McLeod Cooperative Power
NEWS
June 2016

In this issue...

Official publication of

McLeod COOPERATIVE POWER

www.mcleodcoop.com

Unlimited hot water charging on weekends!!

The 1,300 plus families participating in the Co-op's Electric Storage Water Heating Program are getting a gift of unlimited hot water almost every weekend and holiday for the foreseeable future. Due to low energy prices in the wholesale energy market there is little need or little value in controlling ETS water heaters on weekends or holidays, unless there is the possibility of a weekend or holiday billing peak, was the message from Great River Energy, the Co-op's power supplier. Monday through Friday non-holidays will keep the same ETS schedule of 8 hours of charge time overnight and water heaters controlled 7 a.m.-11 p.m.

This means members can use a lot more hot water on the weekends if they need to! Bathe the dog, wash the car, wash bedding, or take an extra-long shower on the weekends because you now have virtually unlimited hot water. No worries about running out of hot water when the whole family comes

home for a reunion. Any kilowatts used during these non-control hours are still at the half-price off-peak electric rate.

This new "no control" strategy began the end of May and will continue every weekend and holiday in the foreseeable future unless extremely hot or cold weather, a system emergency, or other reason presents the possibility of a weekend or holiday billing peak. Members can check MCPA's website any day to see if ETS water heater control is scheduled at www.mcleodcoop.com. Click on the blue "Is it a peak control day?" box on the homepage.

If you are not already a participant in the Hot Water Storage Program, or if you have questions on the unlimited charging, call the MCPA Energy Experts at 1-800-494-6272. New participants joining the ETS program are eligible for a $400 rebate and half-price energy rate. Members with good payment history may also qualify for interest-free financing of a Marathon water heater.

How does MCPA Community Solar Stack Up?

Eye-opening results after one year of energy production from the sun

We are happy to report that the MCPA Community Solar arrays have been generating energy from sunshine for over a year. It has been a success, in many respects, for both the Co-op and the members who subscribed to the 100 panels in the array. From June 1, 2015 through June 1, 2016, the array produced 48,000 kWh. This is enough to power four average homes (using 1,000 kWh/month) for an entire year.

Besides generating some of the energy used on MCPA's system by renewable sources, other benefits from the project include the power of cooperation between MCPA and its members.

Co-op members chose to participate for many reasons, including interest in renewables, environmental stewardship, or to lock in energy prices on the kWhs they receive from the solar production. Members were able to use those benefits without dealing with the headaches of backyard construction, metering interconnection rules, and maintaining equipment that requires frequent monitoring and repair.

With community solar, the member lets the Co-op deal with any problems for them. Members just sit back and get a monthly credit on their electric bill for production from their share of the array. Any member on the single phase rate, who subscribed to one solar panel was paid $59.08 for their first 12 months of solar credits.

The Co-op does have space to build an additional 50-panel array. "We would like to hear from any members that may be interested in participating in a second project," said MCPA employee Bob Thomes. "We already have a list of members that are interested, but we need a few more people to sign up before plans to expand the Community Solar Project can happen" he added.

Here are some facts about MCPA's existing Community Solar Project. It is a 41 kW dc system

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Direct Payment Plan is safest and easiest way to pay your bill

This is an especially good time for members to sign up for the Direct Payment (Autopay) Plan. You can get away from writing a check, putting on a stamp and mailing your payment to the Cooperative. It is so simple to sign up. Once on the program, MCPA will automatically take care of the bank draft from your account. You save time and money each month and so does the Cooperative.

Here is how it works:

- You will receive your normal monthly bill around the 15th of each month, giving you 13 days to review the charges.
- Your bank account will not be charged until the 28th of the month (or the next business day if it falls on a weekend).

To get on the Direct Payment Plan, just fill out the Authorization for Direct Payment form and return it to the Cooperative along with a voided check. Please allow 3-4 weeks for your enrollment on the program.

Call 1-800-494-6272 today if you need assistance signing up.

AUTHORIZATION FOR DIRECT PAYMENT

I authorize McLeod Cooperative Power Association and the financial institution named below to initiate entries to my checking/savings account. This authority will remain in effect until I notify you in writing to cancel it in such time to afford the financial institution a reasonable opportunity to act on it. I can stop payment of any entry by notifying my financial institution three business days before my account is charged.

Name of Financial Institution _____

_____

Branch _____

City _____ State _____ Zip Code_____

Signature of Member_____

Date_____

Name (Please Print) _____

Telephone # _____

Address (Please Print) _____

_____

Bank Acct. #_____ Checking ____ Savings _____

PLEASE ATTACH A BLANK, VOIDED CHECK FROM YOUR DESIGNATED ACCOUNT FOR VERIFICATION.

Electric Acct. # _____

Location # _____

How did MCPA Community Solar Stack Up?

Continued from page 1

manufactured by TenKSolar, a Minnesota solar panel maker. While the system output is measured in direct current (dc), homes and businesses with central station power use alternating current (ac). The conversion brings the actual output of energy down to 36 kW. This means that under optimal conditions, the system will generate a maximum of 36 kW of electricity. The system consists of 100 panels that are 410 watts each.

TenKSolar estimates that systems like ours should have an annual production of 60,000 kWhs per year. On paper, this sounds great, but here are some things we learned, and must consider. Sun is an intermittent resource. Passing cloud cover can cause energy production to go from 36 kW to 0 kW and back again in less than a minute. MCPA's system is tied directly into the grid and does not have any storage devices tied to it. The intermittent ups and downs of solar production pose some challenges to its integration into the grid. Hopefully, storage options will provide solutions in the future.

MCPA's system only produced 48,000 kWh in its first full 12 months, falling short of the Co-op's 51,100 kWh per year production estimate (based upon an annual capacity factor of 15% dc) and far short of TenKSolar's design estimate of 60,000 kWh (based on 16.6% capacity factor). We believe the failure of over a dozen micro-inverters at various times over the first operational year contributed to the lower than expected production numbers. However, since production will vary significantly each month and year, we will know better only after two to three years of operation what the true production numbers will be at the MCPA Community Solar Garden.

Operating a solar array has been a great learning experience for MCPA. It was a truly eye-opening experience to discover:

- A new reason to be thankful for each good, hard rain we receive, because it washes dust off the solar panels and keeps them at maximum production.
- Another reason to be thankful for every sunny day, because we know the community solar array is producing carbon-free kWh for MCPA members.
- Very little energy is produced in December or January because of cloudy, dark days.
- Generation during any summer month can be up to three times greater than December production.
- Arrays require regular monitoring to make sure all the parts are working.
- No moving parts does not mean solar is maintenance-free. Inverter or panel failures can and do happen, sometimes more than you want or expect, and result in warranty claims and parts replacement.
- Annual production may be less than estimated by the manufacturer.
- On summer days, most solar production has ended before the Co-op's peak demand hours begin.
- Solar is more intermittent than we realized.
- On cloudless days, when panels are producing at a steady rate, the array is able to offset the demand and energy use of about 12 central air conditioners.

The office of McLeod Cooperative Power will be closed Monday, July 4 in observance of Independence Day.

Outages may be reported 24 hours a day to 1-800-927-5685.

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General Manager: Carrie L. Buckley

The McLeod Cooperative Power News is the official member publication of McLeod Coop Power Association and focuses on our members, programs and events.

All member story ideas and comments are welcome. Send to Sue Pawelk at the address shown.

Office Hours:
Monday - Friday
7:45 a.m. - 4:30 p.m.

Phone: 320-864-3148
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Fax: 320-864-4850
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Gopher State One Call 811 or 1-800-252-1166

10 TIPS for BIG Summer Savings

1. Raise your thermostat to 78 degrees or higher
2. When you are away from home for more than 8 hours, raise the thermostat setting
3. Keep shades closed when the air conditioning is on
4. Check and clean filters
5. Install ceiling fans
6. Make sure ceiling fans are blowing down
7. Run appliances that use a lot of energy late in the evening
8. On hot days, limit showers, cooking, and activities that put heat or humidity into the air
9. Participate in off-peak cooling and water heating programs
10. Turn off lights

Be prepared for summer storm season

Before a summer storm hits, prepare your house and your family for a possible power outage or other storm related inconveniences by:

- Checking your homeowner's insurance policy for coverage on tree removal, food in the freezer that spoils if power is out, basement flooding if your sump pump does not operate, etc. to make sure you have the coverage you need.
- Make sure your only phone is not a portable model that needs to be recharged.
- Have the Co-op's phone # next to the telephone so it is easy to find in the dark.
- Make sure all family members know the safest place in your basement or other shelter area that they should go to during a tornado or severe thunderstorm.
- Have a basic Emergency Supply Kit stored in your storm shelter room.

Recommended Items to Include in a Basic Emergency Supply Kit:

- Water; one gallon of water per person per day for at least three days, for drinking and sanitation.
- Food; at least a three-day supply of non-perishable food.
- Battery-powered or hand crank radio and a NOAA Weather Radio with tone alert and extra batteries.
- Flashlight and extra batteries.

What to do if the power goes out:

1. Call the Cooperative at 800-927-5685 to report that you are without power. Do not assume your neighbors will call. The outage may just affect your residence.

2. Stay clear of power lines. Never try to remove trees on electric lines yourself. Report all downed lines.

3. Do not open refrigerators or freezers during an outage. Food will stay colder longer if the door is not opened.

4. Turn off air conditioners, well pumps, and major appliances with motors. Electricity that goes on and off repeatedly during a storm or when power is being restored can be hard on motors and compressors.

5. Shut off electric breakers or power to basement outlets if water rises in your basement. Water and electricity do not mix. Basement appliances should be unplugged and power shut off well before water rises to threaten outlets or electrical equipment.

6. Use extra caution when using candles or lanterns for light.

Future lineman awarded scholarship

Austin Bernstein of Glencoe has been selected to receive a $500 power line worker scholarship. Austin plans to attend Minnesota West Technical College in Jackson, Minnesota beginning this summer. He will be enrolled in the power line worker program.

Austin is a 2016 graduate of Glencoe Silver Lake High School. He is the son of Dan and Annette Bernstein of Glencoe. He will be following in the career path of his father Dan, who is also a lineman.

Veteran Steffes technician, Julie Thorpe, who taught the classes, watches as local heating technicians Nate Johnson, Brandon Draeger, and Jerome Borchardt check operational display codes for heating equipment problems and learn how to adjust programming on furnaces using the simulator panels provided for training.

Contractors get up to speed on new Steffes innovations

About 16 area electricians and heating contractors, and a few co-op employees, participated in a training session to refresh their installation and troubleshooting skills on Steffes central storage furnaces and room units. At the training sessions in May, contractors came to the Cooperative office to get updated on the new innovations coming in Steffes products, including a new water heater product.

Ground source heat pumps: *Time is running out*

A GSHP can be installed even in a crawl space, like this unit installed under a lake cabin.

Energy Management Technician Allen Lendt does a "check out" of the system to make sure it is set to deliver low-cost heat and air.

If you've been thinking about installing a ground source heat pump (GSHP) to heat and cool your home, congratulations! There is no other system that is more efficient; a heat pump can give you up to four times more energy than you pay for.

However, time is running out to claim a substantial government tax credit. December 31, 2016 is the deadline to receive a 30% tax credit for installation of an Energy Star certified GSHP. While the tax credit may be extended, there is currently no indication to that effect. If you've been thinking that this is the way to go, we recommend that you take the steps necessary to make that happen and take advantage of the tax credit.

Why a GSHP?

Ground source heat pumps (also called geothermal systems) are an extremely energy and cost-efficient way to both heat and cool a home. The reason behind this is that geothermal systems draw existing heat energy from the ground, instead of having to use energy to produce it.

Ground that lies several feet below the surface maintains a very stable temperature (about 55 degrees) throughout the year. By placing pipes in the ground (either horizontally or vertically), the geothermal unit circulates liquid through the pipes to pull available heat from the ground and distribute it into the home. During the summer the system is reversed. Heat from the home is pulled from the air and desposited by the same pipes into the ground.

Why aren't they used more often?

In many European countries, geothermal systems are the standard. This technology has been around for decades. In the U.S., people are sometimes put off by the up-front cost of a geothermal system which usually run $10,000 to $15,000 depending on the size of the home. While other heating systems may cost less in the beginning, the geothermal system makes up for its expense in the monthly energy bill. Because the geothermal system frugally uses existing energy, it also requires much less energy to run. While it's difficult to predict the payback of a system due to differences in size and price, climate, electricity rates, how the home is used, etc., a substantial amount of money can be saved each and every month.

For example, a member on our lines installed a GSHP system half-way through the year in 2014. The previous year, the family used 2,299 kilowatt hours of electricity. In 2015, which represents the first full year of operation, they used only 1,505 kilowatt hours, which translates into a savings of 35 percent. Depending on how much energy you use each year to heat and cool your home, you could see paybacks more quickly than you think.

This is a forced-air unit. However, GSHPs can also be used to provide radiant water heat, either baseboard or underfloor.

Find a Qualified Installer

Do some research when choosing a contractor to install a GSHP system. It's important to size a system to your needs to avoid greater cost and inefficient operation. Contractors that have gone through Qualified Installation training are experts at sizing systems for each home. Contact the Co-op or go to the website for a list of contractors that have received the training.

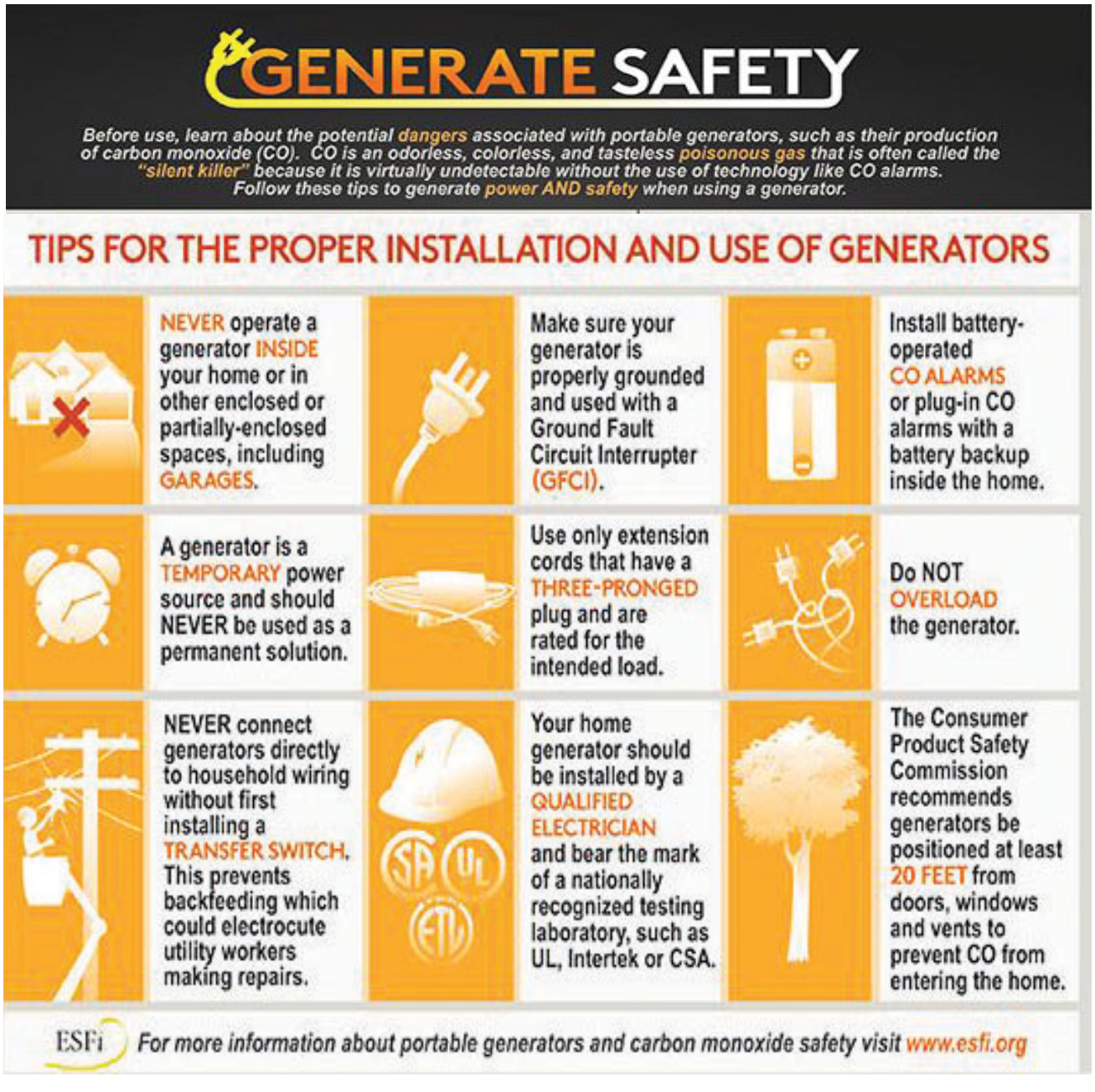
How to apply for the tax credit

In order to qualify for the tax credit, the system must be installed in a home you own and use as a residence (no rentals, but second homes qualify) before December 31, 2016. Existing homes and new construction qualify.

The system also must meet the requirements of the ENERGY STAR program which are in effect at the time that the expenditure for the equipment is made.

When you file your next tax return, it must include Tax Form 5695 in order to receive the credit.

If you're interested in exploring this option, the best first step is to contact the Co-op and speak with one of our Energy Experts. Their experience can be a valuable asset as you move forward to enjoying many years of exceptionally low-cost space conditioning.



Sizing your residential generator

It's never wise to exceed the wattage capacity of your generator. Doing so can damage the generator and/or any appliances plugged into the generator. Plan ahead to determine which appliances you plan to run with the generator, and then determine the wattage necessary to start and run each appliance. Your generator must be rated to handle the total starting and running wattage. The wattages shown below are examples only and your appliance wattages may differ. Check your appliance name plate for specific wattage needed. Then start your largest motor first, plugging in additional items one by one.

Appliance	Running Wattage	Startup (Surge) Wattage
Refrigerator/Freezer	700	2200
Furnace Fan	300 to 875 (dep. on hp)	500 to 2350 (dep. on hp)
Sump Pump	1050	2150
Central Air Conditioner	10,000	11,200
Lights (10 60-Watt Bulbs)	600	0
Keurig Coffee Maker	300	1500
625-Watt Microwave	625	800
50-in. LCD HDTV	300	0
Desktop Computer	600 to 800	0

Note: It is strongly recommended to upsize the generator from 20 percent to 125 percent for more stable voltage and to account for future appliance use. For farm and other commercial generators, speak with the appropriate equipment manufacturer for sizing guidance based on your individual requirements.

Industry News

Wildlife Thriving In Chernobyl Disaster Area

Reports show that thirty years after the "catastrophic explosion and fire at the Chernobyl nuclear plant in Pripyat, Ukraine, wildlife rules an area abandoned by residents after the release of radioactive material." According to a recent study "published in Frontiers in Ecology and the Environment, James Beasley, an assistant professor at the University of Georgia's Savannah River Ecology Laboratory, found radiation levels aren't affecting animal distribution in the Chernobyl Exclusion Zone." A 2015 "study of animal tracks found wildlife populations thriving in the contaminated zone" and it was recently reported that "nuclear contamination didn't necessarily damage the health of all people who refused to leave after the disaster."

~Greenwire

WSJournal: Like Europe, California's Cap-And-Trade Program Looks Doomed

The Wall Street Journal (5/30, Subscription Publication, 6.27M) editorializes that like the bursting of Europe's carbon cap-and-trade bubble, a similar program in California appears headed for failure after the California Air Resources Board (CARB) sold only two percent of the carbon emissions it put up for auction in May. The auction raised only $10 million of the $500 million CARB had projected would be available to spend on high-speed rail, housing, and electric-car subsidies. CARB has brushed the auction off, which, according to the Journal, signals that the state's climate officials don't appear to care about the suffering of businesses and consumers.

Great River Energy, Three Rivers Park District restore pollinator habitat

Bees will buzz and butterflies will flutter when the seeds planted by Prairie Restorations in two Three Rivers Park District parks — including Murphy-Hanrehan Park Reserve in Savage — along a Great River Energy transmission line begin to bloom. Great River Energy, Three Rivers Park District and Prairie Restorations came together to install a 0.6-acre prairie planting along a new 115-kV transmission line, the Elko New Market and Cleary Lakes project, near Savage.

"As both a cooperative and transmission owner, Great River Energy has a unique opportunity to serve in our local communities," Craig Poorker, Great River Energy's manager of land rights, said in a press release. "We do that through our environmental stewardship and our commitment to sustainability. Great River Energy has made numerous investments in pollinator projects, but this is the first time we've been able to leverage a private-public partnership with one of our transmission partners in planting pollinator friendly habitat."

Paul Kortebein, senior forestry and horticulture manager for Three Rivers Park District, said that although utility construction does disrupt the terrain, Great River Energy took additional steps to mitigate their potential impacts. "We applaud the effort of Great River Energy staff to minimize the impact and to reestablish native plants, such as using pollinator seed mix after their work was completed at Cleary Lake Regional Park and Murphy-Hanrehan Park Reserve," Kortebein said in a press release. Prairie Restorations, a native plant restoration company, planted a native grass mix, including big bluestem, Indian grass, prairie drop seed, and wildflower seed mix, which included black-eyed susan, goldenrod and purple prairie clover on May 17.

Some federal tax credits for energy get extended

Congress has extended income tax credits for both energy efficiency measures and renewables through 2016, and in the case of solar, all the way to 2021. Energy efficiency tax credits will expire the end of 2016. The 30% federal tax credits for wind, geothermal heat pumps, and fuel cells expire the end of 2016 also. Tax credits for solar systems has been extended through 2019 for solar electric and solar water heating. After 2019, there is a gradual decrease in credits for solar through 2021. Please check with your income tax preparer to determine if you qualify for all or a portion of any credits.

April Outage Summary

April had 38 outages affecting 1,389 consumers.

The largest outage affected 977 accounts on Sunday, April 3 just after noon. An outage on the transmission system caused the Hook Lake Sub Station northeast of Hutchinson to lose power. Members were without power for 51 minutes.

The second largest outage affected 198 members southwest of Winsted. Power went out about 8:40 a.m. on Saturday, April 2. Cause of outage was wind. Duration of outage was one hour and 14 minutes.

Most outages affect only one or two members. They are frequently caused by small animals, trees in the line, equipment failure, or motor vehicle/machinery accidents. Larger outages affecting hundreds of members at a time are usually caused by transmission outages, storms, equipment failure to substation equipment, or accidents. Restoration time on weekend and evening outages, when line crews are called out from home, usually take a little longer to get back on than outages when crews are already out working on the project.

MCPA News Ads — Free want ad service for members

Please limit your ad to nine words. Use the coupon printed here or available at McLeod Cooperative's front desk to submit your ad. Ads will be printed for one month only. Please submit a new ad if you want it published more than one month. Include your name and address, which will be used for identification purposes only. Ads must be received by June 28 to be included in the July issue.

Please run this ad in the next MCPA News

Name: _____

Address: _____

Telephone number: _____

Remember to limit your ad to nine words!

1_____ 2_____ 3_____

4_____ 5_____ 6_____

7_____ 8_____ 9_____

Please check ad category

___Giveaway
___For Rent
___For Sale
___Wanted

Clip and Send to: McLeod Cooperative Power, ATTN: Classified Ads
P.O. Box 70, Glencoe, MN 55336

These want ads are designed to help members buy items from or sell items to other members, or rent their property to members. They are not designed to advertise services or for-profit business pursuits. That is why we do not offer a services column and do not accept advertisements for commercial businesses.

Disclaimer – McLeod Cooperative Power Association (MCPA) assumes no liability for the content of, or reply to, any item posted. The party posting any advertisement assumes complete liability for the content of, and all replies to, any advertisement and for any claims against MCPA as a result thereof, and agrees to indemnify and hold MCPA harmless from all costs, expenses, liabilities and damages resulting from, or caused by, any advertisement or reply thereto.

For Sale - Miscellaneous

- Carrier room air conditioner $50. 320-328-4041
- 12 X 15 area rug $25. 320-328-4041
- Magic Chef white microwave $25. 320-395-2209
- Heavy duty, quality made indoor rocker, American made $50. 320-327-2521
- Entertainment center w/glass doors/shelves. Best offer. 952-955-1705
- Dog house for medium size dog $50. 320-779-0015
- Never been used charcoal grill. 320-587-6413 after 7 p.m.
- 2-line jet pump with foot valve. Jet body complete. 320-979-0513
- Wood dresser $25. 320-864-4972
- Sofa $25. 320-864-4972
- Hi-top table w/4 chairs $75. 320-864-4972
- Steel t-post and variety of wood post. 50¢/each
- LP fired boiler 97,000 Btu. One year old. $750/obo. 320-328-5587
- Garage Heater LP fired, unvented, 65,000 Btu. $125/obo. 320-328-5587
- Wood burning stoves, Northern Leader, Round Oak, and Franklin. 507-227-1749
- 84in Patio door vertical blinds, track Roman shade 43in X 27 1/2in. 952-353-2448
- Desk and sewing machine. 320-327-2962
- Portable patio fireplace, never used. Perfect for now! $25. 320-238-2331
- Battery powered wheel chair scooter with chargers. Works good. 320-583-1200
- Two country school desks. 320-864-3666
- Pop up camper, extra storage, heater, awning. Exc. cond. 507-326-5102

For Sale - Farm

- 3 bottom MM plow. 320-522-2167
- JD 800 swather for parts. 320-522-2167
- John Deere stacker and stack mover $2,500/each or B.O. 612-202-5207
- Round corn-crib 12ft — 18ft. 952-449-1008
- JD RM four row crop cultivator. 952-449-1008
- New Holland whirl-a-feed blower model 28. Excel. Condition. 507-327-1869
- Farmhand 810 feed master w/H806-A corn sheller. Always shedded. 507-380-8778

Giveaway

- Electric organ. 320-328-4041
- 25in Color console TV with remote. 320-328-4041

For Rent

- Hay field for rent. Cut your own hay. 320-238-0110

Wanted

- Maroon fiberglass topper. Fits 1995 Ford regular cab 8ft box. 320-587-7443
- Converter box to make old TV's work. 952.467-2103
- Two bottom plow on rubber. Prefer IH. 320-582-1758

Pump up summer fun without inflating your electric bill

There are more than 5 million in-ground pools installed across America and over 150,000 new pools are built annually. A key component of these pools is the pool pump, which re-circulates water through a filter to maintain water clarity and hygiene. All swimming pools have at least one recirculation pump, but many have multiple pumps. Many pool owners don't realize how much energy their pool pump may be wasting. Pool pump speed requirements vary based on the pool's operation status. Filtration, for example, only requires half the flow rate of running a pool cleaner. Conventional pool pumps, with only one speed, are set to run at the higher speed as required by the pool cleaner and waste energy during the filtration mode by running faster than necessary.

An ENERGY STAR certified, variable speed pool pump can operate at many different speeds and be programmed to match the pool operation requirements with its appropriate pump speed. The energy saved is considerable; reducing pump speed by one-half allows the pump to use just one-eighth as much energy. ENERGY STAR certified pool pumps will:

- Save you over a thousand dollars over their lifetime.
- Pay for themselves in less than 2 years.
- Run more quietly.
- Prolong the life of your pool's filtering system.

On average, an ENERGY STAR certified pool pump can save you over $300 per year. In warmer climates where pools are used year-round, savings can be significantly higher.

Rebates: McLeod Co-op Power members installing an ENERGY STAR-rated variable speed, multi-speed, or variable-flow pump for their residential swimming pool, may apply for a $200 rebate. Pump must have an Energy Factor greater than or equal to 3.8 for the most efficient speed. The most efficient speed is the speed with the highest Energy Factor for a given pump. Check online at http://www.energystar.gov to verify if the pump you plan on purchasing is ENERGY STAR rated.

Rebate program for 2016

Electric Storage Water Heating* $400

Electric Storage Space Heating** $50/kW

Air Source Heat Pump
- 14.5 SEER $480
- 15 SEER $580
- 16 SEER or higher $630

Ductless Air Source Heat Pump
- Delivered Fuels $300
- Primary Electric Heat $500

Ground Source Heat Pumps (controlled or uncontrolled) $400/ton

ECM (fan motor) $100

Recycling of Old Refrigerator or Freezer with documented proof of recycling $75

LED Yard Light $60

ENERGY STAR Swimming Pool
- Air source heat pump $400
- Variable speed pump $200

ENERGY STAR Dehumidifier ..... $ 25

*** Marathon or equivalent energy rated heater that is being installed on the Storage Program.**

**** ETS space heating rebate is exempt from $2,000 per member maximum rebate limit.**

There is a $2,000 maximum rebate per member per year. Only Storage Space Heating rebate is not included in the $2,000 cap. Rebates are always on a first come, first serve basis, so please turn in your paperwork promptly. Rebate forms are available for download from the Co-op's website. Air source heat pump rebate forms should be completed by installing contractor. Rebates for high efficiency heat pumps will continue to require installation by a "registered contractor" which has been designated as a quality installer and is listed on the hvacreducation.net web site. A list of all "registered" contractors in Minnesota is on our cooperative web site at www.mcleodcoop.com. There will be no rebates on central air conditioners in 2016. The Cooperative encourages any member replacing their air conditioner to upgrade to an ENERGY STAR rated air source heat pump.

Rebate forms must be received by December 20, 2016 to be eligible for rebate.

The Bongards Cow stands in front of the Bongards Cheese Factory. She reminds us that June is Dairy Month.

Here's a quick look at dairy by the numbers:

- Dairy farmers support rural communities in all 50 states and Puerto Rico.
- There are about 47,000 dairy farms in the United States, including about 8,000 in the Midwest Dairy's 10 states.
- About 97 percent of U.S. dairy farms are family owned and operated.
- There are approximately 25 million dairy cows in the United States. The average herd size is 196 cows.
- The value of all milk products sold from U.S. dairy farms is more than $40.2 billion.
- Dairy farms sustain rural America. Even under the nation's current economic challenges, dairy farmers and companies are a lifeline to more than 900,000 jobs in the United States.
- Milk is local. It takes about 48 hours for milk to travel from dairy farms to the store.

In Minnesota:

- In the state of Minnesota, there are 3,495 licensed dairy herds.
- The size of the dairy farming industry in Minnesota makes it the 8th largest milk-producing state in the United States.
- Milk production on Minnesota dairy farms yielded approximately 1,061 million gallons of milk in 2014.
- Minnesota dairy farms generate approximately$1.87 billion in milk sales annually.
- Dairy products are the 4th largest agricultural commodity in Minnesota.
- In Minnesota, the average dairy cow produces about 6.3 gallons of milk per day. That's more than 2,290 gallons of milk over the course of a typical year.
- Minnesota has 36 plants that process one or more dairy products.

YEAR TO DATE FINANCIALS

Through March 31	2016	2015
Operating Revenue	$ 5,083,272	$ 5,301,174
Cost of Purchased Power	$ 3,241,782	$ 3,357,367
Other Operating Expenses	$ 1,833,437	$ 1,610,060
Total Cost of Electric Service	$ 5,075,219	$ 4,967,427
Operating Margins	**$ 8,053**	**$ 333,747**
Non Operating Margins	$ 112,137	$ 98,823
Total Margins	**$ 120,190**	**$ 432,570**
kWh's Sold	46,929,281	51,334,518
Member Services Billed	6,639	6,601
Avg kWh Used, Residential/Month	1,351	1,790

Cooperatives measure Minnesota's solar potential

Southern solar installations outpace the north, while winter output stalls statewide

After almost two years of collecting output data and other information from the Maple Grove and 19 member cooperative arrays, Great River Energy's generation engineers have a better idea of what the Land of 10,000 Lakes is capable of in terms of solar energy production.

Great River Energy's 250-kilowatt (kW) research and demonstration array at its Maple Grove headquarters tests the performance of three types of panels, while the 19 arrays across Greater Minnesota have a generating capacity of 20 kW each and provide statewide distributed generation information. All of the projects are helping Great River Energy and its member cooperatives evaluate the impact of solar energy while providing up to 450,000 kilowatt-hours of renewable energy annually — equivalent to powering about 38 homes.

The most data has been collected from the Maple Grove array, since it was completed in May 2014. The member projects wrapped up just after the fall season in 2015 with arrays installed in cities as north as Lutsen and as south as Worthington.

Andy Bergrud, a senior engineering project manager at Great River Energy, notes that one of the main findings is that the Maple Grove array is representative of the average annual performance of the member sites.

"The statewide average is very similar to Maple Grove's output," Bergrud said. "As expected, the southern arrays perform slightly better than the northern arrays, but the difference in annual capacity factor from the Maple Grove site has only been about half a percent."

The Maple Grove array's annual capacity factor average is 13.6 percent, which falls in between the

Annual capacity factor comparisons

Month	Northern MN	Southern MN	Maple Grove
January	3.8%	6.5%	5.7%
February	6.1%	11.2%	10.8%
March	17.1%	17.0%	16.2%
April	18.8%	18.6%	18.6%
May	16.9%	16.6%	16.2%
June	20.2%	19.9%	19.2%
July	20.8%	21.5%	20.6%
August	17.0%	18.0%	17.4%
September	16.2%	16.4%	16.3%
October	12.2%	13.3%	12.7%
November	6.8%	8.6%	8.2%
December	2.3%	3.1%	2.8%
Annual	**13.2%**	**14.2%**	**13.6%**

250 kW array at GRE's Maple Grove headquarters

installations at Cooperative Light and Power (13.2 percent) in Two Harbors, and Goodhue County Cooperative Electric Association (14.2 percent) in Zumbrota. These percentages indicate how much energy output the panels produced, on average, compared to its full nameplate capacity throughout the year. McLeod's array in Glencoe came in at 13.3% percent annual capacity factor for its first 12 months of production.

Bergrud noted that the Maple Grove array saw a slightly better summer performances in its second year of operation, which may have been caused by less cloud cover in the sunnier months. The array saw 17 percent "ideal" days in 2015 — those days with sunshine and clear skies — versus 10 percent in 2014. Also in 2015 were less recorded "erratic" days — when clouds either don't clear out or cover the sun on and off throughout the day. That percentage went down from 70 percent in the array's first year to 62 percent in year two.

"These figures still represent that our ideal days are a low minority of the time," Bergrud noted. "Knowing this information helps us from a grid management perspective in understanding how solar production tends to behave in our region."

The Maple Grove array's time-of-day generation percentages are also representative of the 19 member projects. In the summer months, solar production begins at about 6 a.m., exponentially increases throughout the morning and early afternoon (peaking at 13.75 percent at noon) then it tapers off during the early evening, with no production after 7 p.m.

Overall, Bergrud said, the average annual output for each of the arrays is slightly lower than the 15 percent capacity factor expectation they had going into the projects, but it represents "one of the realities of solar in Minnesota." One of the project team's biggest takeaways going into the third year of solar generation on the Great River

Solar arrays stop generating power before Co-op's peak demand hours

Solar Time of Day Generation

Hr Beginning	% of Annual Solar Generation
1 a.m.	0.00%
2 a.m.	0.00%
3 a.m.	0.00%
4 a.m.	0.00%
5 a.m.	0.02%
6 a.m.	0.31%
7 a.m.	1.69%
8 a.m.	4.52%
9 a.m.	8.14%
10 a.m.	11.14%
11 a.m.	12.83%
Noon	13.74%
1 p.m.	13.59%
2 p.m.	12.32%
3 p.m.	9.93%
4 p.m.	6.94%
5 p.m.	3.56%
6 p.m.	1.10%
7 p.m.	0.17%
8 p.m.	0.00%
9 p.m.	0.00%
10 p.m.	0.00%
11 p.m.	0.00%
Midnight	0.00%

Energy system is how much of an effect frequent, rapid power swings have on the output — again, due to Minnesota's tendency to have more cloudy days over pure sunny days. An understanding of the sudden shifts in power output caused by cloud interference is an important lesson learned for utilities to find ways to properly manage the grid as more solar and other renewable energy resources are interconnected to the electric system.

"We still see the value in incorporating energy storage for these projects to see if that gives us the ability to minimize the impacts from these power swings or use the energy that is produced from the array at a time that better coincides with our members "peak load," Bergrud said. "We will complete a storage project later this spring at our headquarters array, and it will be interesting to see what we learn about battery storage as a resource paired with solar."