

K.C. ELECTRIC ASSOCIATION

MARCH 2019

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Our mission is to provide our members with safe, reliable service at the lowest cost, while maintaining an environmentally responsible, accountable and sustainable operation now and in the future.

OUTAGE MANAGEMENT TECHNOLOGIES IMPROVE RELIABILITY

BY DAVID CHURCHWELL GENERAL MANAGER

“The only things certain in life are death and taxes,” as the old saying goes. Well, we can add another to the list: power outages. An outage can range from annoying to dangerous, depending on its timing and length.

K.C. Electric Association's primary goal is to deliver the highest possible quality of electric service at the lowest possible price. Perhaps the key measure of quality in the eyes of members is the number of times their lights blink or go out.

Let's talk a bit about how the grid is designed as a backdrop to how technology is improving reliability by reducing blinks and outages. In substations and along the power lines that bring electricity to your home, K.C. Electric installs protective devices in the form of fuses and reclosers (high-voltage circuit breakers). Fuses and reclosers serve the same purpose as the circuit breakers in your home.

A fuse is a “one-shot” device. When a fault occurs, the fuse blows and everyone downstream from it loses power. Reclosers are “multi shot” devices, meaning they can operate a certain number of times before they stay open and an outage occurs. A common setting is what's known as three-shot. Here's how that works: A tree limb contacts the power lines and creates a fault. The recloser senses it and opens, creating the first blink.

Here's where a recloser differs from your home circuit breaker. It waits a certain amount of time (typically a few seconds), then recloses to try and complete the circuit. If the fault is still there, it opens again. This creates the second blink. Three-shot settings

allow the device to reclose a third time and if the fault is still there, it stays open and the members downstream experience a power outage.

Blinks are a nuisance, but they eliminate a lot of extended outages by protecting wires and equipment from serious damage.

So, what kind of technology is improving service reliability? The smart grid is spawning an amazing array of equipment and software that are already improving reliability. When combined with field construction practices, such as building multiple ways to feed power loads, and the deployment of advanced metering infrastructure systems (AMI), the future of reliability is bright — pun intended.

Electric co-ops are starting to use more of what are called intelligent electronic devices. “Intelligent” basically means a co-op can program the device to behave a certain way when a specific event occurs. It also means the co-op can remotely command the device to take an action, either preprogrammed or ad hoc.

Eventually, there will be a power outage despite the best efforts of K.C. Electric. That is where AMI and outage management systems (OMS) earn their keep. The basic element of AMI is a meter that can communicate with your electric co-op. The OMS maps system data and meter locations into a piece of software that models the electric grid. When a device on the grid reports loss of power, the OMS runs calculations to determine the probable location of the fault and the number of members impacted.

Now, the whole suite of systems your co-op uses comes into play. The dispatcher



can call out or redirect a crew to the general location of the problem.

The end result of all this technology is the minimization of outages and their length, plus more availability of up-to-date information for the consumer.

Mother Nature is a tough opponent, and it's impossible to eliminate outages and blinks altogether. But with the way technology is advancing, we can expect to see some remarkable improvements.

“Green” Homes Can Make You More Green

When looking at resale values, there are certain improvements that bring a decent return on homeowners' investments: new siding, bathroom remodels and wooden decks (76.7, 70 and 82.8 percent return, respectively). But there are certain energy efficiency projects that add value as well, one of which can even make you money.

According to the U.S. Green Building Council and the McCombs School of Business at the University of Texas Austin, homes that were certified energy-saving “green” sold for 6 to 8 percent more than non green homes in the Austin-Round Rock market between 2008 and 2016. Across the nation, energy-efficient-designated homes have a 2 to 6 percent sales premium, according to the U.S. Department of Energy.

To break down the numbers, certified homes brought in an additional \$3,416 to \$8,882 over non green homes, according to the DOE, or \$2.99 to \$13.82 per square foot for every dollar saved on annual electricity bills from efficiency investments. Studies compiled and released by the DOE show they sell faster as well, by 18 to 89 days.

Before you scramble to turn your home totally green, consider where you live — the price green homes can bring depends greatly on location and, of course, housing market conditions. A certified home in California can have a 12 percent premium while other states bring less than half of that number.

Even if you're not planning on selling your home in the near future or have no idea where your home fits on the green spectrum, there are several energy-friendly improvements that can help keep you comfortable and save money on your energy bills. If you are considering making energy improvements in your home, consider this cost-versus-value national data provided by *Remodeling*, a home improvement magazine and website:

- Attic insulation: In 2017, homeowners recouped more than what they paid — 107.7 percent — for fiberglass installation in the attic. Not many home projects return more than what you pay, so this is a great place to start. Homeowners should always insulate from the top of the home down, since most air escapes out of the top.
- Front door: If you replace your older, inefficient entry door with an energy-efficient steel version, you'll get back 90.7 percent, according to the cost-versus-value data. A fiberglass door got a 77.7 percent return in 2017. While that may not sound great, compare it to a midrange bathroom remodel, which brought a 64.8 percent return.
- New windows: In 2017, upscale wood and vinyl window replacement brought about the same return: 73 and 73.9 percent, respectively.

For more information, visit <https://www.remodeling.hw.net/cost-vs-value/2017/> or SafeElectricity.org.



March 2019

Energy Efficiency

Tip of the Month

A/C TIP:

Spring is nearly here! Now is the perfect time to test your air conditioner and ensure it's ready for summer. Remember to check the evaporator coil, which should be cleaned annually for optimal efficiency.

Source: energy.gov

Claim Your Savings

Each month, members have a chance to claim a \$10 credit on their next electric bill. All you must do is find your account number, call the Hugo office at 719-743-2431 and ask for your credit. The account numbers are listed below. How simple is that?

Creighton Osborne, Hugo — 633200000

Amber Stum, Hugo — 609500003

Thomas Herman, Seibert — 1132520000

Ashton Mitchek, Cheyenne Wells

— 446600017

You must claim your credit during the month in which your name appears in the magazine (check the date on the front cover). In January 2019, two consumers called to claim their savings: Brett Legg, Cheyenne Wells; Rana Epperly, Bethune.

Energy Tips and News : Farm Lighting

The design and management of a farm's lighting system greatly affects its energy efficiency. Upgrading lighting fixtures will often give the best return on investment to reduce energy costs. Replacing older lamps with new energy-efficient LED lamps will reduce energy consumption and often improve the quality of the lighting.

Lighting efficiency is reported as lumens per watt or the light output per unit of energy used. Lamps that produce high lumens per watt will be most efficient. Use sunlight as often as possible; it will generally be the most efficient light available.

Incandescent bulbs should be replaced with LEDs or an appropriate lumens lamp in most circumstances. Mercury vapor lamps can be replaced with high-pressure sodium lamps, but if light quality is important, LED lamps and fixtures might be a better choice.



QUESTIONS TO ASK

1. Are lights turned off if they are not needed?
2. Are light fixtures kept clean?
3. Can task lighting be used instead of general lighting for the job?
4. Have you replaced incandescent bulbs with LEDs?
5. Can high-intensity discharge lamps (HID) also be replaced when applicable with LEDs and the variety of LED fixtures available?
6. Are LEDs in the best location for the job?
7. Would timers be beneficial in turning lights on and off?
8. Would lights controlled with a motion sensor be a possibility?
9. Do you dispose of old bulbs, lamps and ballast transformers properly?

FACTS AND ACTIONS ON FARM LIGHTING

Tip 1 : Replace incandescent bulbs with LEDs for immediate savings — an LED light or fixture is the most energy-efficient lighting available. An incandescent bulb that uses 100 watts of electricity can be replaced with a 14-watt LED, which produces the same amount of light but uses over 75 percent less energy. If you replace five 100-watt incandescent bulbs with five LEDs, you can save \$54.02 per year (based on 10 cents per kilowatt-hour and four hours use per day, for example). LEDs also have a longer average life, lasting 8,000 to 20,000 hours versus about 1,000 hours for an incandescent bulb. LEDs can be used outdoors in temperatures as low as minus 10 degrees F (check label for ratings and ensure it is an outdoor sealed fixture or bulb).

Tip 2 : Consider high-intensity discharge (HID) lights if there is no other option, HID lights consume 50 to 90 percent less energy than comparable incandescent bulbs, though they take several minutes to achieve

rated intensity (turn on fully). HID lights are generally used to illuminate large areas, such as stall barns or outdoor arenas.

Tip 3 : Investigate new, more efficient options to mercury vapor lights that have been historically used for security yard lighting. Mercury vapor lights produce 35 lumens per watt of power, while pulse-start metal halide lights emit 65 lumens per watt and high-pressure sodium produce 90 lumens per watt. Many people opt for LED lamps because they are highly efficient, and because they produce a light that has a truer color (higher color rendering properties) than the yellow light emitted by high-pressure sodium lamps. They also use the least amount of energy.

Tip 4 : Install timers, photo sensors and motion detectors to ensure that lights will be turned off during hours when they are not in use. They can be set to turn lighting on when it is dark or when there is motion and then turn off automatically when

activity is less. Several companies make photo sensors with built-in clocks or timers for exterior lighting needs. Some types will turn the lamp off the second half of the night while others can be programmed to turn off and on at set times (for example, off at 11 p.m. and on at 4 a.m.).

Tip 5 : Use motion sensors to turn on lights in areas when someone enters the room or there is motion outdoors. These sensors will turn off the lights after a period of time when no motion is sensed, eliminating unnecessary electrical usage. Note: HID lamps cannot be used with motion sensors because they require several minutes to warm up and emit full output.

Tip 6 : Frequently switching lamps on and off will reduce lamp life.

Tip 7 : Prolonged exposure to moisture, such as in an enclosed building that houses animals, will reduce lamp life. Lamps installed in animal housing should be in fixtures with

moisture resistant ratings that are also well sealed and rated for outdoor use.

Tip 8 : Clean or dust off reflective surfaces of light fixtures to help maintain light output. Dust absorbs light waves and will reduce the output of lights. Dust also reduces heat transfer from transformers used on fluorescent and HID lamps, causing them to operate at elevated temperatures which will shorten transformer life (not an issue with LEDs).

Tip 9 : Provide spot lighting for work areas so you will need less higher-wattage general lighting that can cost more to operate.

Tip 10 : If installing new fixtures, ask your lighting contractor or electrical wholesaler to provide a recommended spacing and layout based on the light fixtures you're purchasing. The number of fixtures and the layout required depends on the LED lumens and wattage, the type and shape of refractor lens on the fixture, and the area to be illuminated. Most manufacturers offer assistance for lighting design free of charge to dealers and installers.

Tip 11 : Dispose of lamps properly. All lamps except for incandescent and halogen lamps contain mercury; most states require them to be recycled.

Some older ballast transformers from fluorescent or HID lamps contain PCBs, or polychlorinated biphenyls, a substance that contaminates the environment. If the transformer doesn't have PCBs, the manufacturer's label will read "contains no PCBs" or "no PCBs," and it can be disposed of in general trash. If that phrase is not located on the label, you must assume the ballast to be the PCB type, and it must be recycled or disposed of as hazardous waste by law.



BE ALERT

Those who steal copper are not only risking their own lives, but also the safety and well-being of others. Report suspicious activity near common targets, which include farm equipment, air conditioners, vacant buildings, construction sites and electric utility properties, including substations and power poles.

Programmable Lighting Options

BY BRIAN SLOBODA

In the past, the ability to easily control lights within the home was fairly rudimentary. You flipped a switch on or off. Perhaps you had a dimmer switch. To turn lights on when you were on vacation, you plugged a lamp into a gadget with a dial and it turned the lamp on and off. Today, consumers have more options than ever before.

The growing use of LED bulbs and the proliferation of smartphones and Wi-Fi brought lighting options to a new level. In addition to using less energy, many LEDs can be controlled from a smartphone app, making the LED more of a consumer electronic than a lightbulb.

When shopping for new LEDs, you essentially have two options:

A less expensive LED still offers longer life, lower energy use and will work for most fixtures. However, consumers with older dimmer switches often find that they must replace them with switches that work with newer LEDs.

The second and more expensive option is a "connected" LED. These LEDs offer features like controlling lights remotely from a smartphone app or via voice control through an in-home speaker. They can also be connected to a home security system or dimmed to enhance entertaining.

Connected LEDs require a central controller or hub, like Amazon's Alexa or the Apple HomeKit. The hub can control other smart devices and become the center of a smart home system.

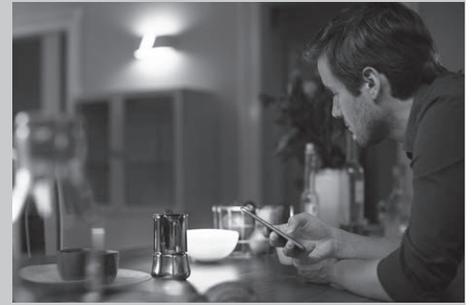
Consumers can choose from a variety of manufacturers when purchasing connected LEDs. Some bulbs are compatible with different hubs or systems, but if you're planning a major overhaul to your home lighting, it's best to buy one brand and stick with it.

Smart lighting options aren't necessarily about saving energy, but if they can help you remember to turn the light off when you are not in a room, then a small amount of energy savings can be achieved.

As technology continues to advance, more smart home products will become available. Many of these products will include features that focus on home security and quality of life.

If you're interested in smart technologies for your home, the key will be to research your options and understand how the system works with the other devices within your home.

Brian Sloboda is a program manager specializing in energy efficiency for the National Rural Electric Cooperative Association.



Many LEDs, like the Phillips Hue line, can be controlled from a smartphone app, making the LED more of a consumer electronic than a lightbulb. Photo Source: Signify.com



Consumers have many options for smart lighting systems. Shown here is the Phillips Hue White Ambiance Starter Kit. Photo Source: Signify.com