

# A Powerful Combination:

Why connectivity is the key to electric cooperatives' unlocking the power of advanced devices and applications.



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In many ways, the mission of electric cooperatives has changed little over the eight-plus decades of their existence. More than anything, the 833 distribution and the 62 generation and transmission cooperatives in America are devoted to delivering safe, reliable and affordable electricity to the 19 million homes, schools, businesses and farms they serve.



While that underlying mission remains the same today as it was in the [1930s and 1940s](#), how cooperatives go about fulfilling their mission is more complex and technologically sophisticated than ever before. As just one example, advanced metering infrastructure (AMI) combined with improved connectivity is providing important tools to help cooperatives better serve their members. In fact, a [report](#) released at the end of 2017 by The Edison Foundation's Institute for Electric Innovation found that cooperatives had collectively installed 18.6 million advanced meters at the end of 2016, a number that was expected to increase to 20 million by 2020.

The embrace of AMI is just one indication of how cooperatives are increasingly tapping the power of connectivity and advanced devices and applications to proactively serve their members. This is more revolutionary than it may initially seem.

We live in a world where consumers can order a book on Amazon and receive it the same day and where entertainment companies, such as Netflix, can offer up a highly personalized menu of offerings based on a customer's viewing history.

In the regulated utility world, the importance of improving the customer experience has gained traction for some fundamental economic reasons. A PricewaterhouseCoopers [report](#) noted that customer satisfaction plays an important role in determining regulatory outcomes for utilities and is also an important differentiator as more utilities target unregulated and competitive markets.





# Member service experts

Electric cooperatives have long understood the importance of delivering exceptional service to members. Proof of that came in the release of the J.D. Power 2018 Electric Utility Residential Customer Satisfaction [Survey](#). The annual survey compared customer satisfaction at 138 utilities of all types serving nearly 100 million U.S. households, based on factors such as power quality and reliability, price, billing, payment, and customer service. Not only were the top three companies electric cooperatives, cooperatives garnered seven of the top 10 spots and 15 of the top 20.

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**"The more proactive electric utilities are in clearly communicating information about the cause, anticipated duration and repair of an outage, the more satisfied members will be with their overall service."**

JOHN HAZEN, SENIOR DIRECTOR OF THE ENERGY PRACTICE AT J.D. POWER

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What put cooperatives at the top of the rankings was a commitment to proactive member service — most often through the use of digital channels — particularly during power outages. "Power outages are going to happen," said John Hazen, senior director of the energy practice at J.D. Power.

Cooperatives, perhaps more so than other utilities, understand that there is a direct line between member satisfaction and the implementation of advanced technologies supported by networks that allow for the fast and easy exchange of data. It's why more and more cooperatives are examining how to leverage the many capabilities advanced connectivity allows. "The members of cooperatives want reliable service and good member service, which is a lot of what connectivity allows you to do," said Greg Fergason, solutions architect for the Americas at Trilliant, a North Carolina headquartered connectivity company.

"This is what makes things like read for change, remote disconnects and better asset management possible."

In truth, connectivity isn't just one specific technology or solution. What makes it such a versatile tool in addressing the challenges cooperatives face in running efficient operations and satisfying members is that connectivity provides the flexibility needed to benefit from new technologies. "We provide private networks in the energy space that leverage multiple connectivity technologies inclusive of things like NAN (neighborhood area networks) and WAN (wide area networks), and we also integrate with cellular," Fergason said. "What makes us unique is that we are not meter manufacturers. We partner with them to embed our solutions, and cooperatives get the connectivity technology. They then can put anything they want onto it, whether that's AMI activities or smart city activities,

and do it in a way that offers security and recurring costs rather than owning the networks."

As J.D. Power noted in its customer-satisfaction survey, price matters when it comes to customer satisfaction.

This is why one common objective of cooperative infrastructure upgrades is not only to leverage the capabilities of advanced technology but also to choose solutions that can contain costs. "A lot of cooperatives are looking at more advanced infrastructure, with an eye toward their capex [capital expenditures] and opex [operational expenditures]," Fergason said.

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**"So while cooperatives are looking to modernize their infrastructure to address smart city needs and to reduce truck rolls or to reduce carbon dioxide emissions, it's also about improving the bottom line."**

GREG FERGASON, SOLUTIONS ARCHITECT FOR THE AMERICAS AT TRILLIANT

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# Connectivity in action

To truly understand how the combination of improved connectivity and AMI can improve the service cooperatives provide their members, it's helpful to look at a real-world example. At Nolin Rural Electric Cooperative Corporation (Nolin) in Elizabethtown, Kentucky, the combination has both revolutionized how its service technicians do their work and, more importantly, vastly improved the flexibility and experience members enjoy.

Indeed, before Nolin replaced its existing infrastructure with advanced meters, Nolin's technicians spent a lot of time in a truck." Most of our high-volume truck rolls

were in the northern part of our service territory, and our office is in the central area. It can be up to 30 miles from the office to the end of the line," said Jason Mattingly, meter and power use controller at Nolin. With a number of its 35,000-plus members stationed temporarily at Fort Knox, the vast majority of the service calls were to connect or disconnect service.

All that changed in 2016 when Nolin began deploying 35,600 advanced meters outfitted with bidirectional communications features, thanks to an RF (radio frequency) network supplied by Trilliant. Among other capabilities, the cooperative can now

disconnect and connect service remotely. In fact, Nolin has reduced truck rolls by more than 99% (down to about 10 per month), and the service technicians who used to spend so much of their time on the road now have the bandwidth to do other things. "They have moved to other roles that put them in a position of more value to Nolin and our members," Mattingly said.

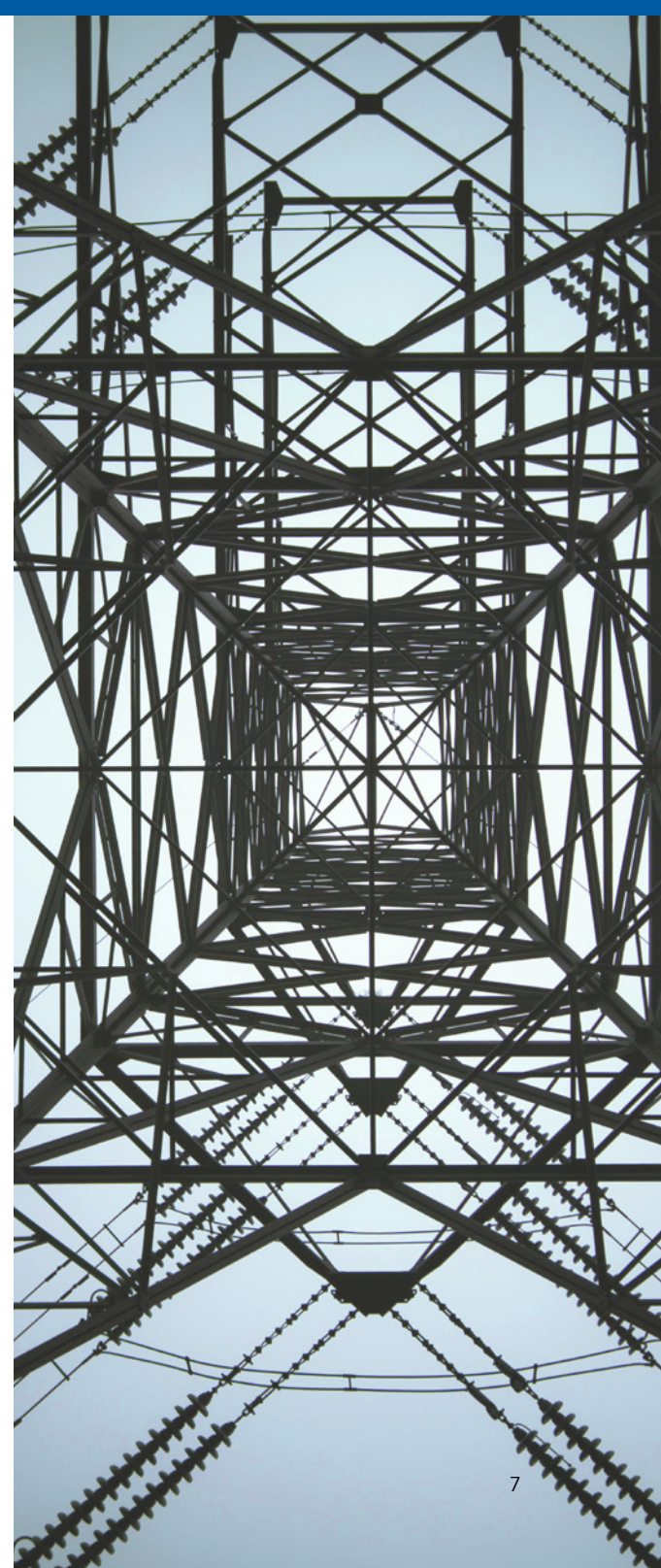
It isn't just the cooperative that benefits. Reducing the expense involved with connecting and disconnecting service also has allowed Nolin to reduce the fee associated with the service by half. In addition, the coop's 1,500 or so prepay



members are not charged a fee for disconnects or reconnects as a result of nonpayment.

With a fleet of advanced meters and the secure communications network necessary to support them, Nolin typically issues between 6,000 and 7,000 remote disconnect, reconnect and read for change commands during its busiest months. This provides Nolin's members with a unique capability to manage their energy consumption. "With our tariffs, there's no minimum payment required on prepay accounts, so a member may make a payment daily, and they may be disconnected daily," Mattingly said. "Our RF system also provides hourly kilowatt-hour consumption, which helps members manage their energy use. With an RF system, a prepayment option and hourly kilowatt-hour consumption readings, our members are able to reduce their bills."

Nolin's initial impetus to install advanced meters was that existing meters were reaching the end of their useful life. However, deciding to augment their new meters with a sophisticated and secure hybrid wireless communications network was easy because the utility saw an opportunity to improve the efficiency of its operations with reliable, low-maintenance and future-proof technology. Ultimately, the motivation for Nolin to embrace new technologies — as it is for all other cooperatives and utilities generally — was to bolster the experience and satisfaction of their members.





# Solace in a storm

One area that can harm member satisfaction more than anything else is extensive power outages, particularly after a bad storm. Case in point: The aftermath of Superstorm Sandy in 2012 generated ferocious blowback from unhappy customers. That anger translated into stiff fines for utilities inadequately responding to outages and a raft of new rules and regulations to ensure faster action time.

While Superstorm Sandy and other extreme weather events have led the electrical power industry to look closer at ways to improve resilience and reliability — particularly with

the development of microgrids — improved communication before, during and after a storm has also become a priority.

The wisdom of a focus on reliable communication to improve power restoration was underscored by the experience of one South Texas cooperative during and after Hurricane Harvey in 2017. With a service territory in southeast Texas, the cooperative and its members were among the worst hit as Harvey made landfall. Winds reached up to 130 mph and nearly 2 feet of rain fell in the first 24 hours of the storm, so it's hardly a surprise that

nearly all of the cooperative's members lost power.

Thanks to the implementation of AMI, an outage management system and Trilliant's SecureMesh WAN/NAN and UnitySuite technology, the cooperative restored power to 95% of its members within 10 days. Before implementing these upgrades, the cooperative relied on phone calls from members to pinpoint and respond to power outages. This is hardly an effective method for the sort of agile response required to recover from a crippling storm.





The upgrade gave the cooperative the awareness necessary to pinpoint where its crews needed to go to restore power as well as the ability to communicate with one another to coordinate their work. This is especially important since hurricanes often damage established communications infrastructure.

In this case, the cooperative could also track the progress of its work crews because Trilliant's solution showed when meters came back online as well as when a re-energized meter went dark again after being restored. While its crews worked to restore power, the cooperative could communicate with its members via social media, providing updates about the storm and its effects as well as progress toward returning power.

This view into the condition of assets on a cooperative's system that connectivity provides has important benefits even when the weather is clear and calm. Besides remotely reading meters and monitoring the condition of transformers, transparency is critical as the grid becomes increasingly more complex. The ongoing influx of intermittent generation sources, such as wind and solar as well as distributed energy resources, such as rooftop solar and electric vehicles makes asset visibility key.



# Overcoming the fear of the unknown

Since Nolin installed its RF network and AMI meters, it has received a steady stream of inquiries from other utilities interested in learning about its performance. Most have concerns that mirror what Nolin fretted about before moving forward, such as whether the antennas necessary for the network to function would be vulnerable to lightning strikes or if the communications coverage and capabilities would match manufacturer claims.

Jason Mattingly has straightforward answers to all these concerns.

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**“For the past four years, we have not had those issues. For people looking into this new technology, none of those things have been a concern,” he said.**

MATTINGLY, METER AND POWER USE CONTROLLER  
AT NOLIN

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It has worked so well, in fact, that Nolin is pursuing even more features and functions enabled by its RF network. Not long ago,

Nolin rolled out NISC’s SmartHub app that allows members who opt in to do everything from view their hourly kilowatt-hour power consumption to receive notifications during power outages. “Once outages are confirmed with our dispatch system, members will receive an alert through SmartHub,” he said.

Moving forward, Nolin is exploring new ways to get more benefits from its investments in connectivity and AMI technology, including receiving





meter-level power factor readings. While Nolin can pursue plenty of other possibilities, Mattingly says, the key for other cooperatives to tap those benefits is getting over the fear of the unknown. "A lot of utilities fear the RF market because it's new. RF installations are very straightforward. They're not complicated. We have had very good reliability," he said.

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**"We're excited about the ways this has set us up to serve our members better and better into the future."**

MATTINGLY, METER AND POWER USE CONTROLLER  
AT NOLIN

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