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Cooperative Connections

MAY 2016 VOL. 68 NO. 5

Energy Rx

Wall Drug Looks for Prescription for Savings

P8-9


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South Dakota Electric Cooperative Connections

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Editorial

Focusing on Electrical Safety in the Month of May

Ed Anderson
General Manager, South Dakota Rural Electric Association

May is National Electrical Safety Month, and electric cooperatives throughout the country join with the Electrical Safety Foundation International (ESFI) to raise awareness about potential home electrical hazards and the importance of electrical safety. This year's campaign features the launch of the third edition of its National Electrical Safety Month publication, *Electrical Safety Illustrated*. The issue is titled "At Home and at Work, Make Electrical Safety Everyone's Responsibility" and informs readers about a number of topics that address workplace safety along with home safety

The National Fire Protection Association (NFPA) estimates 47,700 home structure fires reported to U.S. fire departments each year involve some type of electrical failure or malfunction as a factor contributing to ignition. These fires result in 418 civilian deaths, 1,570 civilian injuries, and $1.4 billion in direct property damage. Awareness and education are critical to reduce the incidence of electrical fires, and ESFI sponsors National Electrical Safety Month each May to educate the public in order to reduce the number of related fires, fatalities, injuries and property loss.

National Electrical Safety Month is held each May to educate the public in order to reduce the number of electrically related fires, fatalities, injuries and property loss.

Cooperatives are dedicated to the safety of their employees, their members and the general public. Maintaining safety around electricity is at the forefront of what cooperatives do. Cooperatives provide training and education opportunities to employees and their communities throughout the year.

Raising awareness of electrical safety practices benefits all of us. Whether you want to educate a loved one or raise awareness in your community, school, or workplace, this guide provides step-by-step instructions on how to be an Electrical Safety Advocate and help champion ESFI's cause of minimizing electrically-related deaths and injuries.

Electrical safety awareness and education among consumers, families, employees, and communities will prevent electrical fires, injuries, and fatalities. For ESFI's complete collection of National Electrical Safety Month resources, and for more information on spring safety, visit www.esfi.org.

D.I.Y. Electrical Safety

Each year, thousands of people in the United States are critically injured and electrocuted as a result of electrical fires, accidents or electrocution in their own homes.

The current economic downturn has inspired more homeowners to tackle do-it-yourself projects than ever before. Faced with declining home values and aging properties, homeowners may choose not to pay for the services of a licensed electrician. However, most do not have the training or experience needed to safely perform home electrical work, increasing the risk of immediate injuries and electrocutions and potentially introducing new dangers into the home. Working with electricity requires thorough planning and extreme care and cutting corners can be a costly mistake.

D.I.Y. Facts and Statistics

• There are an estimated average of 70 electrocution fatalities associated with consumer products per year.

• The most recent data from the U.S. Consumer Product Safety Commission shows that there are nearly 400 electrocutions in the United States each year.

• Approximately 15 percent of electrocutions are related to consumer products. Wiring hazards, including damaged or exposed wiring and household wiring, accounted for nearly 14 percent of these deaths.

• An estimated 360,900 residential building fires are reported to United States fire departments each year and caused an estimated 2,495 deaths, 13,250 injuries and $7 billion in property losses. The leading cause of the largest fires was electrical malfunction.

• There are about 37,000 nail-gun injuries each year; a 200 percent increase since 1991.

• Electrical failure accounted for 89 percent of electrical fires in residential buildings from 2003-2005.

D.I.Y. Safety Tips

ESFI strongly recommends hiring a qualified, licensed electrician to perform any electrical work in your home. However, if you do decide to do-it-yourself, consider the following safety tips before undertaking any home electrical project:

• Make an effort to learn about your home electrical system so that you can safely navigate and maintain it.

• Never attempt a project that is beyond your skill level. Knowing when to call a professional may help prevent electrical fires, injuries and fatalities.

• Always turn off the power to the circuit that you plan to work on by switching off the circuit breaker in the main service panel.

• Be sure to unplug any appliance before working on it.

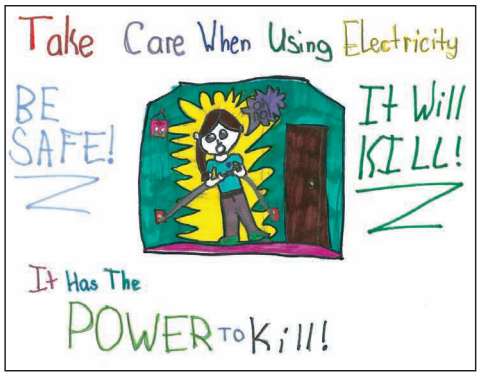
• Test the wires before you touch them to make sure that the power has been turned off.

• Never touch plumbing or gas pipes when performing a do-it-yourself electrical project.

Source: esfi.org

Kids' Corner Safety Poster

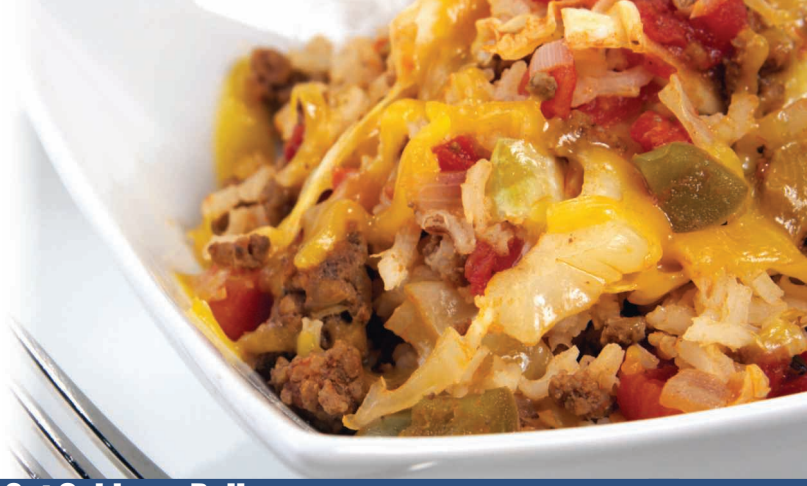
"Take care when using electricity – it has the power to kill!"



Evelyn Fritz, 10 years old
Evelyn is the daughter of Jamie and Kristi Fritz, New Effington, S.D. They are members of Traverse Electric, Wheaton, Minn.

Kids, send your drawing with an electrical safety tip to your local electric cooperative (address found on Page 3). If your poster is published, you'll receive a prize. All entries must include your name, age, mailing address and the names of your parents. Colored drawings are encouraged.

Comforting Casseroles



Mexican Spoon Bread Casserole

1-1/2 lbs. ground beef
1 large onion, chopped
1/4 c. chopped green pepper
1 clove garlic, minced
1 cup tomato sauce
1 can corn, undrained
1-1/2 tsp. salt
2 to 3 tsp. chili powder
1/2 c. sliced ripe olives
Cornbread Topping:
1-1/2 cups milk
1 cup cornmeal
1/2 tsp. salt
3/4 cup shredded Cheddar cheese
2 eggs, beaten

Brown first 4 ingredients in a large skillet until onion is tender; drain. Stir in tomato sauce, corn, salt, chili powder and olives; heat to boiling. Reduce heat and simmer uncovered while preparing cornbread topping. For topping: Mix milk, cornmeal and salt in saucepan. Cook and stir over medium heat until mixture boils. Remove from heat and stir in Cheddar cheese and beaten eggs. Turn hot meat mixture into 2-1/2-quart dish and pour cornbread mixture on top. Bake uncovered at 375°F. for about 40 minutes.

Carolyn K. Wickert, Baltic

Chicken Crescent Almondine Hot Dish

3 cups cooked and cubed chicken
1 can cream of chicken soup
1 (8 oz.) can sliced water chestnuts, drained
1 (4 oz.) can mushrooms, stems and pieces
2/3 cup Hellman's mayonnaise
1/2 cup chopped celery
1/2 cup chopped onion
1/2 cup sour cream
Topping:
1 (8 oz.) can crescent rolls
2/3 cup shredded Cheddar cheese
1/2 cup slivered almonds
3 T. melted butter

Combine the first 8 ingredients in saucepan. Cook until hot and bubbly; pour into ungreased 9x13-inch pan. Separate rolls into long rectangles and place over chicken mixture. Combine remaining ingredients and spread over dough. Bake at 350°F. for 20 to 25 minutes.

Nancy Noess, Mitchell

Chicken Noodle Hot Dish

1 can each chicken noodle, cream of chicken and cream of celery soups
1 lb. ground beef, browned
1 onion, chopped
1 T. soy sauce
2 cups water
1 cup uncooked rice

Combine all ingredients in baking dish. Bake at 350°F. for 1 hour.

Michele Hoffer, Brandon

Inside-Out Cabbage Rolls

1 lb. lean ground beef
1 large onion, chopped
1 large green pepper, chopped
1 small head cabbage chopped
1 cup reduced sodium beef broth
1 (10 oz.) can diced tomatoes and green chilies
1 (8 oz.) can pizza sauce
1 cup cooked brown rice
1/2 cup shredded reduced-fat Cheddar cheese

In a Dutch oven, cook beef, onion and green pepper over medium heat until meat is no longer pink; drain. Stir in the cabbage, broth, tomatoes and pizza sauce. Bring mixture to a boil. Reduce heat; cover and simmer for 20 to 25 minutes or until cabbage is tender; stirring occasionally. Stir in rice; heat through. Remove from heat. Sprinkle with cheese. Cover and let stand until cheese is melted. Makes 6 servings

Nutritional Facts Per Serving: Calories 140, Total Fat 7g, Cholesterol 10mg, Sodium 330mg, Carbohydrates 13g, Dietary Fiber 2g, Protein 7g (3.8g from dairy), Calcium 15% Daily Value

Pictured, Cooperative Connections

Turkey and Dressing Casserole

4 cups cubed cooked turkey or chicken
3 T. chicken broth
1 box stuffing mix, prepared
1 (4 oz.) can sliced mushrooms
1 (10 oz.) can cream of mushroom soup
1 (10 oz.) can golden mushroom soup

Place cubed meat in a greased 9x13-inch baking dish. Moisten with chicken broth. Top with prepared stuffing mix. Add canned mushrooms, if desired. Mix soups and spread over casserole. Cover with greased foil and bake at 350°F. for 45 to 60 minutes. Can be prepared and frozen; adjust baking time.

Charlotte Hoverstadt, Webster

Tuna Biscuit Casserole

1 can Cheddar cheese soup
1/2 soup can milk
1 can tuna, drained if using oil-packed
1 T. grated onion
1 T. parsley flakes, optional
1 pkg. or tube (10) refrigerated biscuits

Mix soup and milk until smooth. Add tuna and break in chunks, then add onion and parsley flakes. Heat just to boiling. Put biscuits in ungreased pan (9x9 or 11x2 inch.) Pour heated mixture over top of biscuits. Bake uncovered at 350°F. for 25 minutes or until biscuits pop up through the sauce and are well browned.

Elfrieda Postma, Sioux Falls

Please send your favorite dairy, dessert and salad recipes to your local electric cooperative (address found on Page 3). Each recipe printed will be entered into a drawing for a prize in June 2016. All entries must include your name, mailing address, telephone number and cooperative name.

Improve Comfort and Save Energy By Sealing Air Leaks

Patrick Keegan
Collaborative Efficiency

Dear Pat: I recently moved into a new home, and it feels drafty. I added weatherstripping to the doors and windows, but it doesn't seem to have solved the problem. Are there additional steps I can take to increase comfort? – Rob J.

Dear Rob: Sealing air leaks is one of the easiest and most cost-effective improvements you can make in your home. Weatherstripping doors and windows is a great first step and one that will likely pay for itself within a year. However, there are less obvious sources of air leakage that can cause significant discomfort in your home. The average home leaks about half of its air every hour through various cracks and gaps. These air leak openings add up to a two-foot-square hole in the average home – that's like having a window open all day, every day! Sealing your home can help keep heated and cooled air indoors, making your home more comfortable and reducing your energy bill.

While drafty windows and doors are obvious sources of air leakage, there are other places where air could be escaping and where moisture, pollen, dust and pests could be seeping in. For example, holes drilled into your walls, ceiling and attic for plumbing pipes and electrical lines can be a major source of air leakage. Outlet covers and recessed lights can also have small gaps where conditioned air can escape. Other sources could be leaks in air ducts in unheated spaces, fireplace chimneys and attic access hatches.

To find air leaks, you can start with a visual inspection, checking for gaps and cracks where air could escape. Walk around your home's exterior and closely examine where different building materials meet, such as around the foundation perimeter, around outdoor water faucets and where the siding and the chimney meet. Indoors, examine common sources of air leakage, including electrical and water service entrances, baseboards, door and window frames and attic hatches.

Though a visual inspection can often identify the most obvious areas for improvement, a blower door test can give you the most thorough accounting of air leaks in your home. A blower door test is commonly performed during an energy audit. During this test, a powerful fan is mounted in the frame of an exterior door, pulling air outside of the house and lowering the air pressure inside. Then, the higher pressure air from outside of the house comes in through any unsealed openings, which the energy auditor locates, often using a smoke pen. Check with your electric co-op to see if they offer home energy audits.

Once you have found the air leaks, the next step is to seal them up. The materials you need will depend on what gap is being sealed. Your co-op's energy advisor, an energy auditor or your local hardware store can help guide you to the right products:

- Doors and windows with gaps at the frame need weatherstripping.
- Small gaps, such as around outlets or between the baseboard and the floor, can be filled with caulk, a flexible material dispensed with a caulking gun.
- Large gaps and holes, such as around pipes, may need foam insulation, foil insulation, sheeting or a combination of materials.

Sealing air leaks is one of the easiest and most cost-effective improvements you can make in your home.

You may have heard that your home needs some amount of air leakage to stay properly ventilated – and this is true. A home that is too "tight" can have issues with too much interior moisture, as well as carbon monoxide risks if combustion appliances don't have adequate ventilation. It is especially important that you not plug up vents that bring in outside air to a gas or propane furnace or stove.

However, relying on uncontrolled air leaks instead of using mechanical ventilation is not a good idea. In cold, windy weather, your home will be drafty, but in warm, still weather, not enough air may come in, leaving you with moisture and air quality issues. An energy auditor can use a blower door test to ensure a healthy level of air infiltration for your home and, in the unlikely event that your home is too tight, recommend a good ventilation strategy.

This column was co-written by Pat Keegan and Amy Wheeless of Collaborative Efficiency. For more information on identifying and sealing air leaks, please visit: www.collaborativeefficiency.com/energytips or email Pat Keegan at energytips@collaborativeefficiency.com.

Future Linemen Awarded Scholarships

The South Dakota Rural Electric Line Superintendents Association awarded its annual scholarships at a presentation held at Mitchell Technical Institute in March.

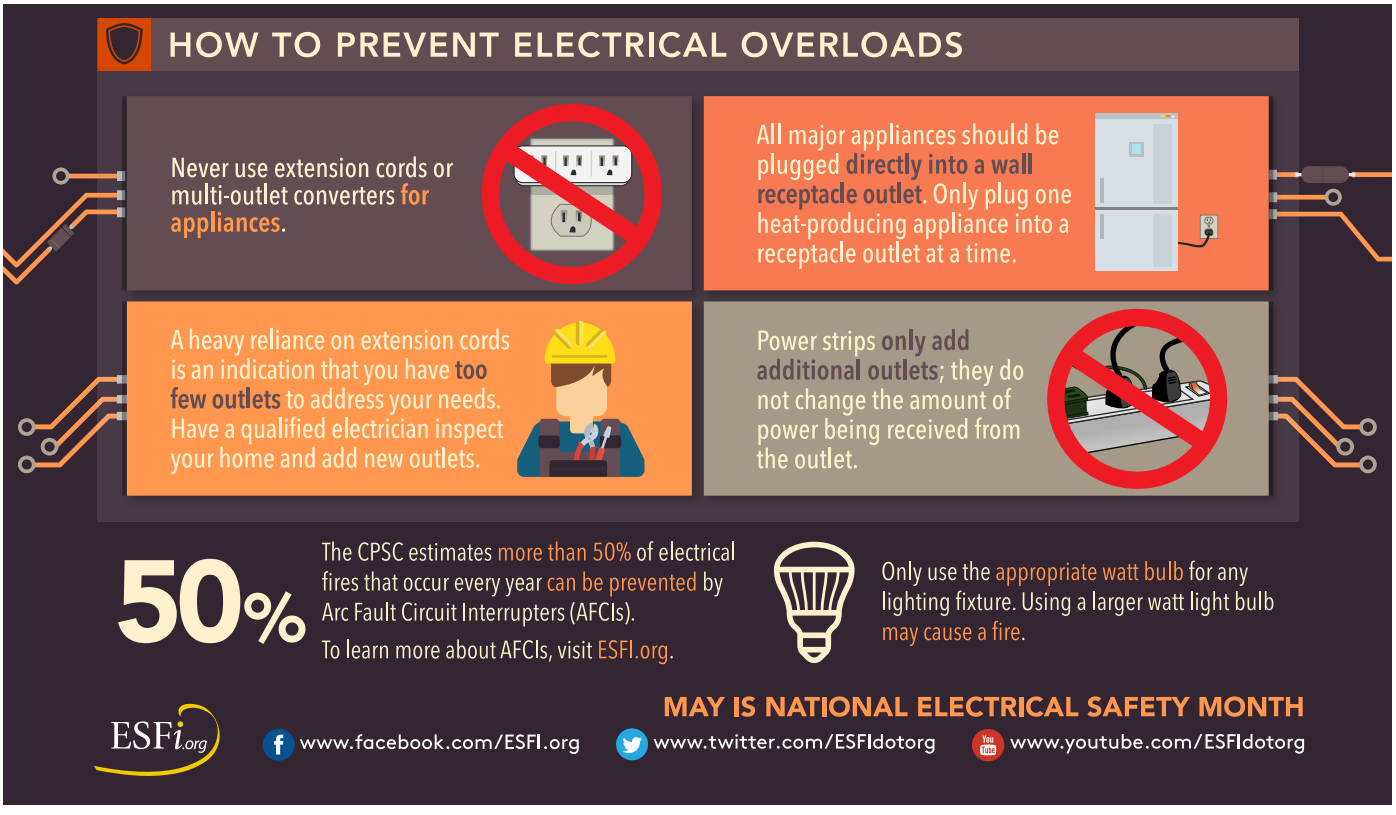
Eight recipients each received $500 each to apply toward school expenses: Bradley Huffman, Philip; Gunner Kieler, McCook Lake; Connor McGarry, Aberdeen; Brad Kari, Newell; Hayden Thiry, White Lake; Gunnar Hagstrom, Crocker; Kane LaPlante, Clark; Derek Bille, Watertown. The eight will graduate in May with diplomas in power line construction and maintenance.

In addition, the group awarded the $500 Mark and Kathy Hofer Scholarship to Brandon Warnke, Gregory; and the $500 Larry Brink Memorial Scholarship to Ryan Himley, Brookings.

Brandon Warnke

Ryan Himley

Members of the South Dakota Rural Electric Line Superintendents Association are pictured with Mitchell Technical Institute students who received scholarships from the group. Pictured are (front row, left to right): Lynn Kruse, Dakota Energy Cooperative, Huron; Mark DeFea, Whetstone Valley Electric Cooperative, Milbank; and Bill Brisk, Black Hills Electric Cooperative, Custer. Middle row, left to right: Randy Borer, Cherry-Todd Electric Cooperative, Mission; Bradley Huffman, Philip; Gunner Kieler, McCook Lake; Connor McGarry, Aberdeen; Brad Kari, Newell; and Dave Zaug, Codington-Clark Electric Cooperative, Watertown. Back row, left to right: Hayden Thiry, White Lake; Rob Vetch, FEM Electric Association, Ipswich; Gunnar Hagstrom, Crocker; Kane LaPlante, Clark; Derek Bille, Watertown; and Mike Kelly, Northern Electric Cooperative, Bath.



A Prescription for Energy Savings

Wall Drug Turns to Co-ops for Tips to Save

By Brenda Kleinjan

When Rick Hustead, Chairman of the Wall Drug Store in Wall, S.D., wanted to look at ways to cut the tourist destination's energy bill, he knew just who to call: his local Touchstone Energy® Cooperative, West River Electric Association in Wall.

Wall Drug has historically been one of WREA's largest using members, and easily the largest user in the eastern half of the co-op's territory which extends from Rapid City to the Badlands and north into southern Meade County.

"We're thrilled in Wall, S.D., to have WREA here, to have a major power company headquartered in a town of 800 is a big thing. When we have questions about our consumption and bill, we know who we're talking to," said Hustead.

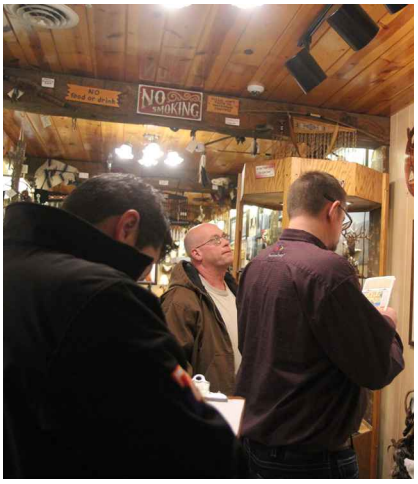
The Hustead family started The Wall Drug Store in 1931 as a simple pharmacy by Ted and Dorothy Hustead, Rick's grandparents.

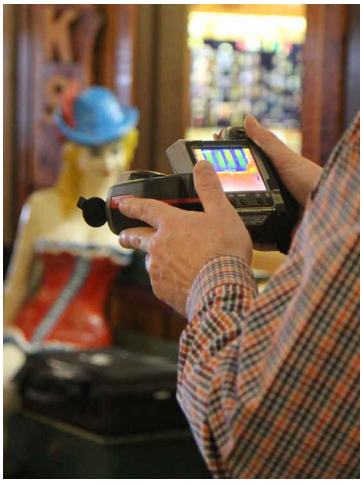
"They were slowly going broke in the Depression. There was a constant drone of tourist cars going West on US16, which was a packed dirt road. Dorothy thought how hot and dusty travelers were," Rick explained.

The Husteads began advertising free ice water and once they could get the customers to stop then they could tempt them with purchasing items in the store and at the old fashioned soda fountain. The plan worked.

The attraction, which Hustead notes is America's No. 1 roadside attraction, which has grown from a single, 24 foot by 50 foot storefront pharmacy to encompass more than a square block, welcoming visitors from across the world to the prairie town year round. The store occupies 78,000 square feet on the street level. Storage areas extend below the store and above on a second story not open to the public.

And as a business owner, Hustead looks for ways to make the operation run more efficiently while still





Left: West River Electric Association's Robert Raker, Willy Nohr and Adam Daigle inventory the more than 5,400 light bulbs used at Wall Drug. Right: Under the watchful gaze of one of the denizens of The Wall Drug Mall pedestrian area, Basin Electric Power Cooperative's Chad Reisenauer uses an infrared camera to look for energy leaks. Opposite Page: WREA's Veronica Kusser and BEPC's Reisenauer review the steps for the energy audit with Rick Hustead, Chairman of The Wall Drug Store. Cover: Using a meter, Reisenauer measures the lumens emitted from one of the 3,100 light fixtures at Wall Drug.

giving their guests the best experience possible. (By one estimate, more than two million people will visit Wall Drug each year.)

"We want to be continually improving," said Hustead. "In visiting with Veronica (Kusser) at WREA about our bill, I asked if we could have an energy audit, thinking there must be things we can do to improve our usage and consumption. We had started doing what we could to switch to LED lighting."

Kusser and her co-workers enlisted the assistance of Chad Resienauer, a certified energy manager at Basin Electric Power Cooperative, in Bismarck, N.D. The group spent a day inventorying and assessing Wall Drug's energy usage.

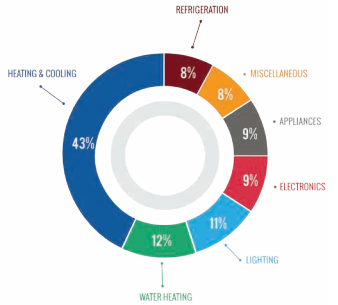
One thing that was immediately apparent was that Wall Drug has a lot of lights. A lot of lights. More than 5,400 bulbs housed in 3,100 fixtures throughout all levels of the business. Combined, the six different types of bulbs used – if turned on all at once – would account for more than 125 kilowatts of load. So, Hustead's steps to convert to LED lighting were certainly a good start.

Reisenauer's recommendations included continuing to convert the lights to more efficient bulbs, examining the amount of lumens of light needed for different tasks and sizing the lighting appropriately (in some instances, spaces may be over lit and fixtures can be removed, in other areas more lights may be needed.)

While Resinaer's recommendation are unique to Wall Drug, the basic concepts apply to most all homes and businesses: look for the things that use the most energy and see how they can become more efficient. For appliances, make sure that gaskets are tight and filters are clean and consider upgrading the appliance to an EnergyStar® model. Often times, the energy saved can cover the costs of the upgrade in a short timeframe.

HOME ENERGY USE

WHERE DOES YOUR ENERGY GO?



Home energy use is different for everyone and hinges on several factors, including size of home, members in your household, your location and preferences. Knowing how your energy is divided will help you prioritize your energy saving habits.

Source: U.S. Energy Information Administration www.EIA.gov

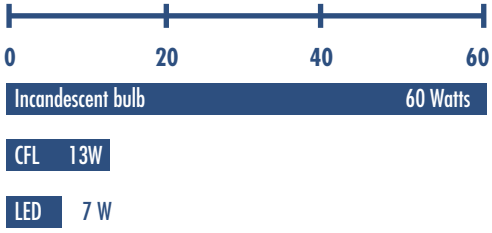
Shining a Light on Energy Savings

Traditional lighting can amount to 11 percent of your monthly energy use. Energy saving light bulbs can slice lighting costs by 75 percent.

- Replace outdoor lighting with its equivalant outdoor-rated LED bulb. LEDs work well in cold weather.
- Use fixtures with electronic ballasts and T-8, 32 Watt fluorescent lamps.
- Use outdoor security lights with a photocell and/or a motion sensor.
- Turn off unnecessary lighting.

A lumen is a unit used for the measurement of visible light. A traditional 60 Watt light bulb produces 800 lumens. See the chart below to see how many Watts other bulbs use to produce the same amount of light.

WATT USAGE 800 LUMENS



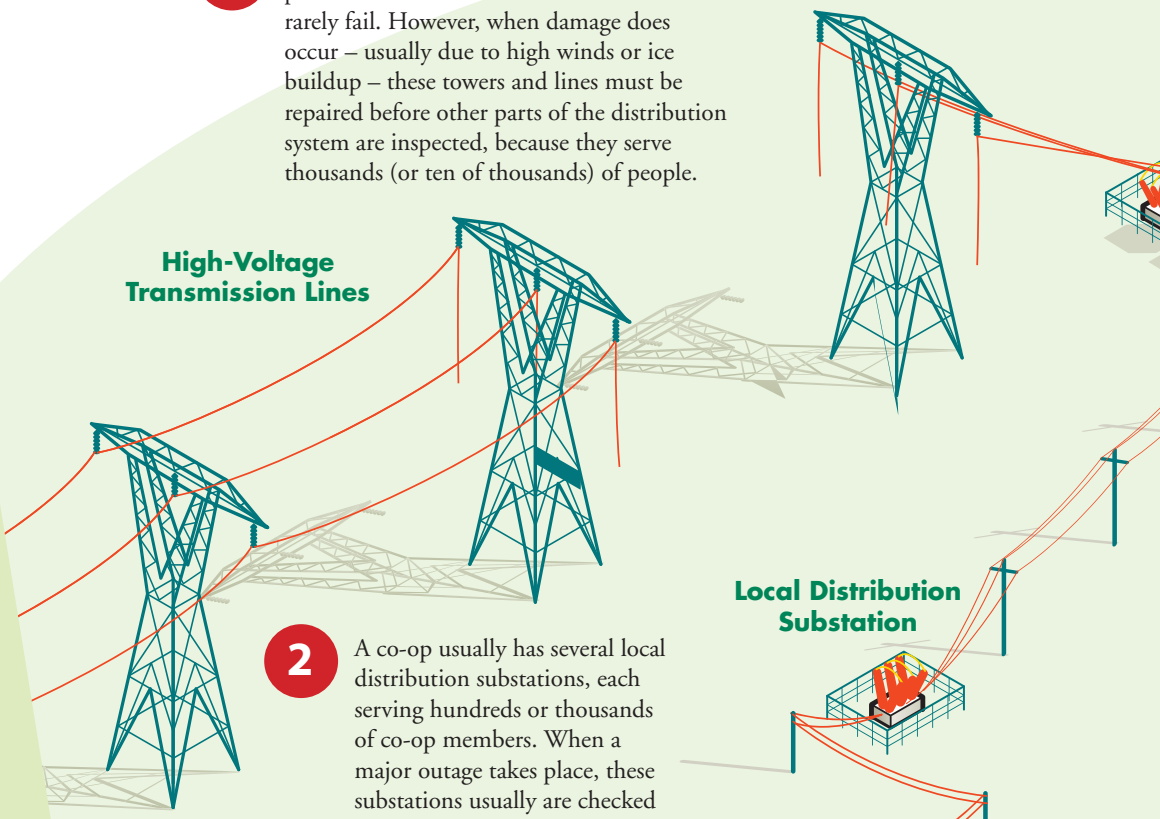
Source: Touchstone Energy® Cooperatives 101 Easy Ways to Save Energy and Money
For more tips and helpful videos, go to: http://www.touchstoneenergy.com/together-we-save/energy-saving-tips/

How power is restored after an outage

Restoring the power after a severe storm *involves much more than just flipping a switch at a substation or pulling a fallen tree off a downed power line. Highly trained workers from local electric cooperatives, crews from neighboring states and specialists from the Iowa Association of Electric Cooperatives work together around the clock to restore service.*

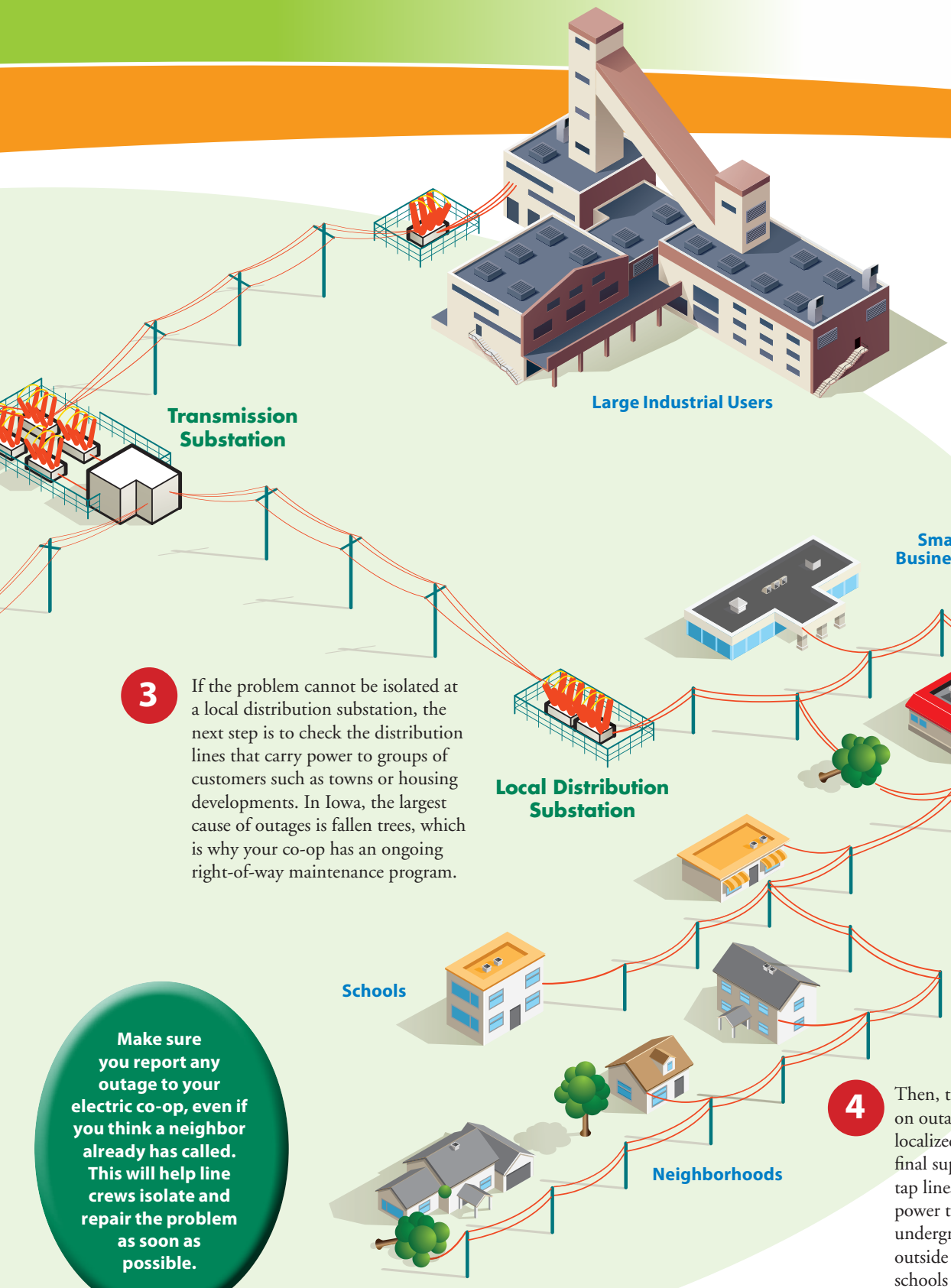
Shown here are the steps co-ops follow in restoring power. At each stage, the primary goal is getting the greatest number of co-op members back online in the shortest time possible.

1 Transmission towers and lines that supply power to one or more transmission substations rarely fail. However, when damage does occur – usually due to high winds or ice buildup – these towers and lines must be repaired before other parts of the distribution system are inspected, because they serve thousands (or ten of thousands) of people.



2 A co-op usually has several local distribution substations, each serving hundreds or thousands of co-op members. When a major outage takes place, these substations usually are checked first to see if the problem is in the transmission system to the substations or the substations themselves.

5 Finally, isolated outages – caused, for example, by a damaged service line between a transformer and an individual home – are repaired.



3 If the problem cannot be isolated at a local distribution substation, the next step is to check the distribution lines that carry power to groups of customers such as towns or housing developments. In Iowa, the largest cause of outages is fallen trees, which is why your co-op has an ongoing right-of-way maintenance program.

Make sure you report any outage to your electric co-op, even if you think a neighbor already has called. This will help line crews isolate and repair the problem as soon as possible.

4 Then, the line crews work on outages that are more localized by inspecting the final supply lines – called tap lines – that carry power to utility poles or underground transformers outside small businesses, schools and homes.

Graphic reprinted with permission from the Iowa Association of Electric Cooperatives.

Hot Water on the Grid

Can Your Hot Water Be a Battery?

By
Thomas Kirk and
Brian Sloboda

Most people think of their water heater as a device designed solely for heating bath water or helping to wash a sink full of dishes. But electric water heaters can provide some of the most rapidly responding, flexible, scalable and cost-effective energy storage available.

By adding bidirectional control to electric resistance water heaters, GIWHs enable a utility or third-party aggregator to quickly and repeatedly turn the devices off and on. Bidirectional control is a much more powerful tool than standard direct load control, which only allows devices to be turned off, because it effectively turns the water heater into a battery. Traditional batteries supply power when generation is low and absorb power when generation is high. In this way, they help modulate the supply of electricity to follow the load. GIWHs can't supply electricity, but they provide exactly the same functionality by reversing this equation: They can modulate the load in order to follow generation. In times of overgeneration, fleets of water heaters can be switched on to absorb excess power, and in times of undergeneration, they can be switched off to shed load and redistribute the existing electricity on the grid. Thus, aggregated GIWHs can act as virtual power plants to quickly and effectively control the amount of power on the grid. Moreover, these fleets are completely scalable and can perform this functionality within seconds.

Benefits To The Utility

GIWHs enable the utility or aggregator to shift loads, perform demand response, conserve revenue via the arbitrage of wholesale electricity, generate revenue via ancillary services, and keep the grid stabilized during unexpected events.

Load shifting and traditional demand response. In addition to traditional demand response, which sheds loads in times of peak demand, GIWHs can be used to shift loads and perform intelligent load control. Pre- or postcharging of GIWHs around peak times and smaller spikes throughout the day can smooth the load curve while maintaining customers' supply of hot water. Instead of simply shedding the peak load, the energy consumption is redistributed to times of lesser demand

Arbitrage of wholesale electricity. Electricity

Advanced community storage strategies employ electric water heaters to help electric co-ops to beat peak prices and save members money. ***(Illustration by NRECA)***

providers can charge GIWHs when the price of energy is low and discharge them when the price is high, saving utilities and their customers money. This strategy can be especially useful for cooperatives and municipal utilities, where the savings can easily be passed along directly to customers.

Revenue from ancillary services. Utilities can also use GIWHs for frequency regulation or other services. Frequency regulation – or just regulation – is the second-by-second matching of generation to the load. Depending on the market, there can be significant revenue potential from regulation.

Furthermore, the need for regulation will only increase as more intermittent renewables are added to the grid. Solar and wind power, for example, inherently fluctuate with the availability of sun and wind, causing generation to spike and dip unexpectedly. Regulation is required to smooth these fluctuations and keep generation matched to the load. Not many resources are flexible enough to provide this service, but energy storage can do it very well.

The monetary value of frequency regulation depends on the transmission organization that monitors and controls the delivery of high-voltage electricity on the grid. Regional transmission organizations (RTOs) cover large interstate areas, and independent system operators (ISOs) cover smaller geographical areas.

Heat pump water heaters (HPWHs) can't provide frequency regulation nearly as well as electric resistance water heaters can. Although they're a great energy-efficiency technology and are gaining in market share due to efforts by the DOE and Energy Star, HPWHs can't be cycled off and on nearly as quickly as electric resistance water heaters can. They also don't draw as much power as electric resistance water heaters. As such, the revenue potential from regulating HPWHs is only one-eighth the revenue of electric resistance water heaters.

Grid stabilization. Perhaps one of the most valuable services that GIWHs provide is the ability to respond to grid stabilization events within seconds. If a transformer trips or another unexpected event occurs, GIWHs allow the utility or aggregator to shed or increase load within seconds.

Additional benefits and implications. Not all locations on the grid are created equal. GIWHs are more

valuable to distribution-constrained areas than to areas with excess distribution resources because they can reduce peak demand, potentially allowing the utility to defer distribution upgrades.

For territories that have plentiful renewable energy resources, utilities or aggregators can consider a renewable storage water heater (RSWH). RSWH systems use a dedicated auxiliary thermal storage tank (or tanks) to capture low-cost or no-cost excess renewable electricity. The auxiliary tank sits next to the original hot water tank and supplies the renewably generated hot water when it's available. The tank uses a mixing valve to dilute the hot water to reduce temperatures to standard domestic hot water (DHW) levels before delivering the water to the customer.

What's Happening With GIWHs Now?

Great River Energy, a generation and transmission company in Minnesota, currently controls tens of thousands of large-capacity water heaters for arbitrage benefits to its customers. The co-op charges the GIWHs at night, when the wholesale market price for electricity is low, saving its customers money while providing the same amenity. Dairyland Power Cooperative, another generation and transmission company in Wisconsin, also has a large fleet of water heaters it uses for arbitrage.

Community Storage Gives Co-ops Flexibility

By Cathy Cash –ECT.coop

Energy storage—the holy grail of the electric power industry—that will save consumers money and give electric cooperatives new flexibility might be as close as your water heater.

So says new research from The Brattle Group, a global economic consulting firm.

NRECA, the Natural Resources Defense Council (NRDC), Great River Energy, and the Peak Load Management Alliance commissioned the study, "The Hidden Battery," to launch a "community storage" initiative to aggregate battery-like features of appliances.

Electric water heaters rank third-largest in residential electricity consumption, behind space cooling and lighting, according to the research released in February. "The magnitude of this relatively untapped resource is significant."

Advanced community storage strategies can equip electric co-ops to beat peak prices and save their members as much as $200 a year – enough to pay for a grid-enabled water heater within five winters, says the study. Further, these water heaters can interact with the electric grid to help with balancing and frequency response.

Great River Energy controls more than 110,000 residential water heaters that can store more than 1 gigawatt-hour of electricity. Between 11 p.m. and 7 a.m., 65,000 electric thermal water heaters mass enough hot water for an entire day; 45,000 water heaters are used to shave peak demand.

"We believe there's a battery hidden in basements all across our service territory," says Gary Connett, director of member services at the Maple Grove, Minn., G&T.

Community storage also is an important tool for meeting Minnesota's "25 percent by 2025" renewable energy standard that is resulting in more variable generation resources.

"When the wind is blowing or the sun is shining, large-capacity water heaters can be enabled to make immediate use of that energy to heat water to high temperatures," Connett says. "Water heaters can be shut down when renewables are scarce and wholesale costs are high."

NRECA worked closely with NRDC in 2015 to achieve federal law that preserves the production of large grid-enabled water heaters that 250 electric co-ops already rely on for energy savings programs.

Editor's Note: *South Dakota electric cooperatives, especially those in eastern South Dakota and western Minnesota, have a long history of using energy savings from water heating. Contact your local electric cooperative for more information.*

Tech Growth Gives New Relevance to Electrical Safety

By Justin LaBerge

When you think of electrical safety, what types of hazards come to mind? For many, the answer is likely to include an overloaded rat's nest of extension cords and power strips like Clark Griswold uses to light up his home in the classic holiday comedy *Christmas Vacation*.

Others might think of the farmer who has a little "run in" with a utility pole or live wire while operating heavy machinery in the field.

Or perhaps you think of the careless do-it-yourselfer digging trenches without calling 811 or forgetting to look overhead when using a ladder to clean out the gutters.

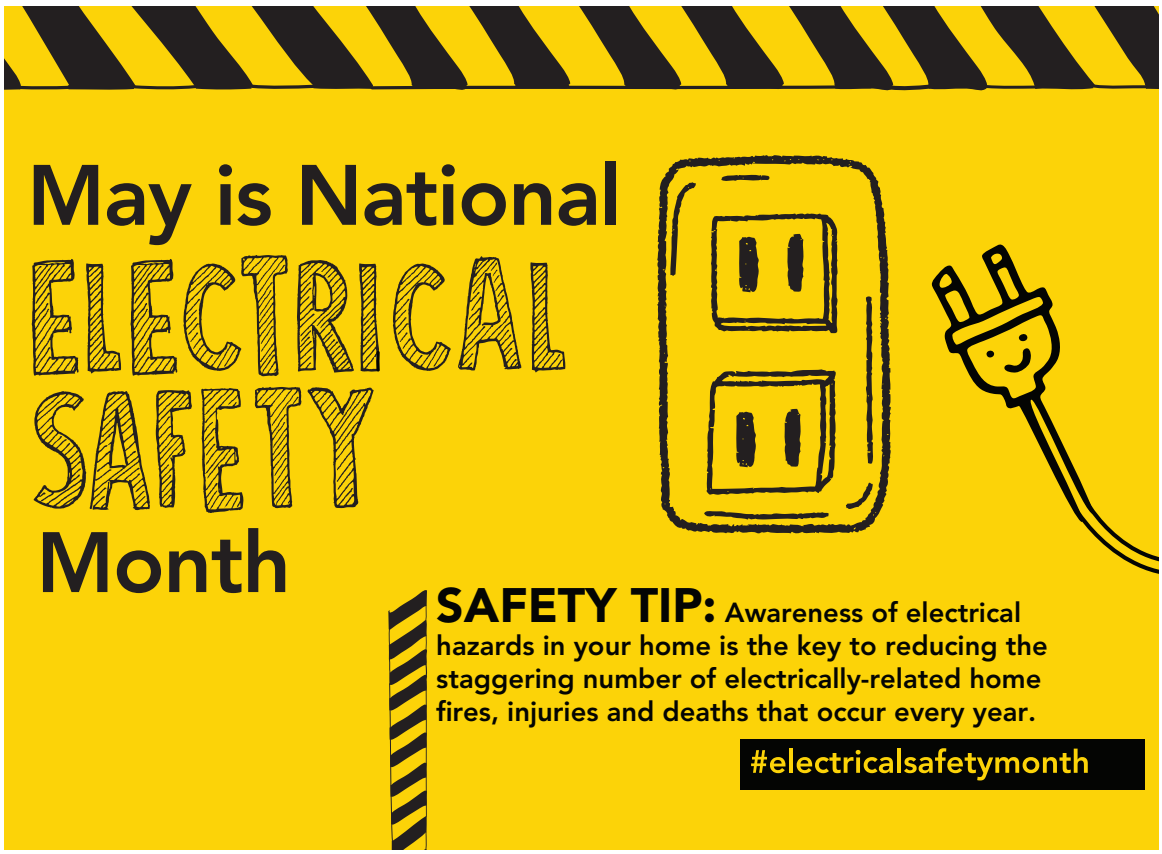
Those are all good answers, and the region's electric cooperatives have plenty of experience dealing with these kinds of hazards.

It can be tempting to look at these extreme examples and think that's where the safety conversation begins and ends, but there are safety considerations for every device powered by electricity.

Electricity is likely to play a more prominent role in our lives as advances in technology make it the preferred energy source for more and more of the devices we use every day – from cars to tech gadgets, to heating and cooling. As our use of electricity grows, so too must our awareness of electrical safety.

Smartphones and Other Gadgets

When most people think of counterfeiting, they probably think of money or perhaps knockoff



designer handbags. But it's a big business that impacts most segments of the American economy.

In 2014, consumer electronics ranked second on a list of the most common types of counterfeit goods seized by U.S. Customs and Border Protection. Computers and accessories ranked eighth on that list.

In 2010, nearly 500,000 smartphone batteries were recalled after they were discovered to be counterfeit.

These knockoffs aren't just illegal and of inferior quality. They're often dangerous. Counterfeiters have no vested interest in your safety or the integrity of the brand they're impersonating. These products haven't been tested by consumer protection groups and are unlikely to comply with safety regulations.

How can you tell if your product is legit? The Electrical Safety Foundation International (ESFI) has this advice:

• Use established vendors who purchase their goods from legitimate distributors and genuine manufacturers.

• Read the packaging and labels carefully. Text should be free of grammatical errors and should not contain conflicting information.

• Packaging should contain the name and contact information of the manufacturer.

• Avoid unknown brands and products that do not display any brand affiliation.

• Do your research. Organizations such as the Consumer Product Safety Commission (CPSC), CSA Group and Underwriters Laboratories (UL) provide information about product recalls, including those related to counterfeiting, on their websites.

In addition to counterfeits, consumers should be wary of deeply discounted off-brand chargers and other accessories. While there are many legitimate third-party manufacturers that make safe and reliable accessories that cost less than original equipment manufacturers, there are also manufacturers that produce poorly made products that sell for low prices and pose a high danger of shock, overheating or fire.

Whether it's counterfeit or just poorly manufactured, if the price seems too good to be true, it probably is.

Electric Vehicles

Electric vehicles have made remarkable strides in reliability, performance and affordability in recent years. Their price is still out of reach for most consumers, but like many new technologies, prices are likely to fall and quality is likely to rise as the market matures.

When that happens, drivers will be in for a win-win of better torque and performance and lower emissions than vehicles powered by internal combustion engines.

Electric vehicles must be recharged, and those charging systems have certain electrical requirements. If you're considering making the switch to an electric vehicle, you should start by ensuring your home's electrical system is up to the task.

Your local electric cooperative can help guide you through that process, but the assessment should include an evaluation of the lines and meter that connect your home to the electric co-op's distribution system, the panel that feeds the circuits in your home, and the wiring that delivers electricity to your outlets and appliances.

Assuming everything is up to snuff, the charging system should be installed by a licensed electrician.

Once it's installed and your shiny new car is parked in the driveway, ESFI offers the following safety tips:

• Carefully read the Owner's Manual for your charging station upon installation.

• Never use an extension cord to charge the vehicle. Use of extension cords can increase risk of electric shock and other hazards.

• Inspect for damaged cords and plugs, which could result in shock and fire hazards.

• Charging equipment should not be installed in an area with heavy foot traffic, or near any materials that are flammable or explosive.

• Outdoor charging equipment is weatherproof, but should be protected from damage.

Solar Panels

The solar power industry has seen explosive growth in recent years, and America's electric cooperatives have been active participants in that growth. In fact, three of the top four solar utilities in America are electric cooperatives.

There are many factors that will determine if installing rooftop solar on your home or business makes sense. Your local electric cooperative can help you with that assessment and explain all applicable incentives, rates, policies and state regulations related to the installation of rooftop solar.

A growing number of cooperatives are building community solar gardens that allow members to purchase locally generated solar energy without installing it on their homes. This can be an attractive option for members who live on lots that are not ideally situated to collect solar energy, members who don't want to deal with the maintenance of their own system, members who live in apartments or condos, and members who would like to support solar energy but don't have the financial resources to invest in a large-scale installation on their home.

If, after carefully assessing your options, you determine that a rooftop solar installation is the right choice for you, ESFI has the following safety recommendations:

• Before adding an active solar system to your home, have your home electrical system evaluated by a licensed, qualified professional to ensure it can support this new technology.

• Always hire a professional to install and repair solar panels at your home or workplace. Specific licenses and qualifications must be obtained before attempting to install solar equipment.

• Building, electrical, and plumbing codes also apply to solar power installations. Ensure your installer requests the appropriate permits and follows all applicable codes.

• Solar power systems present unique safety challenges for fire fighters. In the event of a fire, inform all officials of the use of solar panels as well as identify the type used. This will help them mitigate the risks.

As you can see, electricity is playing a more prominent role in our lives, which is why the lesson of electrical safety is so important.

Justin LaBerge writes on cooperative issues for the National Rural Electric Cooperative Association, the Arlington, Va.-based service arm of the nation's 900-plus consumer-owned, not-for-profit electric cooperatives.

Regional Dateline

April 23
RiverRat Marathon, Riverside Park, Yankton, SD
605-660-9483
www.riverratmarathon.com

April 23
Jeff Dunham: Perfectly Unbalanced Tour
Sioux Falls, SD, 605-367-7288

April 23-24
Quilt Show, Swiftel Center
Brookings, SD, 605-690-3246

April 24
Jeff Dunham: Perfectly Unbalanced Tour
Rapid City, SD, 800-468-6463

April 30-May 1
Annual Art Show
Chamber of Commerce
Pierre, SD, 605-567-3562
dan46@gwtc.net

May 20
11th Annual Custer Stampede Buffalo Art Auction Unveiling
Custer, SD, 605-673-2244

May 21
Red Rock Ribfest
Rowena, SD, 605-254-6367
mitch@snortzbbq.com

May 26
Purses with a Purpose
Sioux Falls, SD, 605-271-9703

May 27-October 10
Legends in Light® Laser Light Show, Nightly, Crazy Horse Memorial, Crazy Horse, SD

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Events of Special Note

May 7
Avera Race Against Breast Cancer, Sioux Falls, SD
605-322-8900

May 20
Tesla Road Trip Car Rally
Custer, SD, 605-673-2244

To have your event listed on this page, send complete information, including date, event, place and contact to your local electric cooperative. Include your name, address and daytime telephone number. Information must be submitted at least eight weeks prior to your event. Please call ahead to confirm date, time and location of event.

June 1-4
South Dakota Senior Games
Rapid City, SD, Contact Kristi Lintz at 605-394-4168

June 3-4
The Original SD BBQ Championships, Huron, SD
605-353-7340

June 3-4
South Dakota Senior Games
Sioux Falls, SD, Contact Scott Juhnke at 605-367-8222

June 3-5
Wheel Jam, Huron, SD
605-353-7354

June 3-5
Black Hills Quilters Guild Quilt Show and Sale
Rushmore Plaza Civic Center
Rapid City, SD
info@bhquilters.org
www.bhquilters.org

June 4-5
Spring Volksmarch at Crazy Horse Memorial
Crazy Horse, SD, 605-673-4681

June 10-11
Two Rivers Exposition
Expo Center, Fort Pierre, SD
605-224-8686

June 10-11
South Dakota Senior Games
Spearfish, SD, Contact Kris Harwood at 605-722-1430

June 14
Seventh Annual Ag Women's Day, First Lutheran Church Activity Center, Brookings, SD
605-692-8003 Ext. 2

June 17-19
Crazy Horse Stampede Rodeo and Gift from Mother Earth
Crazy Horse, SD

June 24-25
South Dakota Senior Games
Mitchell, SD, Contact Barb Pierkowski at 605-995-8048

July 8-9
South Dakota Senior Games
Madison, SD, Contact Bernie Schuurmans at 605-270-3327

July 22-23
South Dakota Senior Games
Brookings, SD, Contact Traci Saugstad at 605-692-4492

August 5-6
South Dakota Senior Games
Yankton, SD, Contact Kristi Hauer at 605-665-4685 or Tracy Grotenhuis at 605-668-5238

August 13
South Dakota Senior Games
Huron, SD, Contact LaRon Klock at 605-353-8533