June 2019 Share Package
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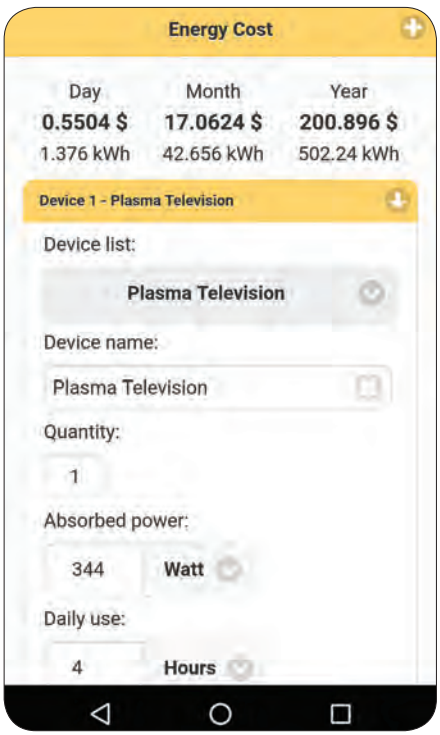
Energy-Saving Apps and Devices

Advanced smart thermostats such as the Ecobee4 can work with sensors that detect when someone is in a room and adjust the temperature accordingly.
Photo courtesy of Ecobee



Q: I want to learn about simple ways I can use technology to save energy. Where should I start looking?

A: Every new piece of technology seems to come with a lot of promise, doesn't it? Then we have to find out for ourselves if it lives up to the hype. Here are a few products we recommend.

Smartphone Apps

There are several energy apps available today, but two stand out. They are free, easy to use, effective and available for both Android and iOS devices.

- JouleBug is a fun app that helps you save energy. You collect points for each energy-efficient move you make inside the home, on your commute and in daily life. The app helps you make changes and build ongoing energy-saving habits. It's designed as a competition among friends, and it can help you and your family create an energy efficient household together. The app includes fun, educational videos and links to helpful articles.
- There are several energy cost calculator apps that help you identify where you use the most energy in your home. You can enter how many hours a day you use each appliance or electronic device and the rate you pay for power, which you can find on your energy bill. The app creates a total operating cost for that device.
- How much does that hallway chandelier cost you each month? How much would you save by turning it off for an additional hour each day? How about that second freezer or the big-screen TV? The answers aren't exact, but the apps will give you a better idea of your overall energy use and help you focus your efforts on opportunities that save the most energy.

Smart Thermostats

A smart thermostat connects to the internet and your computer and/or smartphone through your home's Wi-Fi. It could shave $50 off your energy bill every year. Most fall within the $100 to $250 range. If the price for a feature-rich model is more than you're comfortable spending, ask yourself if it's worth buying a lower-cost model, or if your current thermostat does the job.

Here are some features to keep in mind if you're considering a smart thermostat:

- **Learning.** A learning thermostat will figure out your habits and adapt, which is probably the best way to make the most of a smart thermostat's energy-saving potential.
- **Geofencing.** This detects when you leave home and return, and adjusts the temperature so energy is not wasted.

Additional features include remote room sensors and voice control.

Learn what you can about the functionality of the smart thermostat's app. Take a look at how easy it is to program the thermostat unit directly. Finally, consider the installation. Some models are more difficult to install and may require rewiring.

Smart Power Plugs and Switches

Smart outlets and light switches are still considered a relatively new technology, and we think improvements will be made over time. That said, if this is a technology you're interested in, there are a couple of options consumers seem to like.

Hub-based systems such as the Currant Dual Smart Outlet and Philips Hue smart lighting systems are highly rated and cost about $200 or more for eight to 10 smart outlets or light switches. That's a pretty big investment, so we recommend using an energy cost calculator app first to decide if it's worth the additional cost.

We hope these reviews will be helpful as you consider smart technology that promotes energy efficiency. Don't forget to check with your local electric utility about additional programs and services designed to help you save on your energy bills. ■

This column was co-written by Pat Keegan and Brad Thiessen of Collaborative Efficiency. For more information on energy efficiency, visit www.collaborativeefficiency.com/energytips.

To ask a question, send an email to **Patrick Keegan** at energytips@collaborativeefficiency.com.

Install an Attic Ridge Vent to Reduce Air-Conditioning Costs

Install half of the required vent area in soffit vents. These are 4-by-16-inch vents.

Roll out the ridge vent, smooth it down and cut it to length.

To ask a question, write to **James Dulley**, Energy Report, 6906 Royalgreen Dr., Cincinnati, OH. 45244, or go to **www.dulley.com**.

Q. *My house has gable attic vents on each end. What is my best choice for attic venting, how much do I need and can I install it myself?*

A. Adequate attic ventilation is important to reduce your utility bills and avoid damage to the roof and attic. Having a vent in each side of the gable was the typical attic ventilation configuration in older houses, but today it is considered woefully inadequate for an efficient house.

People often think of attic ventilation as being important only during summer to control air-conditioning costs. A typical dark-shingle roof can easily reach 170 F, and the air temperature inside the attic can reach 140 F without adequate ventilation.

Even with enough insulation on the attic floor, this extreme radiant heat transfers through the insulation to the ceiling below. The structural lumber in the attic also reaches 140 F by afternoon. With its thermal mass, it can stay hot well into the evening and continually transfer heat into your house.

During winter, the attic can get cold. No matter how well the vapor barriers were installed in the walls and ceiling, indoor air and water vapor get into the attic. If this moisture-laden air collects in the attic—even in relatively mild climates —it can condense on the lumber and drip onto the insulation. The R-value of insulation is much lower when damp.

In cold climates where the temperature often drops below freezing at night, it is even more important to ventilate the attic to keep the roof cold. If warm air from the ceiling below stagnates near the roof peak, it can melt snow on the roof. This water runs down the roof to a cooler area and refreezes, causing an ice dam. Over time, this dam causes water to back up under the shingles and leak into the attic and destroy the lumber. Its weight can damage the gutters.

The ideal ventilation flow comes in low over the insulation to keep it dry and cool. Some of it should flow up under the roof sheathing to keep it cooler, then exhaust out near the peak of the roof. This air flow out of the roof peak keeps it cooler during summer and much colder during winter to minimize condensation and ice dam formation.

There are various attic venting options, all of which are better than gable vents. A combination of a ridge vent and soffit vents is most effective and not difficult to install yourself. Once you install proper new attic ventilation, block off the gable vents because they will interfere with the desired air flow. I stapled extra attic foil over my gable vents to block them.

The ridge vent is at the roof peak where hot attic air is least dense so it naturally flows up and out. Breezes over the top of the ridge vent cover create a low pressure area to draw even more air through the attic. The cool air is drawn in the soffit vents.

Before you run buy vents, calculate how much ventilation you need. This is measured by the net free vent area of the particular product you select. The net free vent area is marked on the packaging. It is always less than the actual area of the vent because of screening and other obstructions to the air flow inside the vent.

Measure the area of the attic floor. A typical rule of thumb is 1 square foot of net free vent area of each 150 square feet of attic floor area is needed. This amount of vent area should be divided evenly between the ridge vent and the inlet soffit vents.

If you run the ridge vent all the way across the roof because it looks better, even if it is more ventilation than you need, match it with the proper amount of inlet soffit vents. Depending upon how much inlet soffit vent area you need and the depth of your soffits, you may find it easiest to install continuous lengths of under-eve soffit vent. This is less time consuming than sawing many small rectangular holes and installing individual soffit vents.

To install the ridge vent, cut a slot along the roof ridge with a circular saw. A typical 1-foot-wide ridge vent provides 18 square inches of net free vent area per lineal foot. ■

Training Up in Times of Change

As technology and consumer-thinking evolve, so do public utilities

Scott Corwin is executive director of the Northwest Public Power Association, which represents public power utilities and their consumers across the West and British Columbia.

Handling the rapid pace of industry change has become a central concern in the electricity sector in recent years. This is an exciting time to be in the energy business and to work with organizations that are well-positioned to help utilities address elements of the challenges arising during this evolution.

Many newcomers to our industry are perplexed by the alphabet soup of organizational acronyms. Because each entity has a distinct function, we coordinate with each other to avoid redundancy, enhance efficiency and reduce costs to utility members. For 79 years, the Northwest Public Power Association has had the unique role of being a premier education and workforce development provider that also provides communications and legislative and regulatory services.

NWPPA serves a broad member base across nine Western states and British Columbia. We see the high demand for utility-related education every day, and the commitment of utilities that invest in their people. In 2018, we delivered more than 250 educational events to more than 6,500 participants.

The long-awaited "retirement bubble" has now burst, and new employees are entering the electric utility industry by the hundreds. Each new staff member benefits from having the education and training tools critical in the modern workforce.

The courses and events offered by NWPPA cover all aspects of the electric utility business, including operations, engineering, leadership, accounting and finance, human resources, information technology, environmental compliance and customer service. The most popular series are those that enable participants to earn a certification as a staking technician, administrative professional or someone with credentialed leadership skills. We have launched new online, learning-on-demand and webinar services to reach an even broader group of utility staff.

How does this affect you, the consumer?

Accompanying the wave of new employees in the electricity industry is a new generation of end users. No longer do we serve the generation that saw the advent of lights and other electric conveniences. Today's generation takes power for granted and is changing the profile of power use through consumer electronics and the vast storage and processing of data and content that feeds those devices. These residential and business consumers desire more options for how—and from what sources—their electricity is provided.

We are responding to these societal changes by constantly updating our curriculum to address the hot topics of our industry. For example, bitcoin and blockchain are of interest not only with utilities, but also consumers. We held two high-density load events for our members last year—a webinar and a workshop. We also are focusing events on new generation resources, rates or pricing approaches, wildfire preparation and recovery, developing markets, consumer engagement, third-party technologies and products, big data, robotics, drones, and cyber and physical security.

As public power moves forward, it will remain important that utility consumers understand the value of public power. To this end, NWPPA teamed up with Ruralite Services to create the award-winning More Powerful Together campaign. More Powerful Together materials provide avenues for public power utilities to increase engagement with their consumers and raise the profile of public power.

NWPPA also advocates for public power at the federal level. We work closely across our membership to provide a Western voice on important local issues, such as wildfire prevention and suppression, hydropower licensing reform, right-of-way permitting and vegetation management.

This is more than behind-the-scenes knowledge. NWPPA supports local utilities and their goal to bring you safe, reliable and affordable power.

The next decade will bring vast change and significant challenges to electric utilities. Public power utilities will want to stay closely connected to their consumers and understand the trends driving this change.

NWPPA will continue to listen to its members to create the best tools for an educated and trained workforce that can meet these challenges. We will continue to communicate and advocate on the critical issues impacting our business now and into the future. ■

Upgrading Energy Efficiency

Increasing awareness, reducing energy use and improving lives one family at a time

Celilo Village is a small community of Columbia Gorge residents approximately 10 miles east of The Dalles, Oregon, near the mouth of the Deschutes River. Most residents of Celilo Village are members of either the Yakama Nation or the Confederated Tribes of Warm Springs.

When the gates of The Dalles Dam were closed in 1957, subsequent flooding of the Celilo area brought an end to 9,000 years of tribal fishing life at Celilo Falls. This led to nearly 50 years of substandard replacement housing and a lasting, negative impact on Native American inhabitants and their way of life.

After decades of failed negotiations, an agreement was solidified in 2006 between the U.S. Army Corps of Engineers and Celilo community members to build a tribal longhouse for gathering and ceremonies. By 2009, 15 permanent two-, three- and four- bedroom homes were completed on the 100-acre parcel of land. These modern, fully insulated dwellings are built on slab foundations and equipped with marginally efficient heat pumps, small wood stoves, vinyl-framed windows and many multi-bulb light fixtures. While the construction of these new homes was a huge step forward in the reparation process, years of poverty, lack of outreach about energy consumption and efficiency, and geographic separation have taken a toll on the underserved community of Celilo Village.

The NWCPUD Energy Management Department recently noticed a disproportionate number of residents struggling to keep their bills manageable. During the first outreach visit to Celilo Village in mid-2018, we learned that many of the outdoor heat pump compressors had prematurely failed due to lack of maintenance and manufacturer warranty expiration. Once these systems fail, they no longer provide affordable heating to families, necessitating the use of the costly "emergency heat" furnace function.

A backup heating method for these customers is a centrally located wood stove, which requires firewood to fuel a powerful heat source located at the entrance to the hallway in an open living room. Most of the wood stoves no longer have original features such as glass in the doors, rope seal or handles, and are not being used. In some instances, the wood stoves have been removed due to health and safety concerns. All of these issues sent a strong message to the PUD that this community needed substantial support sooner rather than later.

During the appointment for their initial energy-efficiency assessment, longtime Celilo residents Fred and Karen Whitford mentioned that in addition to repairing their failed heat pump, they struggled with the constant replacement of lightbulbs in the home. The original fixtures installed were outfitted with 75-watt incandescent bulbs, and few had been upgraded. After discussing the advancements in LED bulb technology, the Whitfords began to grasp the cost of simply lighting these homes with approximately 30 incandescent lightbulbs per home. Needless to say, we put this measure on the top of our list to tackle next.

During the next nine months, several residents took part in NWCPUD's Energy-Efficiency Upgrade Program and were eligible to add a ductless heat pump, replace broken windows and exterior doors, and install a heat pump water heater. In conjunction with this homeowner upgrade program, our team worked with members of Efficiency Services Group Inc. to design a free direct-install lighting upgrade program for all NWCPUD customers.

With the help of John Macapagal, ESG energy efficiency manager, every Celilo Village home was upgraded or supplied with lumen-equivalent, 9-watt LED lightbulbs, water-saving showerheads and a smart power strip in one upbeat, powerful day of connection and support. All Celilo Village residents were enthusiastic. Many homeowners opted into the direct install program, which allows us to install all replacements. This single day of service and outreach should provide an estimated savings of 15,560 kilowatt-hours per year for this community.

While lower monthly bills and an increased energy-efficiency consciousness are powerful customer benefits in their own right, these valuable programs also have inspired residents to be more hands-on with home maintenance and more communicative about utility bill concerns. This empowered connection between NWCPUD and its customers allows for a quicker response to abnormalities in use and fosters a sense of mutual understanding when it comes to serving Northern Wasco County with compassion and integrity.

NWCPUD looks forward to continuing to serve Celilo Village residents and all of our consumer-owners with energy-efficiency programs that positively impact the lives of our customer owners for years to come. ■

Travis Hardy is an energy management specialist at Northern Wasco PUD in The Dalles, Oregon.

Landscaping for Energy Efficiency

Proper plants in the right locations can save money for years to come

By Derrill Holly

The approach of summer has many gardeners turning their attention to planting plans. If your goal is energy efficiency, landscaping can not only beautify your home, but help you control future energy costs for years to come.

According to researchers at the Department of Energy's National Renewable Energy Laboratory, trees carefully positioned around a home can save as much as 25% of household energy consumption for heating and cooling. Shrubs can help control costs by diffusing wind or solar heating, thereby moderating the transfer of heat.

Meet Your Microclimate

For years, gardeners have used the U.S. Department of Agriculture's Hardiness Zones as guidelines for plant stock selection, seasonal cultivation and projected harvest. But understanding the impact of nearby vegetation, topography and soil science will help you know your yard better, providing flexibility for landscape planning and potentially more options for using plants to control energy costs.

Other factors influencing microclimate are the duration and intensity of sunlight over areas considered for planting, and proximity to topographic or vegetative wind breaks or wooded areas, which can regulate local temperatures by several degrees.

Trees at the Top

No matter how much you love trees, you will want to plant them at a distance.

Placed too close to foundations, pavement and plumbing, root systems or maturing branches can damage foundations or roofs.

Never plant trees close to power lines. Always consider their mature height, and make sure they will not grow into lines.

Planted in the right place, in five to 10 years a fast-growing shade tree can reduce outside air temperatures near walls and roofs by as much as 6 degrees Fahrenheit on sunny days. Surface temperatures immediately under the canopy of a mature shade tree can be up to 25 degrees cooler than surrounding shingles or siding exposed to direct sunlight.

According to the Department of Energy, deciduous trees—those that lose their leaves in autumn—are great options for seasonal summer shade. Tall varieties planted to the south of a home can help diffuse sunlight and shade the roof.

Shorter varieties of deciduous trees can be planted near exposed west-facing windows to help shade homes on summer afternoons. Mass plantings of evergreens selected for their adaptability to regional growing conditions can be planted further away on a north or northwest section of a yard to form a windbreak, shielding the home from winter winds.

Deciduous trees with high, spreading crowns—leaves and branches—can be planted to the south of your home to provide maximum summertime roof shading. Trees with crowns lower to the ground are more appropriate to the west, where shade is needed from lower afternoon sun angles.

Trees should not be planted on the southern sides of solar-heated homes in cold climates. The branches of deciduous trees will block the winter sun.

Using shade effectively requires you to know the size, shape and location of the moving shadow your shading device casts. Homes in cool regions may never overheat and may not require shading. You need to know what landscape shade strategies will work best in your climate and microclimate.

Trees are available in the appropriate

Dense evergreen trees or shrubs provide continuous shade and can block heavy winds.

Deciduous trees provide year-round benefit, offering summer shade and letting sunlight in during winter.

sizes, densities and shapes for almost any shade application. To block solar heat in the summer, but let much of it in during the winter, use deciduous trees. To provide continuous shade or to block heavy winds, use dense evergreen trees or shrubs.

Although a slow-growing tree may require many years of growth before it shades your roof, it will generally live longer than a fast-growing tree. Because slow-growing trees often have deeper roots and stronger branches, they also are less prone to breakage by windstorms or heavy snow.

Trees, shrubs and groundcover plants can shade the ground and pavement around the home. This reduces heat radiation and cools the air before it reaches your home's walls and windows.

Use a large bush or row of shrubs to shade a patio or driveway. Plant a hedge to shade a sidewalk. Build a trellis for climbing vines to shade a patio area.

To ensure lasting performance of energy-saving landscaping, use plant species that are adapted to the local climate. Native species are best because they require little maintenance once established and avoid the dangers of invasive species.

Properly selected, placed and maintained landscaping can provide excellent wind protection, or windbreaks, which will reduce heating costs considerably. The benefits from these windbreaks will increase as trees and shrubs mature. ■

Climate Strategies

The energy-conserving landscape strategies you use depend on where you live. With a little research and planning, you'll be well on your way to a beautiful, energy-efficient lawn.

The United States can be divided roughly into four climate regions: temperate, hot-arid, hot-humid and cool. Below are suggested landscaping strategies listed by region and order of importance.

Temperate

- Maximize warming effects of the sun in the winter.
- Maximize shade during the summer.
- Deflect winter winds away from buildings with windbreaks of trees and shrubs on the north and northwest side of the house.
- Tunnel summer breezes toward the home.

Hot-Arid

- Provide shade to cool roofs, walls and windows.
- Allow summer winds to access naturally cooled homes.
- Block or deflect winds away from air-conditioned homes.

Hot-Humid

- Channel summer breezes toward the home.
- Maximize summer shade with trees that still allow penetration of low-angle winter sun.
- Avoid locating planting beds close to the home if they require frequent watering.

Cool

- Use dense windbreaks to protect the home from cold winter winds.
- Allow the winter sun to reach south-facing windows.
- Shade south and west windows and walls from the direct summer sun if summer overheating is a problem.

Stay Clear of Electrical Hazards

Whether at work or play, be aware of electrical safety risks when outdoors

By Pam Blair

Warm summer weather draws people outside. Whether taking a dip in a pool, boating, playing outdoors, planting flowers or tackling home improvement projects, it is important to remember you are surrounded by electricity.

Practicing good habits around electricity helps ensure your family, friends and neighbors safely enjoy the outdoors.

Below are tips to help reduce the number of electrical deaths and injuries.

Power Lines and Utility Equipment

Before starting any project, identify the location of power lines. Look above for overhead lines. Be aware that some power lines are buried underground.

- Call 811 before you begin any digging project. A local call center will send out a crew to identify underground lines.
- Metal ladders conduct electricity, so use wooden or fiberglass ladders outdoors. Keep ladders at least 10 feet away from overhead power lines, and carry them horizontally.
- Always look up before raising any long piece of equipment—a ladder, irrigation pipe, antenna or pole—to make sure it won't come near a power line.
- Don't fly kites or drones near power lines. Reserve these for flight in wide-open spaces, such as a field or park.
- Do not attempt to retrieve balloons, kites or other objects stuck on power lines or other electrical equipment.
- Leave tree trimming to the professionals, particularly when the tree and its limbs are anywhere near a power line.
- Never play near or touch a power line with any part of your body, a toy, a stick or any other object. Assume all power lines are live and dangerous.
- Do not climb or play around a utility pole, an electric substation or a transformer box containing underground electrical facilities.
- Never climb a tree that is close to power lines. Even if lines do not touch the tree, they could touch when more weight is added to a branch.
- Do not post signs, hang banners, or tie ribbons or balloons onto utility poles or other electrical equipment. This can be dangerous to you and utility workers.
- Never try to rescue a family member, friend or pet that has come into contact with electrical equipment. Stay at least 35 feet away from downed power lines, and call 911.

Swimming Pools and Boating

Water and electricity do not mix. Inside and outside, electrical devices and cords should be kept at least 10 feet away from pools, spas and other water sources.

- Have an electrician inspect the pool, spa or hot tub. Make sure all equipment meets local codes and the National Electrical Code, which specifies that all electrical wires and junction boxes must be at least 5 feet away from the water.
- Use battery-operated instead of cord-connected devices around water.
- Cover all outdoor receptacles to keep them dry. This is especially important around pools and other water sources.
- Use a ground-fault circuit interrupter on outside outlets, especially those near water. A GFCI will shut off power to the outlet if the circuit is compromised.
- Make sure all electrical equipment used for swimming pools—even the cleaning equipment—is grounded.
- Never touch electrical devices when you are wet, either from water activities or from perspiration.
- Do not swim or hang out near the water before, during or after a thunderstorm. Water and lightning are a dangerous combination.
- Know the location of all electrical switches and circuit breakers.
- Post a detailed emergency plan around the pool, spa or hot tub area, outlining what to do if someone is suffering from electric shock.

When moving irrigation lines, ladders or other tall items, look up and make sure you do not come in contact with overhead power lines.

Photo by Mike Teegarden

Warn youngsters not to play around or climb on the green transformer boxes that house underground electrical facilities.

Photo courtesy of Touchstone Energy Cooperatives

Boating and Open-Water Fun

Docks and boats carry sources of electricity. Faulty wiring or damaged cords and other devices can cause the surrounding water to become energized.

Just like your home, it is critical a licensed electrician inspects your boat and that you are familiar with its electrical system so you can identify hazards.

- The National Electrical Code requires marinas and boatyards to have ground-fault protection. Test GFCIs and equipment leakage circuit interrupters monthly. Make sure electrical current is not escaping from the vessel.
- Check for nearby power lines before boating, fishing or swimming.
- Never swim near a marina or a boat while it is running. Residual current could flow into the water, putting anyone in the water at risk of electric shock drowning. There is no visible warning. As little as 10 milliamps—1/50th the amount used by a 60-watt lightbulb—can cause paralysis and drowning.
- If you feel tingling sensations while in the water, swim back in the direction from which you came, and immediately report it to the dock or marina owner.
- Know where main breakers are on both the boat and shore-power source so you can respond quickly in an emergency.
- If you see an electric shock drowning in progress, turn power off, throw a life ring and call 911. Never enter the water, or you also could become a victim.

Power Tools, Cords and Outlets

The U.S. Consumer Protection Safety Commission reports there are nearly 400 electrocutions in the United States a year. About 15% are related to consumer products, with 8% attributed to electrical accidents with electric power tools. Lawn and garden equipment and ladders coming into contact with overhead power lines account for 9% of consumer product-related electrocutions each year.

- Inspect power tools and appliances for frayed cords, broken plugs and cracked or broken housing. Repair or replace damaged items.
- Never use power tools near live electrical wires or water pipes.
- Check that each outlet has its own weatherproof outlet cover, and keep it closed when not in use.
- Use GFCIs with every power tool to protect against electric shocks.
- Do not use corded power tools in wet or damp locations.
- Use tools with insulated grips to avoid the potential of electric shock.
- Use only extension cords rated for outdoor use. Indoor cords cannot withstand outdoor weather conditions, and may become a fire or shock hazard.
- Before using an extension cord, inspect it carefully for damage. Discard cords with cracks or exposed wires.
- Use extreme caution when cutting or drilling into walls where electrical wires or water pipes could be accidentally touched or penetrated.
- If a power tool trips a safety device while in use, take the tool to a manufacturer-authorized repair center for service.
- Do not use power tools without the proper guards.
- Unplug outdoor tools and appliances when not in use. ■

Fighting to Keep the Lights On

Electric utilities are winning reliability battles against squirrels, storms and hackers

By Paul Wesslund

Did you know squirrels, lightning and trees have something in common? All three can knock out your electricity.

Electric cooperatives and publicly owned utilities work hard to keep your lights on all the time, but "you're going to have power outages, and that's just the way it is," says Tony Thomas, senior principal engineer with the National Rural Electric Cooperative Association.

An electric utility's basic job of keeping the power flowing 24/7 calls for maintaining a complex network of power plants, poles and wires. But it also means battling the unpredictable.

Thomas cites the top three troublemakers to electric reliability:

- Trees falling on power lines and other interferences from vegetation.
- Lightning strikes.
- Animals going about their daily routines, especially squirrels chewing on electrical equipment.

"Utilities do an awfully good job, but Mother Nature gets in the way sometimes," says Thomas.

Humans also contribute to power outages. Vandals deliberately damage electrical equipment and drivers accidentally crash into utility poles.

When it comes to electric reliability, the biggest challenge is maintaining and updating the massive machinery that makes up the nation's electric grid.

Despite the challenges, statistics show the lights are almost always on.

According to numbers collected from electric utilities, power in the United States is incredibly reliable. The percentage of time the average American has electricity at the flip of a switch is 99.97.

Equally impressive, Thomas says, is those numbers don't change much.

"I don't see big swings from year to year," he explains. "If things are fairly consistent, that means the utility is operating about as efficiently as it can."

Nonetheless, utilities still try to improve on that reliability.

Techniques being used to foil critter catastrophes include snake barriers around substations, buzzard shields on transmission towers and mesh coverings on wood poles to protect them from woodpeckers.

Utilities operate extensive right-of-way programs to keep vegetation away from power lines—from clearing underbrush to public awareness campaigns asking people not to plant trees where they can fall on power lines.

Those efforts can be aided by digital software that forecasts the growth of trees and other plants so utilities can prune branches before they cause a problem.

Other software tries to manage lightning by analyzing the age and wear on utility equipment, minimizing damage from lightning strikes so equipment can be replaced before it fails.

Fighting storms and squirrels are two ways to keep the power on. By far the biggest task comes from building, maintaining and updating the massive machinery of the nation's electric grid.

More than 8,500 power plants generate electricity that is shipped through 200,000 miles of high-voltage transmission lines. Banks of substations and transformers step-down that voltage to send it to homes and businesses through 5.5 million miles of distribution lines.

Keeping the power flowing 24/7 requires not only maintaining a complex network of equipment, but preparing as much as possible for the unpredictable.

Keeping that network up and running requires planning among utilities to anticipate how electricity will be used in the future. Part of that reliability planning focuses on protecting the electricity system from computer-based digital attacks.

Bridgette Bourge is among those overseeing how digital technology affects reliability for electric cooperatives and their consumer-members. As director of government affairs for NRECA, she sees both positives and the negatives to the latest internet-based, or cyber, technology.

"Cyber helps a lot on reliability because it gives us the ability to monitor and know everything right away," she says. "But whenever you increase reliability through a technology, you do potentially open up vulnerabilities as well from the security angle."

For any organization—including electric utilities—the benefits of the internet come infested with mischief makers.

Bourge says it is routine for a company to receive tens of thousands of attempts each day to break into its computer network. Those "knocks" at the cyber door can come from individuals, countries and organizations, or from an army of automated "bots" roaming the internet worldwide, testing for weaknesses where a hacker could enter.

A troublemaker inside the computer network could affect electric service. That is why NRECA has organized a variety of cyber reliability programs.

Bourge says those programs aim to help protect against a range of threats—from broad attempts to shut down parts of the electric grid to more focused efforts to corrupt pieces of software.

NRECA's cyber protection efforts include working closely with the nation's electric cooperatives to share techniques for protecting utility systems from internet invaders. NRECA also works closely with federal government cybersecurity groups in the Department of Energy and the Department of Homeland Security.

NRECA is part of a national program to create a cyber mutual assistance agreement. Much like how groups of lineworkers from an electric co-op travel to help restore power after a hurricane, these cyber agreements would mobilize teams of information technology experts in the case of a cyber incident.

"You can't solve cybersecurity," Bourge says. "No matter what you do today, the bad guys are going to figure out a way around it tomorrow. You have to keep thinking about the next step."

Bourge says community-based, member-led electric co-ops have a unique interest in protecting the reliability of the local community's energy supply.

"Electric cooperatives take cybersecurity very seriously," Bourge says. "It's built into their DNA." ■

New Era in the Electric Utility Industry

Solar, batteries and energy efficiency create a consumer-centric system of electricity

By Paul Wesslund

The power that lights your home is not your grandfather's electricity. It might not even be your older brother's electricity.

"Consumers are becoming more active participants in their daily energy lives," says Jan Ahlen, director of energy solutions at the National Rural Electric Cooperative Association.

Think about it. When a homeowner installs an array of solar panels on their roof, they are no longer just a customer. They have become a generator of electricity. Under federal and state rules, that homeowner can sell their excess electricity back to their utility.

"The utility industry has traditionally generated electricity from large power plants, then sent that to the distribution system, and then to the consumer," Jan says. "It's going to be a huge transformation. We're moving from a top-down approach to a networked model."

The transformation that's going on is huge because it is not just about the solar energy hobbyist, but about more people using a growing number of energy choices.

It's a trend utility insiders call "distributed generation," meaning electricity is getting made in different ways and places.

Backup generators give a homeowner the option to run a refrigerator during a power outage. A smart thermostat helps a consumer control energy use by automatically using less heating or cooling at times when nobody is home. Even electric cars can store electricity and use it in a different way at a different time.

Jan sees the trends as a new era of the industry that is "more consumer-centric."

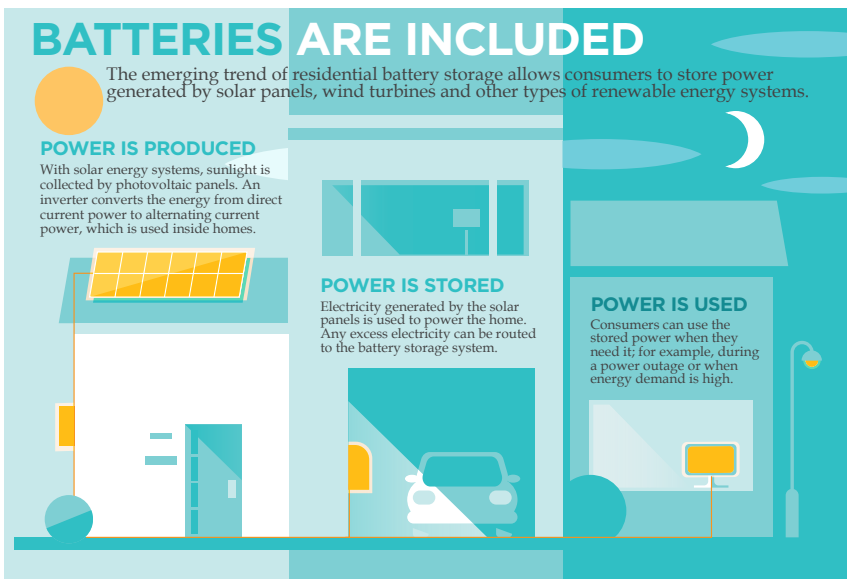
The new era means utilities will have to find new ways of doing business. It gives consumers more choices, but more choices mean homeowners and businesses will need the time and expertise to figure out how to get the best deal.

Jan says electric utilities are positioning themselves to help sort out the options for consumer-members in ways that benefit the surrounding community as well by connecting to the larger electricity network.

The distributed energy revolution is spreading as technology gets better and cheaper. New ideas are even changing ways of thinking about what generating electricity means. Energy efficiency can be thought of as a substitute for generating electricity, as improved lighting and appliances do the same work with less energy.

Here are a few of the trends creating the new era of distributed energy:

- Wind and solar energy have grown from generating about 3% of the electricity in the United States 10 years ago to about 8% today. The Energy Information Administration says that will continue, with wind energy growing 12% this year and 14% next year. EIA projects large-scale solar power will jump 10% in 2019 and 17% in 2020. Smaller-scale solar installed at homes and businesses is predicted to increase 44% in the next two years.
- Falling costs help drive that rise in renewable energy. One industry group estimates the cost of wind power is about a third of what it was 10 years ago. The Solar Energy Industries Association says the cost to install an average-size residential system has dropped from $40,000 in 2010 to $17,000 last year.
- Americans are becoming increasingly energy efficient, and in a new way of thinking that is considered distributed generation. One way to measure efficiency is to calculate the amount of electricity used by each household—a number called energy intensity. EIA



More homeowners are installing rooftop solar systems. During the next two years, the U.S. Department of Energy expects small-scale solar to increase 44%.

projects that number will decrease 0.3% each year for the next 20 years.

- Big batteries are putting more power under the control of consumers. From large home models that let rooftop solar owners store electricity from sunlight for use at night to huge industrial-scale arrays, batteries are getting better and cheaper. One industry group forecasts the U.S. energy storage market will reach $4.5 billion by 2023.
- Batteries power increasingly popular electric vehicles. About 700,000 electric vehicles are on American roads today, according to an analysis by CoBank, a financier for electric cooperatives. That number could jump to 3 million in the next five years.

One of the newer forms of distributed energy comes in the form of microgrids—essentially, a miniature utility system.

A hog farm might get some of its electricity from the local utility, but it also might have its own wiring system powered by an anaerobic digester producing electricity from pig waste, a set of solar panels and a large battery.

Those interested in microgrids and others jumping on the distributed generation bandwagon can benefit by working with their electric utility, says Brian Sloboda, director of consumer solutions for NRECA.

"A commercial company could put in a battery to benefit themselves, but they're only going to get a fraction of the benefit they could get from working with their co-op," Brian says.

Electric utilities could help the company use its extra capacity to provide backup power to the surrounding community, with financial benefits to the company.

In an era of distributed energy, electric utilities are in a position to help consumers make the best energy decisions, Brian says.

"There are all sorts of people out there trying to sell you stuff, and they may or may not have your best interests at heart," Brian says.

Instead of putting solar on your roof, your utility may have a community solar program you could participate in at a cheaper cost. He encourages consumers to talk to folks at their local utility before making an investment.

"They're the electricity experts, and they're your fellow community members," Brian says. "They're going to give you the most unbiased information." ■

Electric Co-ops Are Engines of Economic Development

By Dan Riedinger

Consumers Power Inc. is deeply committed to providing affordable and reliable electricity to our consumer-members and empowering the communities we serve. This means being more than just an electricity provider. It means being a partner in economic development and other activities that improve the lives of our members.

But have you ever stopped to wonder what kind of impact the nation's roughly 900 electric co-ops have across the United States?

A new report on this topic shows electric co-ops supported nearly 612,000 American jobs and contributed $440 billion in U.S. GDP from 2013 to 2017, or $88 billion annually. Those are some big numbers.

The study, "The Economic Impact of America's Electric Cooperatives," was conducted by FTI Consulting for the National Rural Electric Cooperative Association and the National Rural Utilities Cooperative Finance Corporation.

The report quantifies what many rural American families and businesses know well: Electric cooperatives are powerful engines of economic development in their local communities. Affordable and reliable electricity is a key ingredient for a successful economy. Because electric co-ops were built by, belong to and are rooted in the communities they serve, they play a vibrant role as economic cornerstones for millions of American families, businesses and workers.

Access to electricity was a vital component of economic development and diversification in the mid-20th century, and that remains true today. Roughly one in eight residents nationwide are served by an electric co-op, meaning direct co-op employment and investments can ripple throughout the economy and create additional economic value for local communities, regions and the country.

From 2013 to 2017, electric co-ops contributed $881 billion in U.S. sales output, $200 billion in labor income and $112 billion in federal, state and local tax revenues.

Nationally, electric co-ops spent $359 billion on goods and services across the economy, including $274 billion on operational expenditures, $60 billion on capital investments, $20 billion on maintenance and $5 billion on credits retired and paid in cash to members under the membership structure of cooperatives.

In conducting its analysis, FTI Consulting input data from 815 distribution cooperatives and 57 generation and transmission cooperatives into a national model to simulate the economic effects from direct expenditures by co-ops. The model also calculates the indirect effects throughout the industrial supply chain and the induced effects from consumer spending by the co-ops' employees and their suppliers.

The result of this effort is a first-of-its-kind study that reveals electric cooperatives are economic anchors across rural America. It demonstrates on a macroeconomic scale one of the seven guiding cooperative principles: Concern for Community. ■

Mark Your Calendar

Each September, Consumers Power holds its annual meeting at its Philomath headquarters. This year marks the 80th anniversary of providing safe, reliable, low-cost electricity to our members. The event is Saturday, September 7. Each year, three positions on our board of directors are up for election. This year, the positions are in zones 3,6 and 9. Election results are announced at the meeting. More details will be provided in upcoming issues of Ruralite, but mark your calendar now for the opportunity to learn more about your electric cooperative.

POWERFUL CONNECTIONS

The Economic Impact of America's Electric Cooperatives

In 2017, electric cooperatives...

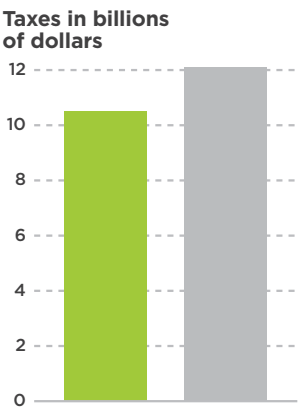
Supported

611,600

American jobs.

- **165,800** direct jobs
- **170,900** indirect jobs
- **274,900** induced jobs*

*Jobs that are created as a direct or indirect result of the work electric cooperatives do.



Generated

$22.5 billion

in federal, state and local taxes.

- **$10.5 billion** in federal tax
- **$12.0 billion** in state/local tax

Contributed

$88.4 billion

to U.S. GDP, **including**

$40.4 billion

in labor income to American workers.

NRECA
America's Electric Cooperatives

You Spoke, We Listened

Extended Office Hours

Beginning June 3rd

Monday - Thursday
7:00 a.m. - 5:30 p.m.

In response to our membership whose work schedule has always inconveniently coincided with ours, we will now be open longer hours to accommodate their needs. The office will be closed Fridays, but what won't change is the ability for members to make payments and report outages 24 hours a day, 7 days a week, by calling 1-888-420-8826.

If you have any questions about the new schedule, please call 541-673-6616 or 1-800-233-2733. Thank you for your feedback. It is our pleasure to serve you!

DOUGLAS ELECTRIC COOPERATIVE
A Touchstone Energy® Cooperative

Substation upgrades are needed to meet the growing needs of CEC members. Photo by Jeff Beaman

System Upgrades Key to Safety and Growth

Substations are the hub of Central Electric's distribution system

By Courtney Cobb

Among the biggest projects Central Electric Cooperative undertakes each year are upgrades to its equipment, from power lines to poles to substations. In 2018, CEC spent approximately $3.5 million on capital projects for its electric system. This figure does not include expenses for regular maintenance and inspections.

While most people can see the work involved when placing new poles and stringing new lines, many do not see the work going into substations, which are key to the backbone of the electrical grid. Substations convert high voltage from the transmission system into a lower voltage so it can be sent out over the distribution system or power lines.

"Substations are one of the most critical parts of our electric system," says Brad Wilson, CEC director of operations. "They serve all of our distribution system, which in turn, serves all of our members."

Line crews, substation technicians and engineers can find working on substations difficult as they deal with a variety of voltages, overhead obstacles, and equipment.

"All the equipment is energized at high voltages, and any omission or error can lead to a catastrophic result," Brad says.

He says the improvements allow CEC to adopt new technologies and

CEC linemen make system upgrades at the Hampton Substation.

Photo by Erika Henderson

protection devices for its substation equipment and communication.

"Upgrading also allows for increasing capacity at a substation to accommodate current and future growth in the surrounding area," Brad says. "These projects are completed looking 20 to 40 years out for sizing and development trends."

Central Electric Cooperative Chief Engineer Robert Bronson says modernizing substations better protects the equipment from catastrophic failure, greatly reduces the time necessary to restore an outage and provides more reliability for members.

The process for planning, designing and constructing substation upgrades varies by project. The process is broken down into load analysis, permitting, engineering and construction work.

"We try to accomplish this process in 12 to 18 months if feasible, but it may take as long as 36 months, depending on the complexity of the project," Brad says.

It also takes time for the necessary equipment to be manufactured and delivered to CEC. For example, on average, eight months is needed for a new substation power transformer.

When it can, the cooperative repurposes its equipment. In 2018, CEC completed an upgrade to the Sisters Substation by replacing a 20-megawatt transformer with a 50-MW transformer. The 20-MW transformer will replace a smaller transformer in service at the Tumalo Substation later this year.

Other projects slated for this year include completing a capacity expansion at the Bend Substation and starting a similar upgrade at the Powell Butte Substation.

A lot of work goes on behind the scenes that members don't see. Brad and Robert agree substations and substation equipment play one of the most vital roles in serving members now and into the future. ■

How Does a Substation Work?

Electricity is part of your everyday life—from your cellphone to your light switch. Have you ever stopped to think about how this energy reaches you?

Substations play a critical role in the electrical system. If not systematically upgraded, too much electricity to meet demand may compromise equipment, cause outages and reduce liability for the entire electrical system.

Electricity generated at a power plant moves through a system of transmission power lines carrying large amounts of high-voltage electricity long distances. The transmission lines connect with substations, where transformers reduce the high voltage and send electricity through distribution lines to consumers and businesses.

"CEC is a distribution co-op, so we use substations exclusively to step voltage down from transmission level to distribution level," CEC Chief Engineer Robert Bronson says. "Also included at a substation is equipment used to protect the circuits—the lines through which the electrons flow—leaving the substation. These circuit breakers open and deenergize the circuit if there is a problem downstream, much like the breakers in your electrical panel at home."

A substation consists of one or two larger transformers, regulators and circuit breakers. Regulators on the distribution side of the transformer help provide a steady voltage output so the electricity going to members is not affected by fluctuations from the transmission side. Circuit breakers serve as a switch to turn off a circuit to prevent it from being damaged due to a surge or excessive load of electricity.

When outages occur, it typically means a circuit breaker protecting a line leaving the substation has opened.

"Rarely is the crew actually working on the breaker during an outage," Robert says. "We have capabilities to bypass breakers at the substations to do maintenance and service work on them."

CEC has 24 substations throughout its electrical system. Each substation is important to the region it serves. If there is a problem at the substation, thousands of members served out of that substation will be affected.

Due to the specialized equipment in a substation and the danger from the levels of power coming into and leaving the substation; regular maintenance and repair work can take time.

"Above all, members need to remember substations are community assets that need to be protected," Robert says.

Willie Takes on Reddy

Electric cooperatives formed in the 1930s to bring electric power to the vast unserved areas of rural America. Though most of rural America had power by 1949, many consumers were still in the dark when it came to understanding electricity and the ways it could improve the farm and the lives of farm families. To help get the message out, co-ops wanted a spokes-character.

Leaders turned to the popular industry spokesman, the fanciful Reddy Kilowatt. Reddy had been around since 1926 and was used by 188 utilities in almost every state. He was depicted with a body, arms and legs of jagged red lightning bolts. He had a round head with a lightbulb for a nose and wall outlets for ears.

Ashton B. Collins, who licensed his character to private power companies, refused to let consumer-owned co-ops use the symbol. He cited power company propaganda that co-ops were "socialistic" because they relied on federal loans, and didn't want Reddy associated with them. Through a series of letters, Collins' lawyers warned co-ops that any character co-ops created would infringe on Reddy's exclusive patents and trademarks.

A year later, in 1950, NRECA pressed on believing its new creation—Willie—with his UL-like-approved body suggesting the practical application of electricity, was different enough from Reddy, who represented the abstract idea of electrical energy.

"Any similarity between trim, efficient Willie and the shocking figure of Reddy Kilowatt is purely coincidental," one co-op official said.

Willie's creation and adoption by the electric cooperatives was a jolt to Reddy and the investor-owned utilities. After a couple of years of angry exchanges and increasing static between Reddy's lawyers and Willie's defenders, Collins and a coalition of 109 private power companies formed Reddy Kilowatt Inc. Its first act was to file a lawsuit in South Carolina's federal district court against young Willie on July 14, 1953. The suit charged co-ops of infringing on Reddy's registered trademarks and practicing unfair competition in the electric utility industry. Reddy and company asked for an injunction to bar the use of Willie in co-op advertising and repayment of damages caused to Reddy's owners. In essence, Reddy and his legal henchmen were trying to pull the plug on Willie.

The gist of Reddy's lawsuit was not in how Willie looked. Rather, Reddy's lawyers argued that in marketing electricity, Willie's poses so closely resembled Reddy's that the public would be confused. Willie's attorneys countered that long before Reddy, other animated characters had been in widespread use, even in the electrical industry, as trademarks and ad promotions. From their beginning, co-ops constantly fought skirmishes with private power companies attempting to thwart the success of nonprofit utilities over territory and power supply. Appropriately, the battle between Willie and Reddy was symbolic of the David vs. Goliath struggle between co-ops and private power companies.

"This is the most vicious thing that the rural electric systems have yet encountered," quipped Clyde T. Ellis, NRECA general manager at the time. "We're not fighting one or 10 power companies this time. There are over a hundred of them suing us."

In June 1956, a federal judge sided with Willie and the co-ops. Reddy appealed to the U.S. Court of Appeals Fourth Circuit. A three-judge panel heard the case and, on January 7, 1957, issued its unanimous decision reaffirming the lower court.

The court noted the similarities between their poses, but added that Reddy has appeared in "thousands of poses doing almost everything humanly possible and in every conceivable activity." The judges ruled, "The plaintiff has no right to appropriate as its exclusive property all the situations in which figures may be used to illustrate the manifold uses of electricity."

The case also ended Reddy's monopoly over other power companies. Testimony during the trials revealed that Reddy's syndicate often acted like B-grade movie gangsters, using threats of lawsuits and intimidation to keep other private power companies from creating their own spokes-characters. Characters silenced by Reddy's handlers included The Willing Watts from Arkansas Power & Light Co.; Eddie Edison by Boston Edison Co.; Elec-Tric by Cincinnati Gas and Electric Co.; Mr. Watts-His-Name by Bradford Electric Co.; and Mr. Watt-A-Worker, by New Orleans Public Service Inc.

Though Willie symbolized co-op friendliness, he also embodied co-op spunk, willing to stand up for what was right in the face of impossible odds. "He's small, but he's 'wirey'" became part of Willie's trademark, which was granted by the U.S. Patent Office later in 1957. The registration allowed Willie to become the beloved character he remains today. ■

Story courtesy of Richard G. Biever, senior editor of Indiana's Electric Consumer. This was written in 2001, in honor of Willie's 50th birthday. Willie Wiredhand is a registered trademark of the National Rural Electric Cooperative Association and cannot be used without permission of NRECA.

Next month:
Willie transforms with the times to remain relevant

The front of the remodeled office space at Blachly-Lane Electric Cooperative.

Blachly-Lane Remodel Revealed

More space, ADA-compliance and earthquake-ready are a few of the improvements

By Craig Reed

The management and staff of Blachly-Lane Electric Cooperative made the recent remodel of their facility as much of a cooperative effort as possible.

Blachly-Lane members Murphy Plywood, States Industries, Seneca Lumber, Farwest Steel and FEI Testing & Inspection were part of the two-year, $5 million project. Some employees of these businesses are cooperative members and were also involved in the remodel work completed a year ago.

"I told the contractor entering into this project that we wanted to use our members as much as we could," recalls Greg Gardner, who was the co-op's project coordinator for the remodel and is now the co-op's general manager. "It was a very collaborative effort. I think Essex did a really good job of working with us to make that happen, and we're very appreciative of that."

Essex General Construction was selected as the general contractor for the project. Tim McMahen, the project manager, says this was the most extensive remodel he has been involved with in his 40 years in the construction industry.

"We get different requests like that one from Blachly-Lane about using its members," Tim says. "Sometimes somebody will want a brother to do the work or if it's a church, they'll want their members to do the work. We always want to work with the owners and their requests as best we can."

Tim, Greg, and Joe Jarvis, Blachly-Lane's general manager at the time, met weekly to discuss the progress of the work and to review bids for materials and work. They evaluated the figures and researched the quality of work of those submitting bids.

"The bids we received from the Blachly-Lane members were competitive in the market," Tim says. "These are all top-notch material providers and suppliers, so it was easy to work with them."

Murphy Plywood provided plywood for framing and wall and roof sheeting. States Industries provided plywood wall paneling. Seneca provided wall studs, Farwest Steel delivered rebar. FEI provided special construction testing, checking the compaction under the building, the concrete and the structural bolts.

The original building for the

Above, the meeting space is expanded and on the ground floor, providing ADA-compliant access to all members.

Left, the main lobby is bright and inviting.

Photos by Essex Construction

cooperative was built in 1964 and 1965. There was a remodel and an addition in 1988.

But that building was not up to seismic code, it did not have sufficient security and fire protection systems, and it was not 100% compliant with the Americans with Disabilities Act.

The remodel involved stripping the main building down to a skeleton and starting over. Tim estimates 20 dumpsters of debris were hauled to EcoSort, a company in Eugene that recycles construction waste.

The tear down did produce a unique discovery: a small safe embedded in the floor's concrete base.

Mary Locke, the keeper of the keys for the co-op, had a key that didn't have a home, so it was tried in the safe. It worked.

"We were hoping something cool would be in there, but it was empty," Greg says. "A big letdown."

This time, however, the Blachly-Lane staff put the co-op's 80th anniversary report, a brochure that explained the renovation of the building, a jump drive with photos of the current co-op employees and a 2018 penny, nickel, dime and quarter in the safe before closing it. The key was taped to the top of the safe.

The reconstruction then proceeded, following the blueprints provided by Loren Berry Architect of Leaburg.

"Everything was new except the shell," Tim says. "New Sheetrock, doors, flooring, windows. Every bit of plumbing and electrical wiring were replaced with new systems."

Overhead sprinklers were included in the building, a few fire hydrants were added outside and the facility was upgraded to 100% ADA compliant.

"It was critical that we do a seismic upgrade because this is an essential facility," Tim says. "It's now built to one-and-a-half times beyond code. In case of an earthquake, this facility has to be up and running because it needs to be here to help put everything else back in order."

A huge propane generator was installed so the building can operate even if power is out.

Greg explains that a previous analysis indicated the original building had little rebar in its construction and that it would not survive an earthquake over a magnitude of 4 or 5. With the remodel, the southern one-third of the building is designed to stand alone and survive a 9.0 Cascadia earthquake event. The other two-thirds of the building might shake some, but shouldn't come down.

"Now things can move around, but not fall down," Tim says of how seismic activity will affect the facility.

In addition to work on the main building, the project also included building an enclosed lockable storage area on the back side of the truck bay.

Another request Blachly-Lane made to Essex was to accomplish the work without the co-op office having to close and without the staff moving off the property to continue its everyday work. Those goals were accomplished despite some minor inconveniences to staff and members coming to the facility.

"The employees were great," Tim says. "They were very accommodating, moving around so we could get work done in specific places."

"Everybody here took it in stride," Greg says. "They knew they would benefit and eventually have a new home in which to work."

When the project was completed on schedule and on budget in May 2018, those involved were pleased.

"I think it's a very nice modern design," Tim says. "It looks great, it seems very functional and there have been a lot of compliments on it."

It was a cooperative effort by the co-op that was chartered in 1938. The facility is expected to be fully operational for many more decades. ■

Unplug to be More Connected

By Anne Prince

"Almost everything will work again if you unplug it for a few minutes, including you." Author Anne Lamott cleverly captures the benefits of unplugging in today's device-driven, multi-tasking world. Keeping up with work, family and school activities or the latest trends on social media makes most of us feel compelled to constantly check our devices.

Summer is a great time to take a family vacation, but it's also a good opportunity to unplug from our devices and enjoy the great outdoors with family and friends. Research has shown that we all need downtime after a busy day to recharge—even though we may resist it. Take a moment to slow down and enjoy some peaceful hours away from technology.

While you're unplugging from your devices, take a look around your home to identify electronics that consume energy even when they are not in use (this is known as "vampire" energy loss). TVs, gaming consoles, phone chargers and computers are some of the biggest culprits.

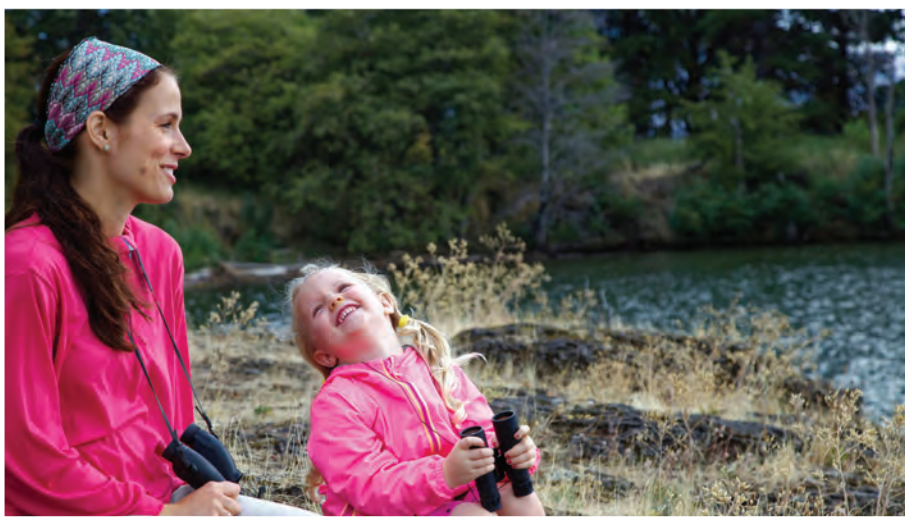
If your summer plans include a staycation, take time to recharge your relationships and be more present with those you love. Enjoy our beautiful surroundings with your family and friends.

Speaking of spending time outdoors, you can also enjoy energy savings by incorporating LED products and fixtures for outdoor use, such as pathway, step and porch lights. Many include features like automatic daylight shut-off and motion sensors. You can also find solar-powered lighting for outdoor spaces.

Save energy by keeping warm summer air outside where it belongs. Add caulk or weather stripping to seal air leaks around doors and windows. You can also employ a programmable thermostat to adjust the settings a few degrees higher when no one is home.

In our connected world, we have forgotten how to slow down. We multitask and text. We check email, then voicemail, then Facebook. Do yourself and your family a favor. Put down the device and smell the fresh air.

While Plumas-Sierra Rural Electric Cooperative can't help you recharge your relationships, we can help you save money and energy by connecting you with our energy-saving programs and services. When you do plug back in, we're just a call or click away at 800-555-2207 or www.psrec.coop. ■



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The Long-Term Impact of Cap and Trade

The Oregon Legislature is poised to pass so-called cap-and-trade legislation in the form of HB 2020. This legislation has been the subject of intense debate, including a remote field hearing in Baker City with the members of the Joint Committee on Carbon Reduction.

A cap-and-trade program is designed to put the state of Oregon on a glide path to reduce its carbon emissions—in this case, an 80% reduction by 2050. The good news for Oregon Trail Electric Cooperative is that our actual carbon emissions are relatively small because of our reliance on the emission-free hydropower from the Federal Columbia River Power System.

There are other important questions that representatives at OTEC have raised during the Legislature's deliberations. What will HB 2020 mean for family-wage manufacturing jobs, which are so important to providing economic opportunity in rural Oregon? If the cap-and-trade program is too onerous for businesses, they will be compelled to leave for states such as Idaho that do not have a similar program.

Then there is the price at the pump. Emissions from the transportation sector account for approximately 40% of the state's emission. One economic study concluded that under a cap-and-trade program, gasoline could increase immediately by an estimated 16 cents per gallon. Over time, this increase could add several dollars to the price of a gallon of gas. What will this mean for rural Oregonians who often have to drive long distances for basic services such as health care? Thus far, there seems to be little relief for those who live far from Portland.

Despite these many unanswered questions, HB 2020 appears to be headed for passage in the final month of the Oregon Legislative Assembly. Then, the real hard work will begin of writing the rules for an ambitious, sweeping program that could change the landscape—and the rural economy—of our state for decades to come.

Ted Case
Executive Director
Oregon Rural Electric Cooperative Association

Inside

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Oregon Trail Electric Cooperative Director Greg Howard, third from left, talks with Rep. Greg Walden during a dinner on Capitol Hill. To the far right is OTEC Director Austin Bingaman.

The largest contingent ever of Oregon electric co-op leaders travelled to Capitol Hill in May for NRECA's Legislative Conference.

Masters of Disaster

Oregon electric co-op leaders travel to Capitol Hill seeking disaster aid for storm damage—as well as relief from policies that could have disastrous consequences for their members

By Ted Case

The largest group from Oregon electric co-ops ever to attend the National Rural Electric Cooperative Association legislative conference traveled to Washington, D.C., in early May to lobby their congressional delegation, key committees and the Trump administration on a range of proposals important to co-op members.

NRECA's legislative conference attracts nearly 2,000 electric co-op leaders from across the country, but the timing of the rally was particularly relevant for Oregon.

In April, Oregon Gov. Kate Brown requested federal disaster declaration for counties devastated by the winter storms that closed roads and caused widespread power outages. The storms caused nearly $10 million in damage for Roseburg-based Douglas Electric Cooperative and $5 million for Lane Electric, headquartered in Eugene. Oregon electric co-op leaders used a White House meeting to urge high-ranking Trump administration officials to approve Gov. Brown's disaster aid request.

Co-op leaders also pressed officials with land management agencies to finalize regulations regarding vegetation management policies that will increase reliability of the electric grid and mitigate wildfires that swept across the West in 2018 because of trees falling into power lines. Oregon co-ops were strong supporters of legislation that passed in the previous Congress to streamline vegetation management practices, including offering congressional testimony on two separate occasions.

After heading to Capitol Hill, the leaders met with their senators and representatives, urging support for the RURAL Act (S. 1032, H.R. 2147) that would protect electric cooperatives' tax-exempt status as a result of an unintended consequence of the tax code. Co-ops receive grants for a variety of purposes, including economic development and storm restoration. Because of tax law, these government grants could jeopardize a co-op's tax-exempt status, forcing difficult choices for co-ops and their members.

The trip yielded positive results for Oregon co-op leaders. Only days after returning from Washington, D.C., President Donald Trump announced he had approved disaster assistance to Oregon counties. Key members of the Oregon delegation also announced support for the RURAL Act. ■

Brandon Martin first got interested in raising chickens at a 4-H event. Now he's running his own roadside egg business along Mount Si Road.

Local Teen Hatches Business Plan

Brandon Martin is building community with his chickens and roadside egg stand

By Anne Herman

About 2 miles along Mount Si Road in North Bend is a sign that reads, "Farm Fresh Eggs." Those three small words hint at an inspiring story of a young man's love for his birds, which has burgeoned into a thriving business and a new community.

Fifteen-year-old Brandon Martin says he got interested in chickens at a 4-H event when he lived in Minnesota. He met with members of the group, who gave him a copy of the Murray McMurray Hatchery catalog.

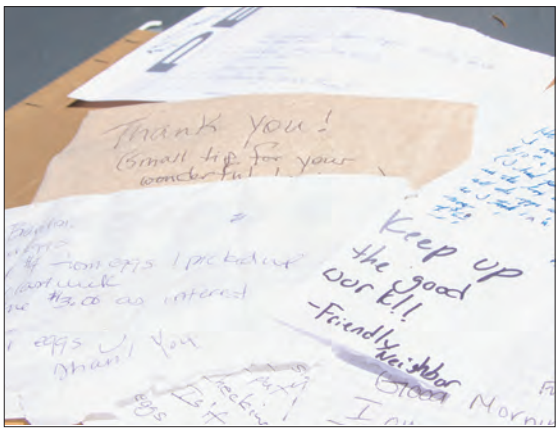
Brandon has autism, which gives him a heightened ability to focus on a subject. He got a book on breeds and kept reading. He learned about temperament, size, egg color and production. The more he read, the more he wanted his own chickens.

Meanwhile, his family moved to North Bend.

"Once we were in Washington, we ordered a mixed breed assortment of baby chicks and began preparations," Brandon says. "We set up a chick brooder in the garage and got the feed, supplements, water and heat ready for their arrival. Then we got a very early morning call from the North Bend post office to come pick up our baby chicks. February 14 was the day I got my long-awaited chicken flock."

He says the chickens are healthy and easy to care for, but still require a lot of work.

"My dad and I built a coop for my initial flock," Brandon says. "Once that



Top row, Brandon's chickens are friendly enough to eat out of his hand. The chickens eat about 200 pounds of feed a week. Left, customers often leave notes of praise.

was built, the maintenance has been easy. This involves filling the feeder and water every couple of days. Twice a month, I clean the coop and add fresh wood chips. Monthly, I sprinkle diatomaceous earth in the wood chips to keep the birds healthy."

The entire family pitches in now.

"Instead of the farm having the kids help, the kid runs the farm and we help," says Brandon's father, Chris.

Brandon says the chickens have different personalities.

"Some talk, some don't," he says. "My favorite thing about raising chickens is having them as pets. Each of the birds has a fun little personality. Some days I sit out with them and watch their daily routine. The birds are very social and hang out and do things together."

Many of the birds have names. Brenda, a 3-year-old Turken, is the leader of the flock. Fiona, nicknamed Fuzzy, is a light Brahma.

As the flock grew, the family added additional coops. At first, the birds were under netting, only gaining access to the full yard when Brandon was out with them.

"The birds pined to be free, so I eventually softened and let them roam free," Brandon says. "This has resulted in losing a few birds over the years to aerial predators. As hard as it is to lose one of my beloved birds, I continue to let them roam free during the day as they enjoy it so much. I have decided their daily enjoyment is worth the risk. Sadly, everything likes chicken."

Jennifer, Brandon's mother, says they have four to five dozen chickens.

"We lost count a while ago," she says. "Every loss is traumatic, so we stopped counting."

When the family started to have more eggs than they needed, they began giving them to neighbors. Soon they had more than they could give away. That's when the idea of a business was hatched.

Brandon's grandfather, a civil engineer, built a modular stand. He shipped it to North Bend in pieces, and the Martins assembled it.

That was two years ago. The business has taken off. Brandon says his biggest challenge is keeping up with demand.

"I'm putting out four to five dozen eggs a day and they sell very quickly," he says.

Customers leave notes like, "Thank you!" and "Keep up the good work!" and the most frequent: "When are you going to have eggs?" Sometimes they stop by just to chat.

The family enjoys the sense of belonging in their new home. One customer offered to buy all the eggs Brandon's chickens can lay, but he declined because then he would no longer have his stand.

"That wouldn't be good," Brandon says. "I feel like I'm contributing to the community." ■

Use Energy Wisely

Beat the Heat

This time of year, consumers typically see their electric bills rise with the temperature due to increased use of air conditioning.

Many consumers work their systems harder than necessary, throwing hard-earned money down the drain. Save money during the hot summer by using energy more efficiently.

Use varies among households, but air conditioning systems can account for 40 to 50 percent of your monthly power bill during the hottest months, when demand is at its highest.

Ultimately, only you can control the amount of energy you use. A few simple, free steps can help you take charge of your energy consumption and save you money.

Need help remembering how long a filter's been in place? When you replace a filter, write the date on the side.

Cost-Free Energy-Saving Tips

To alleviate higher power bills:

- Use ceiling fans to disperse cool air. They can make rooms feel a few degrees cooler than they actually are, allowing you to keep your thermostat at a higher temperature. You can save up to 4 percent of your household energy consumption for each degree you raise your thermostat. Be sure to turn off fans when you leave a room.
- Keep your shades closed during the day, especially on east- and west-facing windows. At night, open windows across from one another for cross-ventilation.
- Delay heat-producing activities—such as dishwashing and laundry—until evening. These appliances heat up your home, creating extra work for your air conditioner.
- Keep lamps and TVs away from the thermostat. The heat they produce will cause your air conditioner to run longer, driving up the cost of your power bill.
- Do not obstruct air-conditioning vents. If they are covered, you won't feel the cool air you are paying for.
- Change your filter. That will cut your household energy consumption between 5 and 15 percent. Remember to change your filters at least once a month.
- Close unnecessary openings in your home. Keeping doors, windows and fireplace dampers closed will prevent cool air from escaping and going to waste.
- Use the "auto fan" setting on your thermostat. This will keep your home at a constant temperature and prevent your air conditioner from working harder than needed.
- When you first turn on your air conditioner, do not set the thermostat lower than the desired temperature. That will not cool your home any quicker. It will make the air conditioner run longer to cool it to a lower temperature. This wastes energy.
- Keep storm windows closed during the summer. They provide extra insulation for your windows, helping keep the hot air out and the cool air in.

Invest a Little for Added Savings

Low- to moderate-cost investments could save on overall energy consumption. While these measures require money initially, they eventually pay for themselves in savings:

- Look for a Seasonal Energy Efficiency Rating of 14 or higher when buying a new air conditioner. You should begin to see the difference on your power bill immediately.
- Install a programmable thermostat and save up to 10 percent a year. It can automatically adjust the temperature 10 to 15 percent for the hours your home is unoccupied. Programmable thermostats are available in a range of prices and options.
- When buying ceiling fans, look for an Energy Star model. They move air up to 20 percent more efficiently than conventional models.
- Be sure your home is properly insulated. It will keep your home cooler and reduce cooling costs up to 30 percent. Start in the attic, where temperatures can reach 155 degrees Fahrenheit.
- Seal leaks to save 10 percent or more on energy bills. Caulk and weather strip all seams, cracks and openings to the outside.
- Consider high-performance Energy Star windows if you are building a new home or replacing windows in an older home. They can reduce average cooling costs 15 to 35 percent—especially in the South, where summer temperatures often reach the upper 90s and low 100s.

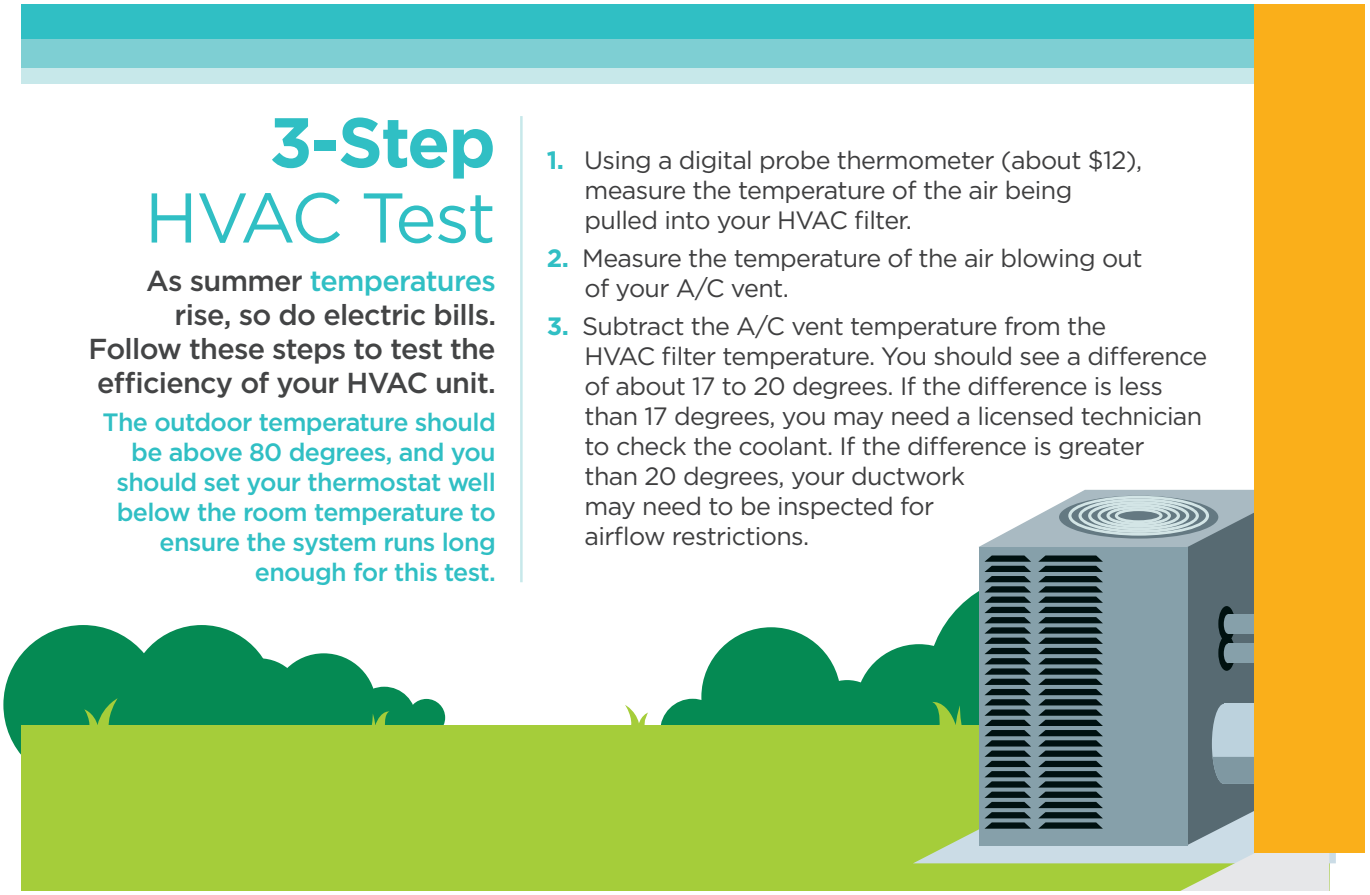
Summer in the South is hot enough already. Why not make your power bill one less thing to sweat about? ■

3-Step HVAC Test

As summer temperatures rise, so do electric bills. Follow these steps to test the efficiency of your HVAC unit.

The outdoor temperature should be above 80 degrees, and you should set your thermostat well below the room temperature to ensure the system runs long enough for this test.

1. Using a digital probe thermometer (about $12), measure the temperature of the air being pulled into your HVAC filter.
2. Measure the temperature of the air blowing out of your A/C vent.
3. Subtract the A/C vent temperature from the HVAC filter temperature. You should see a difference of about 17 to 20 degrees. If the difference is less than 17 degrees, you may need a licensed technician to check the coolant. If the difference is greater than 20 degrees, your ductwork may need to be inspected for airflow restrictions.



Maintaining an Efficient HVAC System

Clean and service your unit to avoid unwelcome summer breakdowns

By Abby Berry

Ah, summer. Cookouts, swimming pools, camping—it's the perfect time to enjoy the outdoors with family and friends. When coming back indoors, there's nothing better than that cool blast you feel from your home's air conditioning unit.

Your heating, ventilating and air conditioning system is essential to keeping your home comfortable during summer months. If it breaks down, it's also the most expensive equipment to repair or replace. Luckily, you can take simple steps to lengthen the life of your HVAC system.

Change or clean filters. Dirty filters block airflow, which can greatly decrease the efficiency of your system. The Department of Energy recommends changing or cleaning filters every month or two during the cooling season. If your unit is in constant use or is subjected to dusty conditions or pet hair, check filters more frequently.

Clean the HVAC unit. Outdoor condenser coils can become clogged with pollen, dirt and small debris. Use a hose to spray the HVAC unit once each season to ensure maximum airflow. Warning: Do not use a pressure washer to do this. It can damage the equipment.

Clear space around the HVAC unit. Dryer vents, falling leaves and grass left behind from the lawnmower can create buildup. Remove any debris around the HVAC unit. If you have foliage near the unit, trim it back at least 2 feet around the condenser to increase airflow.

You should have your HVAC system periodically inspected by a licensed professional. The frequency of inspections depends on the age of your unit, but the U.S. Department of Energy recommends scheduling tuneups during the spring and fall, when contractors aren't as busy.

When HVAC equipment fails, it's inconvenient and uncomfortable—especially during the dog days of summer.

Your HVAC system runs best when it's regularly cleaned and serviced. With a little maintenance along the way, you can add years to your system's lifespan. ■

Unplug to Stay Better Connected

Put down devices and spend time with family and friends

By Anne Prince

"Almost everything will work again if you unplug it for a few minutes, including you."

Author Anne Lamott cleverly captures the benefits of unplugging in today's device-driven, multitasking world. Keeping up with work, family and school activities or the latest trends on social media makes us feel compelled to constantly check our devices.

Summer is a great time to take a family vacation, and an opportunity to unplug from our devices and enjoy the great outdoors with family and friends.

Research shows we all need downtime after a busy day to recharge—even though we may resist it. Take a moment to slow down and enjoy some peaceful hours away from technology.

While you're unplugging from your devices, take a look around your home to identify electronics that consume energy even when not in use. TVs, gaming consoles, phone chargers and computers are some of the biggest culprits of "vampire" energy loss.

If your summer plans include a staycation, take time to recharge your relationships and be more present with those you love. Enjoy some of our local gems: canoe Fisheating Creek, hike Highlands Hammock State Park, camp at Kissimmee Prairie Preserve State Park and admire a dark sky glowing with stars, or fish one of our lakes teeming with exciting catches awaiting you. Enjoy our beautiful surroundings with family and friends.

Speaking of spending time outdoors, you can enjoy energy savings by incorporating LED products and fixtures for outdoor use, such as pathway, step and porch lights. Many include features such as automatic daylight shut-off and motion sensors. You can also find solar-powered lighting for outdoor spaces.

Save energy by keeping warm summer air outside where it belongs. Add caulk or weather stripping to seal air leaks around doors and windows. Employ a programmable thermostat to adjust the settings a few degrees higher when no one is home.

In our connected world, we have forgotten how to slow down. We multitask. We check email, voicemail, then Facebook. Do yourself and your family a favor. Put down the device and smell the fresh air.

While Glades Electric Cooperative can't help you recharge your relationships, we can help you save money and energy by connecting you with our energy-saving programs and services. When you do plug back in, we're just a call or click away. ■

Canoers take time to unplug on Fisheating Creek in Glades County.