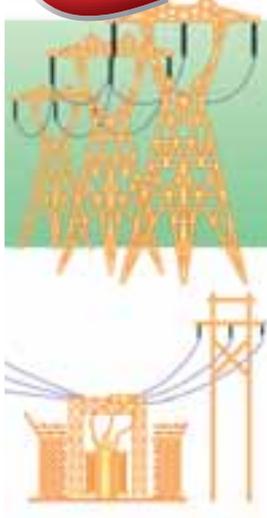


Connections

The U.S. electric grid evolves over 50 years



High-Voltage Transmission Lines

Large amounts of power, measured by watts, are delivered by transmission lines. These lines are energized with very high voltage in order to move the power long distances with minimal losses. Insulators on the towers prevent the power from flowing to the towers or the ground.

Electric cooperatives own and maintain 63,000 miles (16 percent) of the nation's transmission lines!



Substations and Sub-Transmission Lines

Transformers at transmission substations reduce the voltage from transmission levels to sub-transmission levels, typically ranging from 115,000 volts to 34,500 volts. Sub-transmission lines deliver power over short distances to industrial sites and distribution substations.

The lines also deliver electricity to distribution substations, where transformers reduce the voltage. At distribution substations, transformers reduce the voltage to a lower level, typically 34,500 volts, 25,000 volts or 12,500 volts.

Source: National Rural Electric Cooperative Association of Electric Cooperatives

Distribution Lines

The lines typically seen along rural roads and next to homes are generally single-phase distribution lines, energized at 7,200 or 14,400 volts. Transformers on the power poles lower the voltage between 120 and 480 volts to serve residential homes and small businesses.

Electric cooperatives own and maintain 2.5 million miles (42 percent) of the nation's distribution lines!

There is currently no efficient, cost-effective way to store electricity long-term. High voltage transmission lines deliver electricity from generation plants to consumers. This grid keeps evolving to meet changes in generation and policies.

Electric grid tidbits & trivia...

- The science of electricity is that it must be used at the same time it's created, requiring mind-boggling coordination between power plants that might be hundreds of miles from where you decide to turn on your TV.
- According to the U.S. Department of Energy, in addition to transmission lines, the electric grid is made up of 6.3 million miles of smaller distribution lines and more than 6,000 power plants.
- That network delivers electricity to 159 million homes, businesses and industrial plants. ⚡

The 211,000 miles of high-voltage transmission lines are part of the network that brings electricity pretty much wherever and whenever you want it. Plus, this grid is evolving to keep up with equally profound changes in the world of energy, environmental rules and digital technology.

Annual spending to modernize the transmission system in the U.S. quintupled from 1997 to 2012. The financing for that \$11 billion increase changed from one where electric utilities were in charge to one involving a variety of entrepreneurs. Reliability and security concerns also reshaped the grid's regulatory and operational structure, along with renewable energy, environmental requirements and new technology changing many aspects of the industry.

This adds up to an electric utility evolution, said Paul McCurley, chief engineer and acting director of Energy and Power for the National Rural Electric Cooperative Association; he calls it an "evolution" starting in the 1990s, when deregulation was changing the shape of industries from airlines to telephones.

One of the forms deregulation took for the electric industry was to change who was in charge of building transmission lines. Traditionally, the utilities that generated electricity and delivered it to homes and businesses also built the transmission lines that carried it from power plants to distribution wires. A series of court cases and new rules allowed entrepreneurs to build, finance and make money off those high-cost projects.

Two other long-term developments intersected with this reshaped landscape of electric transmission ownership. One was a reaction to a few notable power blackouts, beginning with a 1965 outage that affected 30 million people in the Northeast U.S. Nearly 40 years later, in 2003, a tree branch fell — *Continued on Page 7*



**Brown County
Rural Electrical
Association**

Connecting our co-ops & members
to a progressive future

Inside this issue:

Teens: win a trip to D.C. June 11-16...Page 4

Want to be a BCREA director?...Page 5



Can you dig it?...before ground source heat pump tax credit expires in 2016



Time is running out on ground source heat pump tax credits. Take advantage now if you want to install one of the most efficient heating/cooling systems available.

Geothermal heat pumps are similar to ordinary heat pumps, but they use the ground, instead of outside air to provide heating, air conditioning and, in most cases, hot water. Because ground source heat pumps use the earth's constant, natural heat, they are among the most cost-effective and comfortable heating and cooling systems available.

Energy Star-certified geothermal heat pumps are over 45 percent more energy efficient than standard options. Also, they now include water-to-water models. Water-to-water models provide heating and cooling using indoor refrigerant-to-water heat exchangers.

How much is the tax credit?

Homeowners who install Energy Star-certified geothermal heat pumps are eligible for a tax credit equal to 30 percent of the cost of the ground source heat pump (including installation/labor costs) with no upper limit.

What is the time frame?

The tax credit is available through 2016. The ground source heat pump must be installed in a home you own and



Think of installing a ground source heat pump as digging for buried treasure. Ground source heat pumps use the ground's stable temperature to provide heating and cooling all year!

use as a residence (no rentals, but second homes qualify) between January 1, 2009 and December 31, 2016.

What are the requirements?

The ground source heat pump must meet the requirements of the Energy Star program, which are in effect at the time of the expenditure. COP (coefficient of performance) of a heat pump is the ratio of the change in heat at the "output" (the water reservoir of interest) to the supplied work. EER (energy efficient ratio) — the higher the EER rating, the more energy efficient the equipment is. This can result in lower energy costs.

Qualifying ratings:

- Direct expansion: (EER \geq 16, COP \geq 3.6)
- Water-to-air: closed loop (EER \geq 17.1, COP \geq 3.6), open loop (EER \geq 21.1, COP \geq 4.1)
- Water-to-water: closed loop (EER \geq 16.1, COP \geq 3.1),

open loop (EER \geq 20.1, COP \geq 3.5)

How to apply for the tax credit?

Use file tax form 5695 with your tax return to take advantage of the ground source heat pump credit.

For more information about ground source heat pumps, contact your electric cooperative's energy expert. Not only can they save you money over their lifetime, they can also save money this year with the expiring tax credit! Ask about the co-op's ground source heat pump rebate too. 📌

Take your humidifier with you!



Humidifiers help people deal with allergies, cracked skin, dryness, cold and flu symptoms, but if they travel, they can't take the humidifier with them. Now you can take a humidifier wherever you go and power it with a USB cord!

The Deneve Portable Humidifier Stick is a hassle-free, worry-free, portable personal humidifier. Simply plug it into nearly any USB power source, fill up a glass or water bottle and insert the humidifier. It is small enough to fit into a coat pocket!

Features include:

- No need to find a water bottle that fits or spills while refilling. You provide the water supply in a cup or a bottle.
- Use anywhere USB power ports are available. Use while sleeping, in hotels, in the nursery, at work or the home. Use as a humidifier, mister or even moisturizer.
- Easy to use: 1) Insert end of the Deneve humidifier stick



Humidify your own personal space at the office or in a hotel room with the Deneve Portable Humidifier Stick. It can help you deal with allergies or cracked skin even while on the go.

into empty cup or water bottle. 2) Fill up the cup or bottle, keeping the water below the USB charging port and without getting the top of the device wet. 3) Wait 10 minutes to soak the internal filter. 4) Plug humidifier into a USB power port. 5) Turn the humidifier on and enjoy cool mist coming from the wide top of the device.

- Easy to maintain: 1) On weekly basis, when powered off, wipe or soak the stalk portion with a nine parts water to one part bleach solution. Rinse with

water-dampened cloth. Dry fully before reusing. 2) Replace internal filter wick every three months.

- Eight hour automatic shut-off, nine-foot USB cord and one-year satisfaction guarantee.
- Covers up to 20 square feet. Perfect for using in a cubicle without distracting neighbors.

The Deneve Portable Humidifier Stick is available on Amazon.com for approximately \$40. 📦

Stay safe on snowmobile trails this winter



Once the first heavy snowfall hits, it may be tempting to immediately hop on your snowmobile and cut loose on trails or seemingly wide open farm fields covered with fresh powder. Yet, even seasoned veterans of this winter activity need to keep a number of safety considerations in mind before heading out on the trails.

Besides observing state snowmobile regulations and local laws, it's always a safe practice to drive at moderate speeds and drive defensively. Be especially careful if driving in a power line right-of-way. Reduce your speed and always be on the lookout for electrical (green) transformer boxes and the guy wires — the cables that anchor power poles. Darkness, fog and deep snow can make them hard to see.



Winters offers plenty of opportunity for fun, but take care to keep the fun safe. Watch out for electrical equipment, poles and wires while snowmobiling.

While hazards such as these may present themselves even while riding on marked trails, the importance of staying on designated paths cannot be stressed enough. The groomed snowmobile trail system available across Minnesota includes signs that alert snowmobilers to trail changes. When you venture off these paths, you put yourself and others at risk for coming into

contact with objects — such as electrical equipment — hidden under the deep and undisturbed snow.

Immediately contact your local electric cooperative or authorities if you see a downed or sagging power line, notice missing or damaged guy wire covers or have other safety concerns regarding electrical equipment along your snowmobile ride.

Enjoy a safe and fun snowmobiling season this winter. 📦

Brown County Briefs

Teens: win a trip to D.C.!



The trip of a lifetime awaits one lucky high school sophomore or junior whose parents or guardians are members of Brown County REA. Eligible youth can win an all-expense paid trip to Washington, D.C. June 11-16.

Interested youth are asked to write a 300-word essay on any energy-related topic and submit it, along with the application form, to Brown County REA by the close of business on Friday, March 4.

Brown County REA will select three finalists who will be interviewed, and award the trip to Washington, D.C. to one of the three. The second place winner will receive \$150 and serve as first alternate for the trip. \$100 will be awarded for third place.

Member Advisory Council
The final meeting of the current Member Advisory Council will be January 18 at 7:30 p.m. 🗓️

BCREA 79th Annual Meeting



When: April 7
Location: Civic Center, New Ulm
Registration: 4:30 p.m.
Meal: 5:30 p.m.
Meeting: 6:30 p.m.

War of the Currents presented



Students from Comfrey Public School were given a fast and fun presentation on electricity and electricity generation through *War of the Currents — The Fight for our Electrical Future*, given by staff from the Bakken Museum of Minneapolis. Students learned about Thomas Edison and Nikola

Tesla's battle to control the electrical future of the United States, the basics of electricity and the broader fields of science and engineering. The December 8 presentation told the story of scientists Edison and Tesla using demonstrations, experiments and audience participation.

The assembly was provided courtesy of Brown County REA's wholesale power supplier, Great River Energy. 🗓️

Drop off lights before January 15

As you're taking down your holiday lights, remember you can recycle your old and non-working lights. Brown County REA will again be collecting strands of holiday lights in the office entry area through January 15. After that date, you'll have to hang on to your old lights until November. You may drop off your old lights during business hours, Monday through Friday, 8 a.m. to 4:30 p.m. The collection will be combined with those collected by the Sleepy Eye YES! Team.

Please do not put cord adapters, battery packs, plastic rope lights and CFL light bulbs in the collection box. 🗓️

Community Health Day

Saturday, March 19
Sleepy Eye Public School
6:30 a.m.-10 a.m.



- Blood analysis (including cholesterol, LDL, calcium, glucose, etc.): \$40, plus it requires a 12-hour fast for best results
- Thyroid Stimulating Hormone (TSH) screening: \$30
- Health information and blood pressure check: FREE

Call BCREA for appointments Monday through Friday (8 a.m. - 4:30 p.m.). Walk-ins accepted after 7:30 a.m. on Health Day. Co-sponsored by BCREA, Sleepy Eye Medical Center, Sleepy Eye Community Education and Brown County Public Health.

BCREA director candidates sought

Nominating committees for Districts 1, 4, and 5 are looking for candidates to run for positions on Brown County REA's Board of Directors for 2016.

District 1 is made up of Stately, Bashaw, Burnstown and portions of North Star townships and the city of Comfrey in Brown County, a portion of Brookville Township in Redwood County and part of Delton Township in Cottonwood County. District 4 covers Sigel and Cottonwood townships in Brown County and part of Cambria Township in Blue Earth County. District 5 consists of Stark and Leavenworth townships in Brown County.

The nominating committees are made up of Member Advisory Council members and others representing the respective districts up for election. Member input to the

nominating committee is appreciated and helpful in their selection of director candidates. If interested in being a candidate or have a member in mind whom you believe would be a good candidate, please contact a nominating committee member prior to the January 18 Member Advisory Council meeting. Please make sure the nominee is willing to have his or her name on the ballot.

Members of the nominating committees are:

District 1: Arland Roiger, Duane & Karen Krueger and Nick Yokiel

District 4: Dean & Lori Schneider, Don & Marlene Braulick and Dan Schneider

District 5: Don & Cheryl Bloemke, Dale Kral and Tom & Brenda Schroeffer

Want to be a BCREA Director?

BCREA's nine-member Board of Directors meets monthly (usually the last Thursday of the month, during the day). Meetings are held jointly with the board from BENCO and alternate between the Sleepy Eye and Mankato locations. Other meetings include the Annual Meeting, annual and other meetings of our wholesale power supplier, Great River Energy, Minnesota Rural Electric Association (MREA) district and annual meetings, National Rural Electric Cooperative Association (NRECA) annual meeting, and other meetings to learn and stay current on policies and procedures of the electric industry.

The board is responsible for governing the cooperative. It establishes policies, approve major plans, programs, and budgets, receive management reports and establish broad objectives for the General Manager.

Director responsibilities:

- Develop knowledge and skills as a board member and stay informed of all relevant and material matters affecting the business and operations of the cooperative.
- Authorize the money, facilities and equipment necessary to carry out the objectives of the cooperative including the review and approval of the operating budget.
- Establish controls that can be used in appraising the effectiveness of the cooperative and review periodic reports from the General Manager and staff to ascertain conformity with the board's policies and objectives.
- Assure the financial affairs of the cooperative are being conducted and recorded in accordance with all prescribed



laws and regulations, and that the financial records accurately reflect the financial condition of the cooperative.

- Determine and adopt key issues, strategic initiatives and objectives, major goals, and monitor results.

- Review and approve broad operating programs of service and activities developed and recommended by the general manager.

- Maintain compliance with all legal requirements.
- Conduct meetings and other activities to inform members and obtain their ideas and suggestions.
- Review participation in outside activities that enhance the cooperative's prestige, strengthen the cooperative's operations and fulfill the cooperative's obligations to its members and the communities where the cooperative serves and operates.

The nominating committee will nominate at least two candidates for each directorship at least 35 days before the Annual Meeting. In addition, any 10 or more cooperative members residing in the district may submit a nomination with their signatures for a director in their district. Nominations may also be made for a member residing in the district by another member who resides in the district at the annual meeting. The 79th Annual Meeting will be held the evening of Thursday, April 7, at the Civic Center in New Ulm.

If you have questions about the nomination process or would like to be a candidate for the Board of Directors, please contact Brown County REA.

Line crews begin annual line patrol

As the weather gets too cold for line construction, your electric cooperative linemen switch gears and begin line patrol. Line patrol involves line crews driving lines in selected townships and taking note of how lines, poles and equipment are holding up. Trouble areas then get marked down as potential candidates for repair when construction season comes around again. So if you see electric cooperative vehicles come into your yard, they are likely checking equipment up to the meter and transformer. Likewise, if you see line trucks driving slowly on the road, take care when you pass. Those linemen are out ensuring that you have the most reliable service possible by making sure the lines, transformers and equipment on your distribution system are in working order.

This year's line patrol has additional duties. Linemen are also going through the towns acquired in the recent Alliant purchase. They need to make sure that the lines, transformers and service locations they have on their new maps are accurate. Not only will this help them better serve those communities, it will also help them be safe. For example, the linemen need to know that their information matches the real world when it comes to things like phasing, overhead vs. underground lines, the location of breakers, open points and more.

Line patrol is another duty performed by your electric co-op to show how they work to serve you winter, spring, summer, fall plus every day and night in between. 🛠️



Your electric cooperative linemen have maps of the former Alliant communities similar to the one above. One of this year's line patrol tasks includes going through those communities and making sure such information is accurate.

Relax:

we've got you covered!



Our smart home security systems protect your home and loved ones from intruders, carbon monoxide, fire and other threats. Call 888.264.6380 or visit heartlandss.com



Spread the news! Send in your peanut butter recipes to share with all of us!

Be a nut for peanut butter treats! Share your peanut butter recipes, whether it's for making a dessert, cookies, bars or sandwiches! Send your peanut butter recipes by January 23 to Editor, Federated Rural Electric, PO Box 69, Jackson MN 56143-0069 or e-mail to christoffer@federatedrea.coop. Add your name and phone number. Thanks for sharing! 📧

German Pasta Salad by Mary Gail Lau, Fairmont

- 6-8 oz. medium egg noodles, cooked. Rinse and drain again.
- 3 T. light brown sugar, packed ½ lb. deli corned beef, cut into strips
- ¼ c. vegetable oil 2-3 dill pickles, chopped
- ¼ c. Dijon-style mustard 1 bag coleslaw mixture
- 2 T. dill pickle juice ¼ c. shredded Swiss cheese
- 2 tsp. caraway seeds

Place drained noodles in a large bowl. In a small saucepan combine the sugar, oil, mustard, pickle juice and caraway seeds over low heat for 3-5 minutes. Cook until warmed, stirring occasionally. Add to noodles, along with the remaining ingredients, except the cheese. Toss well. Sprinkle with cheese and serve warm or chilled. Serve with beer bread or dark rye. 📧

Today's grid adds flexibility for renewables

— Continued from Page 1

on a power line near Cleveland, triggering shutdowns that swept from Canada to New England and New York City, cutting power to 50 million people.

That event accelerated a regulatory process that by 2007 established mandatory reliability standards enforced by the North American Electric Reliability Corporation (NERC), a not-for-profit corporation funded through assessments of the utilities and others involved in the electricity system. Those standards cover everything from regional planning and coordination to tree trimming.

The second development changed what was expected of the grid. Instead of transmission lines carrying electricity from power plants to distribution lines, rising demand for electricity and the regional planning rules routed electricity in new ways. The grid also started accommodating more dispersed power plants that ran on natural gas; this offered more flexibility than coal in operating response, ease of construction and meeting environmental rules. Increases in solar and wind power meant more transmission lines to carry electricity from the windy prairies and sunny deserts to where people live and use electricity.

Smart grid technology and distributed energy also added two-way flows of both electricity and digital information as customers with smaller solar and wind generators became interested in selling their electricity back to the utility.

Utility experts warned that the grid was not built for these new uses and needed upgrades involving the increasing intermittent resources. With reliability rules in place and options for non-utility financing, transmission construction took off. The U.S. Energy Information Administration reports that spending on new electricity transmission by major investors and privately owned companies increased from \$2.7 billion in 1997 to \$14.1 billion in 2012.

“The electric grid in Minnesota also received a significant boost from the CapX2020 expansion,” said Lori Buffington in Great River Energy communications. “The CapX2020 investment in Minnesota alone is approximately \$1.5 billion with more than 600 miles of new high voltage transmission line.”

NRECA's McCurley calls the past 25 years of change to the transmission system a “success story” for making the grid reliable and ready for the future. 📧

How faithful is your hot water?



Install your own “old faithful” hot water supply! Electric water heaters from your electric co-op are efficient and so reliable they come with a limited lifetime warranty. Call for details. 📧

Call before digging



Contact Gopher State One Call before doing any digging more than 12-inches deep — 48 hours before digging for foundations, trees, tiling and more. You can also register on www.gopherstateonecall.org. Call a licensed electrician to locate the underground lines on your side of the meter. 📧





Marcia Solie
Member Services

Staff notes

2016 residential rebates

Will 2016 be the year you replace your aging heating and cooling system with more energy efficient equipment? Is it time to update your refrigerator or freezer? In addition to the money you save by going to more energy-efficient models, you may also qualify for rebates through Brown County REA.

Rebates are available on high efficient air source heat pumps when installed by a Quality Installed (QI) contractor and placed on the co-op's load control program:

- Air Source Heat Pump — 14.5 SEER: \$530
- Air Source Heat Pump — 15 SEER: \$630
- Air Source Heat Pump — 16 SEER & higher: \$680

To find a list of QI contractors go to <http://HVACReduction.net/gre/publicsearch.cfm>.

A new geothermal or ground source heat pump qualifies for a \$1,000 rebate. Place it on load control with whole house storage or non-electric backup heat and receive an additional \$50 rebate.

No ductwork in your home? No problem. Install an Energy Star ductless mini-split heat pump, which heats and cools your home. Rebates will vary based on your home's primary heat source. Contact the office to learn more. Members who install or upgrade existing HVAC systems equipped with an Electronically-Commutated Motor (ECM) can receive a \$50 rebate.



Look for the Energy Star label when purchasing appliances and lighting products that qualify for rebates.

Purchase an Energy Star refrigerator or freezer and recycle the replaced unit to earn a \$75 rebate. One appliance rebate per member per year. You must submit proof-of-purchase, Energy Star certification and recycling of the replaced unit to receive the rebate.

Energy Star compact fluorescent (CFL) and LED light bulbs qualify for rebates as well. LED bulbs are rebated up to 50 percent of the bulb cost, but the 2016 maximum has dropped to \$3 each. CFLs are rebated 50 percent of the bulb cost up to \$1 each.

Commercial, Industrial and Agricultural (CI&A) customers may qualify for rebates on energy-efficient lighting projects, electric forklifts, robotic milking systems, premium-efficiency motor retrofits, variable-frequency drives, heating ventilation and cooling, compressed air efficiency evaluation and other custom electrical applications. Please call or stop by the office to learn more. 📞



**Brown County
Rural Electrical
Association**

Brown County Rural Electrical Assn.
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Wade Hensel, General Manager

Board of Directors

James Mickelson, President — 794-6298
Thomas Hayes, Vice President — 228-8954
James D. Hanson, Sec.-Treasurer — 877-3631
William Berg — 354-4895
Brad Sprenger — 877-2633
Allen Hanson — 276-0691
Reuben Kokesch — 359-2112
Greg Mages — 794-3540
Joel Christensen — 249-3962
The Board of Directors meets the last Thursday of each month.

Board meeting highlights

The BCREA Board of Directors held its monthly board meeting December 17, 2015 at the BENCO office in Mankato. Discussion and/or action were taken on the following agenda items:

- Reviewed and approved the cooperative's 2016 Operating Budget and Work Plan.
- Approved appointment of Vicky Kral and Lee Johnson to the Brown County Rural Electric Trust Board.
- Reviewed and accepted Arland Roiger, Duane & Karen Krueger, Nick Yokiel for District 1; Dean & Lori Schneider, Don & Marlene Braulick, Dan Schneider for District 4; Don & Cheryl Bloemke, Dale Kral, Tom & Brenda Schroeffer for District 5 as Nominating Committee members for the 2016 director elections.
- Discussed distributed generation and net metering lost revenue recovery. No action taken.

• Updated on buy down and allocation of transaction costs for purchase of former Alliant Energy territory in BCREA service area.

The next meeting will be on January 28 at the BCREA office in Sleepy Eye. 📞

