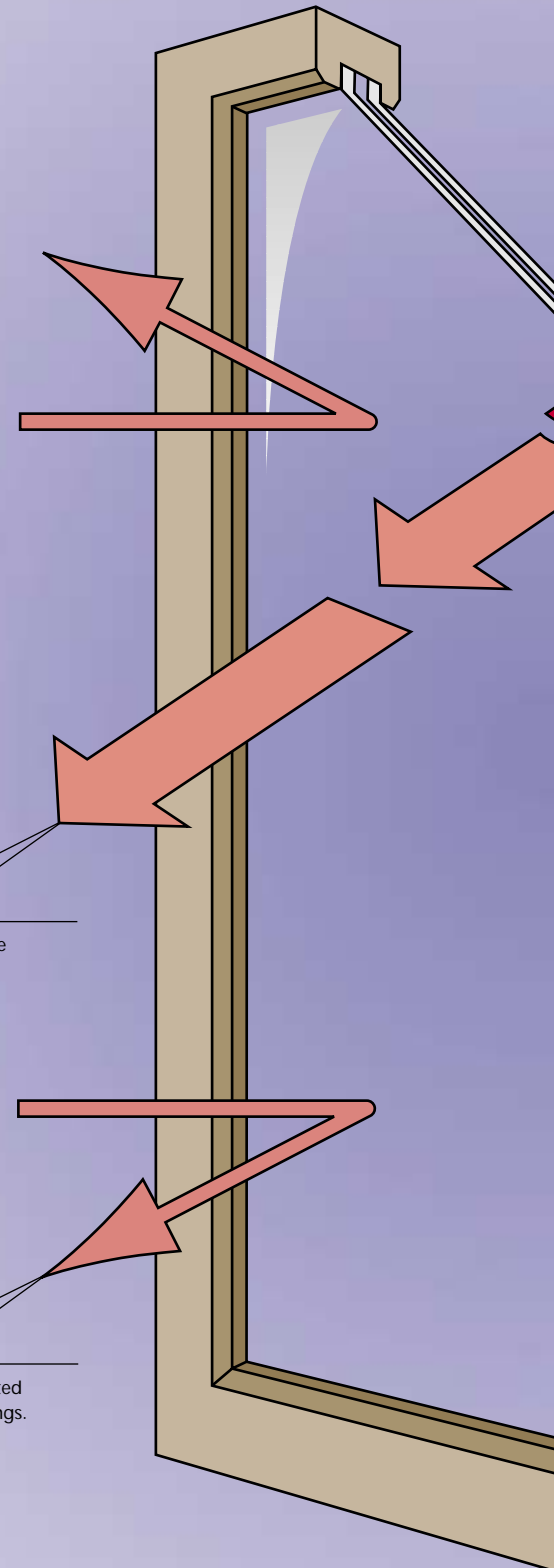
By contrast, windows without a reflective coating allow heat from the room and people to stream outside, making the area near the window feel cold. This can cause people to turn up the thermostat to compensate—something low-e windows help prevent.

## The future

Researchers are already working on advanced window technologies to make windows still more efficient. One idea is to use a vacuum, instead of a gas fill, between the window panes (like a thermos bottle). This would prevent heat loss by air convection and conduction altogether.

Another innovation is so-called "smart windows," which can change their characteristics based on the environment. For example, if there was too much solar heat coming through the windows in the summer, the window would automatically become more reflective. In the winter, the window would let in the maximum amount of heat.

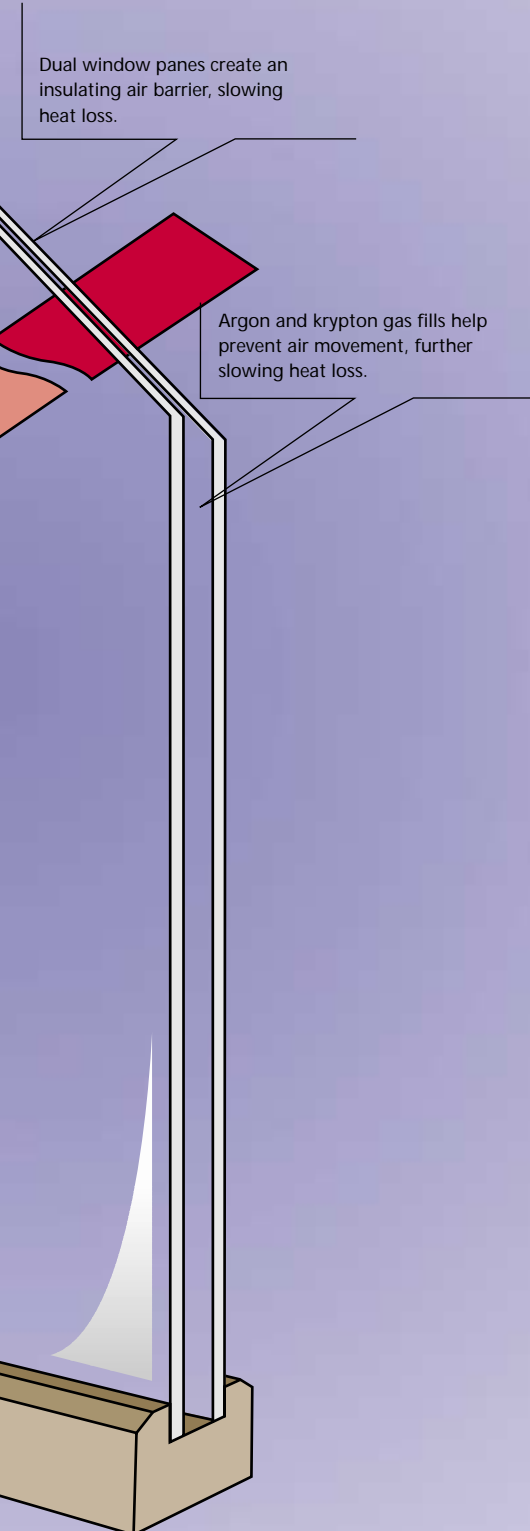
In the future windows may be more efficient than a highly insulated wall. This is because windows can let heat in, not just prevent it from leaking out. Someday we may really be able to live in glass houses. At least it won't be high energy bills that prevent it! ☻




Light and solar heat enter the window.

Heat from the room is reflected back by invisible low-e coatings.

## Understanding window labels





National Fenestration Rating Council

**CERTIFIED**

### World's Best Window Co.

**Millennium 2000 • Casement**  
 CPD#000-x-000  
 Vinyl Clad Wood Frame • Double Glaze  
 Argon Fill • Low E • Solar Control Coatings

ENERGY Performance

- Energy savings will depend on your specific climate, house and lifestyle.
- For more information, call World's Best Window Co. 1-800-000-0000 or visit NFRC's web site at [www.nfrc.org](http://www.nfrc.org).

Technical Information

<b>Res</b>	U-Factor <b>.34</b>	Solar Heat Gain Coefficient <b>.38</b>	Visible Light Transmittance <b>.48</b>
<b>Non-Res</b>	<b>.33</b>	<b>.37</b>	<b>.49</b>

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product energy performance. NFRC ratings are determined for a fixed set of environmental conditions and specific product size.

U-factor

SHGC

VT

Knowing a little label terminology will help you select the most efficient window for your home. These performance numbers apply to the whole window, including the frame.

### U-factor

U-factor measures the rate of heat loss. It is given in terms of Btu per hour for a one square foot window area and a one degree difference in temperature between the indoors and outdoors (Btu/ft<sup>2</sup>°F). A u-factor of .35 is typical for an energy efficient window. Lower numbers are better. If you divide one by the u-factor, you'll get the window's R-value (R-3 in this case).

### SHGC

This is an abbreviation for solar heat gain coefficient. It measures the fraction of solar heating that the window lets in. A SHGC of .6 means the window lets in 60 percent of the solar radiation falling on it. If you want to benefit from solar heating, higher numbers are better. In hot, sunny climates, however, windows with a low SHGC are better because they help reduce cooling costs.

### VT

VT stands for visible light transmittance. A VT of .6 means that the window lets in 60 percent of the light visible to the human eye. Windows with higher VT provide more illumination. Windows with lower VT are often used to control glare.

## news briefs

### ENERGY WAVES 2

#### Milwaukee carpenter recycles houses

Bert Simmons has been a carpenter for 25 years, but it was his five years as a condemnation inspector for the city of Milwaukee, Wisconsin that helped him see the irony of perfectly good lumber, handrails, and cabinets being hauled off to the dump. "I started to wonder if there was some other way to use the materials," Simmons says. It didn't take him long to develop his vision for "closing the recycling loop:" mine old, condemned houses, store the materials, and build new houses from them in the inner city of Milwaukee.

His vision will soon become a reality. Construction of a Energy Center-supported demonstration house will begin this spring. Dubbed REEHouse, for Resource Energy Efficient House, the



demonstration will show how reusing local construction materials—which cuts down on the energy used for production and transportation and also reduces landfill—can play a role in building sustainable, energy efficient homes.

Thanks to an array of sponsors—the City of Milwaukee, Harambee Ombudsman Project, Northwest Side Community Development Corporation, Wisconsin Department of Commerce, and the Wisconsin Department of Natural Resources—Simmons has also created a company by the same name to bring "house recycling" to dozens of new homes for people in inner city Milwaukee, while also creating jobs in an area that badly needs them. The Center will help track the costs of running this business. "We can then provide this information to others," says Center project manager Craig Schepp. "One of the dreams of the project is that this can be expanded to other areas of the state."

At-risk youth from the Wisconsin Conservation Corps will provide labor for the project, another way Simmons is "closing the loop." "It's important to me to see young people taking something old and making something new," he says.



FOR MORE INFORMATION about REEHouse, contact Craig Schepp at (608)238-8276 x116,

[cschepp@ecw.org](mailto:cschepp@ecw.org).

—Eric Nelson



PHOTO COURTESY OF ANDREW KRAMER, PHOTOGRAPHER, HUTTON FORD ARCHITECTS P.C., ENGLEWOOD, CO. AND LIGHTFORMS, LLC, SANTA BARBARA, CA, DAYLIGHT CONSULTANT

#### It's high noon for daylighting

Folks have been shedding a lot of light lately on the subject of daylighting.

A number of developments have taken place in recent months, exposing more and more people to the concept of using natural light to illuminate the inside of buildings. Daylighting saves energy and has plenty of other advantages. Here's a sampling of recent developments:

- This summer, the results of a large, California-based study showed the exciting benefits of sunlight on employees, students, and consumers. The study, conducted on behalf of the California Board of Energy Efficiency, found a strong correlation between daylighting and human productivity. Children in daylight schools learned more quickly, and customers in daylight stores bought significantly more merchandise.

- Here in Wisconsin, representatives of the Hoffman Corporation of Appleton attended the June 1999 daylighting workshop offered by the Energy Center. They'd already decided to build a "green" headquarters, but the workshop helped them decide to use Cool Daylighting™ techniques.

- The Lighting Research Center at Rensselaer Polytechnic Insti-

tute in Troy, New York, recently joined the Daylighting Collaborative. The LRC is recognized as the preeminent independent research organization and source of information about lighting technologies, applications, and human response to light. It provides balanced and objective information about lighting to diverse audiences.

- The Wisconsin Chapter of the American Institute of Architects, along with the Center and the Daylighting Collaborative, sponsored a major workshop in October, "Improving Human and Environmental Performance with Daylighting." Held at the American Club in Kohler, Wisconsin, the conference included information on the latest tools and technologies, data on the psychological benefits of daylighting, and methods of electric illumination that work well with daylighting.



FOR MORE INFORMATION on daylighting or the Daylighting Collaborative, contact Abby Vogen at (608)238-8276 x122, [avogen@ecw.org](mailto:avogen@ecw.org). Or log onto [www.daylighting.org](http://www.daylighting.org).

—Teresa Paprock



# financial report

WE LOOK BACK



**ENERGY CENTER**  
OF WISCONSIN

*We show you how*



# Membership

The Energy Center of Wisconsin is a private nonprofit organization funded primarily by voluntary contributions from Wisconsin's utilities. The Center's Board of Directors oversees the selection of projects and programs. The Advisory Committee—along with several area committees—work with Center staff to guide Center activities. **Member** organizations provide the bulk of the Center's financial support.

Representatives from both member and **participant** organizations serve on committees and on the Board of Directors.

We invite participation, collaboration, and support from any organization that shares the Center's mission. Contact the Center for information on how to participate or become a member.

## Supporting Our Mission

### Members

Alliant Energy*	Marshfield Electric and Water Department	Wisconsin Electric Power Company*
Consolidated Water Power Company	Northern States Power Company-Wisconsin*	Wisconsin Public Power Incorporated
Madison Gas & Electric Company*	Rice Lake Utilities	Wisconsin Public Service Corporation*
Manitowoc Public Utilities	Superior Water, Light and Power	

### Participants

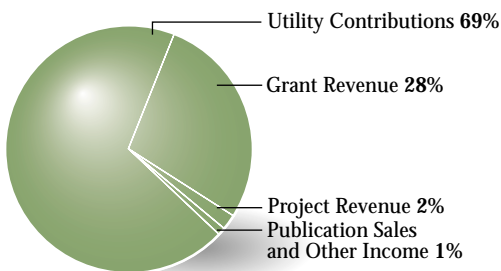
Alliance for Clean Energy Systems*	National Association for the Advancement of Colored People	University of Wisconsin Extension
Badger Safe Energy Alliance	National Center for Appropriate Technology*	University of Wisconsin-Madison*
Citizens' Utility Board	Opportunities Industrialization Center of Greater Milwaukee	Western Dairyland Community Action Agency
Conserv Products, Inc. †	Plumbing & Mechanical Contractors Association* †	Wisconsin Community Action Program Association
Cooperative Educational Service Agency 5	PRO-TEL, Inc. †	Wisconsin Energy Bureau
Kohler Company †	Public Service Commission of Wisconsin*	Wisconsin's Environmental Decade
League of Women Voters of Wisconsin	RENEW Wisconsin	Wisconsin Manufacturers & Commerce
Midwest Renewable Energy Association		Xexoxial Endarchy, Ltd.
Municipal Electric Utilities of Wisconsin*		

\*Representative serves on the Board of Directors  
†Trade ally representative



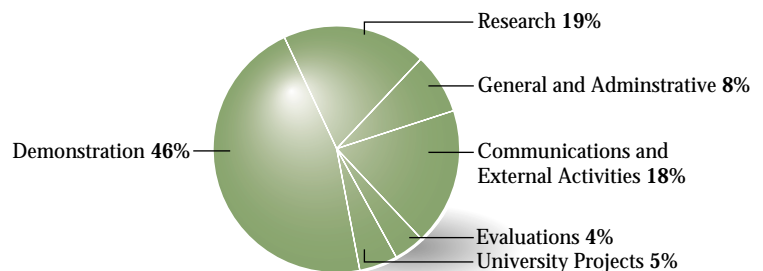
# Financial Summary

## Sources of Income



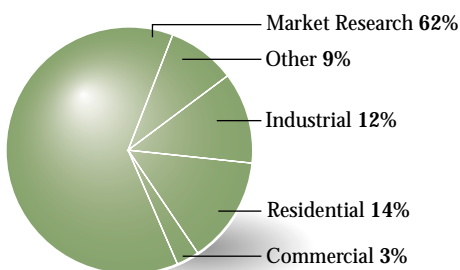
Total Revenue: \$4,580,588

## Application of Funds

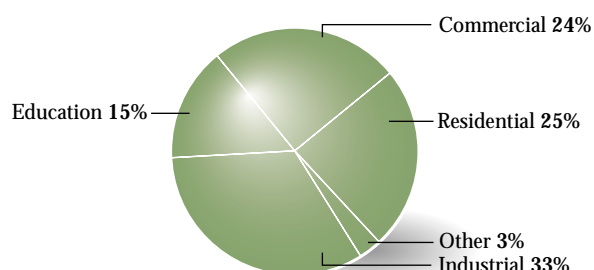


Total Expenditures: \$5,288,862

## Distribution of Research Funds



## Distribution of Demonstration Funds



## Board of Directors



**Lynn Hobbie**  
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Madison Gas  
& Electric Company



**Anthony Maggione**  
Vice President  
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**Dennis Holt**  
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**Paul Liegeois**  
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**John Mitchell**  
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**Terry Nicolai**  
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# Energy efficiency

'Selling' environmentally friendly products to businesses means addressing other needs



## ...and a lot more

Step right up, folks,

and take a look at this gizmo!

Sure, it'll cost you some money—but it saves energy!

Isn't that great...?

By Teresa Paprock

**M**any businesses are simply not impressed by this sales pitch. They want something that slices, and dices, and maybe even does windows. If it happens to make the air cleaner or burn up less fossil fuel, well, that's nice too. After all, everybody wants a clean, bright future. But right now, they mainly want the slicing and the dicing.

That's the challenge when it comes to selling energy efficiency to businesses and industry. Energy savings might not be near the top of their priority list. For some of them, even saving money isn't at or even near the top of their priority list. If you want to sell them a gizmo, you'd better find a way to quantify the benefits in terms of production or profits. The energy efficiency can be a side benefit, something that happens alongside other benefits businesses are seeking.



(BELOW) PHOTO COURTESY OF ANDREW KRAMER, PHOTOGRAPHER, HUTTON FORD ARCHITECTS P.C., ENGLEWOOD, CO, AND LIGHTFORMS, LLC, SANTA BARBARA, CA, DAYLIGHT CONSULTANT



Hey folks,  
this gizmo will help  
school children learn faster,  
behave more positively, and  
even grow taller—and it  
can cut energy usage by  
up to 50 percent.



### Side benefits of daylighting

Take the Hescong-Mahone Group study for the Pacific Gas and Electric Company, which studied daylighting in retail sales in a chain of more than 100 stores. The study showed sales were as much as 40 percent higher in daylit stores (in specially designed structures where some of the light comes from sunlight, rather than artificial illumination).

In this case, the intangible (the positive emotional impact of daylighting) had tangible results (increased sales). According to a June 1999 article in the *Sacramento Bee*, Wal-Mart, Costco, HomeBase, and Target stores are either designing new stores with daylighting or are looking into the possibility.

Developed as a method of saving energy, daylighting has many advantages over artificial illumination. A variety of studies have shown it helps school children learn faster, behave more positively, and even grow taller. Adults who work in daylit buildings tend to be more productive and take fewer sick days. Oh, yes, there are energy benefits too: if done correctly, daylighting can cut energy usage by up to 50 percent. Some retail stores may look at the idea of daylighting purely for the energy savings, but the fact remains that what sets off the bells and whistles for most of them is how daylighting seems to get people to buy more stuff.

There's nothing wrong with that, of course; businesses are in business, after all. And a business' purpose is to make a product (and therefore, a profit). Proponents of energy efficiency just need to be cognizant of this fact in order to bring energy efficiency to businesses and industry. They hope that by doing this, they'll be able reduce waste and pollution in the future, while helping businesses be successful today.

"It's well-recognized in the industrial sector that it's infrequent to do a project just to save energy," says Karen Meadows, Associate Director of the Energy Center. "Most industries look at it in different terms. They see production benefits, safety benefits, decreased maintenance, maybe the increased life of the machinery. To get a project approved, you must quantify the benefits."

Why would a business be interested in making an energy efficient change or purchase? The results of one recent evaluation of the Center's Performance Optimization Service Program showed two main reasons, says Ingo Bensch, Center project manager. One reason is that businesses are often motivated by the need to solve a production problem. Another reason is that energy efficiency might fit into the broader efficiency ethic of a particular business.

### If it's broke, fix it

A problem with production can cost time, energy, and of course, money. Many times, the very thing that fixes the production problem (repairing a machine, for example) results in a decrease in energy use—an excellent side benefit.

Louisiana-Pacific Corporation, of Tomahawk, Wisconsin, a manufacturer of oriented-strand board, wanted to save money on wood drying, so a performance optimization study of the system was done. According to the study, fans were continuing to run at full power, even though their dampers were partially closed. Plant engineers made adjustments including changing belt drives to slow down the fan, opened dampers, and replaced some dampers with variable inlet vanes.

The results were many: quieter machines, a higher-quality product, and (by the way) a huge energy savings. In fact, they've saved \$85,000 a year without sacrificing production.

Another example occurred at the Ellsworth Cooperative Creamery, in Ellsworth, Wisconsin, which makes butter, cheddar cheese, and whey powder. The exhaust fan's damper was partially closed to regulate airflow, but a performance optimization study showed that slowing down the fan while opening the damper would achieve the same airflow using half the energy.

This inefficiency was costing the small creamery \$1,000 a month. Changing the size of the fan pulleys and opening the damper has resulted in a \$12,000 savings every year.

### B&B for the green-minded

For those businesses that have a strong environmental ethic—if being green is part of the business' identity—the process of selling energy efficiency is more direct.

The Arbor House, in Madison, Wisconsin, is an example of a business whose *raison d'être* is to appeal to those who are environmentally aware. Every detail of this upscale bed-and-breakfast was developed with the environment in mind—the windows, the exterior walls, the plumbing, the heating system—even the building's placement on the lot (an L-shaped addition prevented trees from having to be removed).

The builders of Arbor House used ecological construction procedures, including recycling for construction waste. Instead of bathroom fans, there is a heat-recovery ventilation system; instead of air conditioning, there is passive cooling. "We had the idea of combining high quality hospitality with a model for urban ecology," owner John Imes told *In Business Magazine*, "providing a showcase for eco-

efficient design, technology and practices with a mindset of showing that sustainability can be comfortable, beautiful, and elegant.”

Imes had managed environmental affairs for a large, conservation-minded printing company, and he had spent seven years in the hotel business so he had the hospitality background as well. Not only did he want to use his business to promote sustainability and energy savings, he wanted to show that “green” does not necessarily have to cost more. “We wouldn’t compromise on recycled timbers, recycled tile and everything else,” he says. “In some cases, things did cost a bit more, but not as much as what people think.” The inn has received awards from the Boston Society of Architects, and the Imes are planning similar inns in other cities including at the Presidio, a former military base in San Francisco, California.

“The Arbor House serves a niche market,” says Bensch, “and the marketing is designed to appeal to that. For those of us who promote energy efficiency, the challenge is to encourage highly efficient and environmentally friendly buildings like the Arbor House, and to also keep pushing the standards for conventional buildings.” In trying to design a building specifically for energy efficiency and sustainability, one challenge is to keep up with those ever-rising standards. “It’s really a moving target,” says Bensch, pointing out that what used to be considered highly energy efficient may just meet today’s codes.

### Lighting can guzzle energy

For those majority of businesses that are not in existence to promote energy awareness, there are still good reasons to make environmentally responsible decisions. Dan York, project manager at the Center, says that lighting is a big target for energy efficiency, because businesses use so much power for lighting that

even a small gain in efficiency becomes evident very quickly. Fluorescents are the standard in office and school buildings, but even if fluorescents are in use, they might not be the energy efficient type.

York says that in the case of fluorescents, “People don’t notice much difference in performance between standard lighting and energy efficient lighting.” This makes lighting an excellent area to push for energy efficiency in schools and offices. For the balance of business and industry, there’s no reason not to check out environmentally friendly options for lighting. And as the daylighting case studies show, the energy efficient option can increase profits as well.

### Let’s make efficiency attractive

Not all businesses can be the Arbor House—nor should they be. At the same time, businesses and industries should not have to wait until they’re facing major problems with outdated equipment before making environmentally friendly choices. It’s a dilemma being faced by those in the energy efficiency movement. The only way to address the dilemma is for the energy efficiency folks to continue to do what they’ve been doing—learn what makes energy efficient purchases attractive.

Advertising and marketing have evolved to use image, reputation, convenience, enjoyment, and reliability in the selling of products. Perhaps this approach can work with energy efficiency too.

Remember the gizmo? This gizmo can do whatever you want it to do. Maybe it will make your assembly lines run more smoothly, maybe it will make your offices brighter and more comfortable. Maybe it will save you money in the long run.

And it will use less energy. Which is great too! 🌱

The Arbor House has lots of gizmos that make it comfortable as well as environmentally friendly.



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“A must read for anyone who designs, implements, or evaluates market transformation programs.”

—Nick Hall, Tec MRKT Works

# Getting the most out of energy



## Consolidated Paper's Jerry Aue works in a field that fits his philosophy

By Eric Nelson

When I heard of the Energy Center boiler project that was saving Consolidated Papers, Inc. about a million dollars a year, I imagined something cylindrical, smooth, and big. But this boiler, which generates steam for papermaking and electricity for Consolidated's Wisconsin Rapids division, was square, skinned in corrugated aluminum, and very big. The fan that fed it air was two thousand times more powerful than a furnace fan. Three stories high, it is one of the largest gas-fired boilers in Wisconsin.

Projects of this scale are what energy manager Jerry Aue deals with every day. But in meeting him, you wouldn't know this. Dressed casually for our interview, Aue is a polite, down-to-earth man who used to be a dairy farmer. He started his career at Consolidated on the paper machines, going back to school for a second degree and becoming an energy engineer in 1990, and energy manager last year. He's a humble man who's accomplished a lot.

During his career, Aue has helped the company maintain a per ton energy usage that is

about 25 percent below the industry average.

He was the impetus behind Consolidated Water Power Company—a subsidiary electric utility that generates hydroelectric power—joining the Center in 1998. He has also helped arrange company sponsorship of 14 teachers for the Center's K-12 Energy Education Program, as well as sharing case studies as part of the Governor's Business Roundtable.

The need to conserve helped steer Aue's career. "I really didn't set out looking for the energy field. It just found me," he says. "I've always been one to recycle, even before it was popular. I always tried to use the least I could." This philosophy of conservation has carried over into his work.

**"Use as much energy as you need, but make sure you squeeze as much efficiency out as you can"**

There's a reason Consolidated—a maker of coated papers and paper board—supports energy efficiency. It is the biggest gas and electricity customer in Wisconsin, with a 90 million dollar annual energy bill. "The amount of power we use at peak time would light the city of Madison," Aue notes.

Getting the most out of all that energy means projects, and projects mean people. "It's the employees working on the machines who will have the best ideas because they know how things work," he says. "The key thing is to take the time to listen." In recognition of this, Consolidated has assigned energy coordinators throughout the company. Aue calls them the "eyes and ears" of efficiency. They report energy usage data and opportunities for improvements. He helps them sort through

the information to pick out the most promising projects.

Aue crosses his arms behind his head and leans back in his chair, beginning a story. "The best way to save energy is to shut it off if you don't need it," he says. Consolidated had been doing one of many expansions of their Converting Division—which makes rolls of paper into sheets—and with it, their compressed air system. "We expanded and put in more air compressors. Then we expanded again, and put in more compressed air." Before they knew it they had six air compressors going. Then an employee came up with the idea of putting in a "header," which involved adding more pipe and thereby removing constrictions in the line. "We shut down three of those air compressors and it saved us \$49,000 a year."

**"The most important thing is being observant and knowing where to look"**

Once, while fixing a machine that created a vacuum, three pipefitters had been looking for vacuum leaks but weren't having any success. So Jerry joined them.

"I took a look at it and lo and behold I couldn't find anything either," he says. "Then I heard a large air leak coming from behind a post. I went and looked and found an air line with a hole in it. 'Where does this line go?' I asked. 'It goes to a valve,' they said. 'What's the valve for?' It was the shut off valve for a purge system." Because of the air leak the valve was stuck part way open, letting air leak in and preventing a vacuum from forming. "I was looking for a vacuum leak and ended up finding a compressed air leak instead."

Knowing where to look can often save energy, but sometimes just making up your mind is the right approach. Consolidated decided in the mid 1980's to buy the most energy efficient motors available. "We did that because we knew we would get our money back," Aue says. At their Biron plant, for instance, 95 percent of energy usage goes toward running motors.

Aue says he gets good backing from management because he can demonstrate concrete savings like this. But he also gets the backing of maintenance, operations, and production, so that the projects are implemented correctly. “You can have the best, most efficient motor and if you leave it run at full power all the time you’re not going to save energy.”

**“It makes more sense to use resources than to throw them in a landfill”**

Aue says the paper industry is using bigger, faster paper machines that use more energy. This trend necessitates another—maximizing efficiency while minimizing waste. Renewable energy fits into this trend. He notes that Consolidated uses 20 percent of the



Outside a gentle swish of water drew us to the intake pipes at the lip of the dam. During its journey downhill these streams generate over four megawatts of power for the factory’s use.

More and more of Consolidated’s energy coordinators are becoming environmental managers. And so is Jerry. “Use, reuse, and re-reuse water, heat, and any byproducts,” he tells me, gesturing with his hands. And of course, save energy. “If you’re saving energy you’re doing something for the environment.”

renewable energy in the state, in the form of bark, waste, byprod-

ucts, and hydroelectric power.

Earlier in the day we had toured one of Consolidated’s seven hydroelectric dams. In a red brick building, two green General Electric generators made a loud whine as they turned slowly around.

(far left) Consolidated’s Energy Manager Jerry Aue holding raw ingredient. (above left) The boiler control room. (above right) Inside the hydroelectric plant.





# Old McDonald

had (an energy efficient) farm

With long-day lighting here and biogas there the Old McDonald of today can counter the energy-guzzling mechanization of his farm

*By Carolyn Dunn*

Children sing “Old McDonald” to learn about the animals that live on a farm and the noises they make. But what they don’t sing about is the less musical side of farming that involves using energy. It takes a lot of energy to keep those cows mooing and pigs oinking.

And with the ever-present danger of farms going under, farmers are seeing energy efficiency as one cost-cutting option in their struggle to stay afloat.

In Wisconsin research and education are helping farmers fight the fight. New and old conservation technologies are helping them

cut down energy consumption, produce their own energy, and increase productivity.

## **E-I-E-I-that’s a lot of dough**

As with almost every area of the U.S. economy, the concern for energy in farming hit a peak in the 1970’s—and has dropped off ever since. But a revival of sorts is taking place among farmers and their support systems.

National and statewide organizations are pushing for advancements in agricultural energy efficiency and a wider adaptation of energy-saving technologies. For example, the

American Farm Bureau and the National Center for Appropriate Technology recently held a national meeting on energy efficiency in agriculture; the Midwest Rural Energy Council (MREC) continues to support research and educate farmers; and the Wisconsin Department of Agriculture, Trade and Consumer Protection just established the Rural Energy Management Council.

While agriculture only accounts for three percent of the electricity used in Wisconsin that still adds up to about 1.9 billion kilowatt-hours a year or close to \$100 million out of farmers' pockets. And even though energy is a small percentage of farm production costs, it has a fairly sizable economic impact. Fact: there can be a \$10,000 to \$20,000 annual difference between an inefficient milking system and an efficient one. Enough reason for a farmer to sit up and take notice—you'd think.

But University of Wisconsin-Madison researcher Doug Reinemann, who's spent much of his career finding new ways for farmers to save energy, says energy is not high on the list of priorities for farmers. "For expand-



ing and new farms energy is a factor they might think about. If we can get people to make energy efficiency decisions when they're building that's good." Reinemann adds that on older, smaller farms energy concerns only seem to surface when farmers want to put in new equipment. Often, he says, new equipment advancements will force energy conservation. "But unless they're adding equipment to boost productivity, they're not thinking about saving energy."

Mike Moore, president of MREC and Agribusiness Market Leader at Wisconsin Public Service Corporation, agrees with Reinemann's assessment. "Energy is not glamorous. It's not like having a new tractor that sits out and people can see. But it's important," Moore

says. "I ask farmers, 'Do you plan on being in this business 10 or 20 years?' If you do, you must be efficient with your expenses. Make sure your energy technologies are as efficient as possible because it will make you more cost competitive."

## Here a heat recovery system there an adjustable speed drive

Moore's approach has worked for him as he's helped farmers in northeastern Wisconsin—which houses the largest concentration of



farms in the state—plan for their energy needs. "Large, small, and somewhere in-between—it's hard to make generalizations about how farms can save energy because the situation on each farm is unique."

On smaller farms, old wiring can cripple energy efficiency. On expanding farms energy efficiency becomes a conscious choice with equipment upgrades. And on new and larger farms energy efficiency is often planned before building ever begins.

Doug Reinemann uses one general rule when it comes to on-farm energy efficiency. "The most cost efficient and biggest opportunity for energy savings is to get systems installed correctly and maintained properly." He says, for example, that right now a big energy saver on dairy farms is adjustable speed drives on vacuum pumps. The ASDs adjust the speed of the motor running the vacuum pump used for milking the cows. Instead of having a pressure reserve ready at all times, a computer senses when more pressure is needed and boosts the power. "The typical savings on good design and installation alone is 50 percent. You save 50 percent just by properly installing and adjusting the milking machine." Farmers cut energy costs another 50 percent when they install the ASD. That means the system uses 25 percent of the energy consumed by a typical system. Not bad.

Another clever way to save on a dairy farm is by using good ol' well water to cool milk. "Milk cooling is a big chunk of energy costs on a farm," Moore says. "By using a heat exchanger and cold well water flowing in one direction and milk running in the other, you can take ten, 20, or even 30 degrees off the milk."

According to Reinemann this technology saves 25 percent over conventional systems and is becoming widely used on Wisconsin farms.

The biggest success story for energy efficient technologies is the heat recovery system. "There is a big demand for hot water when it comes to cleaning milking equipment," explains Reinemann. The heat recovery system heats water by recovering waste heat from the dairy refrigeration system. Wisconsin has been progressive in adopting this technology, Reinemann notes. He says that pre-heating is

standard equipment on new farms and is being used on 60 percent of older farms.

Every farm can benefit from energy efficient lighting. The latest lighting technique is called long-day lighting. By having their efficient lighting on 16 hours a day, studies show that farmers improve milk production and still save on their lighting bills. Moore recommends that any farmer who is remodeling look at their lighting system. With a payback of less than a year, these systems can't be beat.

While technologies like ASDs are nothing new to industrial companies, their application on farms is more recent. "We're learning in agriculture from our friends in the commercial and industrial areas; we're learning how to apply their technologies to our industry," Moore says. "And we're beginning to see those innovations take hold."

## Everywhere a manure digester

Sure it's great that farmers can now purchase efficient equipment that will save them money in the long run. But wouldn't it be great too if farmers could use more renewable resources to produce their own energy?

For years biomass energy—burning and refining corn, wood, and manure as energy sources—has been used on farms to a small degree. Now new technologies are making it possible for farmers to run their equipment with fuel they grow and collect.

Rich Hackner, Associate Director at the Energy Center, says that as farms get bigger, their problems change. Manure management is a big issue, he says. "The waste from a 1,000-cow farm equals that of a small, 20,000-person city. If a farmer converts this biogas to

fuel gas, he'll maximize the benefits because he's containing his manure and reducing waste run off and also using it for good by producing his own energy."

A manure digester produces methane gas that can be burned directly for heat and hot water or converted to electricity in an internal combustion engine. According to computer models, digesters could be a vital and economical component of good manure management—they generate energy savings that can reduce the overall costs.



Some say it's too expensive to convert manure for energy, says Hackner. He asks, "Are they looking at the long term benefits?" Hackner says he believes it's the growing concern over manure management that will propel biogas technologies into the mainstream.

Among his customers Moore says he's just starting to see development of methane recovery systems on large farms. "Right now the pay-back is not good," he says. "But the issue really

is that farmers can begin to use these systems to address manure management problems."

Another promising on-farm renewable fuel is ethanol. Although small-scale ethanol production—like that on farms—is currently not a viable option for most farmers, further research could make it economical. Fuel and oil account for about 30 percent of a typical farm's total energy bill. Someday soon farmers could use waste from their feed crops to create energy to run their tractors, combines, and energy efficient milking equipment.

### Old McDonald heard about a sustainable farm

There's a lot of good stuff out there for farmers to think about. But they can't think about it unless they actually *hear* about it.

That's why organizations like MREC are educating their members—which include utilities, electrical cooperatives, electricians, and equipment vendors—and in turn informing farmers. "We work through utilities to dis-

tribute brochures on energy issues and hold training sessions on energy efficient technologies across Minnesota, Iowa, and Wisconsin," says Moore.

The University of Wisconsin Extension program has also recognized the importance of agricultural energy efficiency. For the past 12 years Reinemann has served as the state specialist in agricultural energy efficiency, putting on programs and distributing information to dairy producers.

In line with the high-tech energy efficient equipment advances, agricultural education has taken to the superhighway. Most every organization promoting agricultural energy efficiency offers hands-on information on their websites. For web-savvy farmers—according to the American Farm Bureau 33 percent of farmers are logging on to the Internet—with little extra time on their hands, that's good news.

### E-I-E-I-Ooohh!

When he looks to the future of agricultural energy efficiency Reinemann sees more sophisticated control and monitoring systems. He predicts a wider use of biomass technologies. And for the more millennium-esque farmer, Reinemann envisions robotic milking.

Soon we may all be singing about Old McDonald version 4.0. ☺

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It's a great web address—but it has disadvantages. Ours seems to be confusing wrestling fans. In 1997 we started getting emails from website visitors who mistook us for Extreme Championship Wrestling. It became my job to respond to these delightful fans. Here's an unedited sampling:

**FAN 1:** *i love ecw its much better than wwf*

**ECW:** Thank you for your kind words. We appreciate your enthusiasm, although we do feel that the World Wildlife Fund is a worthy organization.

**FAN 2:** *Have a match where the viewers vote by calling a 1-900 number for who should be in a giant street match containing the top 20 people picked and they will be able to bring any weapons! First because it would be the best fight in ECW history and they would make a load of money from the 1-900 number and all the tickets and paper-view.*

**ECW:** Thank you for your interest in the Energy Center of Wisconsin. Your suggestion for a "street match," while intriguing, is not an idea we can use at this time. Energy efficiency competitions of various kinds can be excellent ways to generate new energy-saving ideas and raise awareness, but we don't think it's a concept that is ready for "paper-view" just yet.

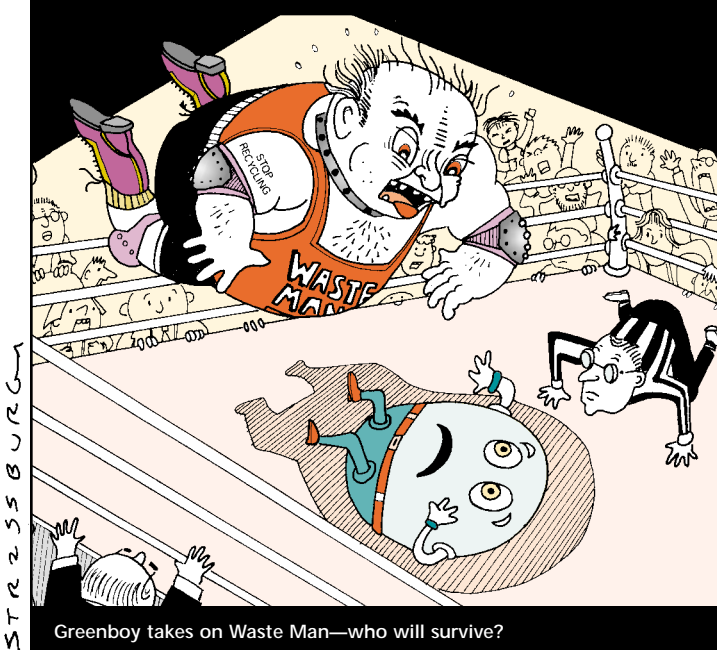
**FAN 3:** *I think you should make wrestling buddies and wrestling figures. Another idea of mine is to bring ecw to the pepsi arena in albany, new york. We are a wrestling city.*

**ECW:** Your idea of action figures is very interesting and we'll certainly consider it. It might be a good way to popularize energy efficiency. "Energy Auditor Man" has definite possibilities. Unfortunately, the Energy Center of Wisconsin has no plans to visit Albany in the foreseeable future.

Incidentally, the webmaster at Extreme Championship Wrestling's site has promised to forward any emails they get about energy efficiency. So far I'm still waiting.

—Dave Shipley

## OFF CENTER



Greenboy takes on Waste Man—who will survive?

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For more information on KEEP, contact Kathy Kuntz at the Energy Center of Wisconsin, (608)238-8276 x124, [kkuntz@ecw.org](mailto:kkuntz@ecw.org), or log onto [www.energyed.ecw.org](http://www.energyed.ecw.org).

### Triglomerate™ Contest

Figure out what the three words or phrases have in common. Then send in your answers. Best—or most imaginative—entries will be eligible to win a free Energy Center tee shirt (10 winners).

1	COW PIE	OUR LOCAL STAR	HIGH PROTEIN BARS
2	SUSTAINABLE BUILDING	PLANT	BOOGER
3	CFLs	ANNUAL BATH	RIDING A HORSE TO WORK
4	FUSION	DILITHIUM CRYSTALS	ESPRESSO
5	ENERGY	ANGULAR MOMENTUM	ENVIRONMENTALISTS
6	FLOWERS	PV	SAVAGE TAN
7	COAL	URANIUM	GAS
8	WIND TURBINE	AIRPLANE	POWER BOAT
9	CONDUCTION	CONVECTION	RADIATION
10	COLD FUSION	PERPETUAL MOTION	A DUCK

Mail in your answers on a separate piece of paper with your name, mailing address, and shirt size (M, L or XL) to:

#### Triglomerate Contest

Energy Center of Wisconsin, 595 Science Drive, Madison, WI 53711

All entries must be postmarked on or before March 1. Look for the answers in the next issue of *e<sup>2</sup>*. The tee shirt drawing will be held on March 7.



## PROFESSIONAL EDUCATION PROGRAMS & CONFERENCES

The Energy Center offers its own education programs and sponsors those given by other organizations.

February 15 & 17

**Daylighting Goes Mainstream: Advanced Tools and Techniques of Cool Daylighting™**

*Distance learning through WisView*

Contact: Don Schramm, (608)263-7757, schramm@engr.wisc.edu

February 22-23

**Wisconsin ENERGY STAR® Homes Presents: Building a High Performance Home 2000**  
*Green Bay, WI*

Contact: Becky Punzel, (608)238-8276 x120, bpunzel@ecw.org

February 29-March 3

**Wisconsin ENERGY STAR® Homes Presents: Residential Heat Loss and Heat Gain/Residential Air System Design**

*Green Bay, WI*

Contact: Renee Abel-Collinge, (608)238-8276 x143, rabel@ecw.org

February & March

**Steam Challenge Training**  
*Milwaukee 2/15 & 2/16, Wausau 3/7, Green Bay 3/8, Madison 3/9, La Crosse 3/21*

Contact: Becky Punzel, (608)238-8276 x120, bpunzel@ecw.org

March 16

**Daylighting Goes Mainstream: How to Daylight Every Office Building**

*Hudson, WI*

Contact: John Bachmeier, Marketing Programs Coordinator, Northern States Power Corporation, (715)839-2651, john.g.bachmeier@nspco.com

April 6

**Fundamentals of Compressed Air Systems**

*Minneapolis, MN*

Contact: Doug Presny, (608)238-8276 x147, dpresny@ecw.org

April 7

**The Greening of the Built Environment III: It's Here, It's Now, Here's How**  
*Milwaukee, WI*

Contact: Connie Lindholm, Wisconsin Green Building Alliance, (414)224-9422, connielindholm@wisgba.com

April 18

**Daylighting Goes Mainstream: Advanced Tools and Techniques of Cool Daylighting™**  
*De Pere, WI*

Contact: Becky Punzel, (608)238-8276 x120, bpunzel@ecw.org

## RECENT & SELECTED PUBLICATIONS

To order a publication call (608)238-4601 or email orders@ecw.org.

### New Technology Fact Sheets

One-page assessments of more than a dozen new commercial and industrial technologies are available for download at [www.ecw.org/products/commindu.html](http://www.ecw.org/products/commindu.html). Recently added: Energy Efficient Electrical Transformers, Fan Speed Reduction, Dimming Controls for High Intensity Discharge Lamps, Utilities Outsourcing, Radio Frequency Drying.

### Technologies to Efficiently Improve Indoor Air Quality

This free fact sheet describes commercial heat recovery technologies that facilitate energy efficient ventilation. Download at [www.ecw.org/products/commindu.html](http://www.ecw.org/products/commindu.html).

### Cutting Energy Waste in Large Refrigeration Systems

This free fact sheet discusses some common performance problems with large refrigeration systems and suggests simple solutions. 314-1

### A Discussion and Critique of Market Transformation

*Challenges and Perspectives*

Review explores the broad diversity of theories, practices, and definitions. 186-1

April 20

**Daylighting Goes Mainstream: Advanced Tools and Techniques of Cool Daylighting™**

*Madison, WI*

Contact: Don Schramm, (608)263-7757, schramm@engr.wisc.edu

April

**Wisconsin ENERGY STAR® Homes Presents: Residential HVAC Options**

*Green Bay, WI*

Contact: Renee Abel-Collinge, (608)238-8276 x143, rabel@ecw.org

April

**Industries of the Future: Metal Casting**

*Northeast WI*

Contact: Becky Punzel, (608)238-8276 x120, bpunzel@ecw.org

May 2

**Wisconsin ENERGY STAR® Homes Presents: Small Business Development for Home Energy Raters**

*Green Bay, WI*

Contact: Renee Abel-Collinge, (608)238-8276 x143, rabel@ecw.org

Learn more about events, publications, and library holdings at [www.ecw.org](http://www.ecw.org)

## SELECTED READINGS

The following publications are now available at the Energy Center Library. For more information call (608)238-8276 x126, library@ecw.org.

*Businesses for an Environmentally Sustainable Tomorrow* (1995). By Urban Consortium Energy Task Force (UCETF); Portland Energy Office. Public Technology, Inc., Washington, DC. #1590

*Consumer Guide to Home Energy Savings: 7th Edition* (1999). By A. Wilson, et al. American Council for an Energy-Efficient Economy (ACEEE), Washington, DC. #7303

*Deep Design: Pathways to a Livable Future* (1996). By D. Wann. Island Press, Washington, DC. #6656

*Energy Conservation Trends: Understanding the Factors that Affect Conservation Gains and Their Implications for Policy Development* (1995). U.S. Department of Energy, Washington, DC. #5656

*Energy for a Sustainable Future* (1997). By Renew America. U.S. Department of Energy, Washington, DC. #6025

*Energy Innovations: A Prosperous Path to a Clean Environment* (1997). By Alliance to Save Energy et al. American Council for an Energy-Efficient Economy (ACEEE), Washington, DC. #5807

*The Evolving Renewable Energy Market* (1999). International Energy Association, Paris, France. #7304

*Green Engineering: Designing for a Brighter Future* (1997). By L. Goldberg. *Electronic Design*, January 1997, pp. 108-116. #6478

*Mid-Course Correction: Toward a Sustainable Enterprise: The Interface Model* (1998). By R. Anderson. Perengrinzilla Press, Atlanta, GA. #7351

*Transportation, Energy, and Environment: How Far Can Technology Take Us?* (1997). By J. DeCicco and M. Delucchi (eds.). American Council for an Energy-Efficient Economy (ACEEE), Washington, DC. #6009

*Trends 2000: How to Prepare for and Profit from the Changes of the 21st Century* (1997). By G. Celente. Warner Books, Inc., New York, NY. #6369

# Consistent yet flexible public benefits

Wisconsin stands on the verge of a state-administered public benefits program that will promote energy efficiency and renewables and deliver energy-related support services to low-income households. Shifting responsibility for these initiatives from the state's energy utilities to state administrators marks a new era in Wisconsin. At this historic moment I find myself with two somewhat contradictory convictions: 1) The shift to statewide consistency will be terrific, and 2) Flexibility will be the ultimate key to the success of these initiatives.

Statewide consistency is an important benefit of this transition—even if some cooperatives and municipals opt out of the state program. Wisconsin's utilities have delivered strong programs over the years but most of those programs varied from one utility territory to the next. The many variances confused vendors and increased their administrative costs.

Most importantly, the differences confused consumers. If you listen to the radio as you drive around Wisconsin you are likely to hear about energy efficiency programs that you cannot access at home. A state-administered program means that the ads you hear in Wausau also apply in Racine. Indeed, the state initiatives provide an opportunity to craft a consistent message to consumers—one that helps people understand the statewide benefits of energy efficiency in both economic and environmental terms.

Still, even as I celebrate consistency, I worry about a loss of flexibility. The easiest way to deliver statewide consistency is to develop and maintain rigid rules that discourage any variation. Flexibility is critical, though, if we are to take full advantage of local conditions, try out new ideas, and leverage off the enthusiasm of local champions.

On this need for balance, consider Wisconsin's K-12 Energy Education Program (KEEP),



which aims to improve and increase energy education in Wisconsin. KEEP provides an inservice and educational materials to all K-12 teachers in the state. These materials and inservice are an excellent—consistent—base and, for many teachers, provide exactly what is needed to increase energy literacy.

In other cases, however, there is the potential for something more. Sometimes we encounter a particularly enthusiastic teacher who needs other things from KEEP to help them realize

their visions—access to energy professionals, more specific information about certain issues, financial assistance in developing new curricular materials, or an inservice tailored to local conditions. KEEP's ultimate success depends on supporting the base while we respond—flexibly—to the needs of specific energy educators.

Genuine flexibility requires two things: rules that acknowledge the need for exceptions and money. Setting up rules that allow flexibility is difficult; authorizing local decision making means relinquishing control. And then there's the issue of money. Flexibility cannot occur without dollars to leverage unexpected opportunities, respond to local markets, and try out new ideas. As a percentage of total funding, the money needed for flexibility is probably quite minor. These dollars are, however, the real test of whether or not any flexibility referenced in the rules is real.

Delivering consistency without sacrificing flexibility will be a difficult, ongoing struggle. The benefits, though, will be well worth the effort.



A handwritten signature in black ink that reads "Kathy Kuntz". The signature is fluid and cursive.

Kathy Kuntz  
Project Manager





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