April 2019 Share Package
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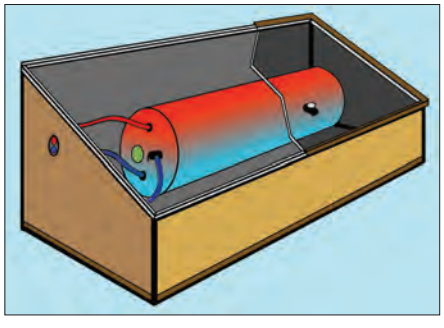
DIY Solar Water Preheating Reduces Cost, Peak Demand



Above and top, this do-it-yourself solar water-heating kit uses a batch design to preheat incoming cold water. The angle of the top depends on the latitude of your region.

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

Q. *We have teenage daughters who take long showers. Our water heating costs are sky high. We are on a tight budget, but want to use some solar water heating. Is there a system we can make ourselves?*

A. For a typical family of four, heating water can account for about 20 percent of its annual utility bills. If you have two daughters taking long showers, yours may be somewhat higher.

Don't expect a solar water-heating system to cut your water heating costs to zero. A target savings of 40 to 50 percent is reasonable for a simple system.

Using solar energy to heat water is generally more economically feasible than for space heating. Your family uses hot water year-round, so the savings continuously pay back the initial investment. By contrast, a solar space-heating system is used only about six months a year, so the payback period is often much longer.

Before you consider using solar or any other efficient water-heating methods, install low-flow showerheads with shut-off tickle valves. Also talk with your family about taking shorter showers. This not only reduces water heating costs. It also conserves our fresh water supply.

Unless you are an accomplished craftsman, I suggest you make a simple batch solar water heater. This is called a passive system because the water moves through it due to the incoming line pressure or temperature differences, yet it can be quite efficient and effective.

Attempting to build an active solar system—with collectors on the roof, plumbing, pumps, control systems and storage tanks—is beyond the skill level of most homeowners. I am a mechanical design engineer and don't think I could build an active system from scratch. There are kits available, but it takes a high skill level to install and set it up properly.

A batch solar system is used as a preheater for your existing water heater. The incoming cold water flows through the solar preheater before going to your water heater. Each degree the water is warmed in the preheater reduces the amount of electricity used by the water heater. This also reduces your peak electricity demand for your electric utility.

The simplest batch solar system is called a breadbox design. It uses a horizontal metal water tank inside of a box with a clear top. The sun shines in through the clear top to heat the water. A slightly more efficient option uses a tall box tilted at an angle to face the sun. This allows the warmer water to be drawn first from the top of the tank.

You can buy a stainless steel water tank especially designed for this application with the inlet and outlet water fittings. If you can find an old water heater that is not leaky, strip off the metal skin and insulation to use the inner tank. Paint it flat black to absorb more of the sun's heat.

It helps to insulate the solid sides and bottom of the box, especially if you plan to use it most of the year. Very heavy insulation is not needed because the tank will not get extremely warm. One-inch-thick foil-faced rigid foam sheets should be fine. Attach them inside the box so they reflect the sun's heat to the tank.

Install water valves and plumbing so the solar tank can be drained and bypassed during cold weather. Install heavy insulation around any exposed pipes and bury as much as possible underground. ■

The following companies offer solar kits and components: Alternative Energy Store, 877-878-4060, www.altestore.com; Solar Components, 603-668-8186, www.solar-components.com; Build It Solar, www.builditsolar.com; and Solar Direct, 800-333-9276, www.solardirect.com.

Electricity 101: The Flip of a Switch

A lot happens behind the scenes to generate and deliver power to homes and businesses

Have you ever wondered why they call it electricity?

It's named after those little pieces of atoms called electrons. That's the place to start in understanding how power plants make something that reliably lights your home with the flip of a switch.

Getting all those electrons to march together inside a wire has been described as one of civilization's greatest and most complex engineering feats.

Just about all of your electricity starts with the scientific phenomenon that spinning a magnet inside a coil of wires will generate electricity. Deep inside most power plants are large turbines that are turned in different ways: falling water at a hydroelectric dam, burning coal or natural gas at a fossil fuel station, atomic energy at a nuclear power plant or the rotating blades of a wind turbine. One exception is solar energy, which uses materials that produce electricity when they are activated by sunlight.

Every power plant is unimaginably complicated. Think about what you would do if you were handed a lump of coal and were told to make it run your refrigerator.

Most large electric generating plants need large banks of transformers to boost the voltage for the cross-country trip through wires held up by tall transmission lines and towers. As it nears your neighborhood, the voltage is reduced at one of those fenced-in complexes of wires and transformers called a substation. Lower voltage makes the electricity safer for home energy use.

As the electricity gets closer to your home or business, the voltage is reduced again with smaller transformers, which typically are mounted on a nearby utility pole or in a ground-level green box in your yard.

Beyond those basics, all that flowing electricity must be coordinated so it gets to the right house just as it's needed. Safety is always a top priority. Line crews must be organized for both routine power line maintenance and restoration after storm damage.

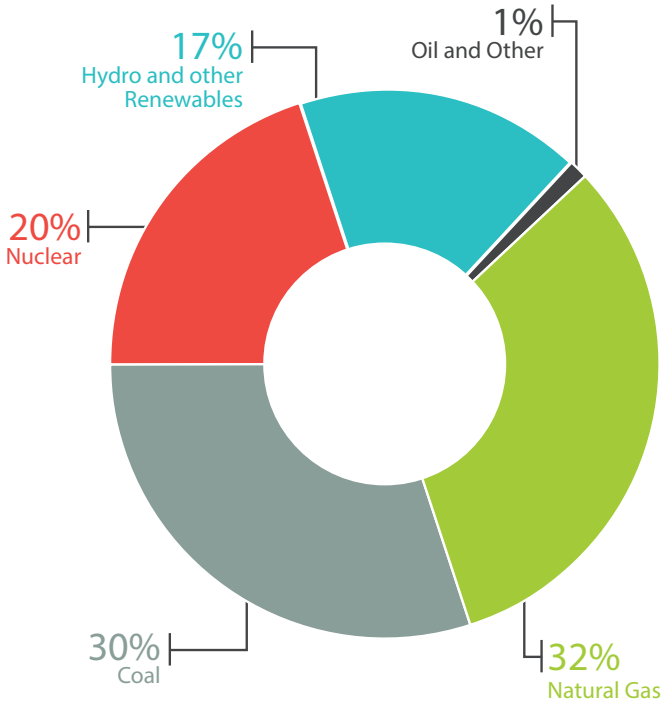
When you think about it, that's a lot of power in the simple flip of a switch! ■

Paul Wesslund writes on consumer and public power affairs for the National Rural Electric Cooperative Association.

Powerful Sources

Nationally, public power utilities use a variety of fuels to power American homes and businesses. This diverse fuel mix supplies consumers with the safe, reliable, affordable power they depend on.

Source: U.S. Energy Information Administration (2017 data)



Structural Support

The pros and cons of power pole options

By Craig Reed

Power poles are part of the landscape and are usually taken for granted. But they have a powerful purpose.

Whether wood, laminate wood, metal, concrete or composite fiberglass, poles are the structures to which transmission and distribution lines and transformers are attached. Working together, the system carries electricity to residences and businesses, powering lamps to refrigerators in homes and complicated computer systems to robotic machines for multimillion-dollar companies.

Using a pole for transmission came about in 1843 after Samuel Morse's demonstration project to send messages over a distance via underground telegraph wires proved ineffective. It was suggested the quickest way to complete the project would be to string telegraph wires overhead using wood poles. While the telegraph system eventually faded away, wood poles did not. They were there to provide the needed structure when electrical systems came on line.

For many decades, wood poles—whether from Douglas fir or cedar trees harvested in the Pacific Northwest, or yellow pine trees from the southern U.S.—had no competitors in providing structure for electrical wires, transformers, insulators and fuses. But that has changed with laminate wood, steel, composite fiberglass and concrete poles becoming options in recent decades.

Because wood poles have the longest history and the electrical industry has been traditionally conservative regarding change, wood is still the most popular option. But depending on conditions, other types of poles are being put into operation.

"Experimentation of the different poles is ongoing," says Brent Hill, vice president of sales for General Pacific, a company that provides products and services to the electrical industry. "Everybody is looking for structures that can withstand whatever Mother Nature has to offer, but I've read articles indicating they are all still susceptible to Mother Nature."

Following are the pros and cons for each of the different power pole options.

Brent Hill of General Pacific contributed information for this article.

Wood power poles are still the most common.
Photo courtesy of Brent Hill, GenPac

Wood

Wood poles are plentiful, renewable and the industry is most familiar with them. The life span of a treated wood poles is 30 to 40 years, but some that are 50 to 60 years old are still in good shape.

Pros:

- Easy to work with and easy to work on.
- Can be climbed by linemen and drilled to add attachments.
- Utilities already have the tools and equipment needed to work on the poles and to maintain them.

Cons:

- Susceptible to fire—especially if treated with a chemical preservative, which most are.
- Some people consider poles treated with a preservative not to be environmentally friendly because rainwater and groundwater can carry the preservative into nearby ground or the water system.
- Testing for deteriorating or rotting wood at the base or in the ground is required on a 5- to 10-year rotation, depending on location. Testing is needed more frequently in wet or coastal terrain than in a drier climate.
- Wood absorbs moisture. In freezing weather, poles can become brittle and susceptible to breaking in windstorms or when hit by falling branches or trees.
- Wood poles can be weakened by woodpeckers.

Laminate Wood

Photo courtesy of Brent Hill, GenPac

These poles are made from wood boards pressed and glued together under extreme pressure. They receive a preservative treatment after lamination. They have lasted more than 50 years.

Pros:

- Because of their tremendous strength, these poles are generally used where there is no room for guy wires, but the utility wants to use wood.
- The pole can be climbed and drilled using the same tools as on traditional wood poles. However, working from a bucket truck is preferred.

Cons:

- Heavier and more expensive than wood.

Steel/Metal

Photo courtesy of Valmont Industries

The second most popular, these poles are one of the strongest options. They are hollow, with about a quarter-inch of metal forming the exterior, and are usually several-sided rather than circular. They have an estimated life span of 60 to 80 years.

Pros:

- Being hollow, these poles are not too heavy.
- When erected correctly and in the right terrain, most do not need guy wires.
- Because they don't need a preservative treatment, they are environmentally friendly.
- In coastal and salty environments, steel lasts longer than wood.
- Steel doesn't need the maintenance and routine testing of wood. Visual condition checks usually are sufficient.
- They stand up better against strong winds.
- Steel is fire resistant.

Cons:

- Steel is more expensive than wood.
- Adding attachments to steel poles is more difficult than wood because welding or drilling on steel is difficult. It's best if the steel is pre-engineered for attachments before the pole goes in the ground.
- Climbing steel is a challenge, so it is best if the pole is accessible to bucket trucks. If not, steps or ladders can be used to access the top of the pole.
- Steel is more conductive than other pole options, so it can be detrimental to work crews and wildlife if the system on the pole is not in the best of shape and becomes energized.
- If hit by a vehicle, the strength of the pole is significantly impacted because it is hollow.

Composite

Photo courtesy of Brent Hill, GenPac

These poles can be made from a combination of materials, with the most prevalent being produced from a mixture of fiberglass and polyurethane resin. Plastics, reclaimed wood or medium-density fiber also can be used. Their longevity is estimated to be 60 to 80 years.

Pros:

- The lightest of the options, it still has strength that exceeds wood.
- Fiberglass is environmentally friendly. When used in a wet environment, there is no leeching of preservative.
- These poles can come in sections, making them easier to move and handle, even by hand in rough terrain.
- Drilling is possible using the same equipment used on wood.
- Maintenance is not extensive.

Cons:

- Composites are more expensive than wood.
- These poles are being monitored and tested for how they react to fire. They don't seem to hold up well, but can be treated with or manufactured with a fire-resistant product.
- Manufacturing composites requires more energy than milling and treating a wood pole, according to the Environmental Literacy Council.

Concrete

Photo courtesy of Valmont Industries

Reinforced concrete poles have become popular as line supports. They permit longer spans of line between poles, and have a life span of 60 to 80 years.

Pros:

- Strength.
- They take little maintenance.
- They have good insulating properties.

Cons:

- The weight of these poles make them difficult and expensive to move. When used, they are usually manufactured on site.
- Few utilities in the West have the equipment to deal with these poles and to drill them, if needed, after they are upright.
- They can't be climbed unless holes or steps in the concrete have been pre-engineered. Otherwise, a bucket truck must be able to reach them.
- If they are knocked over by some event, they will do major damage to nearby structures and are difficult to clean up.

Wells Rural Electric Co. Foreman Jacob Manning, right, tailgates with Apprentice Lineman Joey Payne, left, and Journeyman Lineman Chris Duffy prior to changing out an insulator on an energized line, opposite page. The Nevada co-op has pledged to maintain a culture of safety through the National Rural Electric Cooperative's Commitment to Zero Contacts initiative.

Photos by Layla Welsh

An Initiative to Work Safely

By Pam Blair

Nearly two decades ago, Northfork Electric Cooperative's Heath Martin survived a 7,200-volt shock on the job. He admits the accident was his fault.

Heath and his co-worker, Chad Crompton, had worked all night, then were called to a routine outage.

Heath says he was thinking about an upcoming fishing trip with his buddies.

"I was in a hurry, but it was no reason to take a shortcut," he says.

Heath suffered severe burns to his hands and face, resulting in skin grafts, multiple surgeries and physical therapy.

"Grounding that line down would have taken me maybe five minutes at the most," says Heath, who now is safety director at the Oklahoma co-op. "I just made a bad decision that day."

Although the overall injury rate has fallen dramatically, serious injuries and fatalities among electric cooperative lineworkers are happening with alarming regularity, says Bud Branham, director of safety for the National Rural Electric Cooperative Association.

"Research shows you can have the best injury rates in the world, but you can still fall victim to a catastrophic incident," Bud says. "We must all remain focused."

A nationwide survey of 51,000 co-op employees conducted annually between 2006 and 2015 found an average of more than 23 serious injuries and fatalities, which is defined as any claim greater than $100,000—"a life-altering event for an employee," Bud says.

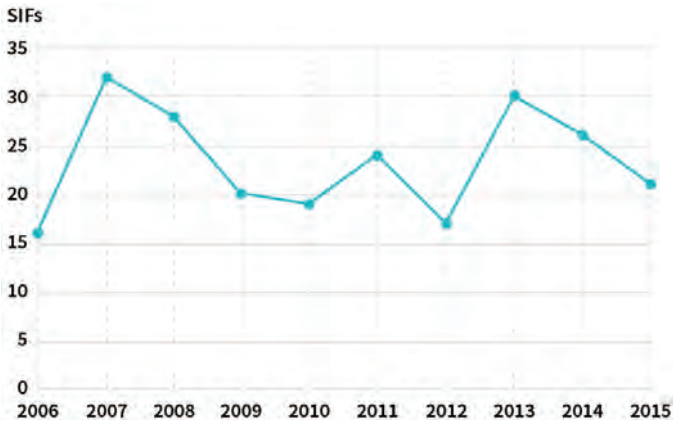
"The No. 1 cause of claims—40 percent—are electrical contacts that result from failure to use appropriate personal protective equipment or insulated covers, or to test and ground facilities—the life-saving rules everyone has been taught," Bud says. "It's like blocking and tackling in football. There are always pressures to take shortcuts. As we become more skilled, we

A Positive Spin on Safety

Commitment to Zero Contacts suggests co-ops avoid a "bad cop" mentality and instead focus on a systemwide approach that helps them:

- Clarify and define life-saving rules.
- Verify use of life-saving rules.
- Create effective job planning on all jobs, including the routine.
- Form a structured safety management process.
- Seek employee involvement.

Serious Injuries and Fatalities for Co-op Lineworkers



In the past decade, the overall injury rate has fallen among co-op lineworkers, but high rates of serious injuries and fatalities persist.

Source: Federated Rural Electric Insurance Exchange and statewide associations

become less risk-aware. The simpler the task, the less our brain focuses on it. With fast-brain thinking, we skip steps."

Especially during outage restoration work, the tendency is to "hurry up and get it done," Bud says, noting the thought pattern can be, "I'll just do it this one time. It won't hurt me."

Sometimes it doesn't. Other times it does. Either way, it's a trend safety leaders across the country want to stop.

In April 2018, NRECA, Federated Rural Electric Insurance Exchange and electric co-op statewide safety leaders introduced the voluntary Commitment to Zero Contacts initiative.

It is designed to provide CEOs, senior leaders and field personnel with resources to help eliminate serious injuries and fatalities due to electrical contact and enhance co-op safety programs.

The campaign provides a toolkit of resources, including field guides, videos, logos and written commitment forms.

One aspect of the campaign is a downloadable job-planning app—Stop and Focus Everyday—for use on mobile devices. It requires step-by-step acknowledgement of the life-saving rules of the job, with a goal of building and reinforcing safe work habits.

Use of the app encourages crew leaders to stop, focus and review crucial risk factors that could lead to employee contacts. The app also provides efficient job-planning processes for energized work, outage restoration and daily tasks.

Job-briefing data is automatically submitted to Federated's website with a time and date stamp. It is accessible in real-time and searchable by date, time, submitting employee, job type or job number so it can be used for training.

"We must do job planning on all jobs," Bud says. "The worst accidents tend to happen during routine jobs where risk awareness declines and complacency is more likely. They know they need to do certain things, but do they?

"If we can get crews to increase job briefings to 100 percent of the time, we will decrease accidents. If you follow these rules every single time, you will go home with your arms, legs and life."

Creating a strong culture of safety helps mitigate the risk at all levels.

Wells Rural Electric Co. in northeastern Nevada has signed onto the Commitment to Zero Contacts initiative and uses the S.A.F.E. app.

"We've been very dedicated at WREC to making sure our job briefings are religiously filled out," says Foreman Jacob Manning. "The one thing that is etched into our heads from day one is that electricity will kill you. Being safe can be a matter of life and death."

Jacob says it is important to him to make sure all of his guys are safe, that they understand the job at hand and the hazards associated with every job.

"Regardless of how high or low on the totem pole a guy might be, every person always has a say in what we are doing and the ability to ask any questions about the job or any hazards they might not understand," Jacob says. "It's important every single person involved understands exactly what we're doing."

At the end of the day, the priority must be safety and doing everything possible to make sure their linemen go home to their families, says WREC CEO Clay Fitch.

"Our guys do a great job in terms of the quality of their work, attention to their training and observing safety on the job," Clay says. "We owe it to them and to their families waiting at home to give them the tools they need to build a culture of safety. That's really the benefit of Commitment to Zero Contacts and the S.A.F.E. app. It's about creating a constant awareness of safety." ■

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.

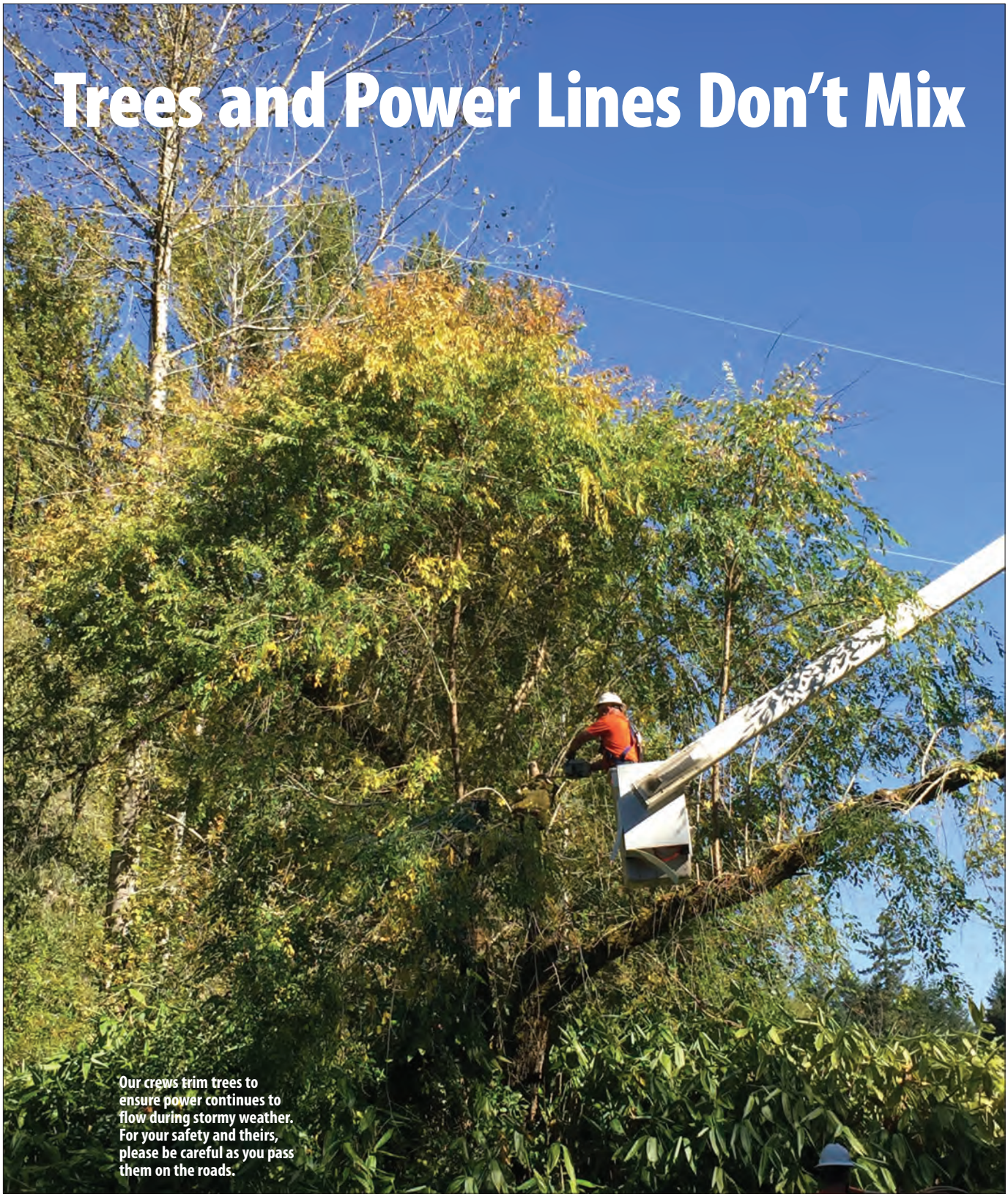
NRECA is part of a national program to create a cyber mutual assistance agreement. Much like how groups of lineworkers from an electric co-op travel to help restore power after a hurricane, these cyber agreements would mobilize teams of information technology experts in the case of a cyber incident.

"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." ■

Trees and Power Lines Don't Mix



Our crews trim trees to ensure power continues to flow during stormy weather. For your safety and theirs, please be careful as you pass them on the roads.

Proactive maintenance saves CPI members money

As an electric cooperative, Consumers Power Inc. is dedicated to offering safe, affordable and reliable power to its members.

The right-of-way management program helps ensure trees and limbs do not interfere with the safe operation and maintenance of utility equipment. Trees falling into power lines are a leading cause of power outages, while incompatible vegetation in rights-of-way prohibit access and slows restoration efforts.

In 2018, our five contract utility tree-trimming crews pruned 16,000 trees and cut down another 6,200 as part of our ongoing right-of-way program. This proactive maintenance has helped keep outages to a minimum during inclement weather.

In 2019, CPI will use contract utility tree-trimming crews to continue this work, focusing on Lyons, Monroe, Highway 34 from Philomath to Alsea, Summit and Nashville areas. When crews are in your area, please give them space to do their job safely, properly and efficiently.

CPI uses only qualified line clearance tree workers to prune and cut trees near power lines. Private individuals and unqualified tree workers should never work near power lines.

If you or someone you have hired is going to perform an activity within 10 feet of an overhead power line, you must contact CPI before any work is done. If there are trees in the right-of-way you do not want cut down, please call CPI to discuss your options.

To help keep our costs low, please plant power line friendly trees. Our Philomath office has incorporated these types of trees into the landscaping. Stop by and take a look.

After a few dry summers, we are seeing many dead fir trees around the service territory. If you have dead fir on your property that you believe might cause a problem with power lines, please call us so we can check and advise. Last year, our crews cut down 493 hazardous trees that were dead or dying.

Above, dead trees near power lines are a hazard and should be removed.

When is the last time you walked the right-of-way on your property? Are all of the poles easily accessible? CPI can field-check your situation, let you know when our regularly scheduled crews will be in the area, and make suggestions for clearing and maintaining the right-of-way on your property. An accessible right-of-way also serves as an effective fire break on your property.

We continue to assist logging operations in cutting trees, making trees safe and dropping power lines to assist in safe logging. If you plan to harvest a tract of timber, please keep the following in mind:

- Overhead power lines are not insulated. Treat all power lines as energized.
- Always look for power lines before site preparation and harvest operations.
- Whenever power lines are present, contact CPI first—especially when establishing new roads or landings. CPI will have a representative meet with you to discuss and verify all required clearances to power lines.
- Never climb or attempt to fall trees that have limbs caught in power lines.
- If a tree has the potential to reach a power line, it should be directionally felled away from the line. If a tree falls into a power line, STOP! Stay clear and call CPI.
- Maintain required clearances between equipment and power lines. If equipment comes into contact with a power line, stay on the equipment until help arrives. Keep others away.
- If a fire starts from an electrical contact or a downed power line, follow your company's procedures and notify CPI when safe to do so. Stay clear of power lines. ■

Utility Tree Service Wins CPI Recognition

Member service is a large part of the right-of-way department's job. The interaction with our line clearance tree crews is sometimes the only interaction a member has with CPI throughout the year. It's a good time to make a great impression.

Seeing the opportunity to continue with positive member engagement, CPI Right-of-Way Supervisor Mark Choitz challenged the tree crews to hand out customer comment cards and set up a contest between themselves.

The contest results showed that crew No. 1 with Utility Tree Service emerged as truly being No. 1 in customer service. The winning crew is led by Chris Carpenter, with crew members Tobie Moe and Gauge Hendrix.

In addition to the yes/no responses, most cards had handwritten comments. One card summed up all of them: "The men were a pleasure to interact with and did a top-notch job. Very positive experience. Thanks!"

A big thanks to Utility Tree Service crews for all their hard work throughout the year and your extra effort to work with our members.

Keep up the great work out there!

Central Electric linemen demonstrate how tree limbs caught in power lines or near fuses can cause outages and in some instances start a fire.

Spring Electrical Safety Reminders

By Courtney Cobb

Electricity is part of our everyday life. We can't see it, hear it or know that it is there. With the right information, you can safely make that determination. Here are some general safety reminders for you and your family.

Dial 811

Spring, summer and fall bring a full list of projects from planting to building outdoors. CEC wants to remind members careless digging poses a threat not only to people, but also to pipelines and underground facilities. Always call 811 first and follow these easy steps:

- Call 811 or make a request online (www.digsafelyoregon.com) two to three days before your work begins. The operator will notify the utilities affected by your project.
- Wait two to three days for the affected utilities to respond to your request. They will send a locator to mark any underground utility lines.
- Confirm that all affected utilities have responded to your request by comparing the markings to the list of utilities the 811 call center notified.
- Locates are required by law. If you do not call or digging occurs before prescribed timelines, you can be charged for repair costs.
- Respect the markers provided by the affected utilities. The markers are your guide for the duration of your project.
- If you can't avoid digging near the markers (within 18-24 inches on all sides, depending on state laws), consider moving your project location.
- If digging within 2 feet of markings, you are required to use noninvasive procedures—digging by hand—until the facilities are located.

Tree Trimming

Keeping trees clear of CEC lines is vital not only for power reliability, but also the safety of members.

Central Electric works to clear trees and overgrown vegetation throughout its service territory. If trees are kept out of lines, CEC can restore outages more quickly, crews and the community will stay safe, and it reduces unexpected costs for repairs.

If you have a tree growing into your lines, make sure to report it to CEC right away. Here are some tips for trees:

- Do not cut trees or tree limbs that are in contact

Left, if you have trees growing into power lines report it to CEC right away.

Photo by Jeff Beaman

Far left, this is what happens when kite strings get caught in live power lines.

or could become in contact with overhead power lines.

- If you plan to planting a tree, identify where overhead power lines are located and do research on the height and spread of the tree.
- Do not plant within 20 feet of a power pole. Instead, use smaller trees or shrubs.

Kite and Balloon Safety

Mylar—metallic balloons—and kites are risky around power lines. Never let your children release mylar helium balloons outside or use metallic cloth, wire or tinsel for kite frames or kite string. These materials contain metal, and if they come into contact with power lines, they can cause electric shock or outages. A good rule of thumb before you fly a kite is to look up and be aware of the area around you.

Transformer Box Safety

If your home is served by underground electric cable, you might be tempted to plant flowers or shrubs nearby to disguise the transformer cabinet on your property. Please don't do it!

CEC line crews need easy access to those cabinets to perform maintenance and repairs. Shrubs, trees—even flower beds—can block access, and after the work is done, you will be unhappy about the state of your plants.

Also remember, those cabinets contain high-voltage cables that should be avoided at all times, except by trained personnel.

So, the takeaways are:

- Don't plant near transformer cabinets. National Electric Code requires 10 feet of clearance in the front and 3 feet of clearance on the back and sides of the equipment for safe operation.
- Teach children to stay away.
- Never attempt to open the cabinet.
- Always report an open or damaged cabinet to CEC.

Downed Lines

From weather events to accidents, downed lines can happen. Do you know what to do if you see a downed power line?

- Stop and immediately call 911 or the authorities.
- Always assume downed power lines are live.
- Don't try to go near the downed line; it can energize the ground around the area.
- If your car comes in contact with a downed line while you are inside it, stay in the car until emergency personnel arrive. Do not touch any part of the car's frame or any other metal. You can use your cellphone or honk a horn to try to call for help. Only rescue personnel should approach the car.
- If you must leave the car, exit the car by jumping or hopping from the vehicle to the ground. Do not touch any part of the vehicle or power lines while touching the ground. Once you have exited, then shuffle your feet in small steps, keeping your feet together and on the ground. ■

More electrical safety tips and information can be found at www.cec.coop.

Serviceman Eric Youngstrom fixes a broken crossarm in Sisters.

Crews Battle Elements to Restore Power

Late winter storm breaks records, triggers maximum response

By Courtney Cobb

Central Oregonians are no strangers to the perils of winter weather, ready to handle whatever Mother Nature deals them. The fairly mild 2018-2019 winter season did nothing to challenge that point of view until the morning of February 24. That's when winter storm forecasters predicted several days of snow.

The next six days tested the resolve of our members and put Central Electric's crews and support staff into nearly a week of maximum emergency response mode.

That fateful Sunday started with light rain, gradually turning to sleet and eventually snow. Two CEC servicemen started hustling around the cooperative's 5,300-square-mile service area in the early hours, chasing small outages. By mid-afternoon, conditions worsened and they alerted Operations and Engineering's leadership to start mobilizing crews.

The Conditions

Heavy snow burdened local trees, covered CEC's power poles with thick layers of white snow, knocked trees or tree limbs into spans of power lines stretching between poles, often bringing them crashing to the ground. The snow also caused buildup on lines, which triggered temporary faults that blow fuses and short circuits that can take entire sections of conductor off line.

"Imagine a power line the size of your pinky finger," Director of Operations and Engineering Brad Wilson says. "Now imagine that same pinky finger has turned into the size of your arm because it is encased by snow and ice. That is a lot of weight placed on a line stretching hundreds of feet."

For six days, crews battled the elements and treacherous roads to restore power.

How bad was it? Here's an excerpt from a post on CEC's outage page on their website a couple of days into the storm:

"For over 48 hours, CEC emergency response crews have been working to restore power to all members. A pattern has emerged where new outages occur, which offsets the progress achieved

Left and above, heavily laden trees filled with snow and ice caused widespread outages in the Sisters and Camp Sherman area.

Photos by Jeff Beaman

by other restoration efforts. Trees are bending under the weight of heavy snowfall on their limbs, which can extend into power lines. This has especially been the case in the Camp Sherman and Sisters areas.

"Crews are continuing to chase and fix problems, but they are also hampered by current travel conditions as well. Snow-clogged roads and shoulders make it risky and difficult to pull over at the location of a section of the system needing repair."

In many instances, CEC crews could not use standard line trucks to get into areas to make repairs. They needed to put materials and tools in snowcats and travel to the problem spots. Linemen also talked about the sheer depth of snow they walked through to reach poles or cut down trees.

Central Electric and contract crews from Potelco Inc. worked around the clock to restore power to members as quickly and safely as possible. Normally, the cooperative would call upon fellow cooperatives for assistance, but the storm was far-reaching across Oregon and into Washington.

CEC was unable to call upon fellow co-ops for assistance since they had their own outage restoration challenges, demanding they keep their resources at home.

The Sisters and Camp Sherman areas were most impacted by the storm due to the high number of large trees surrounding the power line rights-of-way. Crews spent hours cutting trees out of line, fixing crossarms and restringing power lines.

When giving an update to CEC's dispatch 72 hours into the storm, a linemen described the situation in Camp Sherman as follows: "Look out your window ... see how much snow you have? Now add 4 feet."

The Final Numbers

Between CEC and Potelco crews, at any one time there were 20 to 25 linemen working in the field to restore power.

In the six-day event, Central Electric had 143 outages that affected 7,265 members. Some members were without power as long as 48 hours. In the Camp Sherman area, several members saw even longer stretches due to the number of trees near power lines.

"We really want to take the time to thank members for their patience during this event," Brad says. "We also want to thank members for their kind words in the field, on social media, and calls into customer service. These really helped to keep crews going through some difficult conditions."

Brad also acknowledged the dedication and commitment of his crews.

"These guys were out there working hours on end, doing a great job under very difficult conditions," Brad says. "We are very grateful. We also appreciate their families back home who were dealing with the same hard conditions without their help. A line crew member's family deserves a lot of credit for being patient and understanding of the commitment required of their husband and father." ■

Snowstorm 2019: The Facts & FAQs

This is the first of a series of articles to recap this major event, answer your questions and provide information for future preparedness.

By Lindsey K. McCarthy

We all thought the Ice Storm of 2016 was the worst it could get. Well, the snowstorm of 2019 proved us wrong.

Beginning Sunday, February 24, and continuing into the next several days, a heavy, wet snow blanketed the Eugene area and wreaked havoc on both transmission and distribution lines that carry power to Lane Electric members throughout 2,600 miles of rural Lane County. By the time the snow stopped falling, 19.1 inches were reported in the Eugene area by the National Weather Service, making it the fifth snowiest month measured in this area since 1892, when the NWS began keeping records.

Countless trees crashed down on power lines and poles throughout the valley, leaving 77 percent of our service territory—or 10,120 members—without power. Complete restoration efforts took 14 days.

We don't know for certain, but this may have been the most widespread and longest-lasting outage of Lane Electric's 80-year history.

Early on, Lane Electric management realized this was a devistating storm and that we needed additional crews. We called on other rural electric cooperatives in the state plus other utilities and contract crews.

For the first several days, some crews couldn't get to our service territory due to road closures and restoration work needing to be done in their own area. But eventually, we had linemen hailing from all across the state, plus Washington and Wyoming. In total, we added 95 linemen to our usual crew of 16.

Why didn't you bring in more crews?
Logistically, 19 crews in addition to our four crews is the maximum number we can manage safely and efficiently. Plus,

Above and opposite page, downed trees and snow-covered roads made accessing damaged lines difficult after the storm.

crews were in high demand because we weren't the only utility in the state facing severe damage. Lane County was one of 10 counties Oregon Gov. Kate Brown declared to be in a state of emergency. To the south, damage in Douglas County was so extreme that even with 27 crews working, Douglas Electric Cooperative still had 290 members without power as of press time on March 18.

Not only did we need more crews, but we needed more materials for them to complete repair work. Poles had to be produced in an unprecedented amount of time—lead time is usually four weeks and we needed them in two days. Plus, we expedited the shipment of wire from states as far away as Kansas.

Other utilities not only sent linemen, but also provided warehouse support, materials, vehicles and specialized equipment. Behind the scenes, 28 Lane Electric staff worked long hours to orchestrate our restoration efforts, including coordinating logistics with the Oregon Department of Transportation, the Bonneville Power Administration, Lane County and partnering utilities; ordering and managing materials; and organizing meals, laundry and housing for the additional crews. From the accounting department to the lineworkers, it was an all-hands-on-deck operation.

Why did it take so long to restore my power?

There is a systematic process by which power restoration of this magnitude needs to happen. First, we must do a damage assessment to know what materials and labor are needed for the repair work. Assessing our system of 1,400 miles of line takes time. Covering that distance is like driving from Eugene to San Francisco, back to Eugene, and almost all the way back to San Francisco again.

In many areas, the roads needed to be cleared and trees removed before we could begin damage assessment and repairs. In other areas, damage was in off-road areas that required specialized heavy equipment to reach. We supplemented our on-the-ground patrolling with helicopter surveillance to aid in decision-making about the restoration efforts. Despite the record number of crews we had working and extra equipment we were able to obtain, it took time to cover every inch of our territory.

A major obstacle was damage to Bonneville Power Administration's transmission lines that deliver energy to the substations that feed our distribution lines and eventually your homes and businesses. At the peak of the outage, all but one of BPA's substations in our service territory were without power. This was unprecedented. Our crews worked closely with BPA crews to get repairs done on transmission lines while other crews repaired our distribution lines so we could get your power back on as quickly as possible after the substations were online again.

Six tree crews worked in sync with our linemen to clear trees from the lines and right-of-way before we could re-string wire and set new poles. We also collaborated with Lane County and ODOT for road access and plowing. The best example of this was in Oakridge where ODOT needed to close Highway 58 due to safety

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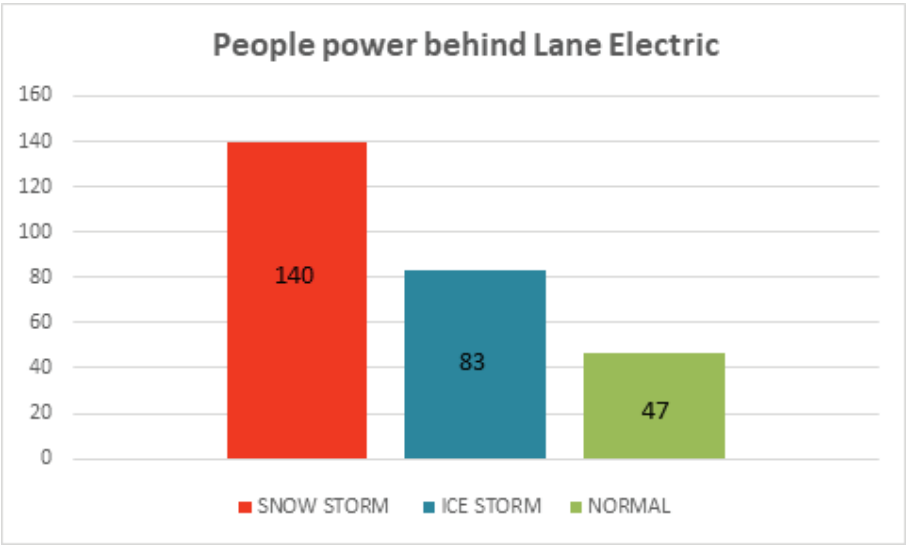
Fallen trees over power lines caused many outages in difficult-to-reach areas.



Triple our normal number of employees were working during the 2019 snowstorm and nearly double during the ice storm of 2016.

Snowstorm 2019

Continued from page 5

concerns but was eventually able to open it up to allow us to get power restored.

During outages, we are commonly compared to our neighboring utilities, with whom we have a great relationship. For utilities that serve more densely populated areas, power invariably is restored to their customers more quickly than our members are energized. The reason is simple: Our service territories couldn't be more different. In heavily populated areas of the county, the damage from trees is often not as significant and roads are typically more accessible. Plus, when power is restored, it is restored in neighborhoods and city blocks.

In our service territory, we enjoy tree-lined roads, more remote areas and an average of only seven members for every mile of power line. Once substations are energized, we work our way out on the feeder lines and taps. There may be only a handful of members in a span of several miles of line. For this reason, our members need to be prepared and self-sufficient, as they are often on their own for an extended time.

Why couldn't we get more frequent updates with specific information?

Throughout the restoration process—from damage assessment to repair work and eventual restoration—it takes time to get information from the field and distill it for member communications. With an outage this extensive, it can take several hours and even days to put together all the pieces and provide an accurate update.

Due to a number of variables, providing an exact restoration time for a specific road is nearly impossible. We gave our best estimate for overarching areas, and usually on the long side to help you prepare for what could be the worst-case scenario. We wished we could have given you more details, but we gave you what was available.

We will explore more technology options that could help get us more real-time data and disperse it to members more quickly. Even so, that technology likely would rely on internet or cell service, which many of you were without for several days.

What now?

Crews from other utilities have been sent home, but Lane Electric's crews are continuing restoration work in the aftermath of the storm. They are addressing hazard trees and branches that were partially damaged in the storm and could now fall into power lines during inclement weather, and they are retrieving downed poles and wires that were covered by snow or fallen trees. This clean-up phase will last several months. Extra crews may be called back in to help us.

Reflecting back and looking forward, we want to reiterate that everyone at Lane Electric—from the staff in the office and warehouse to the crews out in the field—does everything possible to keep you out of the dark, literally and figuratively. We have successes to be proud of during this major event, including our safety record. We had no lost-time accidents during an intense two weeks. We have had an all-employee debrief and will debrief with our partners at other utilities and emergency responders throughout Lane County to deepen our relationships with them.

This experience reminds us all that we need to be prepared to be on our own—and to be thankful when everything is in order and the lights come on with the flip of a switch. ■

NEXT ISSUE: *Why can't we underground all the lines. And disaster preparedness lessons learned.*

Meet Your New General Manager

By Craig Reed

When Greg Gardner received the support of other staff members at Blachly-Lane Electric Cooperative to become the co-op's general manager, he was both grateful and inspired.

He responded by writing a letter to the co-op's board of directors, expressing his interest in the position that was going to become vacant after Joe Jarvis' retirement at the end of 2018.

After considering the options and Greg's interest, the board named the 63-year-old the general manager. He assumed his new role January 1.

"When other managers wrote letters to the board in support of me and other managers came to me and said, 'You're going to apply for the job, aren't you?' I was definitely inspired," Greg says.

Greg had been Blachly-Lane's operations manager. In December 2017, shortly after Joe gave a year's notice on his pending retirement, Greg was named assistant general manager.

"Joe told the board they could test drive me for a year," Greg says.

Greg was already well

Blachly-Lane Electric General Manager Greg Gardner oversaw the building remodel that was completed in 2018.

known to the board, having had numerous dealings with them while being the co-op's project manager on the facility's recent remodel.

After being named the assistant general manager, he worked at changing his focus from operations to the cooperative as a whole.

"I thought Greg would be a good choice," says Joe. "He was the project manager for the remodel and he impressed the board in that role. They figured if he could pull that off, keep the project on budget, then he was capable of running the whole thing. It was a nice transition."

Joe was available to consult with Greg during his first month as general manager, but since then Greg has moved forward on his own.

He describes his management style as collaborative. A month or two before becoming the general manager, Greg—with the support of Joe—created a senior management team. That team includes Greg, Operations/Human Resource Manager Mary Locke, Member Services and Public Relations Manager Pam Spettel and Chief Financial Officer Carole Phillips.

"It's not like I'm giving away my responsibility," Greg says. "We all share in making sure the cooperative is being run well. We're responsible to our members; they're not our customers. We're responsible for maintaining and operating a good power system for them."

Greg has a long history in the electric industry. His father, Tom, worked at the Canby Utility and retired from that utility early in the 1980s.

Greg graduated from Canby Union High School in 1973 and worked at different jobs—including public works for the city of Canby—while attending Clackamas Community College in Oregon City.

During that time, he met some linemen and found their work interesting. He became an apprentice lineman in 1977 and earned his journeyman accreditation in 1980.

Following in his father's footsteps, Greg got a job with the Canby Utility and worked in metering and engineering. His next job was the safety director for Wilson Construction of Portland, a company with about 100 employees.

That job had him frequently on the road visiting company projects. After he and his wife, Autumn, welcomed their son, Brent, into their family, Greg decided he wanted to be at home more. He accepted the line superintendent position at McMinnville Water & Light. Another job change came in 1999 when Greg was named line supervisor at Eugene Water & Electric Board.

While working for the Eugene utility, Greg took online classes at Linfield College and earned a business management degree in 2008.

That same year, Greg was hired by Joe as operations manager for the co-op. He held that position for two years before accepting a regional salesman position with General Pacific of Portland—a company that provides the electric utility, water utility and contractor markets with products and services.

Blachly-Lane was one of Greg's customers, so he stayed in touch with Joe and the co-op. In 2014, Joe asked if he would be interested in returning to the co-op. Greg accepted and became the operations manager again. That set him up to be assistant manager for the two-year remodel project and to transition into the general manager's role.

"The co-op model is the best business model I've seen," Greg says. "I get to practice my management skills and knowledge and work with great people."

Blachly-Lane has 21 employees who work to provide power to 3,600 electrical meters and 2,850 members, both residential and business.

"Financially, the co-op is sound; the margins are good," Greg says. "We're continuing to pay capital credits on time.

"The way I look at my job is to manage the human resources of the cooperative and its financial resources to make sure both provide the best for the membership, and do it all in a safe manner." ■

Managing power generation requires a delicate balance between supply and demand. Thanks to Pacific Northwest dams, this balance is achievable.
Photo by Morgan David de Lossy

Balancing Supply and Demand

Just as a tightrope walker must maintain balance to guarantee a successful and safe high-wire crossing, power grid operators also must maintain a delicate balance, accurately matching supply with demand and carefully preparing for their next move. Hydropower's many positive attributes, coupled with careful planning and precise management, make this one of the most reliable power resources.

Here are a few reasons why.

- **It's always on.** Renewable resources aren't often associated with reliability because their generation depends on Mother Nature. Unlike many other renewables, Northwest hydropower is dependable and predictable. The water cycle constantly replenishes the fuel source of the Columbia River Basin, which receives significant runoff from mountain snowmelt. With such a plentiful fuel source, hydropower serves most of the region's power needs year-round, 24/7. Hydropower is the only renewable resource that excels at producing such a high and continuous electrical output.
- **It follows demand.** Hydro is a "load-following" resource. It can throttle up or down to match the daily peaks and valleys of our energy use—increasing in the morning when people start the day, and decreasing in the evening as people wind down. Operators control the electrical output by choosing how much water to allow through the water intakes in the dam. Opening and closing the intakes directly controls the amount of water flowing to the turbines, which determines the amount of electricity the dam generates.
- **You can save it for later.** One of the greatest challenges of electrical systems is that energy has to be consumed as soon as it's produced. But hydropower offers the next best thing. Storage reservoirs behind dams in the Columbia River Basin can store up to 30 percent of an average year's runoff. These reservoirs act like batteries by storing energy—or in this case, water—when it's not needed, and releasing it later when there is more demand.
- **Hydropower operators can plan ahead for seasonal changes.** Generally, operators in the Columbia Basin fill reservoirs during the wetter months in preparation for drier conditions.
- **It can quickly change output.** Hydropower plants are nimble enough to ramp up and down within minutes, or even seconds. This means they are ideal resources for meeting one of the requirements of electrical systems: The amount of power entering the transmission grid must equal the amount being consumed at all times. An imbalance can cause generating units to react by increasing or decreasing their rotational speed, or frequency, which should always be at 60 hertz. If not corrected, the generator could fall offline or even trigger a cascading outage. Hydropower can respond to imbalances from moment to moment, always keeping the system in balance.
- **It's a self-starter**. In the event of a systemwide blackout, utilities need access to black start capability—the ability to start a generator in the absence of an outside power source. Just as a car needs a jump start when it has a dead battery, most generators need an external power supply to return to operation. Hydropower plants are the only large-scale generators that can dispatch power to the grid immediately when all other sources are inaccessible. ■

We Appreciate Our Linemen

Harney Electric linemen dedicate countless hours to ensuring the lights stay on. Below, Mitchell Ebar and Nathan Drushalla; at right, Bruce Rickman.

Clockwise from top left, HEC crews install a new transmission switch. Wyatt Shelley replaces a transmission arm. Mitchell Ebar and Jeff Pyburn frame a pole for a new irrigation service. Jason Rankin works on a new irrigation service.

Working Hard For You
CVEA Service Awards

Copper Valley Electric employs over 40 Alaskans, all of whom live and work in the communities we serve. We are proud of our employees and the work each one does to help fulfill CVEA's mission to provide exceptional customer service through safe, reliable, cost-effective electric service as well as CVEA's vision to reduce or completely eliminate our dependence on fossil fuel and stabilize the Cooperative's cost of generation with regional, sustainable resources. Each year, CVEA recognizes employees with extended years of loyal and dedicated service to the Cooperative. We invite you to join us in congratulating them on their accomplishment.

Ryan Cook
Copper Basin Lineman
15 Years of Service

Ryan has worked for CVEA as a Lineman and Line Foreman in the Copper Basin District for 15 years. John Schenck, CVEA Operations Manager said, "In his 15 years with CVEA, Ryan's knowledge to keep the lights on day and night has been valuable. He regularly demonstrates that he is one of the most knowledgeable linemen on our team. His dedication to the Copper Basin community is steady. CVEA thanks him for his many years of service."

Todd Stahley
Valdez Line Foreman
15 Years of Service

Todd is the Line Foreman in the Valdez District. In 2019, he celebrates 15 years of service with CVEA. Prior to CVEA, Todd worked for a utility in Indiana.

He lives in Valdez with his wife Laura. They have three children; Amanda, Sara, and Alan, and grandchildren Daniel and Emma. In his spare time he likes hunting, fishing, and camping.

In the last five years, Todd says the big changes have been new management, bigger jobs, and more work. Todd's favorite thing about working for CVEA is all of the different jobs he gets to do, and one thing he wishes people knew is how hard CVEA employees work to keep the lights on. When asked if he'd like to provide a quote, Todd said, "six more years."

According to Schenck, "Todd exemplifies hard work and dedication on a daily basis. I've relied upon his knowledge and experience in planning and completing the many ambitious projects CVEA has undertaken the past several years. He is a valuable asset to the operations team and I appreciate all that he does."

Alexander Gearhart
Copper Basin Plant Operator
10 Years of Service

Alex is celebrating 10 years as a Plant Operator in the Glennallen Diesel Plant. Alex has lived in the Copper Basin for over 30 years and began his career at CVEA after going to school to study process technology.

Alex and his wife Samantha live with their kids Brett and Payton, dog Kizer, and cat Okie. He loves hunting, fishing, jet boating, motorsports, snowmachining, wood and metalworking, being outdoors, and traveling and exploring new places.

We asked Alex what has changed in the last five years and he said, " installation of new engines, different operations protocols to reduce outage times and make things more efficient, and new equipment allowing us to monitor and control things remotely and more effectively."

Alex's favorite thing about working for CVEA is that it is a great job that allows him to make a good living and be home every night to see his family, and if he could tell everyone one thing about the Co-op, it would be, "everyone at CVEA works extremely hard to make sure that the members get reliable power. It may not seem like it all the time, but everything we do throughout the entire company is to make sure CVEA and it's members have the most reliable power and inexpensive power we have the ability to give them. It may not always seem like we make the right decisions, but we do everything with good intentions for our members."

According to Wayne McKinzey, CVEA Production Manager, "Alex is an operator we have come to rely on. He takes pride in the work that he performs and is one of the friendliest people you'll ever meet. I look forward to working with Alex for many more years."

Mike Haley
Valdez Plant Operator
10 Years of Service

Mike has worked for CVEA as a Plant Operator in Valdez for 10 years. Since his last milestone, he's been a part of the Valdez Diesel Plant engine rebuild, implementation of more automation and computerized aspects of the plants and metering, and getting the Allison Creek hydro project up and running. When asked one thing he wished people knew about CVEA, he said, "I wish people knew that CVEA employees pay the same rates as everyone else in town."

Mike's favorite thing about working at CVEA is the people. When asked about Mike, Wayne responded, "Mike has a great attitude and everyone enjoys working with him. He is very dedicated and is always willing to help out."

Anthony Martin
Valdez Plant Operator
10 Years of Service

Anthony celebrates 10 years with CVEA. He began as a groundskeeper and after 3 1/2 years, worked his way to becoming a Plant Operator Trainee, and then an Operator in the Valdez District. He enjoys fast cars, hiking, fishing, snow sports, and working on cars and motorcycles.

According to Wayne, "Anthony is a great mechanic and can be counted on to get any job in the plants done correctly. He's the mini hulk – he makes lifting heavy parts and tools look easy."

Mike Rego
Chief Plant Operator Diesel Plants
10 Years of Service

Mike has worked for CVEA for 10 years and is currently the Chief Diesel Plant Operator serving both districts. Mike has lived in the Copper Basin for over 32 years. He lives with his wife Victoria, kids Nuala and Ike, dogs Gypsy and Sonja, and their chickens and turkeys. In his spare time Mike enjoys spending time with his family outdoors.

When asked about changes in the last five years, Mike said, "it would be easier to conclude what has not changed, than what has. As Chief of the diesel plants, not a day goes by that is repetitive or when not faced by a problem that has arisen. There is also not a single day when I haven't learned something. Our list of accomplishments over the last five years are vast.

In the diesel plants I have been a key employee on major projects including the Valdez Diesel Plant generator set upgrades, major performance upgrades to older Enterprise engines, overhauls, entire fuel offload and deliver systems, and most recently as successful rebuild of an engine from the ground up; of that, each major component weighs 10 tons. In addition there have been supervisory protection, control, and procedure upgrades."

When asked to provide an interesting story, Mike told of a fast, agile 'super' squirrel with the ability to walk through walls, getting the upper hand on the operators in the Glennallen Diesel Plant last year, and he said that his favorite thing about working for CVEA is the creativity the management structure allows for the operations group. It allows employees to come up with new and exciting ways to get the job done safer and more efficiently while providing the experience to troubleshoot, grow, learn, and excel on a daily basis.

Mike wishes everyone knew that, "regardless of the challenges we face daily, and a range of tasks that is so vast, it is hard to quantify, there's nothing we can't accomplish because we have a great, diverse and talented team at CVEA."

When asked, Wayne said, "Mike has terrific juggling skills. He oversees both the Glennallen and Valdez Diesel Plants."

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Employee Service Awards

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Dave Coon
Communication and Controls Engineer
5 Years of Service

Dave celebrates five years as CVEA's Communication and Controls Engineer. He came to the Co-op from HAARP, where he was an electrical engineer for nine years.

Dave lives in Gakona with his wife, Tracy, dogs Joe and Dani, and horses Flash and Toyota. In his spare time he enjoys fishing, woodworking, ATVs, snowmachines, and taking the RV out and about in Alaksa. He loves tinkering with computers and electronics, maintaining their hobby farm and caring for his horses.

When asked his favorite thing about working for CVEA, he said, "I take great pride and enjoyment that my work at CVEA directly benefits our members by increasing overall system reliability and decreasing downtime when there are outages. I love the challenges of learning and programming new equipment." Further, he said, "we have an absolutely amazing bunch of people at CVEA. The challenges the Co-op has overcome to bring this system into the 21st Century with such a small crew has been a sight to see and a pleaseure to be a part of."

Darin Sauls, CVEA Manager of Engineering, had much to say about Dave. "It is not enough to simply say Dave works hard; he not only gets the job done, but gets it done right. These are not always the same thing. With many things often unknown, Dave must identify the problem, research the solution, then apply and test that solution. It is a sometimes painful and long process that for even the simplest tasks can take weeks to resolve. Most people do not have the diligence to research the problem's solution, the persistence to apply the solution, and the patience to start all over again when it does not test perfectly. Dave has demonstrated that in addition to his top notch technical abilities, he possesses the desire to push through every technical issue day after day, time after time and one-by-one."

Mark Kirkpatrick
Copper Basin Lineman
5 Years of Service

Mark has been a Lineman for CVEA for five years. He spent his first 1.5 years in Valdez, and the last 3.5 years in the Copper Basin District, where he was recently promoted to Line Foreman. Mark lives in Glennallen with his wife Crystal, children Bryson, Richard, and Madison, and their dog Pugsley. In his spare time he enjoys hunting, fishing, and spending time with family and friends.

When asked his favorite thing about working for CVEA, he said, "I enjoy the community and working outdoors."

Mark's supervisor, John Schenck, had this to say, "Mark always keeps a positive attitude and calm demeanor that inspires the entire operations team. He readily accepts increased responsibility and never shys away from new technologies or challenges. I look forward to working with Mark for many years to come."

Lindsay Malone
Office Manager
5 Years of Service

Lindsay was recently promoted to the Office Manager of CVEA, but has also served as CVEA Accountant and the Office Admin in the Copper Basin District during her five years with the Cooperative. Prior to joining CVEA, she was a bank teller.

Lindsay lives with her significant other, Jason, children Rogan, Tovey, Savvi, and Davie, dogs Bella, Miley, and Shelby, and cats Rocco and Remi. When not working or tending to her full house, she enjoys hiking, cooking, reading, and anything with her kids.

When asked her favorite things about working for CVEA, she said, "I appreciate the opportunities for growth and education. I also love working with a great team of people." According to CFO Jaime Matthews, "Lindsay started at

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Employee Service Awards

Continues from page 8

CVEA as the Office Admin in 2014. A year later she was promoted to Accountant and has been in that position for four years. She was recently promoted to Office Manager and is responsible for the oversight of the accounting department. Lindsay always has a positive attitude and works extremely hard. CVEA is lucky to have her as part of our team."

Wayne McKinzey
Production Manager
5 Years of Service

Wayne is the CVEA Production Manager, a position he's held all five of his years with the Cooperative. Prior to CVEA he was a plant superintendent for Austin Energy. Although his Dad was a career soldier and he a self proclaimed military 'brat', he spent most of his early years in Alaska, Germany, and Texas.

Wayne's best friend is his dog Hoss, a mellow 17 year-old Red Heeler, who he's had since he was a ferocious little puppy.

In his spare time, Wayne enjoys spending time with his family, especially outdoors, snowmachining, keeping abreast of new technology and science, and working out at the Prince William Sound College Health and Fitness Center.

When asked his favorite thing about working at CVEA, he said, "it's actually a tie - our positive work environment and that we are a cooperative, owned by our members and operating at cost."

CVEA COO, Travis Million, had this to say about Wayne, "First off, it is hard to believe Wayne has already been with CVEA for five years. Wayne was a excellent addition to the team at a time when we needed it the most. His knowledge of power generation and dedication to the cooperative is second to none. Since joining CVEA Wayne has helped to increase the efficiency of the power plants which has resulted in breaking the all time hydro generation output in 2018. I look forward to working with Wayne for many more years."

Congratulations to all CVEA service award recipients.
Thank you for your many contributions to your Cooperative and your community!

Copper Valley ELECTRIC
A Touchstone Energy® Cooperative

National Lineman Appreciation Day

On April 18, electric cooperatives across the nation will celebrate National Lineman Appreciation Day.

CVEA encourages all members to honor the dedicated co-op employees who often work in challenging conditions to keep the lights on. We proudly recognize all electric linemen for the services they perform around the clock in dangerous conditions to keep power flowing and protect the public's safety.

"Our linemen respond to outages at the worst times and in the worst conditions, yet they do it with pride and professionalism" said CVEA CEO John Duhamel. "Despite working with very dangerous equipment in difficult circumstances, they have a safety record better than we have seen before. I appreciate what they do for us every day."

A team of seven linemen maintain over 500 miles of transmission and distribution lines throughout CVEA's service territory.

CVEA encourages members to thank a lineman for the work they do this April, and invites members to visit the Copper Valley Electric Association Facebook page on April 18 to enter a comment of thanks and show your support for the employees who light up our lives.

Please use #thankalineman

District Descriptions

District 1
Includes the Railroad Industrial area of Well St. and Phillips Field Rd. south of the Johansen Expressway to the Chena River, Graehl Subd. to Hamilton Ave. and north of Adak Ave. Heading north out of Fairbanks, the general area west of the Steese Highway including Fox, Chatanika, Haystack, Elliot Highway, Farmers Loop, Goldstream, Murphy Dome and Sheep Creek Roads, the University of Alaska and College Road north of Noyes Slough.

District 2
Includes the general area south of College Road, south of Noyes Slough and north of the Chena River, Danby Street, Aurora Subdivision, Geist Road, University West, Chena Ridge, Goldhill Road, Ester and the Parks Highway.

District 3
Includes the area south of Chena Small Tracts and east of Chena Pump to Rosie Creek. West side of Fairbanks, south of the Chena River, west of Wien/10th Ave, south of Smythe St. and 9th Ave. and west of Turner St. The Van Horn Industrial Area and Richardson Highway up to the west side of Woll, Nordale and Keeney Roads.

District 4
Includes downtown Fairbanks, north of Wien St. and 10th Ave. to the Chena River. The subdivisions of Island Homes, Hamilton Acres, Shannon Park and Birchwood Homes. All areas east of the Steese Highway heading north out of Fairbanks including Chena Hot Springs Rd. Also, the Secluded Acres Subdivision east of Fort Wainwright and north of the Chena River.

District 5
Includes the area of North Pole, the Richardson Highway east side of Woll, Nordale and Keeney Roads, Moose Creek, Eielson and south to the Salcha River.

District 6
Includes Delta Junction, Fort Greely and all areas south of the Salcha River, including Harding and Birch lakes

District 7
Includes the areas of Nenana, Clear, Anderson, Healy, McKinley Village and Cantwell.

2019 Director Election Voting Guide

Golden Valley Electric Association
Districts 5 & 6 Board of Director Elections

Get to Know Your Candidates
As a member of GVEA, the single-most important action you can take is to vote for your board representative. To help you in your selection, candidate bios are presented here. Candidates were also asked the following questions:

- Why are you running for GVEA's board?
- What business, technical and governance knowledge, skills and experiences will you bring to GVEA's board of directors?
- What do you perceive as your role and responsibilities as a GVEA director?
- What specific things would you like to accomplish as a GVEA director?
- What do you think should be GVEA's energy goals and objectives?
- What would you do to position GVEA for the future?

Candidate responses to these questions will be made available on GVEA's website www.gvea.com/elections by April 15. Candidate information will also be in election packets mailed on May 10 to members who live in Districts 5 and 6.

Vote Electronically
Members will receive ballots in the mail and can choose to cast their ballot via mail or online. No computer? No problem. We'll have a voting booth set up in our Fairbanks lobby to vote online.

To Vote Electronically:
STEP 1: Your password will be mailed to you on a postcard, separately from the election packet.
STEP 2: Locate your Electronic Voting Number. This will be located on the back of the postage paid return envelope. It is also provided on your April, May and June bill statements for Districts 5 and 6 members.
STEP 3: Visit https://www.directvote.net/GVEA/

If you need help, contact the Election Helpline at (855) 761-9111 or email goldenvalley@alaska-cpas.com

E-vote is fast, easy and secure.

District 6

Primary residence: 3746 Aurora Heights, Delta Junction

Home phone: 322-4391

Email: js1@gvea.com

Years in Alaska: 37 years

Employer: I'm a retired school teacher. I have interest in Buffalo Center Drive-In in Delta. Education: I have a degree in Education and taught for 24 years.

John Sloan
District 6 Candidate
Nominated by committee

Education: I have a degree in Education and taught for 24 years.

Personal interests/hobbies: I enjoy running, kayaking, reading, traveling in our VW van and the puzzles in the paper.

Organization affiliation: I am a member of the Lion's Club; Pioneers of Alaska Igloo #35. I am vice chair of Alaska Power Association and on the board of trustees for Northwest Public Power.

Special interest/Community service: Through Buffalo Center Drive-In, we sponsor several summer time activities. Starting in June we sponsor Tour to Tok, a 108 mile bike ride from Delta to Tok with an overnight stay half way. We sponsor the Pipeline run, a 5k fun run during the Deltana Fair. In August we do Pedal, Plod and Paddle triathlon for folks 60 years and older and we finish the year with a 5k run called the Fun Bun Run in September.

What distinguishes you from other candidates? This can be as much as 40 to 50 hours per month. I have been on the GVEA board now for 12 years. Through these 12 years I have learned the complexities of generating, transmitting and distributing power to our members. I am committed to working with the board in the best interest of our members. I don't bring a specific set of skills to the board but rather a general common sense in budgeting, strategic planning and identifying with the members. I believe I bring a balanced perspective to the GVEA board.

On March 1, 2019, in accordance with GVEA Bylaws (Article V, Section 4(a)(3)), the District 6 Nominating Committee fulfilled their responsibilities and nominated two candidates for the District 6 board of director seat. One of the two candidates subsequently withdrew from the election process. Because GVEA received no other candidates for this seat via GVEA's petition process, John Sloan is the only candidate for District 6.

District 5

Chris Bunch

District 5 Candidate
Nominated by committee

Primary residence: 1460 Itta Drive, North Pole

Home phone: 488-5557

Email: cmb1@gvea.com

Years in Alaska: 31 years

Employer: TCI Construction Company, Inc., Pipefitter Superintendent

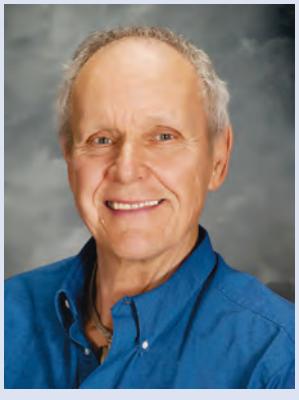
Education: 5 year apprenticeship with Local 375

Personal interests/hobbies: I enjoy playing hockey on a mens hockey league as well as coach my son who is in a youth hockey organization. I love the outdoors and like to snowmachine, hunt and fish.

Organization affiliation: GVEA District 5 Board of Director – 2013 to current; UA Local 375 Executive Board – 01/01/2010 to current; UA Local 375 Pension Committee – 01/01/2016 to current

Special interest/Community service: I enjoy volunteering my time coaching youth sports.

What distinguishes you from other candidates? My background is in construction and I feel that I bring a different perspective to the board. Over the past 18 years I have worked on projects throughout the community. I am currently the director for district 5, and have spent the last 6 years attending GVEA meetings and training classes to gain knowledge that will allow me to be an asset to the CO-OP. I have lived in Alaska for most of my life, and my wife and I are raising our two sons here in North Pole. I could not imagine living my life anywhere else, and that is why I am so passionate and committed to being on this board. I want to be a part of the decision making that not only impacts my family, but the future of our community.



Karl Monetti

District 5 Candidate
Nominated by petition

Primary residence: 4935 Old Valdez Trail, North Pole

Home phone: 322-0242

Email: karlmonetti@gmail.com

Years in Alaska: 48 years

Employer: Retired, Veterinarian (North Pole Vet Hospital (1971-2006), self employed

Education: Hackettstown (N.J.) High School 1961; Moravian College (Bethlehem, Pa. BS Biology 1965); Univ. of Pennsylvania (Phila., Pa. VMD 1969)

Personal interests/hobbies: Play and build guitars, canoe, rugby, environmental advocacy, energy efficiency and conservation, recycling, sustainability

Organization affiliation: FNSB Sustainability Commission (commissioner, 2017-present); FNSB Recycling Commission (Chair, 2009-2017); Northern Alaska Environmental Center (board member 2006-2013)

Special interest/Community service: 1) Energy efficiency and conservation as a first step toward affordable and sustainable energy. 2) The need to reduce our carbon footprint to help stem climate change. 3) take actions to ensure a sustainable lifestyle for future generations. 4) increase access to recycling. 5) advocate for and support increased levels of local food production and storage, and for 6) greater access to and utilization of renewable energy sources.

What distinguishes you from other candidates? I do not know any other candidates at this time. I am focused and hard-working on issues I am passionate about. I believe we need to engage the other Co-ops and the RCA in developing a fee-neutral transco to open the Interior to more existing (and future) renewable energy sources in South-central Alaska. I am eager to learn more about how GVEA works so I can help make it work even better.

District 5

Primary residence: 3082 Probert Drive

Home phone: 488-0732

Email: meoppe@pm.me

Years in Alaska: 19 years

Employer: Fairbanks North Star Borough School District, teacher

Mark Oppe
District 5 Candidate
Nominated by committee

Education: BA in History with Political Science minor (UAF, 2006); post-secondary teaching licensure program (UAF, 2007); MA in Northern Studies (UAF, 2009); elementary and secondary administrative certification program (UAA, 2016)

Personal interests/hobbies: hunting, fishing, camping, travel with family, downhill skiing

Organization affiliation: Air Quality Stakeholders Group; North Pole Regional Representative (June – Nov. 2018): represented North Pole region in process of developing proposals for coming into compliance with clean air standards, solicited input from community members, presented to North Pole Chamber of Commerce on stakeholder process.

Special interest/Community service: My primary concern is to ensure that members are protected from high energy prices and that GVEA is able to work with state and federal agencies to find solutions to local air quality and energy issues that are cost effective. As a responsible community member, GVEA should be pursuing solutions to the Interior's energy and air quality issues that will maximize their return on investment rather than simply adopting control measures and technology that is unproven or not cost effective in our unique environment.

What distinguishes you from other candidates? I believe that my experience working on the air quality issue and attempting to develop local solutions to address this problem give me a perspective on this issue that will be valuable to the Board. The air quality issue is really an energy issue, and solving this problem will require the active participation of the energy industry. In addition, I have diverse experience in the military, local business, and education that gives me the ability to relate to and understand the viewpoints and perspectives of a broad spectrum of GVEA members.

The Commitment of Electric Lineworkers

By Clay Fitch

National studies consistently rank power line installers and repairers among the most dangerous jobs in the country. Laboring high in the air, wearing heavy equipment and working with high voltage creates the perfect storm of a dangerous and unforgiving profession. But electric lineworkers are up to the task. These brave men and women are committed to safety, as well as the challenges of the job.

Wells Rural Electric Co. lineworkers are responsible for keeping power flowing day and night, regardless of national holidays, vacations, birthdays, weddings or other important milestones. Beyond the years of specialized training and apprenticeships, it takes internal fortitude and a service-oriented mentality to be a good lineworker. The job requires lineworkers to set aside their personal priorities to better serve their local community.

Family Support System

To perform their jobs successfully, lineworkers depend on years of training, experience and each other to get the job done safely.

Equally important is their reliance on a strong support system at home. A lineworker's family understands and supports their loved one's commitment to the greater community during severe storms and power outages.

This means in times of prolonged outages, the family and their lineworker may have minimal communication and not see each other for several days. Without strong family support and understanding, this challenging job would be all the more difficult.

Community Commitment

In northern Nevada and across the country, electric co-op lineworkers' mission-focused mentality of helping others often extends beyond their commitment to their work at the co-op. Lineworkers are often familiar figures in the community. WREC's linemen can be found coaching youth sports teams and volunteering for local charities and causes.

Thank You

Monday, April 8, is Lineworker Appreciation Day. Given the dedication of WREC's lineworkers, both on and off the job, I encourage you to take a moment and acknowledge the many contributions they make to our local community. And if you see their family members in the grocery store or out and about in the town, please offer them a thank you as well. ■

WREC electrical linemen participate in pole-top rescue training as part of the cooperative's safety program.

Photo by Layla Welsh

Committed to the job. Committed to safety. Committed to you, our members.

Lineworker Appreciation Day

April 8, 2019

WELLS RURAL ELEC. CO.
Your Touchstone Energy® Cooperative

Heavy spring runoff waters boil and churn as they pass through the spillways at Bonneville Dam near Cascade Locks on the Columbia River. Bonneville Power Administration is projecting a 4.9 percent rate increase for Oregon Trail Electric Cooperative in 2019.

Associated Press file photo

Rate Increase Expected From Bonneville Power Administration

While a final decision remains several months away, Oregon Trail Electric Cooperative leaders are analyzing a signaled rate increase from the Bonneville Power Administration in October.

BPA's projected rate increase for OTEC is 4.9 percent. A complete analysis of BPA's costs and proposed rate increases or decreases occurs every two years.

Several costs BPA incurs have increased and have a direct impact on rates, including court-ordered spill and other fish-related costs. All of the water spilled over a dam instead of run through turbines to generate power can negatively affect rates, particularly if BPA is forced to go out into the market and buy replacement power.

OTEC is under an all-requirements contract through 2028 to buy 100 percent of its power from BPA, which sells electricity from 31 federal dams and one nuclear project along the Columbia and Snake rivers. Of the power OTEC receives from BPA, 97 percent of it is carbon-free, with the majority coming from hydroelectric sources.

The dams are a significant source of revenue for the region through the export of commercial cargo. An estimated $20 billion a year of cargo moves down the Columbia and Snake rivers.

The end result of any BPA increase is a direct pass through cost to our members, OTEC does not collect anything additional. BPA's final number will be announced when it issues its final record of decision July 25.

"In the past decade, we've only had one rate increase that was higher than this proposed rate increase, and it was a 7.7 percent increase," says Anthony Bailey, OTEC's chief financial officer. "Keep in mind, 4.9 percent on a biennial basis is only 2.45 percent per year. It is at or below the rate of inflation."

At this point in the process, it is difficult to get into specifics about what this rate increase might mean to OTEC members. The cooperative will begin its rate review in May. Once BPA releases its final numbers, OTEC will determine the best course of action.

As a not-for-profit electric utility, OTEC's goal is only to collect what is needed to run the utility, not any excess. One strategy the cooperative uses to accomplish this is to put a larger component in the monthly delivery charge. This reduces the risk of over-collecting revenue due to an increase in energy use, which typically occurs when there is a very cold winter or very hot summer. If an increase is put into the kilowatt-hour rate as opposed to the flat delivery charge, members may see a significantly different impact on their bill during those years.

OTEC has done its best to keep the energy charge among the lowest in the state. The last time OTEC increased its energy charge was 2011, going from 6.363 cents per kilowatt-hour to its current rate of 6.797 cents per kWh.

Customers affected by BPA's increase include 54 municipalities, cooperatives, federal entities, tribal utilities and public utility districts in the Pacific Northwest.

OTEC provides service to approximately 31,000 locations in Baker, Harney, Grant and Union counties. ■

A Word About Water

Conserve in the Yard and Garden

Save on your utility bill and help the environment

Water conservation has become an essential practice in all regions, even where water seems abundant. In addition to saving money on your utility bill, water conservation helps prevent water pollution in nearby lakes, rivers and local watersheds.

To conserve water in the yard, garden and when doing outdoor tasks:

- Plant drought-resistant lawns, shrubs and plants. If you plant a new lawn or overseed an existing lawn, use drought-resistant grasses. Many beautiful shrubs and plants thrive with far less watering than other species. Replace herbaceous perennial borders with native plants, which use less water and are more resistant to local diseases. Plant slopes with varieties that retain water and help reduce runoff. Group plants according to watering needs.
- Put a layer of mulch around trees and plants. Mulch slows evaporation of moisture while discouraging weed growth. Adding 2 to 4 inches of organic material such as compost or bark mulch increases the ability of the soil to retain moisture. Press the mulch down around the dripline of each plant to form a slight depression to minimize water runoff.
- Don't water the cement. Position your sprinklers so water lands on the lawn or garden, not on paved areas.
- Water your lawn only when it needs it. To see if your lawn needs water, step on the grass. If it springs back up when you move, it doesn't need water. If it stays flat, the lawn is ready for watering. Letting the grass grow to 3 inches also promotes water retention in the soil. Most lawns only need about 1 inch of water a week. During dry spells, stop watering and the lawn will go brown and dormant. Once cooler weather arrives, the morning dew and rainfall will bring the lawn back to its usual vigor. This may result in a brown summer lawn, but it saves a lot of water.
- Deep-soak your lawn. Water long enough for the moisture to soak down to the roots, where it will do the most good. A light sprinkling evaporates quickly and tends to encourage shallow root systems.
- Water during the early part of the day. Early morning is generally better than dusk since it helps prevent the growth of fungus and is the best defense against slugs and other garden pests. Both early and late watering result in less water loss to evaporation than during the heat of the day. Try not to water when it is windy. Wind can blow sprinklers off target and speed evaporation.
- Add organic matter and use efficient watering systems for shrubs, flower beds and lawns. Organic material helps increase absorption and water retention. Areas already planted can be top-dressed with compost or organic matter. You can greatly reduce the amount of water used for shrubs, beds and lawns by strategically placing soaker hoses, installing a rain barrel water-catching system and installing a simple drip-irrigation system. Avoid overwatering plants and shrubs. This can diminish plant health and cause yellowing of the leaves. When hand watering, use a variable spray nozzle for targeted watering.
- Don't run the hose while washing your car. Clean the car using a pail of soapy water. Use the hose only for rinsing. This simple practice can save as much as 150 gallons when washing a car. Use a spray nozzle when rinsing for more efficient water use.
- Use a broom, not a hose, to clean driveways and sidewalks.
- Check for leaks in pipes, hoses, faucets and couplings. Leaks outside the house may not seem as bad since they are not as visible, but they can be just as wasteful as leaks indoors. Check frequently to keep them drip-free. Use hose washers at spigots and hose connections to eliminate leaks.

Water conservation comes naturally when everyone in the family is aware of its importance. Parents are encouraged to teach their children simple water-saving methods around the home that can make a big difference. ■

Give your lawn a deep soaking when you water so the moisture can soak down to the roots.

Inspect power tools before use, and repair or replace any damaged items.

Photo courtesy of Underwriter's Laboratories Inc.

Keep It Safe

Be Careful When Tackling Outdoor Activities in Spring

After spending long winter days indoors, most folks love to get outside in spring—even if it is just to do chores. But outdoor chores can bring electrical hazards.

Ladders contacting power lines cause 9 percent of electrocution-related deaths each year, according to the U.S. Consumer Product Safety Commission. Landscaping, gardening and farming equipment account for another 7 percent.

To avoid electrical hazards, make sure you and your family follow these tips:

General

- Teach children to stay away from electric transformers and substations, and explain what posted warning signs mean.
- Avoid damp conditions when using electricity. Keep all electrical devices and cords away from water.
- Place waterproof covers on all outdoor outlets.
- Install ground-fault circuit interrupters in outlets where water may be present.
- Only use extension cords marked for outdoor use. Match the power needs of an electric tool or appliance to the cord's label information.
- Dial 811, the national call-before-you-dig phone number, at least 72 hours before engaging in any type of excavation work. Local utilities will be notified to mark the approximate location of any underground utilities on your property.

Power Tools

- Inspect power tools and appliances for frayed cords, broken plugs, and cracked or broken housing. Repair or replace damaged items.
- Unplug tools when not in use.
- Don't carry power tools by the cord.
- Store power tools indoors.

Ladders

- Use only a fiberglass or wooden ladder if working near overhead wires.
- Never touch a person or an object that has made contact with a power line. ■

Source: Electrical Safety Foundation International and Consumer Product Safety Commission

Use Energy Wisely

Give Your AC System Some Attention

Once the weather starts to warm up, but before it gets hot outdoors, schedule an appointment for a qualified air-conditioning technician to take a look at your system.

Chances are you will get good news, and be told your system is good to go for another summer. But between visits:

- Change the filter every month or two, depending on how hot and dusty it gets. A filter clogged with allergens and dust will not let air circulate freely to the air-conditioning system, which makes it work harder, use more energy and cost you more to operate.
- Keep your outdoor unit clean. Sweep away plants, fallen branches and debris that fall on top of it and from the ground around it. Objects that are too close can prevent adequate air flow.
- Vacuum indoor registers and air vents regularly. Heating contractors say simple dust and dirt cause almost half of their service calls.
- Move furniture and drapes away from registers.

Before cooling season arrives, have a professional inspect your air-conditioning system.

Lineworker Safety Gear

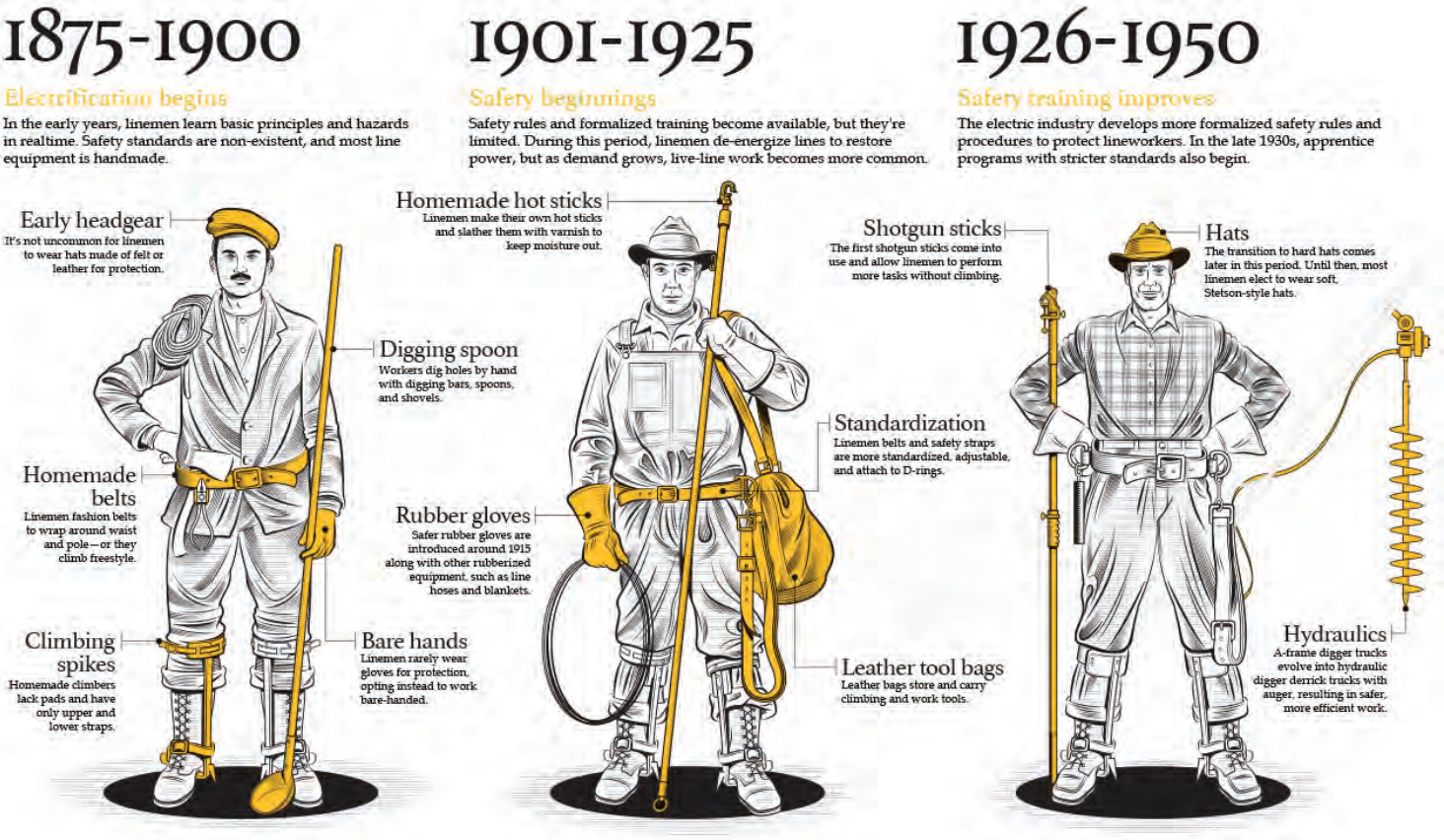
Take a detailed look at the evolution of line equipment

Electric cooperatives strive to provide electricity to their members in the safest, most affordable and most reliable way possible. A part of that service is maintenance.

Lineworkers have provided this service for more than 100 years. Lineworkers at Glades Electric Cooperative have worn the most state-of-the-art safety gear throughout history, but standards have certainly changed from their humble beginnings since GEC's founding in 1945.

In the early days, lineworkers preferred soft, Stetson-style hats. They moved from homemade hot sticks to industry-standard shotgun sticks. Soon after, hard hats became the norm, and bucket trucks came into the picture to provide safer options for line maintenance. Two-way radios began to make communication much easier, especially during emergency and storm restoration efforts.

In the 1970s, President Richard Nixon signed the Occupational Safety and Health



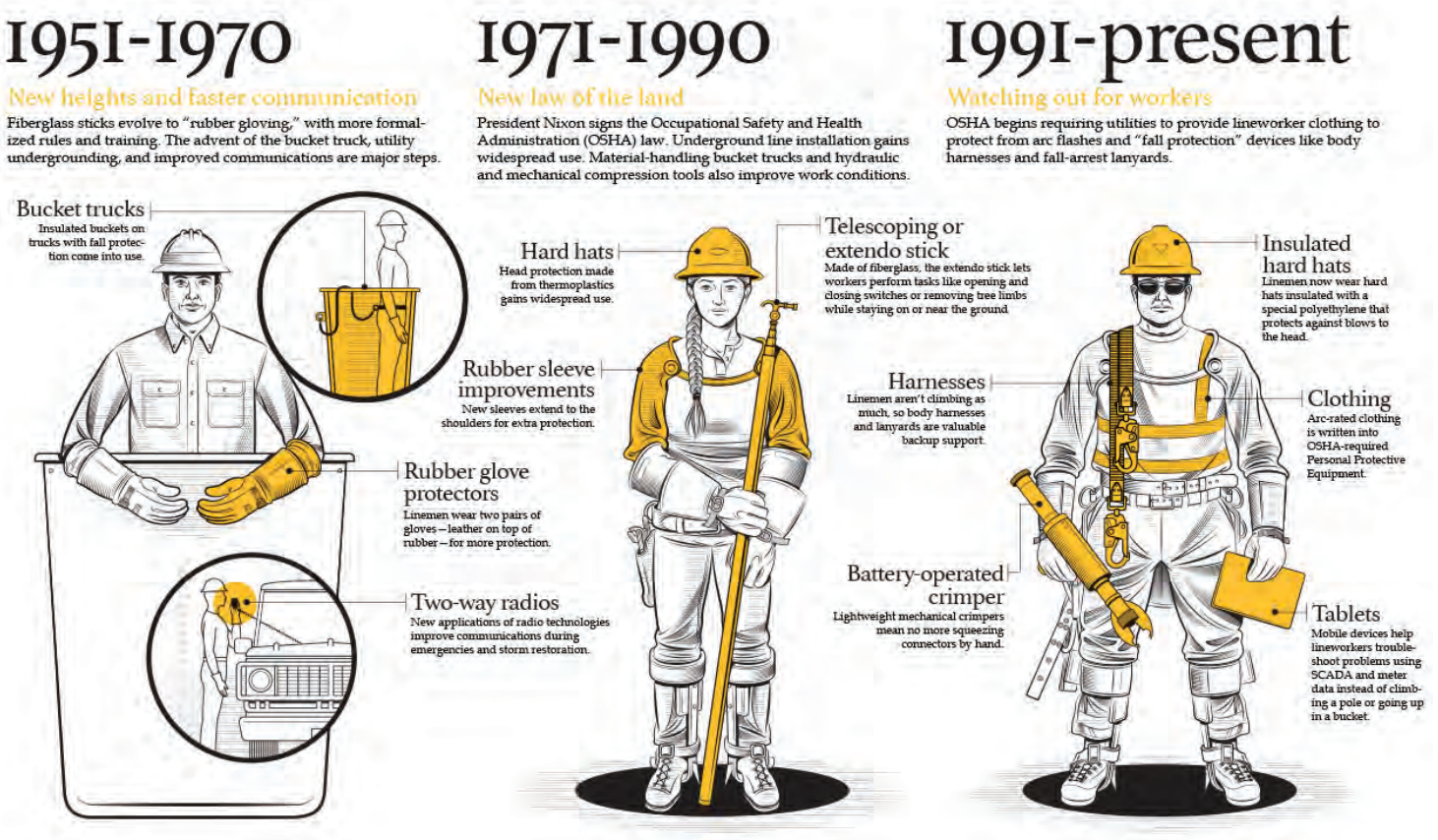
Through Time

Administration law, which required implementation of industry-wide safety practices. Rubber sleeves were introduced and improved, and extendo sticks made out of fiberglass came on the scene to allow workers to remain on the ground more often.

Today, Glades Electric Cooperative employees are protected from arc flashes and falls with additional safety equipment required by law. Hard hats are insulated, and lineworkers carry electronic tablets to better manage their workflow.

New technologies continue to improve work conditions and ensure lineworkers can complete their work safely and efficiently.

Our lineworkers go above and beyond to serve our members. Glades Electric Cooperative wants to do the same for them and their families. We will always provide the most up-to-date and safest equipment for those who keep the electricity flowing to our communities. ■



Thank You!

When the lights go out, so do the dedicated men and women charged with keeping your electricity flowing. Our linemen, including TJ Davis, shown here, worked tirelessly on the front lines to restore power after Hurricane Michael destroyed our electrical system. National Lineman Appreciation Day is Thursday, April 18. Please let them know you appreciate their never-ending commitment.

Photo by John Dean/PowerSouth Energy Cooperative