


 e²

ENERGY EFFICIENCY

Driving our addiction

Inside this issue



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Traditionally, the Energy Center has been concerned with the efficient use of electricity and natural gas in our homes and businesses. While that continues to be our primary focus, we can't ignore the larger energy picture which includes energy used for transportation. Transportation energy use points directly to oil and our dependence on this fuel is one of our nation's most pressing energy and national security problems.

Our oil dependence is a pressing problem because we can't drill our way out of it—our domestic oil production currently is capable of supplying only 35 percent of what we use. We are dependent on imports to supply our oil habit. Not only do we import most of the oil we use, but we rely on only six countries for three-fourths of those imports: Canada, Mexico, Saudi Arabia, Venezuela, Nigeria and Iraq. The National Defense Council Foundation estimates that we spend about \$60 billion per year to protect our oil interest in politically unstable countries. Add in the costs of the war in Iraq and the tab is more than \$200 billion annually.

DRIVING OUR OIL HABIT

Transportation accounts for nearly 70 percent of our oil consumption. Gasoline used in passenger vehicles (cars, minivans,

SUVs, and other types of light trucks) comprises more than half of that energy use. And, passenger motor vehicle fuel use is growing by two percent per year.

Two things contribute to the growing demand for gasoline: decline in the average rated fuel economy and more vehicle miles traveled.

The average rated fuel economy for passenger cars reached a high of about 26 miles per gallon in 1988. Improvements in fuel economy were due mainly to the Corporate Average Fuel Economy (CAFE) standards enacted in 1975. Since 1988, fuel economy has declined to about 22 miles per gallon for passenger cars and 18 miles per gallon for light trucks. Most of these losses are due to increasing vehicle size and power, and the rising market share for inefficient light trucks (a category that includes SUVs). And, for most of the last decade, fuel economy standards have remained unchanged.

Not only are we driving less fuel efficient vehicles, but we're driving more miles. The average vehicle miles traveled per household grew from 12,400 miles per year in 1969 to 21,250 in 2001.

Given the trends in vehicle miles traveled and stagnant fuel efficiency, the Energy Information Administration proj-

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ects that we will be importing 77 percent of our oil by 2024.

SOLUTIONS

Reversing the trend in increased oil consumption requires solutions on multiple fronts, including:

Expanding transportation options for individuals and businesses—investing in mass transit, transportation demand management and non-motorized forms of transportation.

Designing sustainable communities that incorporate transit alternatives.

Developing new engine technologies such as hybrid engines, electric vehicles and fuel cell vehicles.

Investing in bio-derived petroleum substitutes.

And, last but not least, **we need to make our cars and trucks fuel efficient.** We have a host of technologies available today to improve the fuel efficiency of new cars and trucks. Automakers could raise the fuel efficiency of new vehicles to 40 miles per gallon within a decade and 55 miles per gallon by 2020 by expanding production of gasoline-electric hybrids and making improvements in conventional vehicles. We

could save about a billion barrels of oil annually by raising the fuel efficiency standards to 40 miles per gallon for the entire fleet of new cars and light trucks over a ten-year period. Those savings represent 15% of our total oil consumption and 26% of our current oil imports.

Even small improvements in fuel economy standards offer sizeable savings—we could cut gasoline consumption by 2.1 billion gallons simply by requiring light trucks to meet the current efficiency standard for passenger cars. Those savings would be equivalent to 45 million barrels of crude oil.



ANDREA MINNIEAR

A driver for Green Bay Preble High School gears up for the maneuverability competition.

Students set the pace

Wisconsin Electrathon raises awareness of electric-powered vehicles

High school students from across Wisconsin gathered at the Fox Valley Technical College in Appleton, Wisconsin on May 6–7, 2005 for the first annual Wisconsin Electrathon. Teams from eleven schools participated in this exciting event showcasing electric cars built by students and faculty advisors. The event was managed by the Midwest Renewable Energy Association with

financial support from several Wisconsin utilities and the Wisconsin Environmental Education Board.

The goal of the Wisconsin Electrathon is to demonstrate the viability of electric vehicles and teach young people how to make sustainable lifestyle choices. The program takes a team-oriented approach to designing and building efficient vehicles. Students gain leadership skills during

each phase of the project—design, construction, community outreach, fundraising, budgeting, multimedia development and reporting.

High schools participating in the 2005 event included ten from Wisconsin (Bayfield, Berlin, Cashton, Conserve School, Eau Claire North, Edgar, Green Bay Preble, Madison East, Seymour and Stockbridge) and one from Iowa (MFL Marmac). The overall winner was Cashton, with a cumulative score of 877 out of 900 possible points.

In addition to mechanical performance tests, each team earned points by submitting a series of monthly reports that documented each phase of the project. Teams were judged by the Wisconsin Electrathon Board of Directors, a group of representatives from a variety of schools and environmental organizations across the state.

Plans are now underway for the 2006 Wisconsin Electrathon. To find out more about the race and to learn about sponsorship opportunities, please visit www.ecw.org/wielectrathon.



FOR MORE INFORMATION

contact Andrea Minniear (Wisconsin Electrathon Board member) at 608.238.8276 x126, aminniear@ecw.org.

U.S. energy policy and oil dependence



This past August, President Bush signed into law the Energy Policy Act of 2005 (EPAAct 2005), the first effort to address U.S. energy policy since 1992. Does it address our problem of oil dependence?

EPAAct 2005 does acknowledge that our heavy reliance on imported oil puts the country at risk. However, it addresses that reliance by providing incentives to domestic oil producers to mine the little oil remaining on federal lands and on the continental shelf. This policy serves to hasten the decline of our native resources, depleting the reserves that future generations might need and solidifying our dependence on imports.

In the same vein as increasing domestic oil production, EPAAct 2005 provides incentives for hastening the production of transportation fuels from coal, oil shale and tar sands, as well as incentives for producing bio-based fuels. While production of alternative fuels is essential to weaning us from our oil dependency, some of these fuel sources (oil shale for one) are not without their own drawbacks.

The U.S. oil shale resource—a massive deposit in the Green River formation in Wyoming—contains almost one

trillion barrels, more than the oil reserves of the entire Arabian Peninsula. However, in order to produce oil from shale, the rock must be mined, the oil processed from the shale, and the waste disposed. There are significant economic and environmental obstacles to produc-

ing oil from shale: the process is especially water-intensive, a red flag in the arid west and the left over shale that is contaminated may need to be disposed of as hazardous waste. Congress has included provisions in EPAAct 2005 for clarifying the process for developing oil shale on federal lands and explicitly assessing the environmental impacts of that development. Yet the emphasis remains on mining fossil fuels.

EPAAct 2005 does contain incentives for producing more biofuels, primarily ethanol and biodiesel. Yet, substituting ethanol for gasoline provides only modest relief for our oil habit. Ethanol is currently produced from corn, a crop that is heavily reliant on petroleum for growing, harvesting and processing. Even using optimistic estimates, we would net only about half a gallon of ethanol for every gallon of petroleum used in the process. Producing ethanol from cellulose is a less energy intensive process, but is still in the development stage.

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REDUCING GASOLINE CONSUMPTION

Shortly after EPAAct 2005 was signed into law, hurricane Katrina wailed into the Gulf Coast and shut down a quarter of the nation's crude oil production and nearly as much of its natural gas output. Gasoline prices at the pump spiked to over three dollars per gallon and have remained well above two dollars per gallon. The press reported on projected fuel shortages and high prices, and ran stories on how Americans could save at the pump and at home. Even the White House called on American's to conserve energy—asking us to join carpools and drive less. So what can you do to reduce the energy you use for transportation?

TIPS FOR INCREASING YOUR GAS MILEAGE

U.S. Department of Energy Gas Mileage Tips www.fueleconomy.gov/feg/drive.shtml

Federal Trade Commission Good, Better, Best: How to Improve Gas Mileage www.ftc.gov/bcp/online/pubs/alerts/fuelalrt.htm

Commuter Resources:

Best Workplaces for Commuters www.commuterchoice.gov

Commuter Choice www.commuterchoice.com

Bicycle Federation of Wisconsin www.bfw.org

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Given the limited amount of domestically available oil and the economic and environmental barriers to alternative fuels, reducing consumption through energy efficiency and conservation would seem to be both a logical and cost-effective approach for dealing with our oil habit. Yet EPCA 2005 is staggeringly silent on fuel efficiency for our cars and light trucks. While it does provide some incentives for purchasing hybrid vehicles, it does nothing to update the Corporate Average Fuel Economy (CAFE) standards.

CAFE standards have had a dramatic effect on reducing our fuel consumption in the past. They were signed into law in 1975 and required automakers to ramp up the fuel efficiency of cars from 13.8 miles per gallon to 27.5 miles per gallon by the late 1980s. A report from the National Academy of Sciences concluded that those improvements in fuel efficiency reduced our oil consumption by about 2.8 million barrels per day. The study

REDUCING NATURAL GAS CONSUMPTION

Natural gas prices have jumped dramatically as a result of hurricane damage to Gulf Coast production. As cold weather approaches and the winter heating season begins, we can expect natural gas bills to be as much as 50% higher for the year or about \$350 to \$400 more than last year.

WHAT CAN YOU DO ABOUT HIGH NATURAL GAS PRICES?

Use energy wisely and reduce the amount of natural gas you use.

Focus On Energy www.focusonenergy.com

Energy savings checklist for your home

U.S. Department of Energy [http://www.eere.energy.gov/consumer/tips/Energy_Saver\\$](http://www.eere.energy.gov/consumer/tips/Energy_Saver$)

also indicated that, by using existing technology, automakers could achieve an average of nearly 40 miles per gallon for the passenger vehicle fleet. This improvement would save two million barrels of oil a day in 2012 and nearly four million barrels a day by the end of the next decade. Had we steadily increased CAFE standards (rather than letting them stagnate) we might be relying on half the

imported oil we are now consuming.

Given that we'll never be able to satisfy our oil addiction through domestic production, a national energy policy that ignores strategies for reducing consumption does not serve the public well. Nor does a policy that continues to rely on fossil fuels as our predominate energy source.

IN THE NEWS

LEE DEBAILLIE JOINS THE ENERGY CENTER OF WISCONSIN



Lee is an energy engineer with a background in public and institutional facilities including energy efficient building retrofits and new design, energy analysis, energy management, life-cycle modeling, and utility master planning. He will work with the Energy Center's new commercial construction initiatives to provide expertise in energy analysis and modeling. Lee is a certified energy manager, LEED accredited, and licensed as a professional engineer in several states.

GOVERNOR'S TASK FORCE ON ENERGY EFFICIENCY AND RENEWABLES COMMISSIONS REPORT: SHOWS ENERGY EFFICIENCY POTENTIAL FOR WISCONSIN

A draft report issued by the Energy Center of Wisconsin shows that Wisconsin could save enough electricity through conservation to defer construction of one power plant every five years and replace enough natural gas to heat as many as 65,000 homes each year. ftp://doaftp04.doa.state.wi.us/doadocs/Energy_Efficiency_Potential_Study.pdf



we've got a great lineup!

4TH ANNUAL
BETTER BUILDINGS: BETTER BUSINESS
CONFERENCE

January 30–31, 2006
Kalahari Resort and Convention Center
Wisconsin Dells

register now before the clock winds down
at www.ecw.org/betterbuildings

UPCOMING EDUCATIONAL EVENTS

The Energy Center is committed to the lifelong learning needed to excel in our new, knowledge-based economy. Our professional education programs bring people together to create powerful connections and transform the way people work. We strive to keep you, the energy professional, ahead of the curve in understanding industry trends and new technologies. And we use proven, dynamic teaching methods that meet the special needs of adult learners.

Please join us at one or more of the following events. Please visit www.ecw.org for details on the training events below.



BETTER BUILDINGS: BETTER BUSINESS CONFERENCE

(see ad on page 4)

A first-rate learning, networking and business development opportunity tailored to Wisconsin's residential building and remodeling industry.

January 30–31, 2006

Kalahari Resort and Conference Center,
Wisconsin Dells, WI



LUNCH AND LEARNS

(Sponsored by Wisconsin Public Service)

Lunch and Learns are quick and easy ways to keep up on market trends and a chance to ask the expert your questions.

Lean Manufacturing

Lean manufacturing is changing businesses around the world through techniques that create outstanding results and translate directly into bottom-line profits.

December 6, 2005

Best Western Midway Hotel, Wausau, WI

LUNCH AND LEARNS

(Sponsored by the Energy Center of Wisconsin)

Lighting and HVAC Cost Savings from High Performance Designs

Scott Pigg will present the lighting and HVAC cost savings results and the impacts from high performance glazing and daylighting strategies from a controlled experiment of two identical rooms.

December 8, 2005

Energy Center of Wisconsin, Madison, WI

Sustainable Building Practices

Eric Truelove from the Renschler Company will explain the essentials of sustainable building practices, including site selection, building materials, high performance building design as well as the importance of a team approach.

January 12, 2005

Energy Center of Wisconsin, Madison, WI

Life Cycle Cost Analysis

Lee DeBallie will present concepts of the time value of money, net present value and return on investment as they relate to energy efficiency and sustainability in buildings.

February 9, 2006

Energy Center of Wisconsin, Madison, WI

RESIDENTIAL BUILDING PERFORMANCE TRAINING SERIES

(Funded in part by Focus on Energy)

This skill-based training series is designed to provide the skills necessary to construct safe, comfortable, durable and energy efficient homes. Dates and locations to be determined.

Ventilation: Getting Down to Basics

As construction techniques and weatherization practices improve, resulting in tighter and more efficient housing, it is imperative to learn the skills needed to incorporate effective ventilation best practices to enhance indoor air quality and control moisture.

Managing Exterior Moisture

Moisture-related problems lead the list of concerns reported by homeowners, costing the building and remodeling industry billions of dollars a year to address. This training will identify elements of effective drainage and the knowledge to choose components and techniques that will prevent moisture intrusion and damage.

Building Science 101

Wisconsin ENERGY STAR® Homes and Home Performance with ENERGY STAR programs will be introduced along with the fundamentals of building science and the importance of implementing them in construction practices.

IN THE NEWS

SE² AWARDS PRESENTED AT THE 2005 SUSTAINABILITY AND ENERGY EFFICIENCY LEADERSHIP CONFERENCE

The SE² award program recognizes leadership in energy efficient and sustainable design, construction and operation of Wisconsin commercial and other non-residential buildings and related systems. Nine awards were presented at the 2005 Sustainability and Energy Efficiency Leadership conference held in Oconomowoc, Wisconsin on October 19. The SE² conference is a joint project of the Wisconsin Green Building Alliance and the Energy Center of Wisconsin.

Awards of Excellence were presented to:

- Brengel Technology Center, Johnson Controls, Milwaukee
- Karen Peck Katz Conservation Education Center, Milwaukee

Awards of Merit were presented to:

- Alterra at the Lake, MMSD Flushing Station
- Starbuck Middle School, Racine
- Washington Park Library, Milwaukee

Special Citations were presented to:

- City Center West, Madison
- General Mitchell International Airport Intermodal Transit Center, Milwaukee
- The Sigma Group Headquarters, Milwaukee
- Waukesha Dispatch Center, Waukesha

Check out the awards presentation at

www.wgba.org/artman/uploads/presentation_of_winners_-_oct_19_2005.pdf

CENTER FOR TECHNOLOGY TRANSFER RECEIVES AWARD

The Center for Technology Transfer (CTT) received the 2005 “Inspiring Efficiency through Innovation” Award from the Midwest Energy Efficiency Alliance. CTT links energy efficiency with economic development. They use an investment model to commercialize emerging energy-related technologies or to attract new energy best practice technologies to Wisconsin. Visit CTT at www.cttinc.org



Create high performance buildings with tools and training from *Advanced Buildings*.
Go to poweryourdesign.com for training resources, products and tools.
Advanced Buildings—integrated design and high performance within reach.

SUPPORTING OUR MISSION



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The Energy Center develops solutions to energy challenges that promote economic and environmental sustainability through innovative research and education.

Please email Melanie Lord, mlord@ecw.org with comments and questions about e².

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TOM MEINZ—Wisconsin Public Service Corporation

TERRY NICOLAI—Alliant Energy

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DAN SCHOOFF—Public Service Commission of Wisconsin

BILL WARD—Proctor & Gamble Paper Products Company

LAURA WILLIAMS—Madison Gas & Electric Company

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BRIAN ZELENAK—Xcel Energy