

GreatRiver NEWS

For the Member Systems, Friends and Employees of Great River Energy

Filtration system accommodates new fuel

When a change in fuel supply led to unforeseen problems in a power plant's filters and emissions monitoring system, plant staff scrambled to find a solution. After searching for an off-the-shelf fix, they designed and manufactured a one-of-a-kind product that solved a perplexing issue and kept the plant running.

The problem originated when Elk River Energy Recovery Station, a power plant that burns refuse-derived fuel (RDF), was forced to find new fuel sources as a result of expiring supply contracts. Great River Energy staff secured a partial replacement in tire-derived fuel (TDF). Processed tires could be burned in relatively small quantities in combination with existing RDF to maximize the power generated at the plant.



Staff from Great River Energy's Elk River Energy Recovery Station engineered and manufactured a regenerating filter to keep the plant operating without interruption.

TDF proved to be a good fuel for generating electricity, but it didn't cooperate with the plant's Continuous Emissions Monitoring (CEM) system. The CEM system's filtration system would foul to the point of replacement after two hours of operation due to a residue in the flue gas.

The CEM system requires one minute of valid data every 15 minutes in order to measure the plant's emissions, so the filter would need to regenerate quickly.

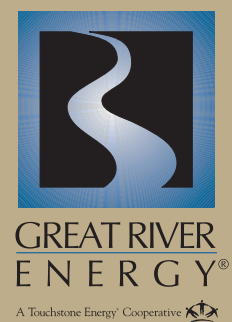
Employees designed, built and installed a filtration system that

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included a larger filter and a heating element. By quadrupling the filter's surface area, the plant is able to operate for longer periods between regenerations. When the filter clogs, the heating element burns off the residue before a blow-back function cleans and cools the filter. Early tests show that the new filter can last more than one month between regenerations.

Drivers may see fireworks with CapX2020 construction

It takes more than a single wire to build a 28-mile section of high-voltage transmission line – and when those wires are transmitting 345 kilovolts of electricity, you need to take extra care to ensure each splice is strong and reliable.

CapX2020 utilities are raising awareness about the loud blasts that will occur while drivers are traveling along the corridor.

The CapX2020 construction team recently completed a demonstration of an impressive splicing technique that will enable stronger spliced conductors. The technique will be used in the construction of a large transmission line along Interstate Highway 94 between Monticello,

Minn., and St. Cloud, Minn. The splicing process involves a loud noise similar to a professional firework.

The impressive splicing will occur in the summer, so the CapX2020 utilities are raising awareness about the loud blasts that will occur while drivers are traveling along the corridor.

The demonstration was conducted at a staging yard near Clearwater, Minn. Utility staff as well as local and state officials were on hand to witness the splicing.

On the same project, a heavy-lift helicopter was used to install transmission structures in a wetland area. Two structures were installed with the helicopters to limit potential damage to sensitive environmental areas.

The Monticello-to-St. Cloud project is expected to be completed by the end of 2011.



A helicopter hoisted transmission tower pieces for the construction of the Monticello-to-St. Cloud CapX2020 project.

Electric generation up in 2010

Net power generation in the country as a whole increased 4.3 percent in 2010 as compared to 2009, according to the U.S.

Department of Energy's Energy Information Administration.

Natural gas-fired generation showed the largest increase, growing by 6.6 percent over

2009. Coal-fired generation increased 5.4 percent and nuclear generation increased

by 1 percent. Natural gas made up almost 24 percent of the fuel mix in 2010;

coal-fired generation made up 45 percent.

Conventional hydropower was the only generation source to take a dip during 2010, falling 6 percent compared to the previous year.

Residential sales of electricity were up 6.3 percent, from 1.36 trillion kilowatt-hours (kWh) to 1.45 trillion kWh.

The average retail price of electricity for residential consumers was up slightly, by 0.6 percent, from 11.51 to 11.58 cents per kWh.

Economic development vital for rural America

The communities served by Great River Energy and its member cooperatives benefit from healthy and growing local economies.

In comments about the state of the economy in rural America, the U.S. Department of Agriculture's (USDA)

Great River Energy helps its member cooperatives pursue grants, loans and other incentives to attract and retain commerce in their communities.

Under Secretary for Rural Development Dallas Tonsager underscored the important role electric cooperatives play in promoting economic development and energy efficiency.

Despite the recent increase in commodity prices – which can favor farm country – many rural communities have not gained as much ground post-recession as the national economy.

Tonsager pointed to the USDA Rural Economic Development Loan and Grant (REDL&G) program as a rural development initiative that has been working extremely well. REDL&G provides zero-interest loans and grants to rural electric cooperatives and telephone companies.

The funds are then re-loaned to local businesses for projects designed to create and retain employment in rural areas. Since the approval of the first applications in 1989, the REDL&G program has provided more than \$500 million to more than 1,500 projects, creating nearly 55,000 jobs across rural America.

Great River Energy helps its member cooperatives pursue grants, loans and other incentives to attract and retain commerce in their communities. Great River Energy and its member cooperatives also regularly exchange input and feedback on economic development efforts.

Electric vehicle sales to grow in coming years

More than 1 million plug-in electric vehicles (PEV) could be on U.S. roads by 2015, according to a report from the U.S.

Department of Energy (DOE).

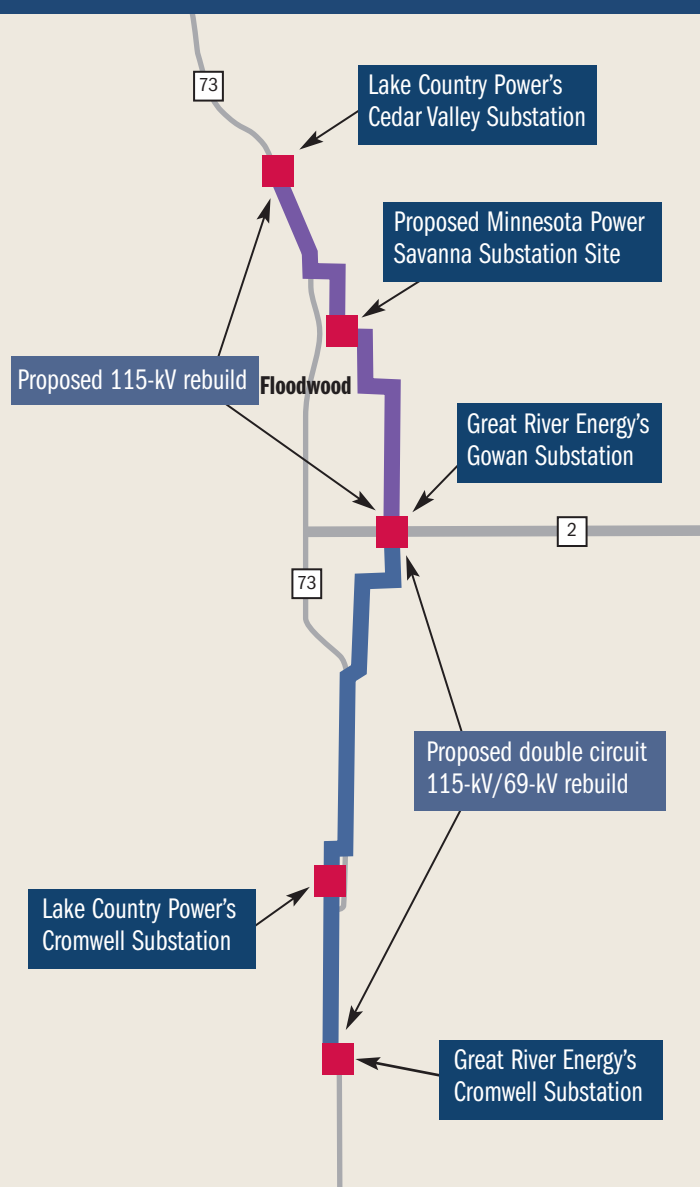
A similar report released by Pike Research estimates total PEV sales will reach almost 360,000 annually by 2017.

“The performance and cost effectiveness of the early [PEVs] in the market will be a major, but unknowable, factor in how many [PEVs] are on the road by 2015,” the DOE report said. “The cumulative impacts of the various policy initiatives, the experience of the early purchasers of electric-drive vehicles and future oil prices will all play a role in determining future consumer demand.”

The DOE report notes that sales of hybrid vehicles have grown to nearly 3 percent of total annual light-duty vehicle sales, with more than 1.6 million sold over the past six years. Electric vehicles are expected to represent 2.4 percent of annual car sales by 2017, according to Pike Research, with the majority being sold in New York, California and Florida.



Project to improve voltage in Northwoods



In the scenic areas surrounding Savanna Portage State Park in northern Minnesota, the electrical grid has provided reliable service for four decades without the need for additional infrastructure.

However, the transmission system that currently serves areas around Floodwood, Cromwell, Aitkin and MacGregor is in need of expansion. Electrical demand in the area has increased to the point that the existing system is no longer adequate to maintain acceptable voltage levels. Low voltage can lead to poor performance of lighting and appliances and puts electric reliability in jeopardy.

To address the electrical system needs, Great River Energy and Minnesota Power have proposed the construction of a new substation and transmission lines with a higher capacity.

The project would include the following construction:

- Rebuilding approximately 16 miles of existing 69-kilovolt (kV) Great River Energy transmission line to a 115-kV line between Cedar Valley Township and Floodwood Township.
- Constructing a new Savanna 115-kV substation in Van Buren Township.
- Rebuilding approximately 21 miles of existing 69-kV Great River Energy transmission line to a double circuit 115-kV/69-kV line between Floodwood Township and Kalevala Township.

The project began in October 2010 when the utilities held an open house for the public and continued when a combined certificate of need and route permit application was submitted to the Minnesota Public Utilities Commission in February.



(Left to right) House Speaker Kurt Zellers, Assistant House Minority Leader Kent Eken, Senate Minority Leader Tom Bakk and Senate Majority Leader Amy Koch discuss energy policy during a panel discussion moderated by MREA's Joel Johnson (right).

Cooperatives gather at the Capitol

Representatives from Minnesota's 44 electric cooperatives gathered in St. Paul in early March to share the cooperative message with government officials at the annual meeting of the Minnesota Rural Electric Association (MREA).

Legislation and regulations are playing an increasingly significant role in the electric utility industry in Minnesota. The meeting gave the cooperatives an opportunity to share with government officials the impact of past and current rules, and provide input on additional energy policies being considered.

For example, the state of Minnesota's Renewable Energy Standard is succeeding at its goal of driving development of wind resources in the state – but it's also causing increases in the cost of electricity for consumers. At the MREA annual meeting, Great River Energy Member Services Vice President Jon Brekke presented about the tendencies of wind generation. Brekke shared results that wind generation produces more energy during the overnight hours when consumers are typically asleep and less able to use wind-generated energy.

Cooperative representatives also expressed some concerns regarding the Conservation Improvement Program, a goal outlined in Minnesota's Next Generation Act of 2007. Cooperatives are different from other utilities in that their customers are largely residential. Although cooperatives have effectively implemented many conservation and efficiency measures, the downturn in the economy has hit them hard.

The group also collectively voiced its support for the repeal of the restrictions on new coal power and long-standing moratorium on nuclear generation.

Because the 2010 elections resulted in significant turnover in the Minnesota House of Representatives and Senate, the event also allowed cooperative leaders and government officials to get to know one another. These relationships are vital in the thoughtful creation of energy policy.

MREA is a service organization for Minnesota's electric utility cooperatives that provides service and leadership including safety training, legislative research and industry education programs.

The challenge of wind

The benefits of wind energy are clear: no emissions, minimal maintenance and free fuel. However, as more wind generation is brought online in the Midwest, utilities are learning more about its tendencies – and discovering challenges.

Consumers expect electricity to be there whenever they need it, and electricity consumption tends to spike in the morning and evening. Unfortunately, those periods coincide with particularly low times for wind generation.

That means wind energy is being generated when it isn't needed. Unneeded wind energy leads to depressed market prices, which increases costs and reduces revenue for utilities. The end result is higher power costs for consumers.

Great River Energy projects that it has sufficient renewable resources in place to exceed Minnesota's renewable energy standard milestones through 2020. Great River Energy also expects to comply with subsequent tiers of Minnesota's renewable energy standard by utilizing its supply of banked renewable energy certificates (RECs) through 2025. To maintain compliance beyond 2025, Great River Energy will need to acquire significantly more renewable resources or purchase renewable energy credits. Even in these early stages of Minnesota's Renewable Energy Standard, wind generation is costing Great River Energy's member cooperatives more than \$16 million every year. Further additions will likely add to those costs.

Like anything else, there are costs and benefits with wind energy. As more wind generation comes to Minnesota, Great River Energy and its members will continue to conduct research and find new ways to incorporate wind energy while delivering reliable and affordable electricity.

N.D. delegation tours Danish plant

North Dakota government officials as well as agricultural and energy industry representatives, including Great River Energy employees, traveled to Denmark in March to learn more about that country's efforts to develop a cellulosic ethanol industry.

"The main purpose of this trip was to visit the Kalundborg cellulosic ethanol demonstration facility to determine how we can build a commercial-size facility in North Dakota," said Agriculture Commissioner Doug Goehring, one of the organizers of the trip. "We especially want to know how the facility impacts local agriculture, both economically and in terms of soil health."

Great River Energy and Inbicon, a subsidiary of the Danish utility company DONG Energy, are working to develop and build a cellulosic biomass refinery, Dakota Spirit AgEnergy, to be located next to Great River Energy's Spiritwood Station power plant in Spiritwood, N.D. Inbicon operates the Kalundborg facility.

"We think the opportunity to experience Danish technology and farming practices first hand is important homework in considering biomass technology for North Dakota," said Greg Ridderbusch, vice president of business development for Great River Energy. "Great River Energy is pleased to participate and appreciates the collaborative approach between agriculture and energy."

MemberCo-op CORNER

MCLEOD INSTALLS THREE-PHASE TRANSFORMER

In late February, McLeod Cooperative Power completed a project that will increase the capability and efficiency of one of its distribution substations.

Crews replaced four existing 833- kilovolt-ampere (kVa) single-phase transformers with one 2,500 kVa three-phase transformer at the Brookfield Substation in Renville County.

The single-phase transformers, which have been in use for many

decades at the Brookfield Substation, will be re-energized by a cooperative in northern Minnesota. The three-phase transformer will allow electricity to be distributed more efficiently.

Members served by the Brookfield Substation received electricity from the nearby Hector and Preston Lake Substations for five days while the project was being completed. After installation the new transformer required a few days to undergo testing before being energized.

On Feb. 28, loads were switched back to the Brookfield Substation, putting the new transformer to work.

AN ENERGY EFFICIENCY EDUCATION

Agralite Electric Cooperative recently participated in an event held in Benson, Minn., that was designed to help farmers and other rural businesses improve their energy efficiency and lower energy bills.

Area experts presented about technological improvements to a variety of devices, including lighting, ventilation, milking equipment and grain drying. Agralite representatives informed attendees about rebates and incentives available for cooperative members who make efficiency improvements.

The event was hosted by the Minnesota Project, and included representatives from Clean Energy Resource Teams and U.S. Department of Agriculture Rural Development.



Stearns Electric Association's Ger Marthaler describes the dangers of electricity to a classroom of fourth graders.

STUDENTS LEARN ABOUT ENERGY EFFICIENCY AND ELECTRICAL SAFETY

Each winter, Stearns Electric Association presents a one-hour energy efficiency and safety program to local fourth grade classrooms throughout its service territory. The program is designed to teach children about the potential dangers of electricity.

The highlight of the presentation is a "live" electric farm model, with which students are shown first hand what to do in case of contact with a power line.

"The students leave the presentation understanding that electricity is useful in their daily lives, but can be incredibly dangerous if it is not used safely," said Stearns Electric Association's Glen Kemper.

In January and February alone, nearly 1,200 students in 30 schools participated in the demonstration, which is provided at no charge to participating schools.



A crane lifts one of the 833-kVa transformers out of the Brookfield Substation and onto a waiting trailer.

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