

Solar power keeps L.A.'s Metro running in black and green

The Los Angeles Metropolitan Transportation Authority was protecting its bottom line and the environment when it installed 425 kW of solar panels atop two bus divisions in the San Fernando Valley.

The bus company with one of the nation's largest compressed natural gas bus fleets took sustainability to another level last May by building the largest PV system of its kind in the transit industry. Metro outfitted its Sun Valley and Chatsworth bus divisions with a total of 1,648 solar panels, enough to provide up to 20 percent of each division's total electricity needs. In its first year of operation, the installation had saved the agency at least \$185,000 in electricity costs.

State, local rebates

It helped that half of project's \$3.3 million price tag was covered by utility company rebates. Metro leveraged state incentives adopted by the California Public Utilities Commission earlier this year and local incentives through Los Angeles Department of Water and Power. "Commercial projects were eligible for both state and local rebates in 2002 and 2003," said LADWP Spokesperson Kim Hughes.

CPUC's California Solar Initiative, is making \$2.7 billion in incentives available over the next 10 years to spur photovoltaic and solar thermal projects like the Metro development. The CPUC program pays a \$2.80-per-watt rebate for systems sized up to 5 MW.

Southern California Gas Company, Metro's natural gas supplier, passed through another \$1.46 million in Self-Generation Incentive Program funds to Metro.

LADWP contributed an additional \$357,000 through its Solar Incentive Program. When Metro applied for the incentive, the payment was based on the size of the system. "We advise commercial customers thinking about PV systems to consider functionality first," said Hughes. "It will make a big difference in the economics of the installation."

Metro will recoup its own \$1.48



Metro's Division 15 maintenance facility is perfect for a large solar installation. (Photo by Los Angeles Metropolitan Transportation Authority)

million investment within 7 to 10 years through reduced electricity costs. The system is designed to last 25 to 30 years.

Rooftop space

Metro is the first transit agency to design a solar power generation project of this magnitude on existing rooftop space. "Our maintenance facilities are big energy hogs and we are always looking for ways to cut electric bills," said Bus Facility Project Manager Tim Lindholm.

The buildings have immense rooftops, he added, with nothing but ventilation on them. "With all that space, plenty of sun in the San Fernando Valley and the availability of rebates, going big just made sense," Lindholm explained.

SolSource Energy, a division of CleanFuel Connections, Inc., of

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Hospitals discover energy efficiency good for ailing budgets

Hospitals face so many challenges that energy efficiency may not be a top priority. Rising energy costs are beginning to change that, however.

In a 2005 Health Facilities Management magazine survey, 90 percent of the responding hospitals reported that their energy bills increased over the previous year. As budgetary pressures mount, hospital administrators are discovering that energy efficiency offers a cost savings opportunity they cannot ignore.

According to the Environmental Protection Agency's Energy Star program, every dollar a nonprofit healthcare organization saves on energy is equivalent to generating \$20 in new revenues for hospitals or \$10 for medical offices.

A first for Montana

More than 1,100 hospitals—30 percent of the acute care market—have received energy performance

ratings from Energy Star. Burke Helmer, deputy director of the Indian Health Service Billings Area Office, made a decision to benchmark his region's facilities when he joined IHS. "We wanted to get an idea of where we were and where we wanted to go with energy use," he recalled.

A few things jumped out of the benchmarking process, Helmer said. "The older Blackfeet Hospital was more efficient than some newer buildings. We wanted to recognize that in a formal way, so that led to the Energy Star rating."

To gain that rating, the hospital underwent several upgrades, including the commissioning of its HVAC system in December 2001. Like many hospitals, the Blackfeet Hospital was built in phases with the first building completed in 1937. Additions followed in 1960, 1986 and 2001. That kind of expansion typically leads to mix-and-match mechanical systems that haven't been commissioned, separately or together.

Other improvements that helped the hospital achieve its rating included Johnson automated building controls, T-8 lamps with electronic ballasts, upgraded roof insulation, fans with variable frequency drives and high-efficiency chillers. "All just good engineering decisions," said Helmer.

Unique issues

Improving energy performance must be balanced with healthcare facilities' necessarily high environmental standards. Infection control requires more frequent



The Blackfeet Hospital in Browning, Mont., was the first hospital in the state of Montana to receive an Energy Star rating. (Photo courtesy of Indian Health Service)

air exchanges, and zones must be separated based on function.

"The standard used to require a complete air exchange 12 times an hour," said IHS Facilities Engineer Rob Smith. "Now it's 18 times. The standards keep getting more rigorous."

Smith, the supervisory facility manager for the Blackfeet Hospital maintenance team, noted, "In isolation wards and surgeries, temperature, humidity and lighting requirements are pretty set."

Business areas offer more flexibility to make the most efficiency gains, he continued. Administrative staff can more easily adapt to a small thermostat adjustment. They can also turn off lights and office equipment that is not being used.

Patient care equipment is another story, said Energy Star National Healthcare Manager Clark Reed. Most of the engineering probably goes into performance rather than efficiency, but nobody really knows at this point.

That may change soon, with a study Energy Star plans to evaluate

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Energy Services Bulletin

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Hospital

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and possibly rate hospital equipment.

People make the difference

It's not just the equipment, Smith emphasized, it's the maintenance. "A lot can be done to keep older equipment working efficiently," he asserted.

Not surprising from the facilities engineer who developed the comprehensive maintenance program that helped Blackfeet Hospital earn its Energy Star, but results bear him out. Helmer pointed

out that one critical difference between the Blackfeet Hospital and the other regional IHS facilities was the highly experienced team. "They were well versed in the control system," he said. "At the other buildings, maintenance crews weren't as familiar with the systems' capabilities."

A rigorous cleaning schedule is also part of the hospital's success. "We tear down our boilers and descale them annually, and we regularly clean coils, heat exchangers and equipment cabinets," said Smith. "You have to remember that buildings don't run themselves."

Echoing facilities managers in every industry, Smith pointed out the importance of educating all employees about wise energy use and how they can help the company control those costs.

Training is another area that can improve a facility's energy performance no matter how old the building is. A well-trained maintenance staff is one of the most effective tools for controlling energy costs, declared Smith. "Invest money in your people and they will save you money down the road," he said. ⚡

Metro

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Arcadia, Calif., designed and installed the solar panel system. Schott Solar, Inc., of Rocklin, Calif., manufactured the solar modules and supplied the mounting system.

The modules on Metro's maintenance and transportation buildings at each bus division cover more than 43,000 square feet of rooftop area. Multiple inverters convert the DC into AC power, and feed it back into electric utility grid. California is a net-metered state so the utilities deduct that electricity from each division's electric bill.

Plans for the future

Based on the success of this solar project, Metro may pursue other solar generation opportunities.

The transit company found two possible sites with especially good potential.

The Division 18 maintenance facility in Carson has the expansive roof and excellent exposure that made Sun Valley and Chatsworth a success. The 25-acre Regional Rebuild Center lends itself to a more ambitious project. "We're looking into a public-private partnership with an energy provider that would enable Metro to build a 1-MW system," said Lindholm.

Under such a deal, Metro would repay the building loan from energy savings, similar to a performance contract. The plan also calls for extensive energy-efficiency upgrades to the facility's HVAC and other systems.

Projects don't have to be big to be considered, however.

Metro is also looking into smaller applications such as solar panels on light rail station platforms to power video surveillance cameras and other station equipment.

With the California Energy Commission launching its new Million Solar Roofs Initiative next year, LADWP anticipates that more commercial customers will use solar energy to cut costs. "We've allocated 50 percent of our incentive budget for the kind of larger systems businesses install," said Hughes.

Since the utility opened its Solar Incentive Program in August, it has received 140 applications. Hughes restated the importance of designing an effective system, urging businesses interested in solar power to thoroughly research their options. ⚡

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Teamwork helps small-town utility keep big customer happy

Small-town utilities fortunate enough to have large industrial customers feel a great responsibility to the local economy to keep those facilities running smoothly. Jackson, Minn., Municipal Utilities—1,800 meters—shouldered that tall order by partnering with Missouri River Energy Services to improve the efficiency of a farming equipment manufacturer's Jackson plant.

Big energy user

The customer consumed almost 15,000 MW in 2005, or 31 percent of JMU's total electricity sales. Compressed air equipment throughout the factory makes up a large part of that load.

"Even the best performing air compressors use a tremendous amount of energy," said MRES Energy Services Supervisor Joni Livingston. "And most systems have significant leaks."

MRES co-sponsored four compressed air workshops with Western in 2003. Leak detection was only one item on a long agenda, Livingston recalled, but it was the one that interested Jim Lutz, Jackson's then-electric superintendent, the most. Lutz, who now works for MRES, had discussed ways to control energy costs with the company's facilities manager.

Savings potential

Since MRES already had its Compressed Air Leak Detection service in place, JMU offered to split the price of an inspection with the manufacturer. The MRES service

identifies the location of the leaks and quantifies them by size. The survey also calculates how much energy could be saved by making the recommended repairs.

MRES performed inspections for the company in 2004 and 2005. The 2004 survey identified a potential savings of more than \$25,000 or about 1 million kWh annually. After repairing those leaks, the plant was able to completely retire two 100-horsepower compressors. In 2005, the inspection found another \$20,000 or 800,000 kWh in potential annual savings.

Utility benefits, too

JMU enjoys its own fringe benefits from MRES Compressed Air Leak Detection services. The Minnesota Public Utilities Commission requires utilities to develop a biannual Conservation Improvement Plan which includes investing 1.5 percent of gross operating revenues on conservation, energy efficiency or load management. The money JMU spends on diagnostic surveys for large customers counts toward its CIP requirement.

As a Western customer, JMU must periodically submit an integrated resource plan to Western. The IRP documents JMU's use of demand side management techniques, new renewable resources and other programs to meet future electricity demands. The CIP counts toward that requirement under Western's minimum investment reporting rule, so the survey helps JMU comply with its Federal requirements, too.



MRES Energy Services Technician Daryl Androli takes a reading on an HVAC system. MRES offers its members a variety of diagnostic services to help consumers gain control their energy use. (Photo by Missouri River Energy Services)

Another reason for JMU to support leak detection is that it helps reduce the utility's coincident peak. "All industrial equipment runs during the coincident peak," said Livingston. "The more efficiently it runs, the less likely the utility will need to buy expensive supplementary power."

Diverse services

Of course, there are different types of key accounts and each has different needs. In addition to the farming equipment manufacturer, JMU's other large accounts include a nursing home, hospital, elevator feed mill group, school district, community college, plastic extrusion factory and seed company. Through MRES, JMU can offer those customers a variety of services designed to reduce energy use.

Infrared inspections and other types of ultrasonic surveys for motor bearings and steam traps can ensure that energy-intensive equipment is in good operating condition. Member utilities and consumers can also call

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Nucor energy teams tune up program with DOE assessment

Some of the 200 industrial plants receiving a DOE Energy Saving Assessment will use it as a launching pad for their own energy efficiency programs, while some, like Nucor Bar Mill's Nebraska facility, consider it one more step on a long journey.

"About 90 percent of my job is now energy related," said Nucor Project Engineer Larry Wenzl, who initiated the assessment. "A day doesn't go by without working on energy savings."

Overlooked savings

The Nucor Nebraska Bar Mill will share the information from its DOE assessment with the rest of the corporation's 19 steel mill divisions. The Nebraska plant prides itself on its energy efficient actions in a company that is dedicated to environmental stewardship. In 1997, the company built a new melt shop that consolidated five furnaces in two separate melt shops into a single shop with one DC Twin Shell furnace.

Extensive capital projects undertaken in 2003, including modernizing the rolling mills, kept Nucor's efficiency momentum moving.

Because of its focus on efficiency, the assessment didn't hold many surprises for Nucor's facility managers. "We were hoping the inspectors would find a 'brass ring,' a big opportunity we had somehow missed," the project engineer acknowledged.

Most of the savings opportunities DOE energy experts identified were

for natural gas, typical of industries that rely heavily on process heating, said Wenzl. Natural gas represents about one third of the plant's energy needs.

Wenzl noted that the assessment highlighted some areas that hadn't received much attention. "We are looking forward to the final report," he said.

Energy teams

The job of incorporating the DOE report into Nucor's energy efficiency program will fall to three energy teams. Nucor formed the teams four years ago as part of an ongoing effort to control energy use. Each team previously had an area of expertise—electrical, natural gas or compressed air. Originally, teams were organized by expertise, but, "We found that teammates who worked in one area of the plant didn't necessarily have the familiarity to apply solutions to the others," said Wenzl.

Now, each of three plant areas—two roll mills and a melt-and-cast facility—has a team focused on its specific operations. "When a team has a thorough understanding of the area, we get better solutions," said Wenzl.

Teams meet every few weeks to identify potential projects for energy savings and discuss progress on active projects. Wenzl keeps a spreadsheet that lists projects by area, tasks associated with the projects, the teammate responsible, target date for completion and comments. Another spreadsheet shows completed projects throughout the plant with resulting savings.



Nucor Steel – Nebraska, a member of the Nucor Bar Mill Group, produces special bar, cold heading and merchant bar steel products. It was one of 200 energy-intensive facilities to receive a DOE Energy Saving Assessment. (Artwork by Nucor Bar Mill Group)

Tracking moves the energy efficiency program forward, Wenzl explained, by keeping goals clear and quantifying what the teams have accomplished. Their progress shows in Nucor's overall energy use which has gone down 13.6 percent over the last five years. "Our projects have reduced electricity use by 13.4 percent and natural gas by 18.3 percent," he said.

Increasing productivity

Making small adjustments to the manufacturing process has produced a lot of those savings, as it did with the walking beam billet furnace. The system moves 40-foot steel billets through the furnace in 10-inch steps. Reducing the step only one inch allowed engineers to lower the temperature set points and fit more billets into the furnace without overloading it. "That saved \$145,000 annually in energy, and improved productivity," Wenzl pointed out proudly.

Reducing the temperature for exit billets saved \$150,000, and turning off vertical ladle heaters and reheat furnaces on days they were not in use saved Nucor more than \$500,000

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NUCOR

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annually.

Wenzl noted that each change took time to sell to operations. "Our teammates get a large portion of their income from a production bonus, so they are understandably wary about any measure that might affect productivity," he said.

Bonuses aside, he added, workers need to know that efficiency measures won't interfere with their jobs. "You can't just leave them hanging."

Having the right equipment to monitor systems and document results helps to persuade production workers. "Once they see that a new strategy actually improves productivity, the line crews are the ones who push to take it to the next level."

Communicate for success

Getting teammates not only to accept but also to participate in energy saving programs takes communication. Nucor's energy team leaders meet with plant supervisors

monthly to update them on projects, go over operation costs and safety measures and solicit ideas for new measures.

The company's quarterly intra-division newsletter provides another vehicle for communicating the importance of energy savings. Wenzl also writes a few paragraphs for the weekly plant e-mail on energy use, the energy teams' efforts and how teammates can help. "You can't miss a chance to let people know their actions make a difference," he said.

This is particularly true on the electrical side, Wenzl observed, where many measures call for teammate support or cooperation. "Teammates need to understand why we set the thermostat on the cooling system a few degrees higher," he said. "If they know how much it costs to leave a torch or a little compressed air hose running, they turn it off."

Valuing environment

It's also the environment at Nucor Corporation, which operates one of the largest recycling programs in the world. The recycled steel

used for Nucor products consists of approximately 83 percent post-consumer scrap. The remaining 17 percent typically consists of post industrial scrap from manufacturing processes for products made with steel.

Nucor received the first-place business and industry award from the Keep Nebraska Beautiful campaign in 2005 and 2006. In 2002, the division earned the Corporation President's Environmental Award and Environmental Leadership Excellence Award.

The DOE Energy Saving Assessment could help Nucor Bar Mill keep its edge, but Wenzl plans on sharing. "The other divisions have already been calling, wanting to know when the report is coming out and what we learned," he said.

No matter how valuable the assessment proves to be, Nucor's energy teams know that saving energy is a journey, not a destination. Or, as Wenzl said, "Improving energy efficiency takes a daily effort." ⚡

Jackson, Minn.

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MRES's Questline with their own questions.

MRES has a customer-owned generation program that helps its members manage peaks. Consumers who install backup generators to power their operations can receive a monthly

payment from MRES to use the generator during peak demand times. MRES also pays the owner for the fuel when the generator is used.

Although no JMU customers are currently enrolled in that program, the utility appreciates all of the services MRES offers to large key accounts in Jackson. "Especially in a small town, those

customers are critical to the health of the economy," said City Administrator Dean Albrecht. "Businesses go where they can get the best customer service, and our partnership with Missouri River allows Jackson Municipal utility to deliver it." ⚡

Energy efficient pool keeps Hemingford residents cool

by Kevin Wickham, NMPP Energy Communications Specialist, for *Essent newsletter*.

The new public swimming pool in Hemingford, Neb., kept residents cool this summer and took a little heat off the city's budget with energy-efficient pool heating technology.

The village in the Nebraska Panhandle held a grand opening for its new \$1.1 million, zero-depth swimming pool last spring. The event also celebrated Hemingford's leadership in municipal energy efficiency. Village officials decided to spend more in upfront costs by installing six, 5.5-horsepower, Heat Siphon heat pumps to replace the pool's old natural gas boiler. "These systems are in use in Arizona and California, where they have year-round pools, but we're probably the first town in Nebraska to install it on a public pool," said Utilities Superintendent Dan Swanson.

Familiar components

The initial cost of the energy efficient heat pumps will be recovered through lower energy costs. City Administrator Peggy Sheldon estimates the payback period to be six to seven years.

Swanson and Sheldon said that since screw-type heat pumps are fairly new technology to heating swimming pools in the area, both state and city engineers scrutinized the equipment carefully before approving the installation.

A local contractor installed the six units and trained the utility's crew on

operation and maintenance. "It took about two minutes," said Swanson. "The system is really simple."

The heat pump consists of a compressor, heat exchanger and fan, and connects to the main system with PVC plumbing. All parts that will be familiar to anyone who works with that kind of equipment, noted Swanson.

The heat pumps are designed specifically for recreational water heating. "These are strictly for pulling heat out of the air," said Swanson.

Greater efficiency

According to the manufacturer, the heat pump extracts four to five Btus for every unit of electrical energy it consumes. "The initial cost is about three times what a gas boiler would have been," said Swanson. "But the payback in savings is phenomenal."

Sheldon said the community expects to save \$4,000-5,000 per year on energy costs. Over the lifespan of the heat pumps, the community should realize significant savings.

The heat pumps contribute to improved energy efficiency since the six units run separately and operate only when needed. The system was able to heat the pool water from 64 to 89 degrees in only two days, faster than the old boiler.

"Once the water temperature gets up to where it needs to be, after a really cold night, it might kick on two or maybe three pumps to maintain that pool temperature," he added.

The system also improves reliability, something residents will appreciate on hot summer days.



The new swimming pool in Hemingford, Neb., may be the first in the state to be heated with a type of heat pump designed specifically for recreational water heating. (Photo by Hemingford Ledger)

"Before, we just had one boiler and ran it," Swanson explained. "Now if one pump goes down we have five other heat sources."

Good investment

Swanson heard about the heat pumps from Bryce Landen, a commercial business account consultant for Nebraska Public Power District. NPPD is the wholesale electricity supplier to Hemingford.

Swanson believes that other towns should check out the heat pumps if they have swimming pool heated by gas or electric boilers. If municipalities look at the big picture when choosing equipment, he said, "There is really only one choice."

Hemingford is a member community of NMPP Energy, a joint-action agency based in Lincoln, Neb. NMPP Energy is composed of four organizations that provide wholesale electricity, wholesale natural gas, retail natural gas and utility related services to nearly 200 communities in seven Midwest and Rocky Mountain states.



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Utilities help local grocery stores find energy savings

Most utilities, no matter how small, have at least one grocery store as a commercial customer. The stores are important to the local economy, and Western customers are doing their part to keep these businesses profitable.

Technical assistance

For a generation and transmission cooperative, that may mean providing technical support and coordination to member utilities serving retail loads. That's what Kansas Electric Power Cooperative, Inc., did for Steve's Thriftway in Valley Falls, Kan.

Steve and Monica Mackison bought the small grocery about 25 miles north of Topeka seven years ago. "It was an old store, and we knew if we wanted to stay in business, we would have to upgrade the equipment," Steve Mackison said.

Al Smith, Jefferson County economic development director, asked the Mackisons if they had heard of the USDA Rural Development Program. The program makes zero-interest loans to utility programs and third-party recipients to finance projects that promote economic development and job creation in rural areas. Farmers, ranchers and rural small businesses can also receive grants for projects to reduce energy costs through USDA's Renewable Energy Systems and Energy Efficiency Improvements Program.

The Mackisons contacted their utility, Leavenworth-Jefferson Electric Cooperative, about applying for

USDA funds. KEPCO helped the co-op pull together the various funding sources. "KEPCO doesn't work directly with consumers, but we help our members provide services for their members," explained Business Development Coordinator Loren Medley, who worked on the Mackisons' project. "Applicants need plenty of support to get through the process."

The paperwork was the hard part, Mackison agreed, "but the utility was very helpful."

Consultants help

Finding an auditor to perform the energy audit necessary to determine the store's eligibility wasn't easy either.

The Kansas Corporation Commission and Kansas State University assisted the Mackisons with a list of licensed engineers qualified to perform a commercial energy audit. The Mackisons hired an auditor from Topeka whose experience included several hospitals.

Steve's Thriftway easily qualified for USDA's program, receiving a Rural Economic Development Loan of \$234,000 and a USDA energy efficiency grant for \$29,000. A bank loan of \$87,000 made up the balance of the \$350,000 project.

The Mackisons hired a local building contractor when it came time to make the improvements. "He walked us through process and suggested changes that would cut our energy use," Mackison said.

Cost-effective upgrades

Recommendations included upgrading the lighting from the old fluorescent ballasts to T-8 fixtures and replacing old refrigerator units. "Our lighting improved if anything, and we doubled our refrigerator space," the store owner declared. "And the electric bills went down."

A trash compactor was the last piece of performance-enhancing equipment the Mackisons installed. "It's a small store, and we didn't think we could find a model that would fit in the space," he said.

Not only did it fit, the unit paid for itself in a year. The Mackisons had been collecting cardboard boxes and paying \$300 to \$350 monthly to have them hauled away. "Now, the disposal company pays us for the compacted boxes and paper," Mackison said. "That offsets the cost of the rest of our trash bill."

The loan required a study documenting savings from replacing old equipment with energy efficient models, which the USDA consultant completed. Equipment for the project cost \$138,000, installation cost \$62,000, the contractor received \$60,000 and electrical work to support the equipment cost \$90,000.

Mackison said the payback varied depending on the equipment. The payback period for the larger systems runs between three to 11 years, as USDA loan guidelines require.

Municipal rebates

Sometimes, targeting one particular system can make a big

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Grocery

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difference, as the seven-store chain Hugo's Family Marketplace proved.

Anti-sweat door heaters prevent condensation from forming on refrigerator cases in supermarkets. "During the 1970s' energy crisis, we turned off half the in-store lights and shut off the door heaters at night," recalled Hugo's Operations Director Doug Driscoll, who was a store manager at the time. "Those two measures alone cut our energy use 33 percent, so we knew that door heaters were a big user."

Driscoll was interested when a vendor, Super Market Energy Technologies, made a presentation to the store on a digital control system for the door heaters. Hugo's agreed to test the units in its East Grand Forks store, and contacted the city Water and Light Department to see if any incentives were available.

Utilities General Manager Dan Boyce heard the presentation and agreed that the system was worth a try. "With energy prices going up, we have more customers of all sizes asking about energy efficiency."

Controls pay off

The municipal utility provided half the funding for the cost of installing the Door Miser on 35 refrigerator cases. The Door Miser cycles the heater on and off based on the moisture level in the case. According to the manufacturer, the Door Miser can cut the store's energy use by up to 15 percent.

Driscoll noted that the actual savings were around 13 percent.

Boyce added that several factors may have affected the results. "The year they installed the units, we had an unusually hot summer," he noted. "There may also be a demand component to the savings calculations, since Hugo's is on our large commercial rate."

The rate, available to three-phase customers using 100,000 kWh or more per month, is based on their 15-minute integrated-kW demand occurring during the city's monthly system peak demand. "The savings from the Door Miser were modest, but 2006 was another hot, humid summer. Hugo's savings continued while the rest of the customers in its class experienced much higher average use over the prior year," said Boyce.

The results were good enough for Hugo's to roll out the technology to its other stores. "We can see the energy savings, so we are satisfied that the technology is good for the bottom line," said Driscoll.

Other possibilities

The operations director prefers to test equipment performance in one store before installing it throughout the chain. This summer, the East Grand Forks Hugo's launched a test on another Supermarket Energy Technologies product.

The Night Shield was installed on Hugo's five-deck, open cold meat and dairy cases. The covers, which resemble window blinds, are pulled down over open cases to keep the cold air in when the store is closed. In the morning, employees simply roll up the covers, out of

customers' sight. "They are a lot more convenient than the plastic curtains that hang over the entrance of walk-in freezers," observed Store Manager Jeff Westrem.

Only after evaluating the energy savings from the East Grand Forks test will Driscoll consider installing the Night Shield in other Hugo's stores. "We've also been looking at a capacitor for compressors that is supposed to eliminate power spiking on electric motors," added Driscoll. "Of course, we would test it first."

Reduced demand

Measures that help large customers reduce energy use have an impact on revenue, especially for smaller utilities. However, Boyce pointed out a number of sound reasons for supporting energy efficiency. "It's better to help a commercial customer control operating costs than to lose the load entirely," he said. "Also, many of our residential customers work at those businesses."

Municipal utilities like East Grand Forks pay hefty charges on purchased power, too. "Energy is money, so ultimately it benefits us to keep our demand down," Boyce said.

Medley agreed that encouraging wise energy use is good for G&Ts, as well. "Helping consumers use less energy helps us control the cost of electricity that members pay," he said. "Simply put, it's good for everybody."



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Many options available to make airports greener

Pinched by rising energy prices and pressured by consumer and regulatory demands for “greener” operations, airports are coming up with creative ways to reduce their environmental impact.

Measures that help other 24/7 loads manage costs, like efficient lighting, automated system controls and building improvements, are available to airports. The U.S. Green Building Council is working toward a LEED standard for airport design. However, some criteria conflict with airport safety and operational needs. Airport operations employ a lot of highly regulated equipment for which there are no more energy-efficient substitutes. Also, since airport occupants are mostly transient, several design criteria that make sense in an office don't apply to an airport space.

That hasn't stopped several airports from pursuing LEED certification for building projects, including Oakland International Airport in California. The airport's Terminal 2 expansion project will soon be LEED certified and 50 percent of its electricity will have green energy attributes. The new terminal area includes the use of recycled materials in restroom partitions, wall wainscoting and ceiling tiles. The material in the ceiling tiles also reflects light to reduce the load on the heating and cooling systems.

Port of Oakland goes solar

Oakland is also among many airports that are offsetting their energy use by purchasing or developing renewable energy. In 2004, the Port



Riverside Airport Solar Canopy

East Elevation (West Elevation Sim.)

Riverside Public Utilities and Riverside Airport Terminal are working together to turn an entryway canopy into a solar power generator. (Artwork supplied by Riverside Public Utilities)

of Oakland, a Western customer, set its own renewable portfolio standard. By 2017, 20 percent of the electricity the port purchases for resale will come from renewable resources. Their ultimate objective is 40 percent renewable energy.

The port board approved its first solar energy purchase agreement last June. Upon signing the power purchase agreement that is being negotiated, SunEdison LLC will design, build, own and operate a 170,000 square foot ground-based solar power system. Port of Oakland Engineering Director Jerry Serventi said that the power purchase agreement is a trial for the port to see how the project comes together. “Private companies are eligible for tax incentives and credits that government agencies like the port can't receive. Through the public-private partnership, SunEdison can collect the incentives that make the project feasible and the Port of Oakland gets the locally-generated renewable power.”

The system will be located on open ground between a runway and an airport access road. Rooftop-based systems on other airport buildings may also be installed. “Airports have a lot of land that just sits there, so at first glance, it would seem to be the perfect place for large solar installations,” Serventi said. “Not all of that space can be used, though, and there are security issues surrounding third-party technicians having access to some buildings.”

Over the 20-year period of the contract, the system will generate an estimated 24 million kWh. “If you count large hydro, the solar power will help put us over our 20 percent goal,” said Serventi. “Our eventual goal is to get 40 percent of our power from renewables.”

The Oakland International Airport is also home to the world's largest corporate solar electric system. FedEx built a 900-kW, 81,000-sq. ft. solar system atop the company's airport hub facility. The courier service buys

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Western helps municipal, Federal agencies purchase RECs

Colorado Springs Utilities recently became Western's first municipal firm power customer to participate in a group purchase of renewable energy credits. Western's Rocky Mountain region coordinated the purchase of almost 1.7 million MWh over a five-year period for the city-owned utility and five Federal agencies.

The purchase for the Federal agencies was under Western's Renewable Resources for Federal Agencies program. Western also purchases RECs for other firm power customers that request the service, as Colorado Springs did.

State standard

Colorado Springs' portion of the purchase amounts to more than 1.5 million MWh over the five-year period. The RECs will help the city in its voluntary compliance with the state's voter-approved renewable portfolio standard. "Amendment 37 does not apply to municipal utilities, but Colorado Springs chose to participate because of the many benefits renewable energy offers," noted Peggy Plate, Rocky Mountain Regional Energy Services representative.

"Colorado Springs could have issued its own request for proposals, but Western's purchasing experience made the process much more efficient," explained Principal Engineer Jean Mueller. "Also, being part of a group purchase offered more potential for cost savings."

The city plans to pursue more cost-effective renewables, she said,

adding that purchasing RECs helps to encourage future renewable development. "Purchasing RECs is the most cost-effective option right now. It is the right thing to do for Springs Utilities, our customers and the environment," Mueller said.

Community Energy, a third-party marketer, will supply certificates from wind energy and other resources generated in California, Kansas and Nebraska.

"Colorado Springs has taken a leadership position in the Renewable Energy market with this large five-year purchase," said Community Energy, Inc. Executive Vice President Brent Alderfer. "This purchase is one of the largest single REC buys in the U.S., and will give an impressive boost to new wind project development in the West."

Federal purchases

The Federal purchases account for up to 235,605 MWhs of RECs over five years. Counting toward compliance with the Energy Policy Act of 2005, these purchases move the agencies toward Federal renewable energy goals. The agencies include:

- Environmental Protection Agency, Denver – 7,000 MWh
 - Fort Lewis, Wash. – 209,455 MWh
 - NASA - Ames Research Center, Calif. – 12,300 MWh
 - NASA – Eastside Airfield, Calif. – 4,100 MWh
 - U.S. Forest Service, Rocky Mountain Region – 2,750 MWh
- Another third-party marketer,

3 Phases Energy is supplying the certificates for the agencies. The certificates are for wind, biomass and geothermal energy. Projects providing the RECs may be in California, Colorado, Kansas, Nebraska, Oregon and South Dakota. "The flexibility to pick and choose facilities according to availability allows 3 Phases to offer a more competitive price on RECs," said 3 Phases Partnership Director Steve McDougal.

3 Phases Energy also provided RECs for a purchase Western coordinated for the EPA in 2004. "When agencies like Western make large-scale purchases, 3 Phases is able to make long-term purchasing commitments to renewable energy developers," said McDougal.

Meeting two goals

Western and DOE's Federal Energy Management Program launched Renewable Resources for Federal Agencies in 2002 to help Federal facilities meet renewable energy goals. The program offers renewable energy delivered to the customer and renewable energy credits, the choice of the agencies participating in this purchase.

Renewable energy certificates, also known as green tags, are the intangible environmental benefits associated with generating one MWh of electric energy by a renewable resource. RECs are the simplest way for customers to support renewable energy. "Certificates are a good option for utilities working toward meeting

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Visit www.wapa.gov/es/pubs/esb/2006/oct/oct069.htm

Airport

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its power from the Port, so that was another case of a private company developing a system that benefits both the owner and the public power provider, noted Serventi.

PV partnership

Riverside Airport Terminal and Riverside Public Utilities in Southern California teamed up to turn a remodeling project into a power producer. The airport is replacing an aging wooden canopy at its entry way with a steel-and-solar panel structure. To be completed this fall, the system will provide the airport with 20 kW of clean power and bring RPU's total of locally generated renewable electricity to 530 kW—more than halfway to the utility's goal of 1 MW.

Both the airport and RPU are city departments, so the installation is a joint project, said RPU Renewable Resources Administrator Atoya Mendez. "The need was there and the timing was right," she explained, referring to the airport expanding its service to business travelers and corporate flights.

"The airport is very excited about the project," said Interim Airport Director John Curts. "Not only will

it provide part of our power needs, it gives the entry way a sleek, high-tech look that fits with the facility upgrade."

Visibility is a high priority for RPU when selecting locations for solar installations. "The educational component of our solar program is very important," Mendez said. "The systems should generate interest and curiosity as well as electricity. We want residents to recognize that their city is a leader in developing environmentally responsible solutions."

RPU contributed \$343,500 to the project's estimated \$393,500 budget. The funding came from state-mandated Public Benefit funds earmarked for renewable energy projects. The airport will allocate the remaining \$50,000.

Grid connected PV powerplants aren't the only option for airports interested in renewable energy. The Truckee-Tahoe airport in northern California installed solar-powered taxiway lights, saving the airport the cost of extending power lines to its runway area.

Waste management

Airports, especially large ones, are often self-contained cities with shops, restaurants, offices, hotels, services from laundry to medical

care—and waste disposal needs for each business. Recycling is an easy way for airports to improve their sustainability and sometimes the bottom line.

The Salt Lake City International Airport has a broad range of recovery and processing initiatives for recyclable materials, from both airport and tenant operations. The city airport department's single stream recycling program recycles office paper, magazines, paperboard, Nos. 1-7 plastic, newspaper, aluminum and junk mail. The airport provides desk-side recycling boxes to each airline, tenant and vendor. Building material and soil from reconstruction projects are recycled and reused, and an extensive program to capture and recycle industrial chemicals is in place.

More efficient facilities, renewable energy and recycling are helping an energy-intensive industry slowly, but surely shrink its environmental footprint. Maybe, someday, we will even have biofueled jets—the research is being done. In the meantime, Serventi said, "Airports can do something tangible to show the community that they are serious about protecting the environment." ⚡

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renewable portfolio standard requirements," commented Program Manager Theresa Williams.

The growth of state and locally-adopted standards is one of the reasons Western decided to extend the service to requesting firm power customers, she added. "The two goals of the program are to help Federal agencies meet their

requirements and to promote renewable energy development," explained Williams. "Making renewable energy purchases easier and more cost-effective for our customers supports the second goal." ⚡

Power partnerships produce renewables education events

Several power industry organizations have teamed up to help electric cooperatives and public power utilities navigate the maze of issues and opportunities surrounding renewables. Western is co-sponsoring a series of educational events on renewable energy applications and opportunities with National Rural Electric Cooperative Association, American Public Power Association, Bonneville Power Administration, Geothermal Resource Council, Utility Energy Forum and DOE's Wind Powering America and GeoPowering the West programs.

Variety of topics

The partnership recently released its event schedule for 2006-07, a mix of live workshops and interactive Web presentations. "Both formats have their advantages, and we wanted to offer utilities the best of both," explained Western Renewable Resource Program Manager Randy Manion.

Putting together a comprehensive list of topics was a challenge, Manion admitted. "So much is happening in the industry right now and every development raises new questions for utilities," he said. "We tried to address as many issues as possible. I think the schedule does a good job of that."

Western's Electric Power Training Center in Golden, Colo., will host a wind interconnection workshop Jan. 24 and 25. Participants will learn how to integrate wind generation into a utility's power mix using EPTC's new wind simulator program.

The workshop will also include an introduction to the Utility Wind Integration Group's new internet-based tools program.

Webinars

The "webinars" cover wind, solar and geothermal applications as well as financing, delivery and strategies for increasing the use of renewable energy.

The schedule kicks off October 11 with "Markets for Renewable Energy Credits." Topics will include competitive REC markets, tracking systems, state policies, potential project sites, financing and more.

The Energy Future Coalition has set a national goal of getting 25 percent of our energy from renewable sources by 2025. Find out more from the Nov. 1 "Project 25 x 25" webinar. Participants will learn about strategies to expand the use of wind and other renewables and how power providers can get involved.

Utility representatives who want to learn more about renewable technologies will have plenty of opportunity. "The Central Solar Option" will be examined on Nov. 17. It is an overview of concentrating solar power, including existing systems, new construction and cost outlook.

The Utility Geothermal Working Group will present two webinars on geothermal power. Geothermal Power Generation on Dec. 6 will focus on electricity from this base load resource. On Jan. 17, "Direct Use and Geothermal Heat Pump Applications"

will highlight the widely available low-temperature technologies.

Wind power is the topic of the Jan. 11 webinar, "Wind Power Case Studies." Power providers can learn from other utilities' experiences presented in small, medium and large wind project case studies.

More issues

There is more to renewable energy than generation, and the webinars address those issues, too. "Clean Renewable Energy Bonds" on Dec. 7 will show how public power utilities are using CREBs to help finance renewable energy generation projects.

Educating consumers about renewable energy and getting their support for project development is another challenge to publicly-owned utilities. Participants will learn strategies for increasing public involvement in "Public Participation to Gain Acceptance of Renewable Energy" on Feb. 7.

"Transmission Opportunities and Constraints" will be the subject of the final webinar March 7. Speakers will discuss transmission projects and issues associated with bringing more wind and other renewable energy projects on line.

Event sponsors anticipate that enrollment for the workshops and webinars will fill quickly, so early reservations are recommended. Electric cooperatives and public power utilities can register for any of these events by contacting Debbie Rock at 720-962-7271. ⚡

Want to know more?

Visit www.wapa.gov/es/pubs/esb/2006/oct/oct0610.htm

Insulation plant participates in DOE energy assessment program

The CertainTeed Corporation's Kansas City, Kan., fiberglass insulation manufacturing plant was one of 200 industrial facilities DOE chose for an Energy Savings Assessment. The world's largest insulation production plant welcomed the chance to boost its operation's efficiency. "The plant uses a ton of energy—both electricity and natural gas," said Ron Rodvelt, CertainTeed plant engineering manager. "Even small percentage energy savings have a big impact on our energy costs."

John Bozek, process improvement manager for CertainTeed's Insulation Group, learned about the assessments from the Glass Manufacturing Industry Council. "GMIC urged all of its members to apply for an ESA because ours is such an energy-intensive business," he said.

Bozek filled out DOE's online application to cover all of CertainTeed insulation's facilities. When the company was selected for an assessment, the Kansas City facility was the automatic choice. "That's our biggest plant," said Bozek.

Software justifies upgrades

CertainTeed had already implemented its own efficiency program, so Rodvelt and Bozek had a good idea of which systems were using the most energy. "Natural gas combustion equipment was the No. 1 suspect," said Rodvelt.

The contractor used DOE's Process Heating Assessment and Survey Tool to evaluate the heat processing equipment's performance and identify savings opportunities. "The software

has been around for awhile, and companies can download it from the DOE Web site," said Bozek. "The assessment didn't turn up anything we hadn't looked at before," Bozek added.

CertainTeed engineers learned how to use PHAST software to refine and quantify estimated energy losses. "The information will help us justify capital investments to improve the plant's efficiency," said Rodvelt. "The assessment showed that the equipment would have a two-year payback."

Other measures in place

Kansas City Board of Public Utilities is CertainTeed's electric utility, and Kansas Gas Service provides natural gas. CertainTeed meets with its energy providers periodically as part of an in-house efficiency program that cut the company's electricity use by 6 to 7 percent over the last 12 months. "Most of the savings come from monitoring compressed air equipment," said Rodvelt.

Large air compressors are big energy users, he observed. "There's always a leak developing somewhere."

The company has trained line workers to identify and prevent leaks. "Things like shutting off equipment when it's not being used," Rodvelt said. "A lot of it is just common sense."

The program also cut CertainTeed's natural gas use by 10 percent. "Once you start monitoring energy use, everything runs more smoothly," the engineering manager said.

An energy-efficient operation also improves the product's energy



Saint-Gobain CertainTeed Corporation chose its Kansas City, Kan., fiber glass insulation manufacturing facility to receive a DOE Energy Saving Assessment. (Photo courtesy of CertainTeed)

use-to-savings ratio. Fiber glass insulation reduces energy use, but the manufacturing process is energy-intensive, Rodvelt acknowledged. His product is still a winning equation, he insisted, even before the DOE assessment. CertainTeed consumes a very large amount of kilowatts to produce insulation each day. Over the insulation's 45-year lifespan, however, it saves 600 times the energy used in making it. ⚡

Calendar of events

Visit Western's regularly updated Energy Event Calendar for a complete list of seminars, workshops and conferences.

<http://www.wapa.gov/es/pubs/esb/2006/oct/oct06coe.htm>

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2006/oct/oct068.htm



Energy Shorts

Western joins Change a Light program

October is Energy Efficiency Awareness month and Western is honoring it by participating in Energy Star's annual "Change a Light, Change the World" campaign, a national call-to-action that encourages individuals to help change the world, one light — one energy-saving step — at a time.

"We're encouraging every employee to change at least one light at home to one that has earned the government's Energy Star label for energy efficiency," said Ron Horstman, Western's campaign lead. "Our goal is to encourage a minimum of 400 employees to take the online Change a Light Pledge by October 31. Over the life of the bulb, that could potentially save 1,128 kWh and prevent 178,400 pounds of greenhouse gases."

Individuals who pledged to change a light in 2005 alone have the potential to save more than \$2 million in energy costs and avoid more than 33 million pounds of greenhouse gas emissions. On a more intimate scale, replacing just five lights in the house with energy-efficient bulbs saves about \$60 annually in energy costs.

Energy Star offers a pledge drive kit and promotional materials for agencies that want to join the Change a Light campaign. Also, Western's Energy Services program provides information on energy-efficient



Energy Star provides promotional items like this poster to agencies participating in the "Change a Light, Change the World" campaign. (Photo courtesy of Energy Star)

lighting through Energy Services Bulletin stories and Western's Power Line. The Equipment Loan Program offers a lighting display kit that Western customers can borrow to demonstrate the differences in lighting technologies.

Key Account Tool Box coming

A new tool to help Western customers identify energy-saving measures for their commercial and industrial accounts will be available online just as the winter heating season arrives.

The Online Key Account Tool Box is a joint project of APPA's Demonstration of Energy-Efficient Developments program, Southeastern Power Administration and Western. Washington State University's Energy Extension Program worked with the agencies to design the Internet-based tool to support utility representatives—the consumer's point of contact—and their key accounts.

The site includes news and links to useful and informative sites that any visitor can access. The "Members only" section features a database of thousands of information resources

on energy efficiency, distributed generation, distribution efficiency, metering, utility safety and health issues, effective communications and innovative utility programs. Account representatives can browse resources and save them to a library cart for e-mail delivery to their key accounts. They can also sign up their key account customers for direct access to the Web site.

Western will preview the Tool Box at the APPA Customer Connections Conference, Nov. 7 in San Antonio, Texas. Watch the Energy Services Web site for more news about the Online Key Account Tool Box.

California Solar Initiative offers incentive

The California Public Utilities Commission adopted performance-based incentives for its groundbreaking California Solar Initiative, a 10-year, \$2.9 billion program designed to build a bright energy future for Californians by promoting the use of solar power.

Beginning Jan. 1, 2007, solar energy systems greater than 100 kilowatts in size installed in businesses and other large facilities will be eligible for the incentive. Residential and small businesses consumers installing systems smaller than 100 kW will receive incentives based on each system's estimated future performance. Both mechanisms

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reward the selection and proper installation of high quality solar systems.

The decision implements the first phase of the California Solar Initiative, adopted by the PUC in January 2006. The initiative's goal is to increase the amount of installed solar capacity in the state by 3,000 megawatts by 2017. Offering incentives for small and large solar energy projects will help create a sustainable solar industry and boost solar power's long-term position in California's energy portfolio while immediately providing clean energy for residents and business owners.

The incentive program will be managed regionally by the existing self-generation program administrators—Pacific Gas and Electric Company, Southern California Edison, Southern California Gas Company and the San Diego Regional Energy Office. The administrators will develop a statewide online application to help simplify the process for solar applicants.

Updated Holiday Lighting fact sheet online

Just in time for holiday decorating season, Western's Energy Services has updated its Holiday Lighting fact sheet.

The fact sheet offers businesses and homeowners tips for holiday decorating the energy-efficient way. A chart comparing lighting costs for standard C-7, LED and mini



lights give the latest savings figures. A current list of Web sites for retail outlets that may carry energy-efficient decorations is also included.

While you are browsing through Energy Services publications, check out the rest of our fact sheet library. Topics to help residential customers save electricity include Energy-Efficient Water Heating, Energy Efficiency and Indoor Air Quality, Energy-Efficient Home Cooling and How to Buy Energy-Efficient Appliances.

Commercial and industrial customers may be interested in fact sheets on pre-rinse spray valves, building commissioning and casino energy management. There are also fact sheets highlighting specific technologies such as fuel cells and infrared thermography.

Fact sheets have space for Western customers to add their own contact information. For a small charge, Energy Services can set up sheets branded with our customers' logo and ready to print. Contact your regional Energy Services representative for more information.

EPA becomes 100-percent green powered

The Environmental Protection Agency has closed a deal making it the first federal agency to purchase renewable energy, or "green power," equivalent to 100 percent of its annual electricity needs.

The agency recently signed a contract with West Coast-based 3 Phases Energy Services to purchase more than 100 million kilowatthours in renewable energy certificates. The agreement extends annual green-power purchases to more than 190 EPA facilities nationwide, and brings the agency total to nearly 300 million kWh per year. That is equivalent to 100 percent of the electricity EPA uses nationwide annually, and is enough electricity to power 27,970 homes for a year. "At EPA, we don't just talk the talk, we walk the walk," said EPA Administrator Stephen L. Johnson.

The program offsets demand for conventional electricity sources by supporting such renewable energy sources as wind power, geothermal sources and biomass—primarily through the purchase of renewable energy certificates. The contract, which continues through Sept. 30, 2007, supports the development of wind farms in California, South Dakota, Oklahoma and Wyoming.



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