



Northern Plains announces

SAFETY POSTER CONTEST

Annually, Northern Plains Electric Cooperative sponsors a safety poster contest for children in kindergarten through sixth grade. The purpose of the safety poster contest is to help make children aware of the dangers of electricity.

At Northern Plains Electric Cooperative, safety always

comes first, and we are dedicated to doing our part to teach children how to be safe around electricity.

Winners will be announced on our Facebook page and featured in the Northern Plains Electric Cooperative local pages of *North Dakota Living*. So, grab your art supplies and be creative!

CONTEST RULES

- Posters must be on white, 8.5x11-inch paper.
- Posters must depict the theme: *"How to stay safe around electricity."*
- Print the child's name, school grade, address and parents' names on the back of the poster.
- Child must be a dependent of a current Northern Plains Electric Cooperative member.

Submit entries to a Northern Plains Electric Cooperative office (Cando or Carrington) or mail to:

Northern Plains Electric Cooperative
Attn: Brittnee Wilson
P.O. Box 608
Cando, ND 58324

Deadline is March 15.

Entry categories

- Kindergarten-first grade
- Second-third grade
- Fourth-sixth grade

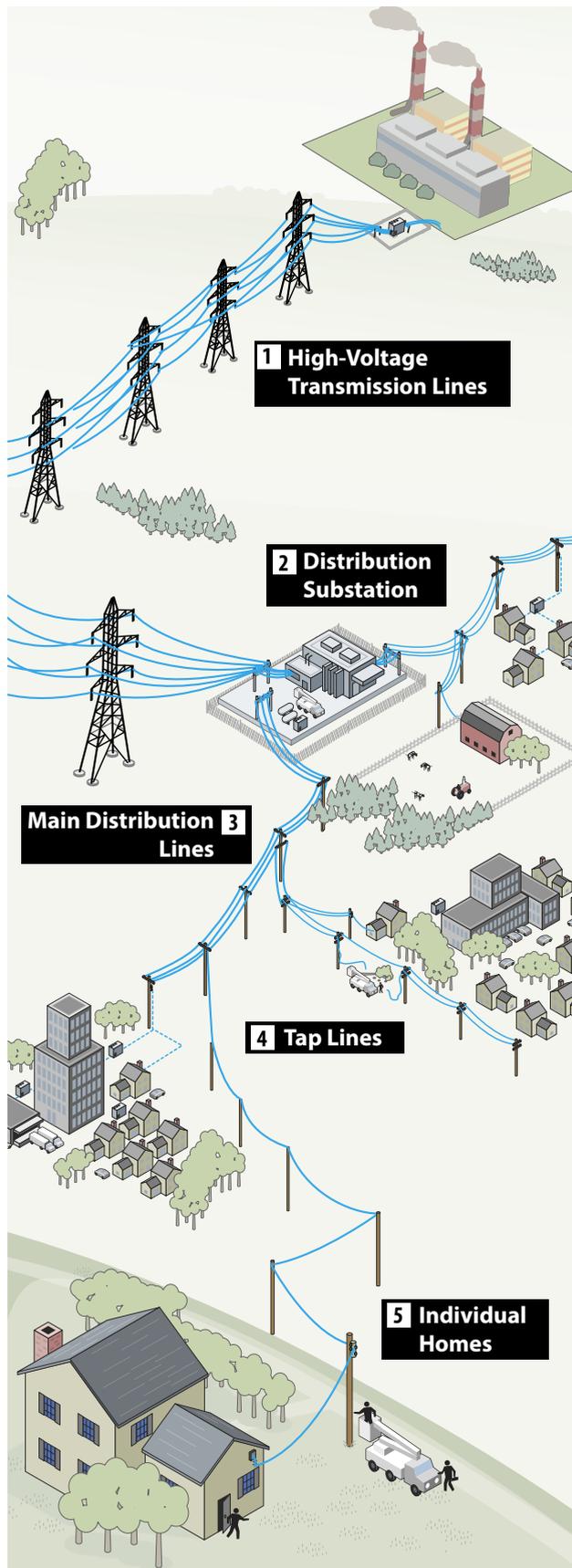
Prizes in each category

- First prize: \$20
- Second prize: \$15
- Third prize: \$10

FEBRUARY 2022

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Understanding the grid

For your lights to turn on, it takes a great deal of effort from a lot of people. Electricity needs to be generated, then transmitted to your home or business. That process takes place on the electrical grid, a web of interconnected transmission and distribution lines that connect supply to demand.

Unless you have a form of distributed generation, such as solar panels, on your property, the electricity you are using at your home or business comes from a power plant located far from your home. The transmission and distribution system connects these power plants to the areas where electricity is ultimately used.

Until the lights go out, one doesn't think about the complex grid of connections that brings power to your home. Then, most of us expect power to be restored within a few hours. But when a major storm causes widespread damage, longer outages may result. Co-op line crews work long, hard hours to restore service safely to the greatest number of consumers in the shortest time possible. Here's what's going on if you find yourself in the dark:

1. High-voltage transmission lines, transmission towers and cables that supply power to transmission substations (and thousands of members) rarely fail. But when damaged, these facilities must be repaired before other parts of the system can operate. Most of Northern Plains Electric Cooperative's (NPEC) transmission lines are owned and maintained by Central Power Electric Cooperative. If these would happen to fail, outage times could be extended.
2. All of NPEC's 42 substations are owned by Central Power Electric Cooperative and each substation serves hundreds of consumers. When a major outage occurs, NPEC line crews inspect substations to determine if problems stem from transmission lines feeding into the substation, from the substation itself or if problems exist downline on the distribution. If the problem, such as equipment failure, occurs within the substation itself, Central Power would be dispatched to repair the equipment. In conjunction, NPEC line crews may isolate the substation and will

backfeed power from an adjacent substation to restore the outage.

3. If the problem cannot be isolated at a distribution substation, NPEC's main distribution lines are checked. These main lines carry power from the substation to tap lines that branch to communities and farmsteads. They are usually larger-capacity cables that span long distances and can be used to pick up adjacent substation. Outages on the distribution lines can usually be isolated and re-fed from an adjacent substation so only a small number of members remain without power.
4. If local outages persist, supply lines, called tap lines, are inspected. These lines branch off the main distribution lines and deliver power to communities, homes and farmsteads. The lines end at the transformers, either mounted on poles or placed on pads. These outages affect only the small number of members on the tap line itself. The downside is these lines cannot normally be back fed to isolate the fault. This results in extended outage times, depending on the equipment that was damaged.
5. If your home remains without power, the service line between a transformer and your residence may need to be repaired. Always call to report an outage to help line crews isolate local issues. If the failure was found to be downline of the main meter, you may need an electrician to find and fix the issue.

U.S. power grid

Unlike water or gas, electricity cannot be stored in large quantities. It must be generated the instant it is used. Generation and transmission operations in North America must be monitored and controlled in real time, 24 hours a day, to ensure a reliable and continuous supply of electricity to homes and businesses. This requires the cooperation and coordination of hundreds of electric industry participants.

The U.S. electric system is made up of interconnections and balancing authorities. The interconnections are broken down into more manageable areas that coordinate, control and monitor the system, called regional transmission organizations (RTO). Two RTOs operate in NPEC's service territory, Southwest Power Pool (SPP) and Midcontinent Independent System Operator (MISO). These RTOs are tasked to manage generation and transmission throughout their footprint to ensure the electric grid

remains stable. These organizations do not own any power, but are more like "traffic controllers" to ensure demand and supply are finely balanced.

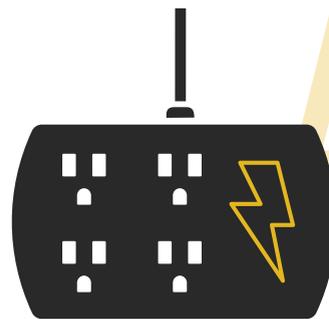
Also working in NPEC's service area is Western Area Power Administration (WAPA), which acts as one of the transmission operators in the Upper Midwest. WAPA is a federal agency that generates and transmits hydroelectric power and acts as the grid operator to control the bulk transmission infrastructure in our area.

Working with providers across a large region is just one way that Central Power Electric Cooperative and NPEC ensure there is always enough energy supply to meet demand. It is a complex system, with the ultimate goal of providing safe and reliable electricity to you, our members.

Next time you turn on your lights or plug in your phone, think about all the people who had a hand in bringing power to your home, all to make sure your life is always "on." ■

SURGE PROTECTION

Keep your electronic equipment safe.



A power surge is typically caused by lightning, changes in electrical loads, faulty wiring or damaged power lines.

Install power strips with surge protection to protect sensitive equipment.

- Easy to use (just plug them in)
- Protect electronics plugged into the device
- Must be replaced over time or after a major surge event

REMEMBER:

Not all power strips offer surge protection. Carefully read the packaging labels when purchasing.

What is a kilowatt-hour?

Whether it's via an app or on paper, the most apparent part of your electric bill is that bottom line – how much your electricity costs. Your electricity is billed at a rate per kilowatt-hour

(kWh), and managing how much electricity you use is tied to that measurement. If you want to better manage your electric bill, it helps to know what kWh means.

What is a kWh?

A kWh is an amount of electricity used during one hour. One kWh is equal to the power consumption of 1,000 watts, or 1 kilowatt, for one hour.

For example, a 100-watt light bulb used for 10 hours is equivalent to one kWh.

One watt is a small amount of power. Some devices require only a few watts to operate, while other devices require larger amounts. An appliance's label will state how many watts it uses.

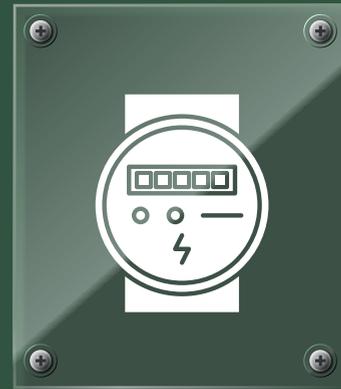
THE DIFFERENCE BETWEEN

KILOWATT



Power required for the appliance to work

KILOWATT-HOUR



Energy used each hour the appliance is on

HOW MUCH ELECTRICITY DOES AN AMERICAN HOME USE?

In 2020, the average annual electricity consumption for a U.S. residential utility customer was

10,715 kWh

or an average of about

893 kWh

per month.

WHAT CAN I DO WITH 1 KWH?

(based on U.S. average electric rates)

89 slices of bread toasted

12 pots of coffee brewed

276 charges for your cellphone

18 hours of refrigerator use

3 loads in the washer

20 hours on your laptop



NPEC members 'round up' \$37,800 in grants

At its December meeting, the Northern Plains Electric Cooperative (NPEC) Operation Round Up board of directors approved grants totaling \$9,800 to help support worthy causes, totaling \$37,800 for the year.

The board meets quarterly to disburse funds to help NPEC members with medical expenses and for area nonprofit organizations. Participating NPEC members voluntarily round up their electric bill to the next whole dollar. The donation averages 50 cents a month and raises about \$37,000 each year. Since the program's beginning in October 1998, grants totaling \$864,966.37 have been awarded to 1,205 local charitable causes.

Grants approved in December include:

- Towner County Historical Society, railroad depot restoration project
- SMP Health-Ave Maria, Jamestown, oxygen concentrators

- Dee DeArton, Cando, medical expenses
- Janelle Carnahan, Rock Lake, home fire expenses
- Esmond Rural Fire Department, brush truck
- Leeds Community, Hungry Free-New Rockford, Carrington Daily Bread, The Bread of Life-Cooperstown, Kidder County, Pierce County, Mt. Pleasant School-Rolla, Community Action-Jamestown, Cando Area, Wells County, The Hope Center-Devils Lake, backpack programs/food banks.

If you would like additional information about this worthy program, please contact Northern Plains Electric Cooperative by calling 800-882-2500, or you may obtain guidelines or download applications at www.nplains.com. The board will meet again in March to review applications. Application deadline is Feb. 20. ■

Leapaldt takes Wagner's seat on Operation Round Up board



Wagner



Leapaldt

Congratulations to Deb Leapaldt, Woodworth, for being elected to the Operation Round Up board. Leapaldt replaces Cara Wagner of Pettibone, who reached her term limit on the board after having served for six years. Northern Plains Electric Cooperative thanks Wagner for her dedication on the board and welcomes Leapaldt.

The Operation Round Up board is comprised of five Northern Plains members who live across the service area. Leapaldt joins Julie McDougall, Rolla; Joan Copenhaver, Carrington; Robin Arnold, Esmond; and Angie Freund, Cando. ■

2021 solar project data

In May 2015, Northern Plains Electric Cooperative (NPEC) and Dakota Valley Electric Cooperative jointly installed a 16-panel solar system at our Carrington office. The 6.56-kilowatt system is used primarily as a research project. The co-op’s goal is to learn how much the system will cost to maintain, how reliable it is and what sort of return members would see on their investment.

With this information, NPEC can help provide unbiased information to members considering installing a system of their own. Data is collected and provided to our members through *North Dakota Living* biannually, and one can view the project’s solar generation in-real time on our website.

System recap

The research solar system is comprised of 16 panels, in an array of four panels wide and four panels deep. Overall, it takes up an area of about 25 feet wide by 25 feet long. Its output is rated at 6.56 kilowatts and produces about 8,500 kilowatt-hours per year.

Cost

Together, the two cooperatives invested approximately \$29,000 in the research solar system. However, \$10,000 in grants was received from U.S. Department of Agriculture Rural Development and N.D. Department of Commerce, bringing the net cost down to \$19,000.

How much electricity is generated?

Since it was installed, the solar system has produced an average of 8,500 kilowatt-hours (kWh) per year, for an average savings of about \$950 per year. Of course, the output varies from month to month, with the total energy generation mostly depending on sunny days. Lower numbers have been attributed to equipment failure, broken reflector panels and cloudy days.

In 2021, the highest output was 1,063 kWh in June, and the least was an output of 231 kWh in January. This trend is unfortunate, as winter is usually the time when electrical use is the highest and is needed the most. The total output for 2021 was 8694 kilowatts, a savings of \$957. This year-end number is lower than the previous year and can be attributed to more cloudy days.

Maintenance

Basic maintenance took place in 2021, including basic cleaning of dust, leaves and snow and the resetting of inverters when they trip. Since the beginning, the only major maintenance took place in 2018 when high winds bent the aluminum supports, causing four reflector panels to fall out and break. Cost of materials to repair these damages was \$373, plus labor to reinstall the parts.

Return on investment

Our geographical location is our biggest downfall when it comes to solar. Limited access to the sun

Total Energy Generated [kWh]

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	\$ Saved
2021	231	590	853	885	997	1063	1036	923	866	607	378	265	8694	\$957.00
2020	321	678	868	947	1019	1048	1188	1012	818	601	445	329	9273	\$1,020.00
2019	303	190	879	814	958	942	1138	978	710	474	250	190	7825	\$861.00
2018	398	593	765	1113	1015	1051	1142	1004	757	584	266	257	8945	\$984.00
2017	276	538	723	759	905	1016	1208	1011	760	721	426	332	8675	\$954.00
2016	325	484	831	821	975	1104	991	1042	730	536	440	248	8527	\$938.00
2015	0	0	0	0	530	961	1065	1019	861	607	413	232	5689	\$626.00

during a good portion of the year can limit the solar panel's output. NPEC is looking at a 20-year return on its \$19,000 16-panel system. Without the \$10,000 in grants received, the payback period would extend to a 30-year return. Any repairs to the system would extend the payback period. The cost of solar panels, however, has declined by about one-third since 2015. There is some uncertainty right now if the federal government could further incentivize the use of solar generation. If that occurs in the future, it may change the economics for solar.

Taking the first step

Before NPEC members install any solar or wind generation system, they are required to follow these steps first:

- 1) Contact NPEC for information regarding the cooperative's policies for interconnection before you make the decision to proceed with anything.
- 2) Complete our application for interconnection generation systems form and return it to us with the fee. NPEC needs to review and approve the equipment that our members are considering to install BEFORE they purchase anything.

Solar Payback Period

Numbers based on Northern Plains Electric Cooperative's 16-panel, 6.56 kWh solar system located at the Carrington headquarters, purchased in 2015.



For more information, visit www.nplains.com, click on the "solar" tab on the homepage or call us at 800-882-2500. ■



KEEP SNOW CLEAR!

REMEMBER:
Electrical equipment may be near

Plow it safe

This winter, take special care when plowing near power equipment and power lines. Take note of the locations of electrical cabinets, poles and guy wires before the snow gets too deep. It may be a good idea to stake areas with tall markers.

Report damage immediately. Call Northern Plains Electric at 800-882-2500 if your equipment strikes a transformer, cabinet, power pole, streetlight, overhead line or a guy wire.

If there is dangerous situation, call 911 first. ■



Prepare for tax season with SmartHub!

Did you know you can print copies of your monthly utility bills for your tax records by logging into SmartHub? Visit www.nplains.com or download the free application to your mobile device and proceed to your billing history. ■

CANDO OFFICE:
609 4th Ave.
Cando, ND 58324

CARRINGTON OFFICE:
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Carrington, ND 58421

OFFICE HOURS:
Monday-Friday
8 a.m. to 4:30 p.m.

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800-882-2500

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