

CHARGING ahead

BY KRISTI BRODD

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In the early 20th century, electric vehicles made up close to 40 percent of the U.S. vehicle market share. They quietly zipped around cities where driving distances were short and charging stations were readily available. Despite their early popularity, they began to disappear from the streets after just a few years. As roadways improved beyond the city limits, people wanted to get out and explore. With their slower speeds and shorter ranges, electric vehicles were not ideal for this type of travel. At the same time, gasoline cars began to improve and became both accessible and affordable. By 1930, electric vehicles had mostly vanished from roads.

Interest in electric vehicles made a bit of a resurgence in the mid to late 1900s, but it wasn't until recently that a more substantial push for electric vehicles developed.

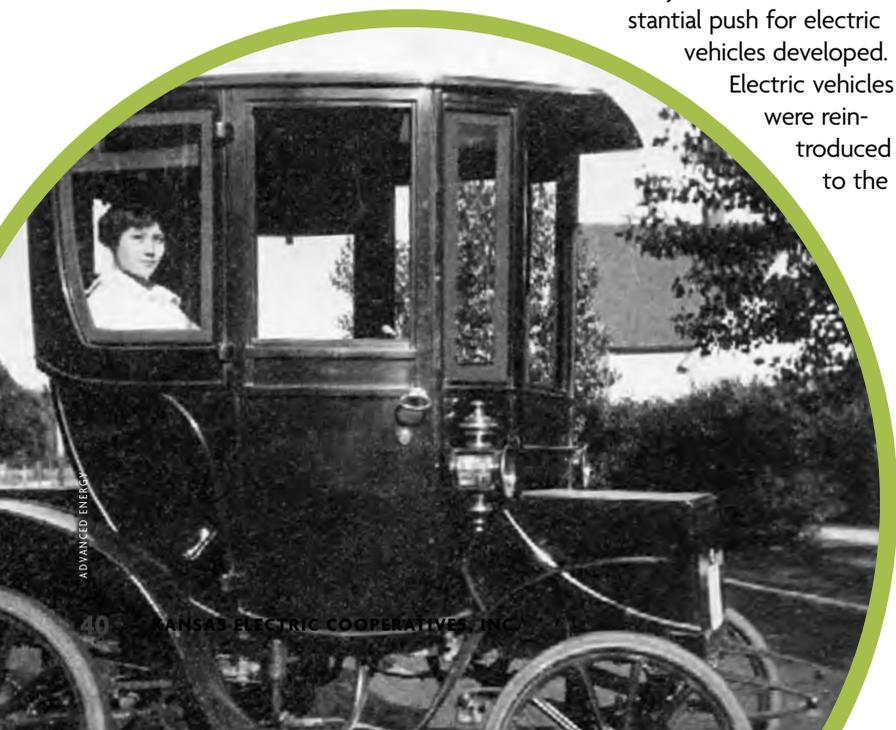
Electric vehicles were reintroduced to the

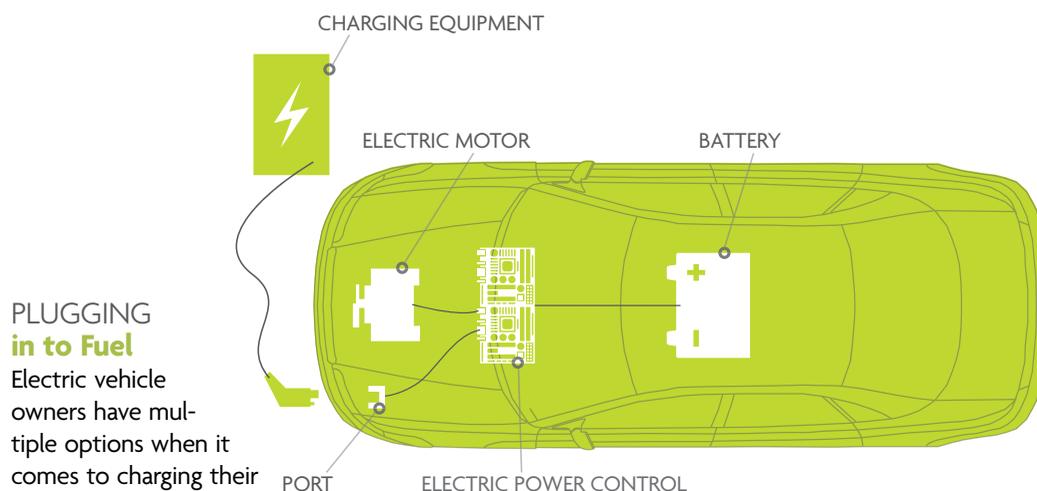
market in 2011, and each year more shoppers are choosing to forgo gasoline models and opt for new all-electric or plug-in hybrid electric models. An all-electric vehicle uses electricity as its primary fuel, and a plug-in hybrid uses electricity along with a conventional engine to improve efficiency. Making the switch from a gas pump to an outlet is a big decision, yet close to 650,000 drivers across the United States have decided to make the switch and purchase an electric vehicle.

There are numerous reasons why people choose to drive electric. The top include saving money on fuel and maintenance costs, the car's driving performance, being environmentally friendly and supporting local energy sources. No matter the reason, most electric drivers see savings by fueling at the outlet instead of a gas pump. Electricity is much cheaper than gasoline, and drivers have reported spending about \$30 a month to fuel their cars compared to about \$100 a month they used to spend on gasoline. Additionally, electric vehicles have less parts and do not need as much maintenance as gasoline vehicles, which saves drivers even more money.

Most major car manufacturers are currently offering electric models, including Chevrolet, Tesla, Toyota, Nissan, Ford, Fiat, BMW, Audi, Volkswagen, Hyundai, Porsche, Kia, Volvo and Mercedes. Many other manufacturers are currently in the planning phase to produce an electric vehicle during the next few years.

In the early 20th century, electric vehicles comprised nearly 40 percent of the U.S. vehicle market share.





PLUGGING in to Fuel

Electric vehicle owners have multiple options when it comes to charging their vehicle. They can plug their vehicle straight into an outlet at home or plug in to a public charging station. To support electric vehicle drivers and help them travel further, over 43,000 charging station outlets have been installed across the country, with over 700 located in Kansas. Charging stations are often categorized into three levels: Level One, Level Two and DC Fast Charge.

All vehicles come with an adapter to plug the car in at home to a standard 120-volt outlet, known as Level One charging. This level provides the slowest charge, around three to five electric miles per hour. Even at this slow speed, however, the majority of electric vehicle owners plug in at home to refuel.

Level Two charging is commonly found in public locations, including shopping centers, downtown areas, multifamily communities and workplaces. Level Two charging stations can also be installed at home if a 240-volt outlet is available. Level Two charging is three to five times faster than Level One and provides 10 to 20 electric miles per hour. It is a great option for public locations where people may be parked for a few hours and can charge their vehicle.

DC Fast Charge stations provide an opportunity for a very quick charge. These stations are capable of charging a depleted electric vehicle's battery to 80 percent capacity in under 30 minutes. DC Fast Charge stations are usually located in high-traffic public areas or along travel corridors.

To locate a charging station, there are mul-

iple apps and websites that list station locations and provide details. The Department of Energy's Clean Cities program runs the Alternative Fuels Data Center, where they maintain a list of charging stations across the country. Another popular website and app is PlugShare, which provides details on a station's location and has a trip planner to help you map out longer drives.

DRIVING Change

Electric vehicles have come a long way since they entered the market in 2011. In only a few years, all major car manufacturers are showing support for electric vehicles by developing new models with longer ranges and more affordable prices. Research shows that by 2040, electric vehicles will account for about 35 percent of new car sales globally.

Businesses and governments are also installing charging stations to provide a place to plug in while working, shopping and traveling. Charging station manufacturers are working to increase the speed of charging, so drivers can take a quick break and charge instead of waiting an hour or more.

With more charging locations, longer driving ranges and numerous new models being developed, electric vehicles are quickly growing in popularity and practicality. Only time will tell if the future is electric.

KRISTI BRODD is the communications manager for **Advanced Energy**, a non-profit energy consulting firm. www.advancedenergy.org.

Technologies Offer Savings for Members FROM BLUESTEM ELECTRIC



Ken Maginley

One of the things I love most about the ever-changing world of electronics is the fact that so many different devices have entered our homes and businesses in

a useful way. I get excited when I hear that the latest gadget can save me money, help me monitor the safety of my family or help me save on home energy costs. This may sound too good to be true, but there are many products on the market that do all these things and more.

Take, for example, smart lighting systems. This energy efficient technology is fun and easy-to-use, and you can control many systems through the convenience of a smartphone app. The bulbs used with smart lighting systems typically require less energy than standard incandescent bulbs, and since

the system can be controlled through your phone or tablet, you can turn off your lights from anywhere. No need to worry about spending money lighting an empty house!

Just like smart lighting, smart security systems allow you to access and control your system through an app on your smartphone. Most smart security systems are customizable, and you can choose whether you want to install the system yourself or hire a professional to set up the system for you. Some smart security systems even offer a professional monitoring feature. Knowing your home is safe, no matter where you are, is comforting.

Of all the new technologies out there, the one I think helps Bluestem Electric Cooperative members most is an online energy monitoring tool. SmartHub is Bluestem's online energy tool. With SmartHub you can view your electrical usage up to the previous day, see your usage by the

hour along with the temperature for that hour. You can also pay your bill, set up recurring payments and view previous bills. You can access your SmartHub account online via a personal computer or as a free app on your smartphone or tablet. Go to www.bluestemelectric.com to set up your SmartHub account or download the app on your phone.

With these systems, you can monitor your energy use anytime from anywhere. In some cases, you can remotely operate your appliances through a smartphone app. These systems can help reduce your energy consumption, which will decrease your monthly electric bill.

It seems like there are new innovations in electronics and technology every day. It can be hard to keep up and determine the systems that are right for your family. Bluestem is here to help you if you have questions about energy efficiency technologies.

Ken Maginley, General Manager

The Importance of Interconnection Agreements FROM FLINT HILLS RECA

Electric cooperatives are responsible for maintaining a safe, reliable electric grid to power the communities they serve. As an increasing number of consumers install grid-connected distributed generation systems, like solar panels or small wind turbines, electric co-ops are prepared to assist members to help maintain the safety of the grid.

Grid-connected generation systems allow you to power your home or business with renewable energy, but the system must be connected to the grid to keep power flowing when the sun does not shine or the wind does not blow. In most cases, these systems must be interconnected to feed excess power back into the electric grid.

If you are interested in distributed generation systems for your home or business, be sure to contact Flint Hills RECA first. As your electric cooperative we want to help you choose a system that includes the safety and power quality components necessary to keep



you, cooperative crews and members of the community safe. Educating our members is crucial because if a storm hits and a power outage occurs, for example, distributed generation systems must be able to properly disconnect from the electric grid to ensure line workers are not injured or electrocuted while restoring power.

An interconnection agreement must be reviewed and signed before your distributed generation system is connected to the electric

grid. The agreement is intended to ensure safe, reliable and quality electric service for all.

The way we generate and use electricity is evolving. Let's work together to ensure a safe, reliable electric system. Flint Hills RECA is here to help. If you have questions about grid-connected generation systems, please contact us at mail@flinthillsrec.com or call us at 620-767-5144.

Consumer Interest Driving Co-op Solar FROM FREESTATE ELECTRIC

Driven by increased interest among consumers as well as declining costs, electric co-ops across the country are finding a multitude of ways to bring the benefits of solar to their members.

New data paints a striking picture: America's electric cooperatives expect to double their current solar capacity by the end of 2017, adding more than 480 MW of solar this year for a total capacity of 872 MW nationwide, according to figures from the National Rural Electric Cooperative Association (NRECA).

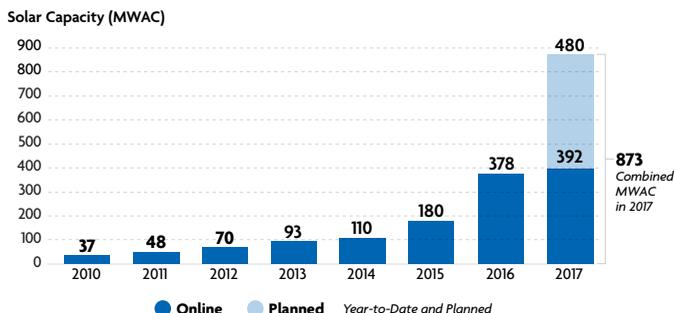
In a recent nationwide survey, electric co-ops were asked why they offer or support solar options. More than two-thirds of respondents said they were motivated by a desire to increase consumer-member satisfaction and a majority cited member demand. Increased affordability also played a role, with nearly half of respondents citing the decline in the cost of renewable energy as a factor in enhancing their solar energy program. The survey results clearly show co-ops are listening to their members and they care about costs.

As consumer-owned utilities, electric co-ops view solar as a consumer resource. That's why co-ops lead the utility sector in developing community solar or "shared solar," a program that enables co-op members to invest in solar farms built and operated by the co-op.

Cooperation among cooperatives is another key co-op principle, and collaboration is critical

Cooperative Solar Set to Skyrocket

Cooperative solar capacity is projected to double in 2017.



Note: Co-op solar capacity owned or purchased under contract
Source: NRECA Business & Technology Strategies

to the growth in solar. In 2016, cooperatives announced nine joint projects involving more than 200 local co-ops. Cost savings from the economies of scale in large projects make these projects more affordable.

Cooperatives also collaborate by sharing information and knowledge with the nationwide network of cooperative peers. As the early solar adopters gained experience and know-how, they shared best practices with the co-op community.

Some co-ops are partnering with local rooftop solar installers or even doing rooftop installation for their members. Other co-ops are installing solar-powered water heaters and irrigation systems. There is no one-size-fits-all program for electric co-ops.

Cooperatives are developing a variety of solar options, from huge arrays covering hundreds of acres to residential solar installations.

In March 2017, Kansas Electric Power Cooperative, FreeState's power supplier, celebrated the opening of its 1 megawatt Prairie Sky Solar Farm. The solar farm, when generating electricity at full capacity, can supply the energy needs of about 164 homes.

No matter their size, circumstances or geographic location, all electric co-ops have one thing in common when it comes to solar: They want to help their members make energy choices that are right for them.

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New Technology Helps You Mind Your eBiz-ness

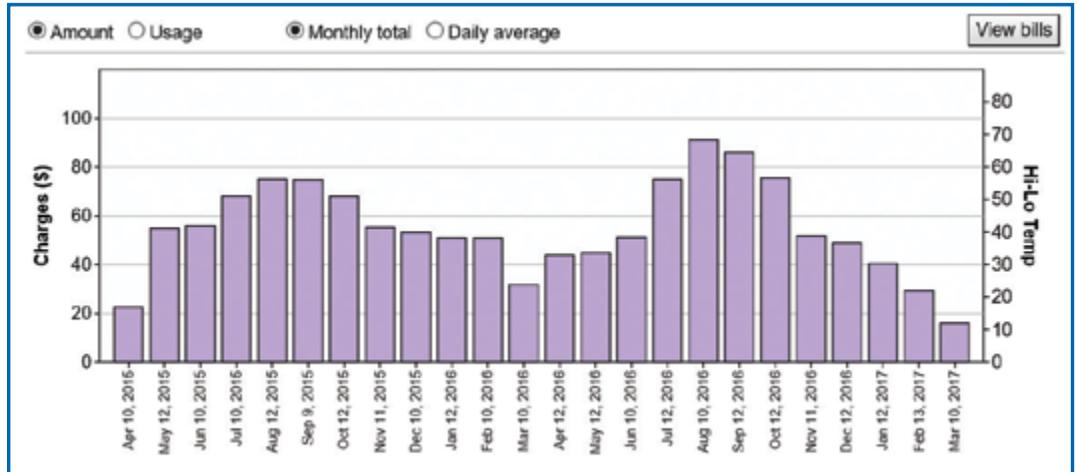
FROM WESTERN COOPERATIVE ELECTRIC

Knowledge is key to being a savvy consumer, especially when it comes to managing electricity bills. Now there are ways to monitor your energy usage and take steps to use the electricity that energizes your home or business more efficiently.

Western has just completed the installation of an Advanced Metering Infrastructure (AMI) system. With AMI, a meter reader no longer travels to your home to record how much electricity your family or business has used. Instead, AMI sends continuous digital data from your meter to Western. This data includes the number of kW hours used each hour, day, and month. AMI even alerts Western when members experience excessive blinks or outages, which give Western staff a “head’s up” to get your service back to normal.

So how does AMI improve service for Western’s members?

With the old analog meters, you could go out to your meter and read the dials to see how much electricity you were using each month. It is not likely that many members kept tabs on their electricity using this method. With AMI, apps on a smart phone or on other electronic devices or programs online can provide you with data about your electric usage with a few clicks. This data can help you make



eBiz, a member-friendly, online application, works in conjunction with Western’s Advanced Metering Infrastructure (AMI) system to bring Western’s members various kinds of data about their electricity use. This chart depicts historical electricity costs in relation to hi-lo temperatures.

smart money-saving decisions about the way you use electricity.

Which energy-usage apps are readily available for Western members?

Western now offers eBiz, a member-friendly online application. It provides you with a wealth of options:

- ▶ View your current billing and payment history;
- ▶ View up-to-date daily readings from your meter;
- ▶ View historical charts and graphs of your electric usage;
- ▶ Use the online bill calculator;
- ▶ Make account changes;
- ▶ Pay your bill with a check or card (no processing fee);
- ▶ Make a one-time payment or set up a monthly payment;
- ▶ Sign up for email billing notifications;
- ▶ Request service from Western; and
- ▶ Store payment options and go paperless.

To access eBiz, go to the westerncoop.com homepage. Click on the eBiz link and enter the requested

information, including user name, password, account number and phone number.

Western also has a mobile app that provides convenient access to each member’s account. Search for “Western Coop Mobile App” in the App Store or Google Play. After the app has downloaded, sign up for the service, which includes bill payment, views of current charges and usage, special notifications, and outage information and updates.

“Information is vital to good decision making when it comes to energy use and efficiency,” said Dennis Deines, Western’s manager of member services and compliance. “eBiz and the mobile app are easy to use and provide information that can put each of our members in the driver’s seat of how to control a household’s or business’s electricity use.”

If you have questions about eBiz any other question related to your electricity use and service, please contact Western at 785-743-5561.

Smart Homes for the Savvy & Not-So-Savvy FROM RADIANT ELECTRIC

The concept of the smart home is not as new as you might expect. In the late 1980s, as a product manager for Honeywell, I saw a real smart home.

Honeywell's smart home contained impressive automation capabilities. Lighting, security, fire monitoring, temperature control and appliance use were all automated to adapt to occupant and environmental inputs.

But the learning curve for the user would be steep. In one room, Honeywell engineers filled a closet floor to ceiling with programmable logic controllers, an industrial digital computer. Talk about something for the tech-savvy!

Today, more than 30 years later, the world has the advantage of the internet and ubiquitous Wi-Fi. The development of these two communications capabilities has spawned a proliferation in the number and type of devices that can be "connected" and used to create smart homes.

For those who feel they are not-so-savvy when it comes to technology, good news abounds. Most devices offer a very simple setup. A typical process goes like this: power up the device, identify your Wi-Fi network from a list the device recognizes, and type in your password. You will be connected and ready for action.

Even easier is the one-button connection using the

Wi-Fi Protected Setup (WPS) feature of many routers. Fire up the device, press the WPS button, and click the connect button in the device's program. Best of all, most devices offer an app for your smartphone.

For those who are tech-savvy, the sky is the limit. An abundance of inexpensive microcontrollers and peripheral sensors and controllers support the creation of a smart home system from scratch. A programming approach termed IFTTT (If This Then That), enables users to connect different devices so an action or output from one generates some reaction in another.

I recommend swinging by one of the earliest purveyors of home automation goodness, Smarthome.com. These days, anything can be automated: lights, curtains, entertainment systems, door locks, garden watering, weather monitoring, appliance use; and this is a great place to see what is possible.

Aside from being cool and making life easier, a smart home can dramatically reduce energy consumption, especially for the major energy consumers in our homes, like lighting and temperature control. Tech savvy or not, we are here to help you. Call Radiant Electric with questions about new smart-home tips.

You Have the Power with Smart Home Technologies

1 Smart Hub/Bridge

If you are looking to make your home smart without having to hire a company to install an interconnected system, then an internet-connected smart hub is the first thing you'll need. A smart hub will allow you to control all your smart devices from one app by acting as a middle man that facilitates communications between all your smart home devices.

2 Smart Lighting

Like most items in a smart home, smart lighting can be controlled with a few swipes of a smart phone app. But smart lighting is more than just convenient. Smart light bulbs are more energy efficient than standard incandescent bulbs. Some bulbs use GPS on your phone to determine your location, and can turn on or off depending on where you are located. Some bulbs are even voice controlled.

3 Smart Blinds

Smart blinds can be useful for those who have tall, hard-to-reach windows; for those who have difficulty moving around the house; or for those who simply want to smarten their home. Smart blinds allow you to schedule your blinds to open and close during certain times of day—a bonus if you are trying to be energy efficient—or control them via an app.

4 Smart Locks

Smart locks allow you and anyone else you wish to enter your home with ease. Some smart locks let you open your doors with your cell phone. Some let you see who is coming and going while you are out of the house. Some even allow you to assign security privileges to certain people.

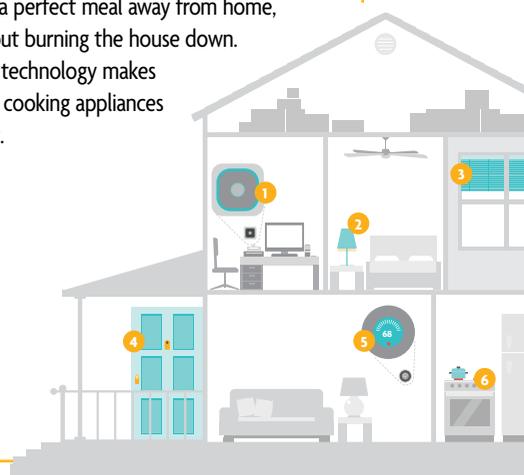
5 Smart Thermostat

A smart thermostat is a great way to

keep your home smart and energy efficient. Many smart thermostats can learn your heating and cooling behavior and will auto-schedule based on your preferences.

6 Smart Cooking Appliances

Smart cooking appliances allow you to cook a perfect meal away from home, without burning the house down. Wi-Fi technology makes these cooking appliances smart.



Plug into the Future

Why More Americans are Driving Electric Vehicles

BY PAT KEEGAN, FROM AUGUST 2017 ISSUE OF KANSAS COUNTRY LIVING MAGAZINE



Pat Keegan

Dear Pat:

My son and his wife just bought an electric vehicle. I was surprised to learn that the cost of their new electric vehicle was comparable to a gasoline-powered car. I need to replace my car in a few years and would like to

learn more about electric vehicles. What are the pros and cons of going electric? – Jeff

Dear Jeff:

Your son is not alone. The electric vehicle (EV) market is growing rapidly. There are good reasons why EVs are becoming more popular, but there are also a few potential drawbacks.

Let's start with the basics: EVs are vehicles that plug into the electric grid for some or all of their power. There are two primary types of EVs. All-electric EVs—such as the Nissan LEAF—are powered entirely with electricity. Plug-in hybrid EVs—such as the Chevrolet Volt—are dual-fuel cars, meaning both the electric motor and the internal combustion engine can propel the car.

A key benefit of EVs is that a driver's trips to the gas station

are either vastly reduced or eliminated altogether. However, in lieu of gas refueling, EVs need to be recharged. At the lowest charging level, called Level 1, an hour of charging typically provides two to five miles of range per hour. Because the average light-duty car is parked for 12 hours per day at a residence, many EV drivers can use Level 1 charging for most of their charging needs. The fastest charging level, called DC Fast-Charging, can provide 60-80 miles of range in a 20-minute period.

Charging with electricity is nearly always cheaper than fueling with gasoline. An electric gallon—or “eGallon”—represents the cost of driving an EV the same distance a gasoline-powered vehicle could travel on one gallon of gasoline. On average, an eGallon is about one-third the cost of a gallon of gasoline. Another benefit of charging with electricity is that, throughout many parts of the country, it is a cleaner fuel source than gasoline. Although the exact environmental benefits of driving an EV will vary, one recent study found that two-thirds of Americans live in regions where driving an EV is cleaner than driving a 50 MPG gas-powered car.

The Nissan LEAF is the world's best-selling EV.



NISSAN

Another key reason for the rise in EV ownership is because of recent reductions in the upfront cost of the cars. The batteries used in EVs are the most expensive component of the cars, but thanks to improving production methods, the cost of the batteries has dropped by more than 35 percent since 2010, and costs are expected to keep dropping. Because of these cost reductions and technology improvements, EVs are hitting some major performance and affordability milestones. For example, in late 2016, General Motors released the Chevrolet Bolt—an all-electric EV with an estimated range of 238 miles per charge, costing about \$30,000 after rebates.

Although even longer range and more affordable EVs are expected to hit the market soon, one of the key drawbacks of EVs is that most models currently have a range of less than 100 miles per charge. More and more public charging stations are available across the United States, but “range anxiety” is still a concern for many potential buyers. Fortunately, if you are considering an EV, keep in mind that the average American’s daily driving patterns are well-suited for EV use. More than half of all U.S. vehicle trips are between one and ten miles, and even in rural areas



JEFF SPRINGER/DAIRYLAND POWER COOPERATIVE

More and more co-ops own EVs as part of their fleets.

the average daily drive distances for typical errands and commutes are well within the range of most currently available EVs.

EVs are also well-suited for many commercial applications. For example, EVs are now being used as part of ride-sharing services like Uber, where average trip distances are between just 5 and 7 miles. Companies like Frito-Lay and FedEx are also introducing EVs into their delivery fleets, and a growing number of municipalities are buying electric buses. One of the primary draws of EVs for commercial use is their minimal maintenance requirements.

If you are interested in learning more about EVs, contact a local car dealer to schedule a test drive. Many curious drivers are impressed by the performance of EVs, especially the instant torque provided by the electric motor.

Your electric co-op could be a resource too.

This column was written by PAT KEEGAN. For more information on how to consider energy efficiency when purchasing a home, please visit: www.collaborativeefficiency.com/energytips.



DAVE CHRISTENSEN/PLATTE-CLAY ELECTRIC COOPERATIVE

