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EDITOR

Peter A. Fitzgerald

SENIOR EDITOR/WRITER

Katherine Hackleman

ASSOCIATE EDITOR

Michael T. Crawford

LAYOUT & DESIGN W. Douglas Shirk

PRODUCTION COORDINATOR

Michelle M. Smith

CONTRIBUTING COLUMNISTS

James Dulley Janette Hess George Weigel

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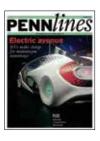






ON THE COVER

This Toyota Concept-i is a hit at the 2017 Consumer Electronics Show in Las Vegas. Photo by Kristen Hall-Geisler



News from across the Commonwealth

State dedicates solar installations at state parks

State officials are in the process of conducting a series of events to mark additions at state parks that are designed to make the parks energy-independent. The state Department of Conservation and Natural Resources (DCNR) manages more than 4,700 buildings within its system and strives to follow practices that conserve and sustain natural resources within those buildings.

Small-scale solar array installations are underway or already completed at Fort Washington State Park in Montgomery County, Mt. Pisgah State Park in Bradford County, Presque Isle State Park in Erie County, Moraine State Park in Butler County, Laurel Hill State Park in Somerset County, and Caledonia State Park in Franklin County.

Fawns more likely to survive in farmland than forest

Penn State University researchers have released the results of a study showing that while only about one-half of all white-tailed deer fawns live through their first year, they have a much better chance of surviving if they are born in farmland rather than in a forest.

Working with Pennsylvania Game Commission deer biologists, the researchers studied fawn survival in four areas of Pennsylvania, and also studied published data on 29 deer populations in 16 states.

They found landscapes with mixed forest and agricultural cover had lower rates of mortality due to predators when compared to forested landscapes. The study showed an estimated average survival to 6 months of age was about



41 percent in contiguous forest landscapes with no agriculture. For every 10 percent increase in land area in farmland, fawn survival increased by nearly 5 percent. Researchers classified mortality in three ways: human-caused (killed by machinery or vehicle collisions), natural (excluding predation) and predation. Predation was the greatest source of mortality in all areas.

Using radio collars placed on 98 fawns from 2015 to 2016 in Susquehannock State Forest in Potter County and in a second area encompassing parts of the Rothrock and Bald Eagle state forests in Centre, Mifflin and Huntingdon counties, researchers found fawn survival rates were just slightly higher than in other parts of the United States.

Another CNG fueling station opens at public transit agency site

A compressed natural gas (CNG) fueling station recently opened at 13227 Dunham Road, Meadville, in Crawford County, marking the 12th of 29 planned fueling stations that have opened in Pennsylvania as part of a public-private partnership (P3).

Through the \$84.5 million statewide P3 project, Trillium CNG is designing, building, financing, and will operate and maintain CNG fueling stations at

29 public transit agency sites through a 20-year, P3 agreement.

The Pennsylvania Department of Transportation's (PennDOT) overall P3 project includes CNG fueling accessible to the public at six transit agency sites, with the option to add sites. PennDOT will receive a 15 percent royalty, excluding taxes, for each gallon of fuel sold to the public at public sites, which will be used to support the cost of the project.

'Big' families make up 3 percent of rural families

The Center for Rural Pennsylvania, using data from the U.S. Census Bureau, recently studied "big" families, defined as having six or more members related by birth, marriage, or adoption, who are living together.

According to the 2016 data, big families made up 3 percent of rural Pennsylvania's 1.06 million families. Nearly one in three rural big families was multigenerational (three generations living together), while on average, the rural big families included 3.6 children under 18 years old.

Center staff reports that across the United States there were nearly 3.89 million big families (5 percent of all families) in 2016. The states with the largest percentage of big families were Utah, Hawaii, Alaska, California and Idaho. In each of those states, more than 6 percent of the families had six or more family members living together. States with the lowest percentages of big families were Rhode Island, Maine, New Hampshire and Vermont, all of which had fewer than 3 percent of all families fitting the criteria for a big family. Pennsylvania ranked 32nd among the states in the percentage of big families.

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Select proper size, design of awnings for energy savings, comfort, privacy

By James Dulley

ear Jim: I have always liked the appearance of window awnings. The salesman told me installing them can also save a lot of energy. What choices are best? — *Kathy F*.

Dear Kathy: The awning salesman was not just blowing smoke to get a sale. Installing window awnings can reduce summer energy use. There are also other benefits, such as reduced fading of furniture, drapes, and carpeting, and protection of your primary windows and doors from the sun and severe weather.

The reduction in air-conditioning electrical use results from the blocking of the direct radiant heat from the sun through windows and doors.

Another advantage of awning energy savings is it is greatest during the hottest hours of the afternoon when the sun is most intense. This reduces the peak electricity load for the cooperative's electric generation.

The first decision to make is if you want fixed or adjustable awnings. They both are equally effective during the summer to reduce your peak electricity use in midafternoon. The advantage of adjustable awnings is the level of shading can be changed throughout the day and various seasons.

Adjustable fabric awnings offer better protection from severe weather because some can be lowered to be almost flat over the window or raised to nearly expose the entire window glass for winter solar heat gain.

The maximum projection from the wall for an adjustable aluminum awning is fixed by the frame and the down arm length. To open them, the aluminum awning slats roll up above the frame and the hinged arms swing



upward. The advantage of aluminum is its strength and its resistance to degradation from the sun's UV rays.

Sideless awning designs, called Venetian awnings, are effective for true south-facing windows because the sun's most intense rays come from directly overhead. If you also need to block the late afternoon sun at those south-facing windows, install hood style awnings with sides. For casement windows, hipstyle awnings provide clearance for the window sash to swing open outward.

If you are also concerned about security and privacy, select an adjustable awning that can be lowered completely flat against the window.

Proper sizing of window awnings is important both for blocking the summer sun and for allowing the winter sun to shine. This is particularly true if you install fixed awnings, because their shading angle cannot be changed. The orientation of the window to the sun also affects the proper awning sizing because the sun is lower in the sky during early morning and late afternoon.

If you still remember high school geometry, you can calculate the size of awnings needed for windows and doors. The latitude angle for your area determines how high the sun is in the sky and its angle of incidence on your windows. You can find the sun location for various regions, seasons and times of day in most basic solar energy books.

If you are not a math whiz, just make a "test stick" awning to determine the proper size. Hold the end of a stick against the top of the window frame or wall at the time of day when you need shading. Vary the stick lengths and the angle until its shadow provides the shading you desire. The shades width should extend at least 2 inches on either side of the window.



Have a question for Jim? Send inquiries to **James Dulley**, *Penn Lines*, 6906 Royalgreen Drive, Cincinnati, OH 45244 or visit www.dulley.com.

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65-69	\$20.50	\$16.00	\$33.50	\$26.00	\$66.00	\$51.00	\$163.50	\$126.00
70-74	\$27.40	\$21.40	\$45.00	\$35.00	\$89.00	\$69.00	\$221.00	\$171.00
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Electric avenue

EVs make charge for mainstream motorways

lectric vehicles, or EVs, are slowly gaining ground in the American marketplace. The all-electric Tesla Model S was the first vehicle of any kind to earn a perfect score from *Consumer Reports*, and nearly every major manufacturer has added (or will soon add) an electric vehicle to its lineup.

People often assume the drivers of these vehicles are early adopters who aren't afraid of new, unproven technologies. But it might be that they're history buffs — or maybe futurists. Let's take a look at the history of the electric vehicle, the current state of the technology and what's headed our way in the near future.

By Kristen Hall-Geisler Penn Lines Contributor

Dawn of the 'automotive age'

In the late 1800s, everybody was building an automobile in his garage. Karl Benz is credited with the first mass-produced, gasoline-powered vehicle in 1897, while the first successful electric vehicle in the United States was built by William Morrison in 1890. There were also steam-powered vehicles, though they ran out of steam as practical cars pretty quickly.

In these early years, electric cars were among the quickest and quietest vehicles on the road. They won races and were the least likely to spook the horses. In 1899, Camille Jenatzy was the first man to reach 100 km/h (62 miles per hour), and he was driving a bullet-shaped, purpose-built electric car when he did it.

In the early 20th century, automotive companies grew like seedlings in the spring. Some would become mighty oaks of the industry, like Ford and Cadillac. Others would bloom for a time before folding, like Auburn and Duesenburg. Electric car companies fell into this second group. Riker Electric, Detroit Automobile, and others sprang up and flourished in the early decades of the century. They were quiet, clean and easy to drive. Advertisements of the day suggested they were best for wom-

en and doctors, neither of whom wanted to smell of gasoline and engine oil when they arrived at their destinations. But their appeal wouldn't last long.

'Dark ages' of electric vehicles

By the end of World War I, most electric car companies had folded. Internal combustion engines, both diesel- and gasoline-powered, had won this round. The vast expanses of the American countryside were too much for the battery technology of the time, and the infrastructure was not in place in rural areas to support roadside charging. It was just easier to fuel up at a gas station.

This era without electric cars lasted decades, with only a few attempts to prove their worth in the middle of the 20th century. In 1968, MIT (Massachusetts Institute of Technology) and Caltech (California Institute of Technology) held a cross-country race using electric vehicles retrofitted by their engineering departments. Even auto shows didn't feature very many concepts as chromed cars of the 1950s and 1960s reigned.

In the 1970s, a gasoline shortage in the United States revived interest in cars that could run without it. But manufacturers were committed to internal combustion, so few if any electric cars were developed at this time. Instead, smaller, more-efficient, gas-powered models with few creature comforts could be found at dealerships.

For the home-EV enthusiast, however, a bustling business in conversion kits existed. Small, lightweight vehicles, like the Porsche 914, were excellent candidates for a swap. Those with the know-how and a decently equipped home garage could remove the engine and gas tank from an inexpensive car and replace it with a DC motor and the means to plug in and recharge the lead-acid batteries. But the pool of people with that kind of know-how and garage space was small.

EVs back in the spotlight

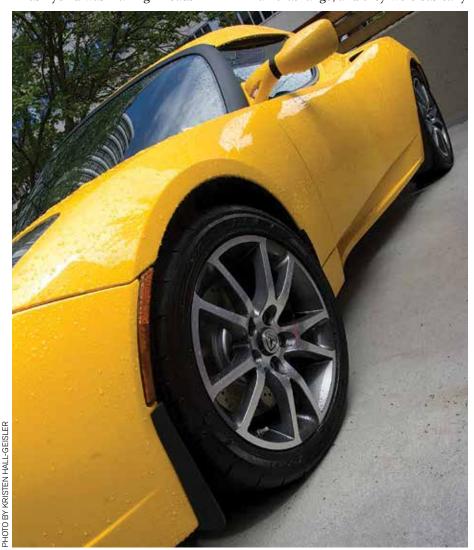
In the late 1990s, there was one electric car from a major manufactur-

er: the GM EV1. Hardly anyone heard of it while it was available, let alone had one. It was only leased to owners in California as a kind of experiment. The manufacturer wanted to test its technology in the real world, and it wanted to gauge the public's interest in an electric car. This is not uncommon; Honda has tested fuel cell vehicles in California using this same model.

The reason many people have a passing knowledge of the EV1 is due to the film Who Killed the Electric Car? It's a question with an easy answer: GM (General Motors Co.) ended the EV1 program and crushed all of the experimental vehicles.

Just at this moment, the Toyota Prius hybrid was making inroads in the early 2000s, so people were getting used to the idea of a car running at least partly on electricity. A few small, low-powered, and frankly weird-looking electric vehicles, like the Zap and Sparrow, were available. The technology was improving, but the best technologies — like lithium-ion batteries — were prohibitively expensive.

But they weren't too expensive for an entrepreneur named Elon Musk, who had cofounded PayPal Holdings, Inc. He used his wealth to next found Tesla and create its first electric car, the Roadster. This was a convertible two-seater powered by lithium-ion batteries with a range of more than 100 miles. Most EVs had a third to half that range, and they were basically



TESLA ROADSTER: This privately owned vehicle is designed for performance and aero efficiency. It was shown at an event in Portland, Ore.



FORMULA E: The race director's car at the 2015 Long Beach, Calif., Formula E event draws a crowd wherever it goes.

glorified golf carts. A fast, sexy electric car was unheard of.

It was also very expensive, topping \$100,000. Despite that price tag and the low volume of Tesla Roadsters rolling off the California assembly line, it grabbed the public's imagination in 2008. If you recall, things weren't going so great for the automotive industry in 2008, and gasoline was very expensive, with no price drop in sight. An electric car, especially one that was fun, was very appealing.

Two seats and a tiny trunk, though, weren't very practical. Major manufacturers stepped up their plans to build electric vehicles, with the family-friendly Nissan Leaf EV and Chevy Volt plug-in hybrid arriving around the same time as the Tesla Model S Sedan in 2011

Electric cars for modern mobility

In 2018, there are more than 30 electrified models available nationwide. That includes everything from purely electric vehicles, like the Chevy Bolt and Nissan Leaf, to plug-in hybrids like the Toyota Prius Prime and Chevy Volt, to hybrids like the Kia Niro. And there are more on the way. Lots more.

Every major manufacturer has announced electrification plans for its fleet by 2030, if not sooner. Volvo will have electrified versions of all of its vehicles by 2020, and it created a new brand — Polestar — to build purely electric performance vehicles. In the

wake of its diesel scandal, Volkswagen has promised to have an electrified fleet by 2025. Even old-school luxury stalwarts like Land Rover Range Rover and Bentley are available as plug-in hybrid electric vehicles (PHEVs) now.

Costs of electric vehicles are dropping, technology is improving, and ranges are getting longer and longer. Only 10 years ago, if your electric car wasn't a Tesla Roadster, you could expect to see about 45 miles on a charge. That doubled in the early 2010s, when ranges expanded to 80 to 100 miles. Now, manufacturers are pushing that envelope to 200 or 300 miles on a charge, with a possible charge time of less than an hour. Plug-in hybrids that use a small gasoline engine as a generator for the batteries can rival conventional cars for range.

Look into my crystal ball

It's not hard to see that, for urban areas at the very least, electric cars are going to be a major presence on the roads. Just as they were 100 years ago, EVs are clean, quiet, and easy to drive. There's only three moving parts that make the car go, so maintenance is minimal. And they have immense amounts of torque as soon as you step on the accelerator, which makes the morning commute more fun.

Besides these feel-good factors, a couple of hard truths will bring EVs to more roadways. First, several cities and even entire countries have banned internal combustion engines — gaso-

line and especially diesel — from sale beginning in 2040. Many industry experts suspect that China, a country with massive pollution problems in its cities, will follow suit.

The automobile industry is global. Vehicles are expensive to produce, and creating a variant of a vehicle to sell in one state or country but not another is challenging. It's far easier for a manufacturer to create one basic version of a vehicle to be sold pretty much anywhere that can be customized for each buyer in each location, whether that's a speedometer in kilometers or miles, or something as personal as leather seats or cloth.

But the basic underpinnings of the car, like the engine and transmission, will probably be the same for most of the world. If enough markets ban internal combustion engines, then car companies will build more electric cars to sell everywhere.

There are a lot of variables that are up in the air. Will these EVs of the future be fully autonomous? Connected to the internet? Shared, or privately owned? These factors will be decided by the speed of technological developments and consumer demand — or disgust. But EVs, and the infrastructure to support their everyday use, will be coming to a town near you in the coming years.

(Kristen Hall-Geisler, a freelance automotive journalist and book editor from Portland, Ore., has had articles published in the New York Times, TechCrunch, How Stuff Works, Popular Science, US News & World Report, and more. She is the author of the recently published monograph Lightning in a Throttle: Three Early Electric Vehicle Victories.)

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– Lindsay R.

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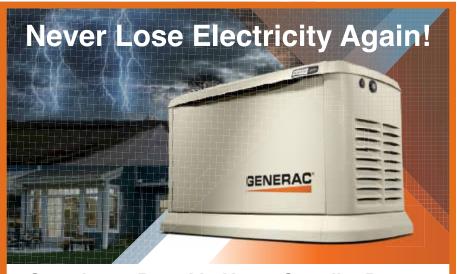
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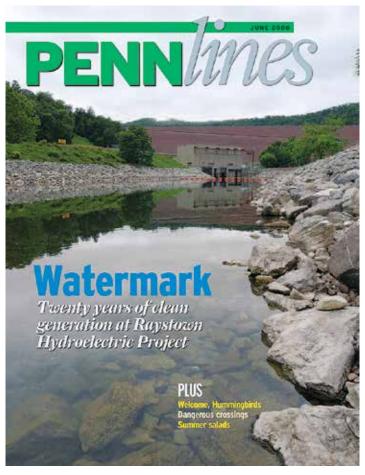




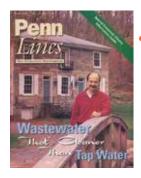
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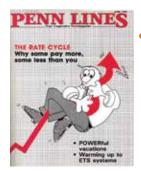


2008



1998

Penn Lines focuses on wastewater woes, and how testing shows an experimental treatment system is a possible solution to rural Pennsylvania's wastewater crisis.



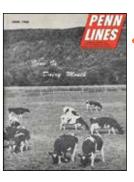
1988

Some consumers pay more for power while others pay less. Major factors affecting the cost of electricity are the source of the supply and the age of the supply.



1978

More than 2,000 electric cooperative board members and key staff attend the 1978 Legislative Conference in Washington, D.C.



1968

Dairy farmers are recognized during "National Dairy Month." In 1968, many of the state's 67 counties relied heavily on dairying as their No. 1 agricultural industry.

The Raystown Hydroelectric Project, which began operations in June 1988, continues to deliver enough electricity to power roughly 8,500 average rural homes in an environmentally friendly manner.

The 21-megawatt, run-of-river facility is operated by Allegheny Electric Cooperative, Inc. (Allegheny), in close cooperation with the Baltimore District of the U.S. Army Corps of Engineers. Allegheny is the wholesale power supplier of electricity to 13 electric cooperatives in Pennsylvania and one in New Jersey.

Construction on the site in Huntingdon County began shortly after a groundbreaking ceremony in August 1986. It involved building an intake structure on the lake side of Raystown Dam, a 930-foot underground tunnel and a powerhouse for two turbine generators. A 550-foot steel penstock (pipe) connects the tunnel to the powerhouse. Almost two-thirds of the powerhouse, which has three levels, is underground.

The plant continues to be a reliable source of clean energy, providing approximately 95.5 million kilowatt-hours of electricity in 2017, representing 2.8 percent of members' needs for the year.





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Ebensburg District Office 127 Municipal Road Ebensburg, PA 15931

814-472-8570 Website: www.reaenergy.com Email: reaenergy@reaenergy.com

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Barry Baker
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7 - 11 a.m. and 11:30 a.m. - 3:30 p.m.
Monday - Friday

From the President & CEO



Look out for scams

By Chad Carrick, MBA, CFPC President and CEO

UNFORTUNATELY, in today's world, scams seem to be inevitable. Scammers can threaten you with everything from legal action involving the IRS to turning off power to your home. REA Energy has informed you of scams that have affected us in the past, and ones that sometimes still pop up. We want all members to be informed and be aware of any possible scams.

Utility scams often involve an individual or group posing as an employee of your electric cooperative. The scammer may use threatening language in order to frighten you into offering your credit card or bank account information. Don't fall victim to these types of scams. Understand the threats posed and your best course of action:

- ▶ If someone calls your home or cellphone demanding you pay your electric bill immediately, gather as much information as you can from that individual, hang up the phone and contact the local authorities. Scammers often use threats and urgency to pressure you into giving them your bank account number or loading a pre-paid credit or debit card. If you have any doubts about your utility bill, contact our member services representatives either in person, or over the phone at 724-349-4800 or 800-211-5667.
- ► If someone comes to your home claiming to be an employee of REA

Energy who needs to collect money or inspect parts of your property, call us to verify they are, in fact, an employee. If they are not, call local authorities for assistance and do not let the individual into your home. There are other types of scams consumers should watch out for:

- ▶ Government agencies like the IRS will never call to inform you that you have unpaid taxes or other liens against you. You will always receive this type of information in the mail. If someone calls claiming to be from the IRS, hang up immediately.
- ▶ If you receive an email from an unknown sender; an email riddled with spelling errors and typos; or an email threatening action unless a sum of money is paid, do not click any links provided within the email, and do not respond to the email. Simply delete the email, or send it to your spam folder.
- ▶ If someone calls your home claiming to have discovered a virus on your computer, hang up. This caller's intent is to access personal information you may be keeping on your computer.

REA Energy wants to make sure you avoid any and all types of scams that could put you or your financial information in jeopardy. Please be aware and vigilant to any strange calls or emails.

2018 area meetings

By Stacy Patterson-Hilliard, CCC, Communications & Marketing Supervisor

REA ENERGY held its yearly area meetings in May. This year, the cooperative held area meetings for members residing in board Districts 7 and 9 at the Kovalchik Convention Complex. Members in District 8 attended a meeting at the Carrolltown Banquet Hall.

Board Chairman Michael Bertolino welcomed members and talked about what it takes to be a board member.

Following the board address, President & CEO Chad Carrick gave a presentation updating members on the financial state of the cooperative, operations, new technology, REA Energy Services, and Touchstone Energy.

Members attending the meeting took advantage of the opportunity to look at displays of the products that our for-profit subsidiary, REA Energy Services, Inc., offers. This subsidiary was formed in 1999 to help offset cooperative costs, as well as give the members an opportunity to purchase quality products at excellent prices.

When members return their reservations to attend the area meeting, they have the opportunity to include a question on the slip. Following are some questions:

Why do we get calls on lowering our electric bill and when I say we are on REA, they hang up? Did you give them our phone number?

REA Energy will never provide any

member's information to a third-party group. These groups that call about lowering rates get their list from a general database in a geographical area and call anyone. If you do get a call from one of these companies, please tell them that you belong to an electric cooperative and are unable to switch providers.

I am looking to install a new electrical panel at my home; how do I contact your subsidiary?

To receive a free quote on the cost of upgrading your electric panel and more information, call our subsidiary, REA Energy Services, at 724-349-4800, option 2. To learn more about all the products and services that REA Energy Services offers, visit www.reaservices.com.

Are the new meters considered to be smart meters?

In 2009, REA Energy, in accordance with Act 129, began to install automated meters, which are often referred to as "smart meters." The meters REA Energy uses allow us to read a member's meter and check on voltage, ampere, and peaking information. Our meters also help streamline our storm management process by showing what members are out of power and pinpointing outage locations.

Are all tree trimming services sub-contracted out to other agencies?

Yes, REA Energy's trained tree contractors are experienced with removing and trimming trees to industry standards. We offer competitive and safe tree maintenance services to all members and

non-members.

Why do I only have REA for electricity? Without competition, is REA free to (over-charge) its customers?

In Pennsylvania, no alternative suppliers have ever entered cooperative service territories to serve cooperative consumers, due in large part to competitive cooperative rates. Recognizing that, in 2014, the General Assembly passed legislation removing cooperatives from the retail market.

Is there a site we can go to for tracking power outages when they occur?

The cooperative recently launched an online outage viewer on its web page, www.reaenergy.com. Members can see the total number of outages, the number of outages per county, number of members affected, and the cause, if known.

Why do we have to pay a monthly base charge?

The service charge has been a part of members' bills for decades. This service charge is to cover the cost of providing electric service to our members, including the upkeep of the electrical system, such as lines, poles, meters and substations.

Why do our lights blink sometimes?

There are several reasons that may cause your service to blink. These include a tree on the line, failing equipment or an increase in electrical load from a commercial account. If a problem persists, please call 724-349-4800.

I want to pay my bill online, how do I set this up?

To sign up for the online member portal, visit www.reaenergy.com and click on the link for the member portal. From there, you will be redirected to a page that contains a link to click to "Sign Up." After filling in the information at the bottom of the page and submitting valid data, your User ID is created. You can then log in using your User ID.

Is REA Energy exploring any possible internet connections for members?

REA Energy is always looking for ways to provide more value-added services to our members. We are currently looking to perform a feasibility study on offering broadband service to our members. Stay tuned for more information later!

The board would like to invite all members to join us at our 81st annual meeting on Thursday, Sept. 20, 2018, at the Kovalchick Convention Complex. We hope to see you there.



MEMBER ENGAGEMENT: REA members visit displays to learn more about products offered by the cooperative and its subsidiary.

Have you been using your Co-op Connections Card?

In 2012, REA Energy joined a nationwide alliance called Touchstone Energy, adding a value-added product to you in addition to our commitment to providing safe, reliable, and affordable electricity.

We are always looking for ways to provide value to our members and our community, especially during tough economic times. REA Energy's Co-op Connections Card is a money-saving tool we're proud to offer our membership. The card connects you with discounts on everything from hotel stays to prescription drugs.

A wide variety of merchants throughout our community accept the card, including Yanov's Bait and Tackle in Portage and Indian Springs Eye Associates in Indiana. Be sure to mention your card to receive your discount.

Our hope is that our local businesses participating in the Co-op Connections Card program continue to benefit from increased traffic from our members. Businesses can sign up for the program at no cost. For a complete list of all participating businesses in our area, simply log on to our website, www.reaenergy.com, and follow the Co-op Connections Card link.

The card also gives you access to online savings at many national retailers. You can check out these great national discounts at www.connections.coop.

Perhaps one of the most valuable features of the Co-op Connections Card is the pharmacy discount. While it is not an insurance card, the discount can mean savings of 10 to 60 percent on prescription drugs. The logo and information on the back of your card is recognized at more than 60,000 national, regional, and local pharmacies.

Co-op Connections Card

PLA energy
Cooperative Inc.

A Touchstone Energy Cooperative
The power of human connections The powe

The pharmacy discount has been widely used by members of Touchstone Energy co-ops across the country. In fact, REA Energy members to date have saved over \$42,000; that's an average of over \$7,000 in savings per year!

Want to find out more? Log on to https://www.mymemberportal.com/#/Login to search for pharmacies in our area that honor the card.

As a Touchstone Energy co-op, REA Energy strives to serve our members according to four core values: integrity, accountability, innovation and commitment to community. Our Co-op Connections Card is one of the ways we live up to those values.

We're eager to answer any questions you have about the card and how to take advantage of the discounts it provides. Call us at 724-349-4800 to find out more, or log onto www.reaenergy.com.

Right-of-way management and facility construction news

REA Energy contractors will be completing tree-trimming work in the following areas in June:

Contractor crews from Asplundh Tree Expert Co. will be trimming the rights-of-way of the Kenwood Substation and Indiana North Substation areas, in addition to emergency maintenance areas. Crews from Penn Line Service, Inc. will be trimming the right-of-way of the Uniontown Substation area.

Notification of work will be made to members in the areas affected. Contractors will perform all right-of-way work per REA Energy specifications. All contractor employees will carry employee identification cards and their vehicles will display their company name.

If you have any questions, call 724-349-4800, or view the specifications at: www.reaenergy.com.

REA Energy offices
will be closed on
Wednesday, July 4,
2018, in observance
of Independence Day.
Power outages can be
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Meet the electric John Deere

By Kaley Lockwood

reen and yellow are arguably the second-most American set of colors, behind red, white and blue of course. This rings true particularly for those who operate John Deere machinery on a daily basis.

Technology in recent years has been the catalyst for the boom and bust of many industries. In the past decade or so, advancements in farming technology have primarily been focused on automation and precision, but with the automobile industry moving toward electric vehicles, the agriculture industry is following suit.

John Deere (the brand name of Deere & Co., a U.S. corporation that manufactures tractors and other machinery) showcased the first, fully battery-powered tractor in 2017 at SIMA, an international agribusiness trade show in Paris. Nicknamed SESAM, for Sustainable Energy Supply for Agricultural Machinery, this all-electric tractor is modeled after John Deere's 6R series tractors.

In a press release by John Deere, SESAM is said to have all of the same "features and functionality of a 'conventional' tractor while offering the benefits of electric power." This emissions-free tractor runs at a lower noise level than other traditional tractors and is operated using two independent electric motors. The electrification of this tractor simplifies the moving parts and thus greatly reduces the need for maintenance.

These two motors power an adapted DirectDrive transmission, producing 130 kilowatts of continuous power with a peak output of 400 horsepower, according to Farm-Equipment.com. The website also notes the tractor takes three hours to fully charge and can run up to four hours in the field with speeds ranging from 2 to 30 miles per hour. As a comparison, the Tesla model 3



THE FUTURE OF TRACTORS: Nicknamed SESAM, for Sustainable Energy Supply for Agricultural Machinery, this all-electric tractor is modeled after John Deere's 6R series tractors. John Deere showcased its first, full battery-powered tractor at an agribusiness trade show in Paris in 2017.

may have a capacity of up to 75 kilowatt-hours (kWh) of battery storage, providing a range of about 310 miles. The SESAM has a capacity of 130 kWh with a range of about 34 miles, which means this tractor uses a lot more electricity in a shorter period of time.

In order for the SESAM to take off, the battery capacity will need to expand to support the dawn-to-dusk longevity of farm work. In fact, the president & CEO of Autonomous Tractor Corporation, Kraig Schulz, says a 200-horse-power electric tractor would hypothetically need about 1,500 kWh of batteries to complete a full day's work.

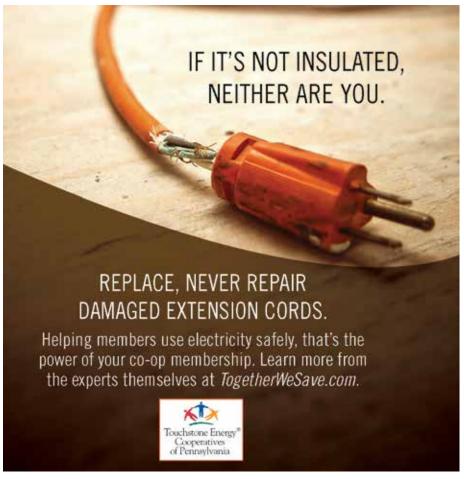
Although SESAM's battery technology may not yet be practical for a full day of farming, the all-electric tractor is an exciting development for the agriculture industry.

John Deere notes in a press release, "The SESAM tractor is a major part of John Deere's vision of the energy-independent farm of the future."

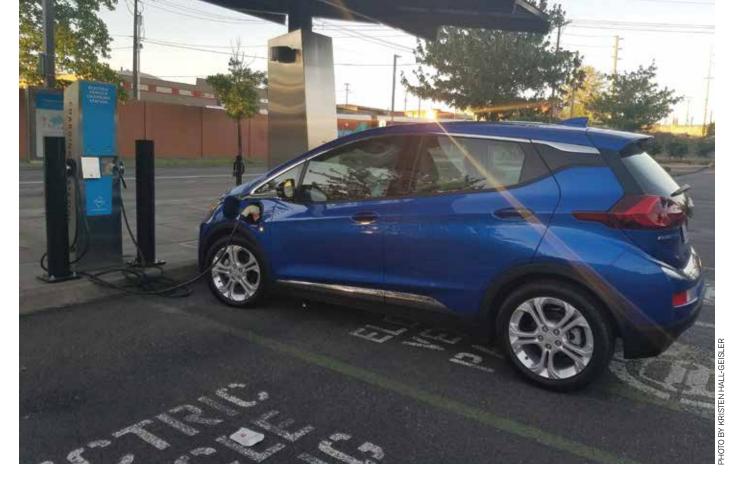
This push toward electrification of farm machinery in lieu of using fossil fuels directly supports the "environmentally beneficial electrification" movement. This concept, which involves technological innovations that are creating new ways to use electricity as a substitute for onsite fossil fuels like natural gas, propane, gasoline and fuel oil, is gaining traction among a growing number of groups in the U.S., including local electric cooperatives. Frequently promoted as a means of reducing greenhouse gases and helping the environment, beneficial electrification also helps consumers by providing products that are cleaner, quieter and easier to maintain. John Deere's SESAM tractor does just that. 🎱

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









Going electric

Drivers share experiences with EVs, hybrids

By Kathy Hackleman Senior Editor/Writer

Jay McGinnis can't remember when he first became interested in energy efficiency. He heats and cools his home and adjacent business — Woolen Mill Fan Company — in southern York County with a 21-kilowatt solar system, and his "yard art" includes a number of restored, antique windmills.

And since 2012, McGinnis, a member of Gettysburg-based Adams Electric Cooperative (EC), has been a committed electric car enthusiast. That's when he bought his first electric car — a 2011 Nissan Leaf. He soon found that even though it had been advertised as having a 100-mile range, he could go only about 60 miles on a full charge, so

a couple of years later, he traded it for a newer model with an 80-mile range.

"I still had 'range anxiety," he says, "so last August, I bought a 2017 Chevy Bolt with an advertised range of 240 miles. Since then, I have driven it 10,000 miles. With this car, I can get to Lancaster or Baltimore and back, piece of cake."

GETTING A CHARGE: Instead of being fueled with gasoline, this Chevy Bolt is connected to a charging station. Adams EC member Jay McGinnis drives a similar 2017 model, which has an advertised range of 240 miles before it needs to be charged.

He even drove the 90 miles from New Park, Pa., to Philadelphia over the winter. Although he thinks he could have returned home with room to spare, he chose to charge it up in the city, using a phone app that lets drivers know the location of charging stations and if they are currently in use.

"When it gets cold and you are using the heater, your battery doesn't hold as long, so your range diminishes," he says.

He has a charging station at home, and his solar system typically generates enough energy to offset his residential, business, and car-charging needs.

"I don't imagine myself going back to an all-gas car," McGinnis says. "I think electric cars are the wave of the future ... I do have a regular pickup if I have to go long distances, so I don't have to figure out a route with charging stations."



READY TO GO: Travis Kuhstos, staff energy specialist and demand response program manager at Valley REC, drives the cooperative's 2010 Ford Escape hybrid as he travels to members' homes.

Savings

Rian Doubet, the energy solutions representative at Cambridge Springs-based Northwestern Rural Electric Cooperative (REC), agrees that the future of "different" vehicles is here. In Doubet's case, it's a hybrid that caught his eye — and benefitted his wallet.

Doubet purchased a 2012 Prius C with 42,000 miles on it in February 2015. Since then, he's put more than 50,000 miles on it. When he uses his vehicle's comparison software to equate what it has cost him to drive his Prius compared to his 2004 Silverado 1500, he figures he has saved right at 2,000 gallons of fuel (as of mid-April), a significant chunk of change.

"I estimate that I should save close to the entire purchase cost of the Prius in fuel savings by the end of the loan term, leaving me with a 'free' vehicle," Doubet says.

While he is pleased to be saving money, Doubet notes a few downsides potential buyers should consider.

"A different driving style is required to achieve 50-plus miles per gallon," he cautions. "I have to keep it under 42 miles per hour for it to go into battery mode; 35 is the ideal cruising speed, so I have mapped out a route to

and from work to get the best mileage."

He also reports the vehicle requires a mechanic who is trained and certified on hybrid technologies, and it sits low to the ground so oncoming headlights bother him at night. In addition, his Prius has a maximum maintainable cabin temperature of 50 degrees plus the outside temperature, which he has found isn't high enough to be comfortable in winters that can dip into the frigid negative double digits.

But he has found the pluses far outweigh the minuses.

"I was tired of mundane cars," he says. "I wanted a fun car. Its computer screen reminds me of playing a video game, and it keeps me entertained competing against my own mileage. I even talked my neighbor into buying one, and we have a weekly pool to see who came out with better gas mileage."

Doubet notes his first experience

in driving a hybrid was at work at Northwestern REC, where the cooperative has maintained a hybrid in its vehicle fleet for several years.

Efficiency

Travis Kuhstos, staff energy specialist and demand response program manager at Huntingdon-based Valley REC, regularly drives a 2010 Ford Escape hybrid thanks to his employer's interest in energy efficiency.

"We wanted to practice what we preach," Kuhstos says. "We want to show we are energy conscious and concerned about energy efficiency, and since I am the energy specialist, it

made sense for me to drive it."

At first, Kuhstos was a bit skeptical about how the small SUV would do as he is regularly on the road traveling through Valley REC's eight-county territory, often in bad weather, but he has been pleasantly surprised.

"About six years ago, I was out on a back road in the middle of nowhere and they had not plowed the road," he recalls. "I came on about 6 or 8 inches of snow and it just blew right through it. It did really well."

He does make a mental note to be on high alert for pedestrians because the vehicle does not make any sound when it is operating in battery mode.

"If you are in a busy parking lot or you are not paying attention, just strolling through the parking lot, it could scare you because you don't hear it coming," Kuhstos says. "I make sure my headlights and fog lights are on, and as a driver, I try to be especially aware of pedestrians because the Escape is so quiet."

But all in all, he's impressed.

"It's very reliable and it has surprised me with its overall power," Kuhstos says. "All of my original concerns have been met with surprise — in a good way."



PERSONAL USE: Rian Doubet, energy solutions representative at Northwestern REC, (shown with his daughter, Kaydanse, 12) drives a Prius hybrid. His first experience with driving a hybrid was at work, but he quickly transitioned into driving one for personal use.

Skewered!

By Janette Hess

Tidely-traveled foodies agree that you haven't lived until you've eaten satay at an open-air hawker market in southeast Asia. But if traveling thousands of miles to eat delicious skewered meat isn't an option for you, live it up in your own backyard with a batch of Savory Chicken Satay.

Savory Chicken Satay and its accompanying sauce expertly showcase a variety of regional flavors — soy sauce, lime, ginger, peanuts and coconut milk. When served together, they constitute an especially satisfying entry in the category of grilled-meat-on-a-stick. Any leftover Satay Sauce may be refrigerated for later use with other Asian dishes.



A trained journalist, **Janette Hess** focuses her writing on interesting people and interesting foods. She is a Master Food Volunteer with her local extension service and enjoys collecting, testing and sharing recipes.

The recipe for Teriyaki Beef also relies on skewers. In this entrée, slices of marinated sirloin steak are threaded onto skewers and cooked to caramelized perfection on a hot grill. The finished product resembles bacon not only in looks but also in not-so-subtle addictiveness!



Savory Chicken Satay

- 1 pound chicken tenderloins
- 1 tablespoon creamy peanut butter
- 1 tablespoon water
- 2 tablespoons peanut oil
- 2 tablespoons regular or reduced-sodium soy sauce
- 2 tablespoons fresh lime juice
- 1 tablespoon honey
- 2 cloves garlic, minced1 teaspoon finely grated
- fresh ginger

 1/8 teaspoon cayenne
 pepper
- **1/2** teaspoon curry powder, if desired Metal skewers*

Cut tenderloins in half lengthwise. Remove any visible tendons. Place peanut butter and water in microwavable bowl. Warm briefly and then whisk until smooth. Add peanut oil, soy sauce, lime juice, honey, garlic, ginger, cayenne pepper and, if desired, curry powder. Whisk until smooth. Add chicken. Cover and marinate in refrigerator for at least 2 hours, stirring at least once. Carefully thread chicken onto metal skewers and place on clean, oiled, pre-heated grill. Discard marinade. Cook 4 to 5 minutes per side, or until chicken is cooked through. Watch closely to make sure chicken does not burn. Cooking time will vary according to type of grill used. To serve, pull chicken off of skewers. Serve with Satay Sauce. Makes 3 to 4 servings.

*Metal skewers are preferred with chicken, as they conduct heat to the center of the meat.



1/3 cup smooth peanut butter

1/3 cup hot water

1/2 cup coconut milk

1 tablespoon fresh lime juice

2 teaspoons regular or reduced-sodium soy sauce 1 teaspoon fresh lime zest

1/4 teaspoon garlic powder

1/8 teaspoon cayenne pepper

Salt to taste

Whisk together peanut butter and hot water. Add remaining ingredients and blend thoroughly. Refrigerate leftovers.



1 pound beef sirloin steak

2 tablespoons soy sauce

2 tablespoons brown sugar

1 tablespoon rice vinegar

1 teaspoon chili sesame

1 teaspoon finely grated fresh ginger

Metal or bamboo skewers*

Carefully trim steak and slice into long, thin strips, 1/8- to 1/4-inch thick. In medium bowl, whisk together soy sauce, brown sugar, vinegar, oil and ginger. Add beef strips. With clean fingers, massage marinade into beef. Cover and refrigerator for 1 to 2 hours. Carefully thread beef strips onto skewers and place on clean, pre-heated grill. Discard marinade. (Meat will resemble strips of thick bacon.) Grill at least 4 minutes per side, or until beef starts to caramelize. Cooking time will vary according to type of grill used. Remove beef from skewers and serve with commercial teriyaki sauce or Satay Sauce. Makes 4 servings.

*If bamboo skewers are used, pre-soak in water 20 minutes to prevent scorching.



Pushing the shade envelope

By George Weigel

If you're gardening in a shady yard, you might have written off all of those plants with "full sun" on the label.

Don't throw in the trowel so fast, though. You're not limited just to hostas and ferns.

Some sun-loving plants do surprisingly well in varying levels of shade.

They might not bloom as fully, but they'll usually perform better than you think

I stumbled into this realization years ago when I transplanted a couple of freebie Knock Out® roses into the shade under a dogwood tree, which happened to be the only place available.

I was hoping the plants at least would live and maybe throw out a few feeble flowers every now and then.

Surprise!

Those sun-lovers actually filled out reasonably well and bloomed at about half the rate of a full-sun Knock Out® — which is still pretty good.

A few years later, I was given a few pink Oriental lily bulbs (another sun-loving species) and again went looking for a spot to cram them in. (This happens a lot in my yard.)

The only spot was under another tree in an opening among three shade-preferring smooth hydrangeas.

Once again, to my surprise, the lilies poked above the hydrangeas and bloomed beautifully in concert with the showy light-pink hydrangea orbs.

It was a superb combination, conceived in ignorance.

The lesson is that it's worth pushing the shade envelope. Don't be afraid



MADE IN THE SHADE: Yes, these supposed sun-loving lilies are blooming nicely in the shade alongside shade-preferring pink smooth hydrangeas

to experiment. It might open a whole new world of strange bedfellows in your yard.

If a sun-lover clearly isn't happy living on the dark side, you can always move it into more light. Or give it to a sunny friend or neighbor.

Three things to keep in mind:

- 1.) Sun-lovers are likely to be leggier and floppier than in bright light.

 Counteract that by choosing compact varieties, by staking/supporting the plants, and for later-bloomers, by trimming them back by one-third to one-half around Memorial Day.
- 2.) Sun-lovers may go downhill over time. This can happen because they're not getting the amount of

recharging sunlight their genetics require.

Salvage them from death by transplanting them into a sunnier spot. Or just replace them. Even if you only get four or five years out of a plant, that's still not a bad investment.

3.) Sun-lovers may be more prone to fungal leaf diseases, such as powdery mildew or leaf spot in shade. The main reason is that leaves don't dry as quickly in shadier spots, aiding the humid conditions that fuel many infections.

Intrigued enough to try? Here's a list of so-called "sun" plants worth trying in something less than full sun:

Evergreens: Boxwood, cherry laurel, globe arborvitae, Hinoki cypress, holly, nandina, yew.

Shrubs: Abelia, beautyberry, blueberry, bush honeysuckle, butterfly bush, clematis, deutzia, ninebark, rose of sharon, shrub rose, spirea, St. Johnswort, variegated caryopteris, variegated weigela, Virginia sweetspire.

Perennials: Black-eyed susan, campanula, coneflower, coralbells, creeping phlox, creeping veronica, daylily, hardy geranium, leadwort, liatris, lily, peony, salvia, shasta daisy, Siberian iris.

Annuals: Alyssum, angelonia, blue salvia, calibrachoa, cleome, euphorbia, geranium, nicotiana, petunia, scaevola, sweet potato vine, verbena.



George Weigel is a Pennsylvania Certified Horticulturist, author of two books geared to gardening in Pennsylvania, and garden columnist for The Patriot-News/Pennlive.com in Harrisburg. His website is http://georgeweigel.net.

Classified Advertisements

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August 2018 June 20 September 2018 July 20 October 2018 August 20 **Penn Lines** classified advertisements reach nearly 166,000 rural Pennsylvania households! Please note ads must be received by the due date to be included in the requested issue month. Ads received beyond the due date will run in the next available issue. Written notice of changes and cancellations must be received 30 days prior to the issue month. Classified ads will not be accepted by phone, fax or email. For more information please contact Michelle M. Smith at 717-233-5704.

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- ☐ **Heading** ad should appear under, or name of special heading (additional fee). See below for FREE heading options.

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FOR SALE: Buckets, forks, thumbs, grapple buckets and pallet forks for skid loaders, backhoes and excavators. Tires for backhoes, rubber tire loaders and excavators also. Call 814-329-0118.

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CABIN FOR SALE – IDYLLIC INDIANA COUNTY location near Cambria and Clearfield county lines. Easy access to Yellow Creek, Glendale and several SGL. Part of private sixmember condominium camp. Individual deed includes cabin and 0.6 acre. Condo membership allows access to additional 40+ acres. Good road, excellent well, 100-amp electrical service, wood burner, propane heater and cook stove. Many extras included. \$29,900. 681-298-4226.





Where there's a will, there's a way

By Earl Pitts, American

am at one a' them life moments right now. A definite sign of gettin' old. Like breakin' your first hip, or orderin' off the Denny's senior menu for the first time.

I am contemplatin' my last will and testament.

My better half, Pearl, has been on me about this since our kids was little. 'Cause God forbid somethin' might happen to us and what would become of them kids. I figgered somebody would take them. Her sister Opal, the state orphanage or maybe they could be raised up by wild coyotes. Nature itself could cover that situation. I figured it didn't need paperwork from me.

Then the other night, Runt Wilson is down at the Duck Inn, and he tells me his granddaughter, Nancy, has become a legal beagle. An official attorney with a license and everythin'. And she's lookin' for clients. Says she will run up a will for a hundred bucks. I mention that to Pearl, and right away, she's into it.

Now here's the thing. It's a hundred bucks for a will. If that will is simple. And by simple I mean if I die, she gets everythin'. If she dies, I get everythin'. If we both die, the kids get everythin'. And if the family all perishes together, you put all our stuff in a big pile and set it on fire. That's called the "Jeremiah Johnson clause."

So here's the problem with that. I have made verbal commitments. Like, when I die, my 12-1/2 percent interest

in the Duck Inn goes to the Meeker brothers. They spotted me one time on a fishin' trip to Mudd Lake when I forgot my wallet at home. Most friends would just hand you cash. Them two circle you like vultures over a crippled calf.

When I die, Dub Meeker gets my truck, if it's got under 150,000 miles on it. Junior Meeker gets the truck if it's got over 150,000 miles on it. Again, same fishin' trip. I'm afraid we're gonna have a will the size of the government budget.

So anyways, before you can say, "I object, your honor," we're in the truck drivin' to make up a will. That was a quiet ride. Here's the problem — Pearl watches them TV killin' shows, mornin', noon and night! And I figger me havin' a legal will is the only thing standin' between me and my strange and mysterious disappearance.

Now, Miss Nancy Wilson Esquire seemed like a competent young lady, if not somewhat ditzy. She had one of them — what you call — a will tenplates on her computer, and she asked us how we wanted to disburse our estate.

Pearl says, "Well, first off, if I die before Earl, I would like our son, Earl Junior, to be raised by my sister Opal." And I go, "Wait a minute, if I'm still around, why wouldn't I raise him?" And them two women look at each other and roll their eyes in unison. I have never seen that before. It was like they practiced it. And Miss Wilson says, "What's Opal's last name, Pearl?" And I go, "Fine, my share of the Duck Inn goes to the Meeker boys. So how about that?" And Pearl goes, "That's fine." And she points at the computer and says, "The Meeker boys will have the first rights to buy Earl's 12-1/2 percent interest in the Duck Inn at the prevailin' market value with proceeds to his estate." That woman has been watchin' too much Judge Judy. And Miss Wilson goes, "What's the Meeker boys first names, Pearl?"

Pearl has obviously been thinkin' about this a lot. I drove there thinkin' after I got a will, it would grease her chances of makin' me disappear. Now I'm thinkin' I might not make it home tonight!

Wake up, America! When we left last night, Runt's granddaughter handed my old lady a card and whispered something to her. After a little diggin', I find out she apparently does divorces, too. Good to know. I'm Earl Pitts, American. The writin' is on the wall.



Social commentary from **Earl Pitts** – a.k.a. GARY BURBANK, a nationally syndicated radio personality – can be heard on the following radio stations that cover electric cooperative service territories in Pennsylvania: WANB-FM 103.1 Pittsburgh;

WARM-AM 590 Wilkes-Barre/Scranton; WIOO-AM 1000 Carlisle; WEEO-AM 1480 Shippensburg; WMTZ-FM 96.5 Johnstown; WQBR-FM 99.9/92.7 McElhattan; WLMI-FM 103.9 Kane; and WVNW-FM 96.7 Burnham-Lewistown. You can also find him at earlpittsamerican.com.

RURALREFLECTIONS

Teresa Etter Adams EC

It's finally summer

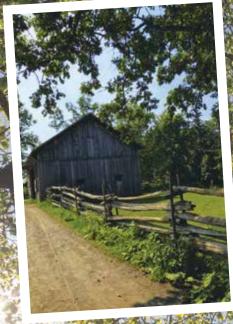
T's June — the month spring turns to summer and kids are free from classroom routines, a perfect time to take some seasonal photos.

Amateur photographers are encouraged to send their photos to *Penn Lines* Photos, P.O. Box 1266, Harrisburg, PA 17108-1266. Include name, address, phone number and the name of your electric cooperative. 2018 winners in each of five categories — artistic, landscape, human, animal and editor's choice — will receive \$75 and runners-up will receive \$25.

We work ahead, so please send fall photos by July and winter photos by September (hint: save your spring and summer photos to submit next year). 2018 photos will be returned in early 2019 if you include a self-addressed, stamped envelope.



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