July 2008

Energy Services BULLETIN

Western's monthly energy efficiency and renewable energy newsletter dedicated to customer activities and sharing information on energy services.

Great River's new headquarters 'LEEDs' by example

Not satisfied to merely practice the energy-efficiency measures it preaches, Great River Energy aims to inspire its members to go for the platinum—LEED certification, that is.

The generation and transmission (G&T) cooperative will apply this fall to the U.S. Green Building Council's Leadership in Energy-efficient Design program for a platinum rating for its new corporate campus in Maple Grove, Minn. The building is designed to use 50 percent less energy than Minnesota code requires, and to use 90 percent less water than comparable facilities. The builder used locally-manufactured and recycled materials in construction, including fly ash from Great River's Coal Creek Station, and diverted 75 percent of the construction waste from the landfill. The facility will save Great River an estimated $90,000 annually in electricity costs after the seven-year payback.

Energy efficiency can be beautiful, as Great River Energy's new headquarters in Maple Grove, Minn., proves. Project leaders are submitting the 166,000-sq. ft. building for LEED platinum certification. (Photo by Great River Energy)

New loan programs

If that doesn't get the G&T's 28 members motivated, the loan program Great River announced at the building's dedication in April should. The $20 million revolving, zero/low-interest loan fund will help commercial members finance the additional costs of LEED construction. Great River will also finance 100 percent of the costs related to applying for LEED certification.

In a press release, President and CEO David Saggau explained that Great River intended the program to encourage construction of more LEED-qualified buildings in its service territory. "Our headquarters may be the first of its kind in the region, but this program will ensure it's only the first of many."

The utility also introduced an $8 million program to finance the purchase and installation of energy-efficient HVAC equipment in commercial members' facilities.

That's a lot of effort to promote energy efficiency, but doing less was not an option, said Gary Connett, director of demand side management and member services. "Great River has been pushing energy conservation for years, to end-use consumers as well as to its member cooperatives," he said. "When the time came to build a new headquarters, we had to walk the talk."

Aiming for a LEED platinum rating was a way to take building efficiency to a new level. "Obviously, all new construction won't be trying for LEED certification, let alone platinum," Connett acknowledged. "Our goal for

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What's inside

New headquarters

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the new headquarters was to show our members and the community how far energy-efficient construction can go."

Systems approach

Minnesota is a pretty green state, he added, so the bar is high. If the high bar posed a challenge in setting a great example, it also ensured that the utility would be able to find LEED-versed architects and builders to help achieve its vision. Great River Energy's vision was to take the systems approach—to design a building where all the components worked together for maximum energy efficiency.

The utility brought the architect, general contractor and owner's representative together at the beginning of the project. "Usually, the general contractor joins the project later in the process," Connett explained. "You don't get an efficient building by having 10 different contractors, each thinking about one piece of the job. Going for a LEED rating requires consensus."

Energy Services Bulletin

The Energy Services Bulletin is published by Western Area Power Administration for its power customers. The mailing address is Western Area Power Administration, P.O.Box 281213, Lakewood, CO 80228-8213; telephone (720) 962-7508.

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Use existing technologies

Getting the rating—even a platinum—does not necessarily involve installing a lot of complicated, experimental systems. "Most of our systems used off-the-shelf technology that is available to any builder," said Connett.

What was innovative was the way the building design combined those systems to optimize performance. Geothermal heat pumps and underfloor displaced ventilation systems are widely used to improve energy efficiency. In the Great River Energy building, the systems are teamed up to cut down on the need for fans to push conditioned air around the building. The floor is built 18 to 21 inches above the concrete structure, and floor vents deliver air to each cubicle. "The system increases everyone's comfort, and, as a bonus, moves fewer germs around the office," Connett noted proudly. "I don't know of any building that has that combo."

The site itself plays a significant role in the building's efficiency. The building's longer east-west orientation maximizes daylight harvesting, while fewer windows on the east and west walls reduce solar heat gain. The geoexchange heating and cooling system takes advantage of nearby Arbor Lake. Plastic pipe—35 miles of it—runs under the water which is cool enough to provide free cooling on most summer days, "So we don't have to run the compressors," said Connett.

Dimming ballasts, lighting sensors and motion sensors help reduce artificial lighting needs. The elevators employ a counterbalance mechanism and high-efficiency motors to use 60 percent less energy—and take up less space—than conventional elevators. Every computer in the building has an energy-efficient flat screen CRT (cathode ray tube) monitor. "Basically, we looked at every operation that used electricity and asked, 'How can we make it more efficient?'"

Adding renewable energy

The less electricity the building used, the easier it would be to meet the LEED platinum requirement that the facility get 12.5 percent of its electricity from renewable energy. That electricity is supplied by a 200-kw wind turbine and a 72-kw solar array mounted on the roof. Solar energy also pre-heats hot water for building use.

The refurbished NEG Micon M700 wind turbine, visible from Interstate 94, reminds passing drivers of Great River Energy's commitment to renewable energy. The gears in the gearbox were remanufactured and the generator rewound to change the unit from a two-speed to a one-speed to increase efficiency. With those modifications to maximize the lower wind resources in the "urban" area of Maple Grove, the turbine is expected to produce 390,000 kWh/yr. The Maple Grove City Council approved a five-year, conditional use permit for the turbine.

The original building plan called for two wind turbines, but installing two commercial grade units within city limits stirred some concern in the community. "We ended up putting on more PV, and that, combined with the turbine, produces almost 15 percent of the building's electricity needs," said Connett.

Great River Energy's payback period for all the measures combined is estimated at seven years. The energy-efficiency measures alone will pay for themselves in just four years.

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Woodbine program promotes big-system replacement

With its successful zero-interest loan program for upgrading heating and cooling systems, Woodbine, Iowa, Municipal Light & Power proves that even small utilities can help customers get big energy savings.

In 2001, the municipal utility launched the program without benefit of consultants or extra staff. "Ours is a small operation with a small budget, so we've done our best to keep it simple," said Office Manager Theresa Corrin.

Both residential and commercial customers can apply to the utility for a loan to install an energy-efficient water heater, air conditioner or electric heat pump—by far the most popular upgrade. "Heat pumps offer the greatest potential for savings," Corrin explained.

Unlike many incentive programs that promote energy-efficient systems, Woodbine designed its loan program with customers in mind, rather than around specific load-management goals. Although the utility does not have any figures, Corrin estimates that an air-source or geothermal heat pump (GHP) can shave $50.00 or more per month off the customer's electric bill during heating season.

The program does have benefits for the utility, as well, noted Corrin. "More efficient HVAC helps to level our top load." Just as important, she added, "It builds up our relationship with our customers."

Easy application

Customers can apply for the rebate by filling out an application available at the utility office. The board of directors evaluates the applications and approves the loans. "The biggest factor is the customer's payment history," said Corrin. "Most applications get approval."

Municipal Light & Power pays 90 percent of the cost and installation of the selected system up to $3,000. The monthly payment is determined by dividing the total loan by 60 for a heat pump, and 36 for air conditioners and water heaters. If the utility loans the customer less than $1,200, the minimum monthly payment is $20. That allows the customer five years to pay for a heating system, three years for the other systems. The loan payment is added to the customer's monthly electric bill.

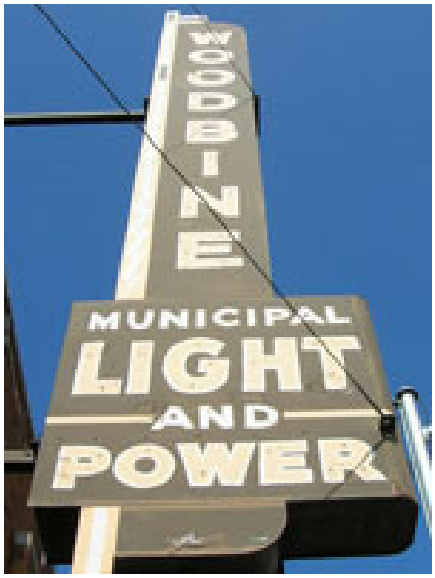
Customers sign an equipment replacement loan contract specifying the system, loan amount and the payment plan. Woodbine also requires customers to take a lien against the property associated with loan. "That step ensures that we get repaid, even if the customer moves," said Corrin who handles the paperwork for the lien.

Corrin had some previous experience with filing liens and needed no training to take on that duty. "But it's pretty self-explanatory," she said. "We keep a copy of the completed paperwork on file to use as a template."

Local contractors help

It is up to the customer to select the equipment and hire a contractor. Heat pumps and air conditioners must have a rating of at least 13 SEER, but otherwise, the utility does not specify any brand of equipment.

For customers choosing a GHP, finding a qualified contractor is not a problem in Woodbine. The town of 1,800 residents boasts two established heat pump vendors, removing what is often a major stumbling block for programs promoting GHPs in other areas. Customers are familiar with the locally-owned businesses and know that the contractors have experience with the region's soil conditions and climate. "Having those vendors right here in town has definitely contributed to the success of the program," Corrin acknowledged.



Woodbine Municipal Light & Power provides electricity—and interest-free energy-efficiency loans—to 1,800 customers in western Iowa. (Photo by Woodbine Municipal Light & Power)

Randy Vandemark of Vandemark Heating and Cooling has been in business since 1992, but has noticed an increase in interest in heat pumps since the utility started offering loans. "About half of our installs are GHPs now," he said.

Stick with big systems

Heat pumps account for the majority of 99 loans Woodbine has made since the beginning of the program. The efficient electric systems were the only equipment the loans covered initially. Woodbine added electric water heaters and efficient air conditioners in 2004. "I wasn't with the utility at

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AWEA reaches out to utilities at WINDPOWER 2008

Many at WINDPOWER 2008 agreed that it will take teamwork to reach the scenario presented in the Department of Energy's recently-published report, 20 Percent Wind Energy by 2030, and the American Wind Energy Association (AWEA) wants to ensure that utilities are on the team.

A key event of WINDPOWER 2008 was the poster presentation displays. Attendees were able to review more than 160 posters covering a wide variety of wind energy topics on display throughout the show. (Photo by American Wind Energy Association)

U.S. wind boom

The conference took place June 1-4 in Houston, Texas, a city most associate with fossil fuels, even though the state is No. 1 for installed wind power capacity. The city of Houston has saved $26 million in electricity costs, thanks to wind purchases, Mayor Bill White noted in his remarks at the opening session. White, Texas Governor Rick Perry and other opening speakers repeatedly sounded the theme that wind is now a mainstream energy source.

Supporting that thesis, AWEA Executive Director Randall Swisher told the opening-day crowd that the United States put 5,249 MW of wind power in the ground last year. That represents 35 percent of the new electric capacity installed in the nation in 2007.

In his address, U.S. Assistant Secretary for Energy Efficiency and Renewable Energy Andy Karsner emphasized the Bush administration's support for extending the production tax credit. Reaching 20 percent wind can be done, he added, with a policy that is technology-neutral, durable and predictable.

In Kansas, policy, leadership and public support are combining to put the ambitious goal of 20 percent by 2020 within reach. Kansas Governor Kathleen Sibelius used her presentation to tell how her state had tripled its wind capacity in recent years.

Utility issues

The growth of the wind industry was also evident in the record-breaking attendance. More than 13,000 registrants and 770 exhibitors gathered at the George R. Brown Convention Center to network, share success stories and talk about how to move wind power forward.

Those numbers included utility professionals drawn by the conference's expanded utility track. Western supported the track with a consumer-owned utility wind panel session and an entry in the poster session entitled "The Strategic Value of Wind in Utility Resource Portfolios."

"Utilities are increasingly looking to wind energy to supply part of their power supply mix – bringing clean, inexhaustible and domestically-sourced energy to their customers," remarked Jeff Anthony, AWEA manager for Utility Programs. "That is why we formed the AWEA Utility Working Group – to enable utilities to learn from other utilities how successful implementation of wind power is working for different types of utilities in different parts of the country."

Reasons for wind power

"Delivering 20 Percent Wind to Customers—The Critical Role of Electric Utilities" kicked off the utility track June 3 with a look at the reasons why utilities are acquiring more wind power. Customer interest, state renewable portfolio goals and anticipation of future carbon regulations were among the reasons cited by presenting utilities CPS Energy and We Energies.

CPS, a municipal utility in San Antonio, Texas, leads municipal utilities for delivering wind power. Its Windtricity green power program purchased 501 MW in 2007. Mike Kotara, CPS executive vice president of energy development, talked about the challenges of scheduling and forecasting an intermittent resource, and coping with strains on the transmission system.

Investor-owned We Energies

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in Wisconsin recently completed construction on the 145-MW Blue Sky Green Field wind farm in Fond du Lac County, Wis. Wind Farm Project Manager Andy Hesselbach said We Energies did not intend to own its own facility but determined that it was ultimately cheaper for the utility and its customers.

Offering tips and lessons for building community support, Hesselbach strongly advised forewarning residents about messy roads, heavy vehicle traffic and muddy fields associated with construction. During the public outreach process, We Energies did everything from conducting the usual landowner meetings to hosting community barbecues.

The session included a report by Galen Barbose of Lawrence Berkeley National Laboratory on a study the lab conducted on how 15 utilities in the West valued wind power as a hedge against carbon regulatory risk. The issue of carbon taxes has emerged relatively recently, so utilities vary widely in how they value renewable energy's contribution to emissions reduction. The study concluded that assigning wind power projects their full value as protection against the financial risks of carbon regulation could stimulate greater development.

Development options

Cooperatives and municipal utilities took center stage in the afternoon session, "Consumer-Owned Utilities Making Wind Part of the Solution." Robert Putnam of CH2M Hill organized and chaired the panel on behalf of Western and the U.S. DOE Wind Powering America Program. Presenters included Western customers Basin Electric Power Cooperative and Great River Energy.

Basin plans to add another 300 MW of wind to the 136 MW the co-op currently owns or purchases. Alternative Technologies Manager Ron Rebenitsch asserted that economics drive development, noting that after the production tax credit, the Great Plains can produce wind power for as low as $.04/kWh. Along with many other speakers, he expressed concern about the affect of the rising cost of turbine components on wind development.

Mark Rathbun, key account representative for Great River, praised Minnesota for an aggressive state energy policy that supports community-based energy development. The G&T currently purchases 218 MW from five Minnesota wind farms, including the landowner-developed Trimont Wind Farm. Rathbun said that the state will be releasing a dispersed generation study this summer, and a renewable energy standard transmission study later this year.

Illinois Rural Electric Cooperative (IREC) and White Creek Wind LLC offered different takes on small utilities developing wind facilities. With a USDA Section 9006 grant and funding from the Illinois Clean Energy Community Foundation, IREC installed the state's first utility-scale, 1.65-MW wind turbine owned by an electric cooperative.

Spurred by the voter-enacted Energy Independence Act, four Washington state utilities partnered to build the 206-MW White Creek Wind Farm. The participation of two large county public utilities districts, Cowlitz and Klickitat, enabled the tiny Lakeview Light & Power and Tanner Electric Cooperative to become part owners of the wind farm.

Getting utility perspective

Those success stories notwithstanding, AWEA believes that the utility viewpoint on meeting the DOE's 20 percent wind energy scenario needs to be further explored. At the utility working group luncheon, Anthony announced plans to launch a study to examine the strategies and business models utilities are using to add wind power to their power supply mix. The study will also look at the impact of those additions on operational and asset management issues within the utility.

Energy Insights, a consultancy that specializes in marketing and customer service issues in the energy industry, will conduct the study. The goal of the study is to identify utilities which are already adding significant amounts of wind energy to their system today, learn from their experiences and share lessons learned with other utilities. AWEA plans to make the results available only to utilities that are members of AWEA and are paying for the study.

Over the next six months, the consultants will interview 12 to 15 utilities to collect information on acquisition approaches, business models and integration strategies. Some topics the study will cover include power purchase agreements versus ownership, PTC issues, transmission, Clean Renewable Energy Bonds and other operation issues.

The final report is expected to address such key concerns as workforce development, operations best practices, equipment longevity, tradable credits and much more. "We are looking for any innovative approaches or evolving business models that are allowing utilities to work with wind developers and other organizations

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to 'mainstream' wind power in their system operations," Anthony told the group gathered at the meeting.

Many utilities have strong opinions about the assumptions in the DOE report, noted Western Renewable Resource Program Manager Randy Manion. He hopes the study will stimulate the discussion needed to address their concerns. "The 20 percent scenario is ambitious, and it can only be reached if the utilities are on board," he said. "If the utilities are behind it, anything is possible, including 20 percent wind energy by 2030," he said.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2008/jul/jul083.htm

New headquarters

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"After that," Connett said, "We'll be saving $90 thousand annually."

Public, member outreach

Throughout the construction process, Great River Energy shared the project costs with its members, including breakouts of incremental costs. "We had to be very transparent, not just for our members," said Connett. "We wanted to make sure that we understood the costs ourselves, so we can share what we've learned."

There has been plenty of opportunity to share since Great River Energy moved into the building. The headquarters is open to the public, and tours come through nearly every day. People will also be able to tour the facility during the Maple Grove Days festival this month. "We've hosted architect and engineering firms, church groups and schools, to name just a few," Connett said. "We are booked up through August, and have had calls from as far away as Boston."

Before touring the building, visitors see a short video presentation on the project that puts energy efficiency in a new light. "A lot of people still equate energy efficiency with doing without," said Connett. "Our headquarters is proof that by applying new thinking to existing technology, you can get the comfort and functionality you want. And you can get it cost effectively."

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2008/jul/jul081.htm

Incentive program

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the time, but I expect that other local vendors were asking to participate in the program,"said Corrin. "We have a really strong relationship with local businesses."

Currently, 43 of the utility's 59 active loans are for heat pumps. Interest built slowly, with three customers applying for heating system loans in 2002. "We advertised mainly in newspapers and bill stuffers," Corrin recalled. Some vendors, including Vandemark, helped to promote the program, too.

Subsequent years saw a small but steady increase in the number of applications, until a surge of interest in 2005, when the utility approved loans for 14 heat pump installations. "It tapered off over the next couple of years," Corrin noted. "We may have saturated the market at that point."

Rising natural gas prices, increased concerns about the environment and, of course, old propane and electric furnaces giving out may change that. So far this year, five loans have been distributed and three are pending. Woodbine has prepared for more applications by increasing the loan pool from $60,000 annually to $75,000.

The utility is looking at other rebates and is considering offering compact fluorescent lights to customers free of charge. But the equipment replacement loan will continue to be Woodbine's main incentive. "We want to put our resources behind a measure that really makes a difference to our customers," Corrin stated.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2008/jul/jul082.htm

TOPICS from the POWER LINE

Making the case for green building

Question:

We are a 40-person architectural firm in Portland, Ore., committed to sustainable architecture. How can we convince our clients that they should incorporate green design into their projects? They think being green is more expensive.

Answer:

Well-executed green development projects perform very well financially, well enough that mainstream developers are coming into the fold at an increasing pace.

The full cost and benefits of the measures must be factored into the calculations. Project costs can be reduced, green measures can cut operating costs for buyers or renters and designing a unique facility can give developers and architects a big marketing boost.

Direct impacts

Traditional decision-making processes in the building industry often overlook many opportunities that actually save on construction and/or operation costs, improving the bottom line:

- Energy savings—Buildings designed to minimize energy use cost considerably less to operate. Using energy-efficient building materials and design practices may increase initial construction costs, but lower operating costs over the life of the building will more than offset the first-cost premium.
- Material reduction—Using materials efficiently and optimizing design make use of smaller spaces, which also reduces energy consumption.
- Water Conservation—Installing water-efficient plumbing fixtures and appliances, and providing low-water-use landscaping (xeriscaping) can add to the initial cost of a project, but will pay back in lower water and sewer bills.
- Site protection and enhancement—Preserving natural landscaping and integrating existing natural resources on your site can reduce landscape maintenance costs. The traditional wide swaths of green lawn are costly to maintain in both labor and water resources.
- Increased occupant health and productivity—The concept of "Total Indoor Environmental Quality," encompassing lighting, indoor air quality, acoustics and ergonomic office furniture and equipment, is a growing concern for businesses. Companies spend an average of 70 times as much (per square foot, per year) on employee salaries as on energy. An increase of just one percent in productivity can result in savings that exceed the company's entire energy bill.

Indirect impacts

Additional features of green buildings may not directly impact the bottom line, but could pay off in positive public relations. Conversely, ignoring the impact of a building on the local environment could lead to backlash from customers and the community.

Many of the following features are not unduly costly to implement, and some are required by environmental regulations:

- Low-impact materials—These resource-efficient materials use less energy for resource extraction, manufacturing and shipping. Some are produced from waste or recycled materials.
- Waste reduction—Return, reuse and recycle job site waste by identifying construction waste recyclers in your area, what they will take and how to transport material. Consider salvage companies or non-profit organizations such as Habitat for Humanity, which uses donated excess building materials in building projects. Packaging, new material scraps and old materials and debris all represent possible recoverable materials.
- Emissions reduction—Buildings produce 35 percent of the chief pollutant blamed for climate change—carbon dioxide. Cleaner, greener buildings can make a big difference. For example, 8.4 million metric tons of carbon emissions each year would be eliminated if 10 percent of U.S. homes used solar water-heating systems.

Want to know more?
Visit www.wapa.gov/es/pubs/2008/jul/jul084.htm

Web site of the month:
FuelEconomy.gov

Controlling operating costs is an important part of delivering affordable power to ratepayers, so publicly-owned utilities have more than one reason to be alarmed by rising gasoline prices. Businesses can't really cut back on trips—field service calls, in the case of utilities—but they can learn strategies for reducing gasoline consumption at FuelEconomy.gov.

This government-run Web site provides accurate mile-per-gallon (MPG) information to consumers. Knowing your vehicle's MPG is only the first step toward maximizing your mileage, however, so the Web site covers much more. "Your Mileage Will Vary" explains why EPA ratings don't always match real world mileage and, most importantly, offers tips for moving your own car closer to the EPA average.

For utilities, customers

Gas Mileage Tips is likely to be the site's most useful page for utilities, and for commercial and industrial (C&I) customers. It never hurts to remind drivers and field crews about safe and efficient driving habits, practices that save gas as well as lives. The fuel economy savings from observing the speed limit ranges from seven to 23 percent. Gentle acceleration and braking can save another five to 33 percent on the price of a gallon of gas. Idling gets zero miles to the gallon, and vehicles with larger engines waste more gas idling.

The rest of the tips may improve mileage for company cars used for attending meetings, running errands or visiting member systems. You can also pass the tips on to C&I customers whose businesses require a lot of driving.

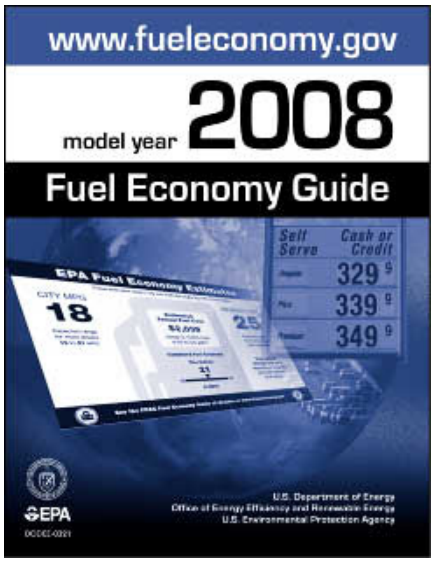
Employees who practice efficient driving in their own cars are more likely to bring their habits to work, so a little competition might help to encourage them. "Your MPG" lets visitors calculate and track their own fuel economy to compare with EPA test ratings, and with other drivers. Registered users can save their MPG data to see how changing their driving habits can change their mileage.

Other gas-savers

Most businesses with a fleet of vehicles understand the importance of keeping your car in shape. Having figures handy to back up your maintenance program is certainly helpful, though, especially at budget time.

Also helpful for fleet budgets is the "Gasoline Prices" section, with links to national, state and local price data. Use the national map to locate the cheapest gallon of gas in your area. The information is provided by the AAA Club and the Energy Information Administration. You can also download a copy of the detailed Fuel Economy Guide.

When the time comes to replace an old, gas-guzzling fleet vehicle with a new, high-efficiency model, visitors can find and compare cars by make, model and year. The searchable database covers the years 1985 to 2009, and has a side-by-side comparison feature. There is even MPG data for vehicles that run on alternative fuels.



FuelEconomy.gov publishes annual Fuel Economy Guides with detailed MPG information about more than 100 cars. (Artwork by FuelEconomy.gov)

Phasing out gasoline

In the long run, advances in transportation technology could make concerns about gasoline prices as obsolete as the horse and carriage. Hybrids and other alternatives are already available to agencies that are looking to build the "fleet of the future."

Municipalities and cooperatives may not be able to take advantage of tax incentives, but business customers might appreciate learning about incentives from their key account representatives.

And just for fun, staff engineers are sure to be intrigued by the Extreme MPG page. News of world fuel-efficiency records and super-mileage competitions may inspire them to come up with their own answer to petroleum-based transportation.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2008/jul/jul085.htm