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PUBLIC POWER MAGAZINE

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PUBLIC POWER MAGAZINE

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EDITORIAL TEAM

David Blaylock
Director, Digital Content and Data Analysis

Paul Ciampoli
News Director

Julio Guerrero
Graphic & Digital Designer

Susan Partain
Senior Manager
Content Strategy

Sharon Winfield
Creative Director

INQUIRIES

Editorial
News@PublicPower.org
202-467-2900

Subscriptions
Subscriptions@PublicPower.org
202-467-2900

Advertising
Tima Good, Tima.Good@theygsgroup.com

Advertising is managed by The YGS Group.

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Powering Strong Communities

ABOUT THE AMERICAN PUBLIC POWER ASSOCIATION

The American Public Power Association is the voice of not-for-profit, community-owned utilities that power 2,000 towns and cities nationwide. We advocate before the federal government to protect the interests of the more than 49 million customers that public power utilities serve, and the 93,000 people they employ. Our association offers expertise on electricity policy, technology, trends, training, and operations. We empower members to strengthen their communities by providing superior service, engaging citizens, and instilling pride in community-owned power.

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A Multi-Pronged Approach to Meeting Infrastructure Challenges

The North American Electric Reliability Corp.'s Summer 2022 Reliability Assessment, issued in May, painted a sobering portrait of the ability of electric utilities in major portions of the United States to meet power needs this season. NERC identified several factors behind reliability concerns, including persistent drought, reduced generating capacity in some areas, supply chain concerns, and heightened cybersecurity threats. In addition, last summer, several solar photovoltaic resources tripped offline during grid disturbances in California and Texas, which NERC warned could happen again this year. The NERC assessment appears at a time when reliability and affordability of electricity are also challenged by rising natural gas prices and demands for new pipeline infrastructure. The Energy Information Administration recently projected that natural gas prices will remain relatively high in 2022 due to lower-than-average natural gas inventories resulting from constrained supply and increased demand. The staff of the Federal Energy Regulatory Commission (FERC) projects that these high natural gas prices will contribute to higher wholesale electric prices in Summer 2022, with FERC staff reporting that, in May, "futures prices for some major U.S. electric price points are up over last year's settled prices by between 77% to 233%." NERC has also asserted that additional gas pipeline infrastructure is needed to serve load reliably.

NERC's summer reliability assessment attracted national media attention. For example, a commentator from *The Wall Street Journal* compared the U.S. grids today to those of developing countries, where power outages are a regular occurrence. That's not the case in reality, but, certainly, dramatic outages in recent years combined with NERC's assessment, are warning signals of potential further degradation to our comparatively highly reliable grids.

The Washington Post also reported on the NERC assessment in a front-page article, published June 3. The industry's move away from fossil fuels to renewable resources may be happening too quickly, industry analysts told the newspaper. Coal plants are being retired at a faster-than-expected rate because operators have concluded it would not be cost-effective to invest in upgrades, NERC CEO Jim Robb told the *Post*.

These challenges all point to the need to continue to invest in 24/7/365 electric system infrastructure, while continuing to integrate intermittent

BY JOY DITTO, PRESIDENT AND CEO,
AMERICAN PUBLIC POWER ASSOCIATION

and new types of generation sources that can be properly balanced and backed up when they are unavailable. The need for reliable power becomes even more important as we prepare for the rapidly growing fleet of electric vehicles that automobile manufacturers are already producing. The EV market in the United States is projected to grow from $28 billion in 2021 to more than $137 billion by 2028.

The good news is that public power utilities can "walk and chew gum at the same time." They understand that reliability and affordability are inextricably linked to sustainability, including addressing climate change goals. They are also preparing to apply for and integrate the federal dollars that have been allocated through the Infrastructure Investment and Jobs Act (IIJA), which could help public power utilities with their ongoing work to bring essential utility services to local homes and businesses, while also offering innovative solutions to meet their customers' needs and ensure sustainable communities.

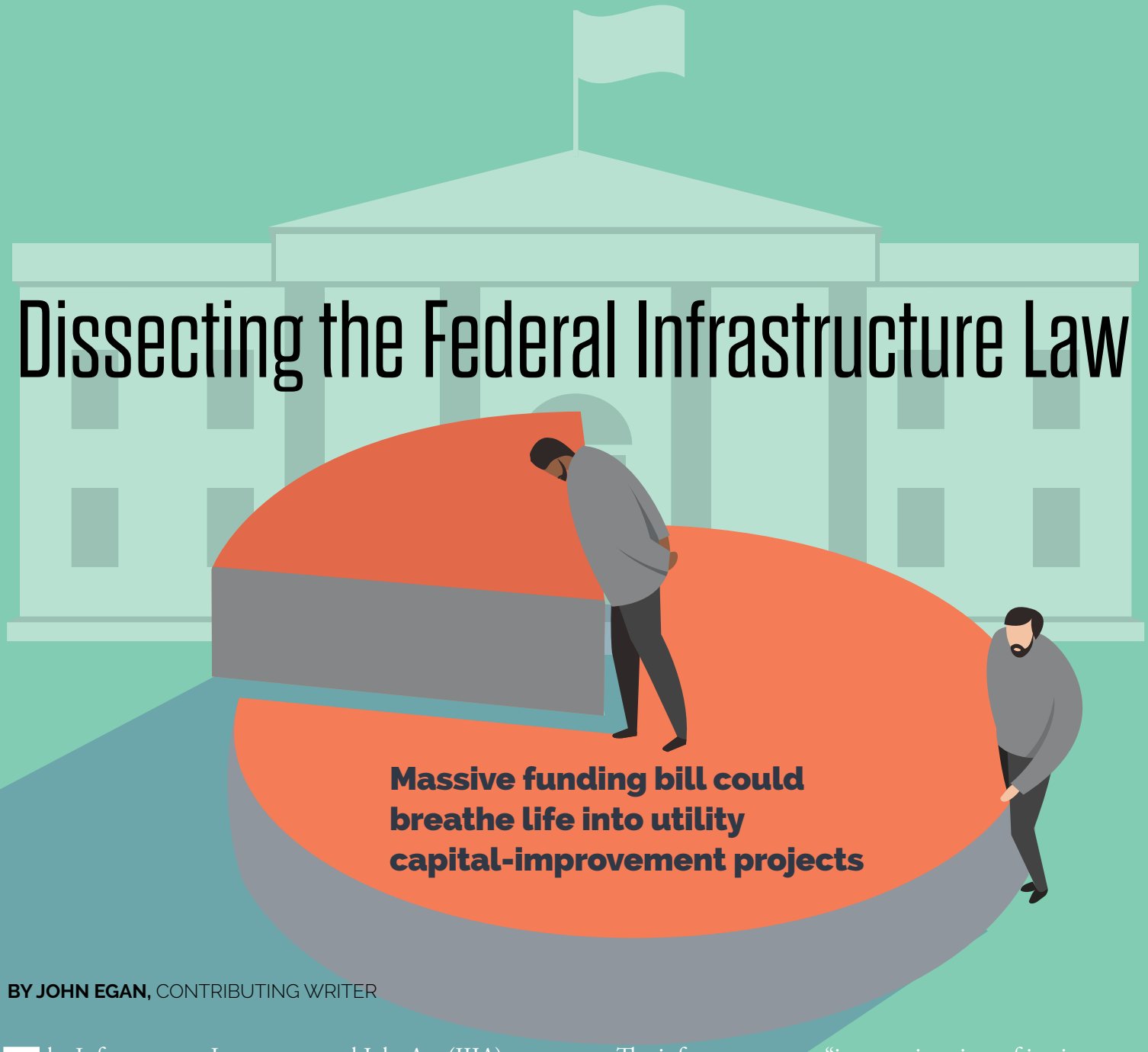
The IIJA allocates more than $192 billion for infrastructure projects related to electric grid, cybersecurity, electric vehicle infrastructure, and broadband expansion. Public power utilities seeking to tap into this funding should work with their state and local agencies to determine how monies will be distributed and what priorities have been set by these government authorities. We've set up a landing page at PublicPower.org/InfrastructureFunding that goes over the latest on IIJA and highlights places where utilities can apply for funding directly. A key part of the immediate task: identify your most important infrastructure needs and make these known to your local and state partners.

In setting priorities, it is important that public power utilities identify their cybersecurity needs and seek to strengthen cybersecurity. The article on page 10 in this issue discusses work underway at APPA, and among our members, to help meet the cybersecurity needs of public power utilities. APPA has a cooperative agreement with the U.S. Department of Energy's Office of Cybersecurity, Energy Security and Emergency Response (CESER). With the funding provided through the cooperative agreement, we are working to increase deployment of operational technology cybersecurity sensors on utility distribution systems and to grow information-sharing among utilities — all with the aim of protecting our members from cyber-attacks.

Many of the infrastructure challenges facing utilities today seem new. Thirty years ago, we did not worry about sophisticated electronics on distribution equipment or give much thought to infiltration of local utility computer systems. These modern needs are important, but it is remarkable that juxtaposed with our quest to meet these modern-day needs is a project that reminds us of the earliest objectives of public power. I want to thank the volunteers from public power utilities from across the nation who traveled to the Navajo Nation to help the Navajo Tribal Utility Authority meet the most basic of needs: bringing electricity to rural homes. The Light Up Navajo project, an industry effort to bring electricity to 14,000 Navajo Nation homes, is now in its third phase. Crews from utilities in Arizona, Arkansas, California, Delaware, Ohio, and Texas have worked on the 2022 phase of the project, or Light Up Navajo III. The photo essay that begins on page 20 tells a piece of that story.

The public power movement began in the 1880s. Local leaders brought electricity to Wabash, Indiana, in March 1880 — 28 months before Thomas Edison's Pearl Street Station began operating in New York City in September 1882. The need for public power utilities to provide reliable and affordable power "keeping their feet on the ground" was juxtaposed with providing sustainable communities, or "reaching for the stars," even then. Even with the added challenges we face now, 142 years later, public power has not lost sight of its primary mission.

Dissecting the Federal Infrastructure Law



Massive funding bill could breathe life into utility capital-improvement projects

BY JOHN EGAN, CONTRIBUTING WRITER

The Infrastructure Investment and Jobs Act (IIJA), signed into law by President Biden in November 2021, is a once-in-a-generation, $1.2 trillion legislative smorgasbord, with about 350 program areas administered by more than a dozen federal agencies.

At 1,039 pages, the law offers funding opportunities for just about every industry and interest. Local concerns determine which programs are a priority. In Washington state, for example, public power utilities have their eyes on funding for water projects, among other things. In South Carolina, transportation funding has emerged as a priority. Every local utility that delivers water has an interest in removing lead service lines and pipes and upgrading infrastructure.

The infrastructure act "is a massive piece of intricate legislation — it's a beast," said Erica Wright a legislative and public advocate at the Municipal Association of South Carolina (MASC). "There's so much there that it's hard to wrap your head around it. I'm drinking through a fire hose."

"By comparison," she said, President Biden's other signature piece of legislation in 2021, the American Rescue Plan, "was easy."

Kent Sulem, director of government relations and senior counsel to the Minnesota Municipal Utilities Association, agreed: "There are an awful lot of spreadsheets floating around, and a lot of uncertainty."

Lots of Money — And Challenges

With the law in place, local governments hoping to secure federal infrastructure funding await directions about next steps. The process is akin to a blindfolded person trying to walk through an unfamiliar room in which furniture, coffee tables, dogs, children and toys are everywhere, ready to trip up the unwary.

Procedurally, after federal agencies develop guidelines, some funds will be transferred to state agencies, which will award grants to applicants. Other funds will be awarded directly to applicants, generally through a competitive grant process. Given the breadth of the IIJA, it is no surprise that notices of funding opportunities have been slow to emerge from federal and state agencies.

Formula Funding for Utility-Specific Titles of IIJA

State	Broadband	EV Charging Network	Climate Change, Cybersecurity and Extreme Weather
Alabama	$100 million	$79 million	$42 million
California	$100 million	$384 million	$124 million
Georgia	$100 million	$135 million	$46 million
Indiana	$100 million	$100 million	$40 million
Iowa	$100 million	$51 million	$36 million
Kansas	$100 million	$40 million	$39 million
Minnesota	$100 million	$68 million	$37 million
Nebraska	$100 million	$30 million	$29.5 million
Ohio	$100 million	$140 million	$51 million
South Carolina	$100 million	$70 million	$33.3 milion
Texas	$100 million	$408 million	$95 million
Washington state	$100 million	$71 million	$57 million

Infrastructure funding will be allocated to states following the same formula historically used for transportation projects. The table contains a sample of the minimum formula funds for utility projects. Source: The White House

Of the law's $1.2 trillion in funding, $550 billion is new federal spending that was not previously authorized, according to an American Public Power Association summary of the legislation. As it relates to utilities, this new federal spending includes:

- $65 billion for broadband infrastructure,
- $65 billion for electric and grid infrastructure,
- $47.2 billion for resiliency, including cybersecurity,
- $7.5 billion for zero- and low-emission school buses and ferries, and
- $7.5 billion in federal spending for electric and alternative fuel vehicle infrastructure.

Several federal agencies have issued guidance on distributing the funding to state agencies, which will make award decisions based on that guidance. Monies will be distributed through two means: formula-based funding and competitive grants.

The table shows IIJA minimum formula funding estimates for a dozen states for three utility-specific areas: broadband; electric vehicle charging infrastructure; and climate change, cybersecurity and extreme weather.

"At the federal level, there have been mass drop-offs of information, then nothing," said MMUA's Sulem. "It's been months of hurry up and wait. Plus, the lack of clarity about the process makes it hard for us to give a straight answer to questions we receive from state lawmakers, some of whom think the act creates opportunities for mischief and want to impose oversight requirements.

"And don't forget that there's still a huge supply chain problem," Sulem said. "It's great if you get funding, but with a two- to four-year wait for transformers, what good is the money if you can't spend it?"

Public power utilities have needs as diverse as the APPA membership, but four areas hold particular interest: electric vehicle infrastructure; transmission; climate change, cybersecurity and extreme weather; and broadband.

Electric Vehicle Infrastructure

Fortune Business Insights, in a February 2022 report, projected a nearly six-fold increase in the U.S. market for electric vehicles between 2021 and 2028. EV charging stations are essential to supporting this new demand for electricity.

"At this point, there are about 80,000 EV chargers in California, and the state's target is to take that to 1.2 million by 2030," said Barry Moline, executive director of the California Municipal Utilities Association. There will be a need for distribution system upgrades to support that network.

MMUA's Sulem said some of his members, mostly those located near interstate highways, are likely to compete for EV infrastructure funding. But Erica Wright said EV infrastructure is a lower priority for public power utilities in South Carolina.

Transmission Infrastructure

Renewable energy generation in California has grown sharply in recent years. Most of that new clean, non-emitting generation is located far away from customers, necessitating the construction of transmission lines.

"In aggregate, $65 billion to upgrade the transmission and distribution (T&D) systems sounds like a lot, but it's actually fairly modest considering the substantial build-out of renewable energy across the country," said Moline. Driven by California's aggressive renewable energy and greenhouse gas-reduction rules, CMUA members will be competing for those dollars, he said.

Competition Expected to Be Keen for Cybersecurity Funding

Cybersecurity became a higher priority for Minnesota public power utilities a few years ago after a hacker phished his way into a utility's system and demanded a $75,000 ransom. The utility did not pay, and it spent months working to completely restore its systems and data. There was no customer impact.

"That attack opened the eyes of our members," Sulem said. It demonstrated that "they were not too small to escape the attention of cybercrooks."

That's why smaller and rural utilities in Minnesota hope to compete aggressively for cybersecurity grants, Sulem said. He said his members consider that a high priority, right after resiliency.

Climate Change, Cybersecurity, and Extreme Weather

Public power utilities in Minnesota hope to secure IIJA funding for strengthening their electric distribution grids, said Sulem.

"Our members live in the northern section of Tornado Alley and it seems like every year we have tornadoes or storms with high straight-line winds that wreak havoc on our overhead lines," he said.

This spring, parts of Minnesota sustained wind gusts in excess of 100 miles per hour over a five-hour period. About 220,000 electricity customers in the state lost power.

"Even though Minnesota gets its share of extreme weather, our members' customers expect the lights to stay on," Sulem said. "Minnesota utilities are trying to become more resilient by undergrounding lines and modernizing transformers."

"The federal dollars to fight climate change are welcome because states and utilities may have difficulty tackling these huge existential challenges without some assistance from the federal government," said Moline.

California's renewable energy and greenhouse-gas-reduction goals "have created a brick wall for our members," he said. "There is only so much land available where they can build large-scale solar or wind generation, there is nowhere near the lithium we need to reach EV goals, and overhanging all of this is the continued supply-chain limitation.

"In our state, there has been a growing acceptance of the need for a strategic, integrated approach to fighting climate change," Moline said. "Our state lawmakers and regulators have shown a high level of cooperation in fighting climate change. The federal dollars will help greatly. The size and scope of climate change poses huge, existential challenges that must be addressed in a holistic, integrated manner."

Some California public power utilities have set their sights on creating hydrogen hubs in the northern and southern parts of the state.

"The energy system of the future has to be carbon-free as well as dispatchable," Moline said. "It's really important that projects that receive funding help move the energy ball downfield. We need to commercialize new technologies and new knowledge, make sure the funds are spent on forward-looking technologies."

Broadband

"The COVID-19 pandemic showed the dire need for, really almost an emergency, around broadband in South Carolina," said MASC's Wright. "During the pandemic, we had so many people learning and living at home. We're talking about children's ability to learn."

She estimated that tens of thousands of South Carolina children lacked smart phones, a computer, or access to broadband. Those children risked being left behind when education went remote.

"Economically, socially, educationally, and medically, broadband is a game changer," Wright said. "You can't work or learn remotely without it. But there have been very few incentives to extend broadband to sparsely populated rural areas."

"We have digital donut holes all around our state, where communities with ample access to broadband surround poorly served communities. The poorly served communities are the donut holes. We will advocate for using our state's broadband formula funding to close those donut holes and make sure more people have access to broadband internet service."

Public power utilities in California serve urban areas like Los Angeles and Sacramento, as well as less-populated areas in and around the Central Valley and Sierra Nevada mountains. Some CMUA members are underserved when it comes to broadband, and Moline expects they will compete for some of those funds.

Teamwork Makes the Dream Work

To advocate for public power's share of broadband dollars, MASC's Wright is part of a broad stakeholder's group organized by the South Carolina Broadband Office. She relays what she learns there to her members. Earlier this year, she participated in webcasts organized by the White House and federal agencies on guidance for applying for IIJA funds. She relays that information to her members and facilitates meetings between her members and federal agency officials involved in developing funding guidance. This summer, she is working with MASC members to sharpen their grant-writing skills.

Starting last fall, even before the IIJA was signed into law, Wright and others interviewed for this article participated in stakeholder groups to build broad support for funding requests. With more than a dozen federal agencies making grant decisions, and numerous state-level groups, that meant a lot of conference calls and video meetings. That likely will continue through the summer, as federal agencies continue to roll out guidance on how applicants can apply for funds.

CMUA's Moline praised a California state agency, the Office of Emergency Services, for its role in coordinating grant applications. I've never seen this level of state and local cooperation in my career," he said. "They have a broad mission to help get California more federal dollars in this area and, through CMUA, eagerly reach out to local governments and our members to review proposals and help make that happen."

Sulem said Minnesota municipal utilities have a great relationship with the state's Department of Commerce, which houses the state energy office. The DOC has acted as an information clearinghouse, providing legislative summaries and notices of funding opportunities to MMUA, which in turn distributes them to its members. During the summer, Sulem said he expects the DOC to host webcasts to help utilities with grant applications.

Sulem, Moline, and Wright all recommended that utilities and their state associations engage as deeply as they can with state agencies and affected stakeholder groups. The breadth of stakeholder support for a grant application is one criterion weighed by agencies making grants.

"This is an extended relay race between federal agencies, state agencies, state public power associations, and individual [utilities]," said MMUA's Sulem. "Making it more complicated, barriers and obstacles are still emerging. The most important priority is to make sure that no one drops the baton."

CYBERSECURITY I

Adding sensors, sharing data, greater collaboration, and joint action are all keys to strengthening grid security

BY BETSY LOEFF, CONTRIBUTING WRITER

You cannot fix a problem you do not see, which is why there is a full-throttle drive toward more sensors to monitor the operational technology (OT) that keeps power systems running. There also are a few impediments hampering widespread sensor deployment. Among them are costs and technological know-how. No utility can tackle these issues alone. It will take an industrywide effort to overcome them.

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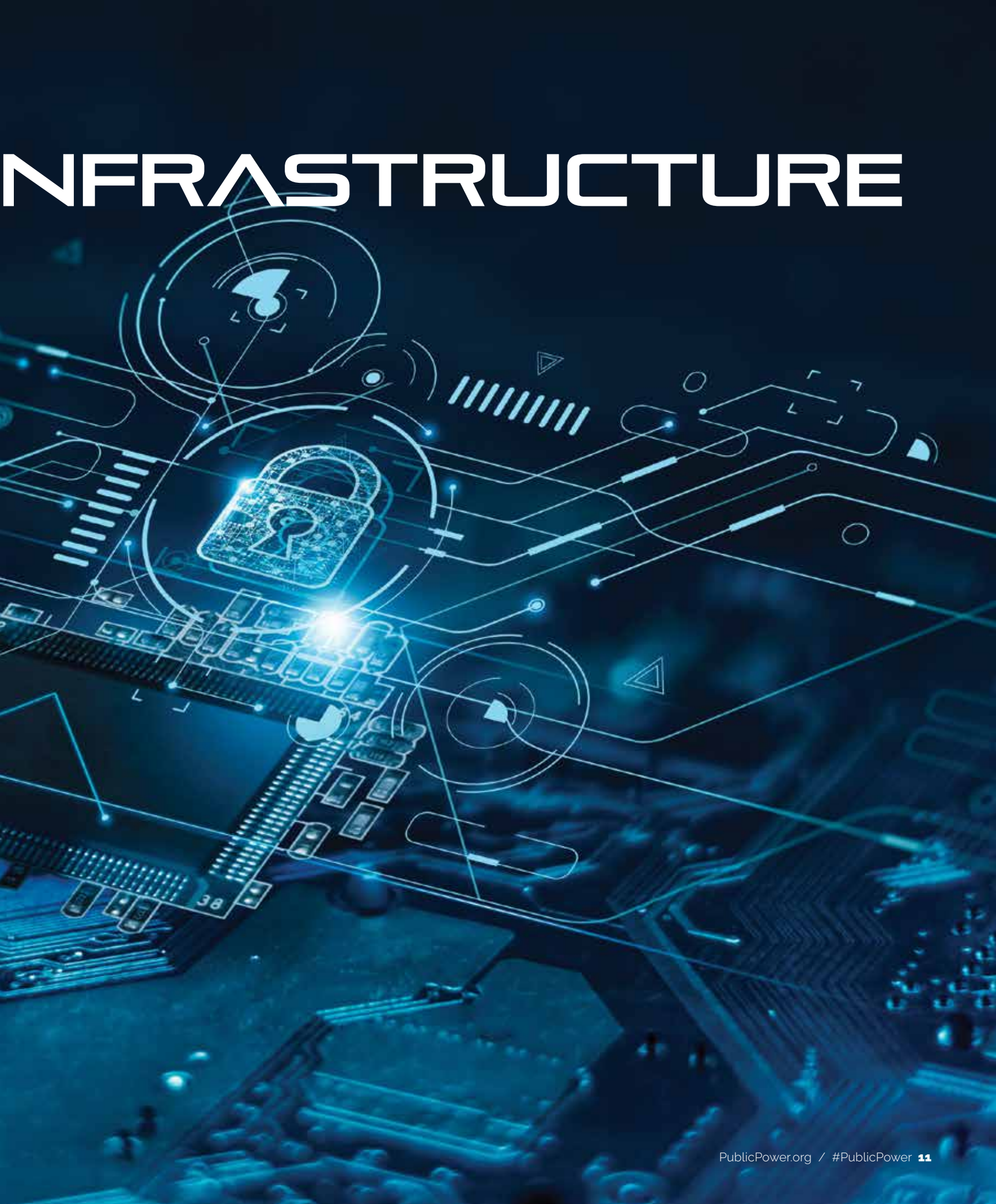

Sensors are vital to the security of the grid. "If you lose your information technology (IT) systems, your operations technology may still run," said Bridgette Bourge, senior director of cybersecurity for the American Public Power Association. "But if you lose your OT, you're offline. Your community is offline."

A successful attack on the electric sector has never happened in the United States, Bourge said. Still, given the current geopolitical environment, "government, private industry, and utilities are on war footing," said Richard Condello, APPA utility cybersecurity deployment manager. "Everyone is hypervigilant, and it's escalated the sharing of information as an industry with the government and among ourselves."

Sensors deliver that information. Bourge said sensors essentially record the state of OT networks, thereby observing any changes that occur, such as a new device added to the operating environment or communications with a new IP address. Any time such changes occur, the sensors send an alert. Sensors can monitor the traffic itself – who and what is coming in and out of the system – to identify when suspicious behavior or communications are occurring or when vulnerabilities or threat actors are involved. Sensor technologies can help the utility be more aware of what is happening on its system and allow for a broader awareness and spotting of cyber tactics, techniques, and procedures (TTPs). More simply put, the sensors alert the utility when patterns and pathways that are known to be used by bad actors are touching your system. They also help identify new ones.

Problem: Resources; Solution: Collaboration

Here's one problem: Most utilities have not deployed enough OT sensors. "The big gap in cybersecurity is visibility into the operational technology systems we have," said Carter Manucy, director of IT/OT cybersecurity at Florida Municipal Power Agency. "Traditionally, when we installed many of our older systems, all we did was install them to do one special function, so we only watch for that one function. We're not watching the network for anything outside normal behavior. That's what these monitoring systems do: Catch the abnormal activity."

But most smaller utilities cannot afford these much-needed sensors.

Some systems could cost hundreds of thousands of dollars, even for small- to medium-sized utilities, Bourge said. Increasing scope and complexity could reach more than $1 million for deployment.

Condello and his team have been working on ways to get sensors deployed through a cooperative agreement with the U.S. Department of Energy's Office of Cybersecurity, Energy Security and Emergency Response (CESER). This effort is funded by a grant CESER awarded to APPA in 2020," said Amy Thomas, APPA senior director of government relations.

Condello, who runs a group funded by this grant, said deployment of OT cybersecurity technologies is only part of the solutions DOE hopes will result from its grant investment. The second goal is collective defense, where utilities take data they get from their sensor technology and share it with government entities and information analysis centers, which, in turn, makes information available to other utilities. The final goal is for utilities to integrate timely and actionable information into their systems to protect their critical assets. Toward that end, Condello and his team created the Cyber Defense Community, a group of 39 member utilities.

"We're providing a forum for collaboration and corroboration," said Condello. "With the community, we share information across our membership as to what challenges they've faced and what has worked in addressing them. We help utilities make informed decisions."

This includes good purchasing decisions on those much-needed sensors. Brian Chandler is general manager of Troy Utilities in Alabama, and a member of Condello's group. "We issued a very extensive request for proposals with a very long list of qualifications and specifications," Chandler said. "For a medium or small municipal utility to have done something like that on their own would have been extremely difficult."

Chandler's utility serves about 20,000 customers with 10,000 meters. He was working with people like Florida Municipal Power's Manucy and Branndon Kelley, senior vice president of technology at American Municipal Power, a joint action agency serving 134 member utilities in 10 states. Both Kelley and Manucy are members of the Cyber Defense Community.

The community evaluated all of the proposals that responded to an RFP, and 11 members of the community are working toward piloting the rapid deployment of sensors as part of the DOE grant money to support deployment. Troy, FMPA and AMP are among 11 utilities that will deploy these systems.

"Part of the requirement of this project is that anonymized threat data is to be passed back to the Department of Energy so they can see what is going on with threats that affect the electric industry and pass that knowl-

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edge along," Chandler said. "The sharing of threats and incidents delivers huge benefits. It tells you what to look for, what to prepare for and what available fixes, if any, are out there."

Time to Act

While large joint action agencies like FMPA and AMP have staff to review threat data and take action, smaller utilities generally do not have those resources. This is why Kelley thinks joint action should eventually offer cybersecurity services.

"A sensor by itself is not going to do anything for you. It collects data, but it's not going to be able to take evasive action to prevent trouble or address threats," he said. "Sending anonymized data to a government agency is a good first step. It gives them information to identify patterns and threats out there. But if there's an actual threat happening in your system, you need to respond in real time. You may not have time to wait a couple days for instructions to come back to you."

What is more, cyber expertise extends beyond knowing what to do. It also encompasses knowing how to do it and having both the time and skill to remediate the threat quickly, Kelley said. He advocates for cybersecurity managed services delivered by what he calls "super joint action agencies," such as Hometown Connections, which can aggregate requirements and deliver programs and services across the whole of public power regardless of how small or large they may be.

Florida Municipal Power Agency and several of its member utilities are working toward participating in the Cybersecurity Risk Information Sharing Program (CRISP), run by the Pacific Northwest National Laboratory and the Electric Information Sharing Analysis Center (E-ISAC). The program involves monitoring internet connections by installation of sensors and a server to support the CRISP application, which can cost more than most utilities' IT budget.

"Since a lot of the smaller utilities we support don't have enough data to tax that big piece of equipment, the concept is to put a smaller device at each utility and bring all that data back to the server in a secure manner," said FMPA's Manucy said.

The fix allows him to analyze data on multiple utilities simultaneously. It also keeps costs down because a smaller utility can participate for a few thousand dollars instead of a much larger installation cost, Manucy said. "This allows a smaller utility to participate without a huge capital outlay and large, ongoing maintenance costs."

Infrastructure Law Provides New Funding

The Infrastructure and Investment Jobs Act, signed into law in November 2021, will make money available to public power utilities hoping to strengthen their cybersecurity. One provision in the law directs the secretary of energy to provide grants and technical assistance for utilities to detect, respond to and recover from cybersecurity threats. The law appropriates $250 million to be distributed to municipal and cooperative utilities between 2022 and 2026.

Kelley thinks the potential for mandatory reporting of cybersecurity incidents will be one more reason managed services should be used to deal with threats. "Municipal utility workers are some of the most dedicated and smartest people ever. These people literally are doing seven jobs, which is why [public power] has the Seven Hats Award," he said. "Now cybersecurity is the eighth job. When this additional burden of mandatory incident reporting happens, it's something that should be managed or at least assisted with at the joint action level to alleviate that burden."

Mandatory incident reporting could be burdensome, but grid cybersecurity will be achieved only if everyone – utilities, government and industry groups – works together, said Manucy. "It's possible that sensor-based technologies could take the place of reporting requirements, but it's much too soon to know," he said. "However, by deploying sensors you gain the visibility required that you will need in order to comply, at some level, with these additional forthcoming laws."

To that end, Condello and his group are tapping members of the Cyber Defense Community for activities beyond funding of the cooperative agreement. "We recognize the community can contribute beyond this narrow investigation of OT technology for rapid deployment," Condello said. APPA is developing a cybersecurity guide for small utilities and has a risk-management working group. Community members will also help APPA plan a table-top security exercise that will be conducted at the Business & Financial Conference in September.

"The community is a gateway to knowledge-sharing and support to inform good decision-making," Condello said.

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Building a Cleaner, More Reliable Grid

BY BETSY LOEFF, CONTRIBUTING WRITER

A look at infrastructure investments now in progress shows an industry striving to boost renewable resources and reliability.

Snohomish PUD Merges Solar, Community Awareness and Aid

A 375-kilowatt solar array Snohomish County Public Utility District is building will support PUD customers in need and help meet electricity needs during hot summer days in an economically disadvantaged corner of Everett, Washington, where the utility is headquartered. The project is expected to produce enough power to serve the needs of approximately 40 homes.

"We are locating the solar array in this neighborhood for a couple reasons," said PUD spokesman Aaron Swaney. "Along with bringing solar to a community densely populated with multifamily housing, much of it income-qualified, there are constraints on the grid in this neighborhood during the summer. So our goal is to help alleviate some of the congestion while raising awareness about clean, local renewable energy."

The solar project will help support the PUD's income-qualified energy assistance program, Project PRIDE, which assists about 500 customers each year. Revenue earned from energy produced at the solar array — expected to exceed $27,000 annually — will be donated to the energy assistance program.

In addition, the solar array will be in a busy, popular area. "It's near a place where a lot of youth sports teams play. It's near a golf course. It's going to be very visible to customers," Swaney said. "We'll be incorporating clean energy messaging there, explaining the clean energy future, talking about how much energy the solar panels produce, and letting people know that money raised by that solar array will go back into the community."

"A lot of people don't understand how clean our PUD's power is," Swaney said. Snohomish PUD's energy mix, dominated by hydro power, is more than 95% green, and this solar array will tell that story, he said. "Our signage will help people understand that these solar panels are powering homes, supporting the grid, and helping people in the community pay power bills when they're struggling."

The facility is being built on city land, but Everett is leasing that land to the utility. The state's clean energy fund awarded a grant of $862,814 to cover part of the solar array's $1.5 million construction cost.

SRP Navigates Supply Issues

In August 2021, Meta – formerly known as Facebook – announced plans to expand its Mesa, Arizona, data center campus to encompass five buildings totaling some 2.5 million square feet. Salt River Project, the utility that serves Meta's facilities, already has some big customers, including an Intel fabrication plant. "When they reach maximum load, Meta will definitely be one of our larger customers," said SRP Project Manager Kevin Woolfolk.

To serve that load, SRP proposes to build a new half-mile, double-circuit 230-kV transmission line and new 230-kV equipment within the in-construction 69-kV substation dedicated to Meta's campus. The project is still in engineering phases, but procurement could start quickly due to supply chain issues, Woolfolk said. "Sometimes the design might not be completely finished, but we have an idea of what we need, so as soon as we enter into an agreement with the customer, we will get up-front funds and start procuring some of the equipment we know we'll need."

Woolfolk said he is already seeing supply chain delays for transformers, control cables that run out to breakers, power panels and more. Some devices have jumped from an eight-week lead time to 30 weeks. "Concrete seems to be one of the main drivers of delay for my projects," he said. "You order concrete one day and get an order cancellation the next."

Meta's Mesa data center will also tap the 500 megawatts of renewable energy to be produced by three new solar plants now under construction. Meta's data center will use 450 megawatts to support the company's 100% renewable energy commitments.

Like many utilities trying to build solar capacity, SRP is seeing its project delivery dates threatened by the U.S. Department of Energy's investigation into whether panel providers from four southeast Asian nations are serving as fronts for Chinese manufacturers trying to circumvent tariffs.

"SRP has six solar projects totaling approximately 1,350 megawatts under contract and scheduled to come on line in the next two years," said spokeswoman Erica Roelfs. "Several developers have initially indicated that projects could be delayed or canceled, and prices will need to be increased."

Blue Earth Invests in Reliability

Blue Earth, Minnesota, is a town of 3,200. To make sure local homes and businesses enjoy non-stop service, Blue Earth Light and Water is investing in reliability.

The utility is installing a new 14-MVA transformer, reconductoring lines and completing a looping project on one of its two interconnections. "We're planning to maintain our reliability while planning for the future," said Tim Stoner, general manager of the utility. Along with high reliability, the new substation design will deliver flexibility for maintenance because any of the circuit breakers can be opened and isolated without service interruptions.

"Our goal is to make sure we're not overloading current feeders while providing additional room for capacity to support the growth we're seeing," Stoner said. "Whether it's electrification or new customers, we need to make room."

The work will not be done quickly; it is hindered by supply chain delays. Delivery of the 14-MVA transformer would have taken about 36 weeks before COVID hit, Stoner said. "That lead time is now 104 weeks," he said. "We've almost doubled our inventory of transformers over the last two years in anticipation of the supply chain issues we've been seeing recently." He is also instructing his lineworkers to plan for two years in advance on some equipment, three years in advance on conductors and transformers.

The utility is doing this work ahead of anticipated needs. Stoner and his team have been evaluating feeders to see how to handle expected load growth. The utility went from having zero electric cars in its service territory last year to half a dozen this year and high gas prices could accelerate adoption. "EVs take a toll through heavier residential load," Stoner said. EVs, potential load growth, and system hardening due to increased storms are among the reasons the utility is working to boost reliability.

Blue Earth Light and Water has earned diamond-level status in APPA's Reliable Public Power Provider (RP3) program. That's the highest RP3 rating conferred. It rewards utilities for completing a rigorous application and earning scores of 98 to 100 for their practices related to reliability, safety, workforce development and system improvement.

Fayetteville Fuel Cell Will Use Biogas

North Carolina's 4,700 poultry farms churn out 5 million tons of poultry waste annually and the state's 2,100 swine operations could fill 15,000 Olympic-size swimming pools with waste, according to a February 2019 report published by the Environmental Working Group, a watchdog organization in Washington, D.C. That's one reason the state's renewable energy portfolio standard requires utilities to produce a percentage of their power with poultry and swine waste gases. Fayetteville Public Works Commission plans to meet that requirement with a 1.5-megawatt fuel cell that will be powered by multiple biogas streams. The fuel cell technology generates electricity through a chemical reaction between the oxygen in ambient air and the methane-rich biogas.

"One of the waste streams we'll be running through the fuel cell is biogas from one of our water treatment facilities," said Elaina Ball, CEO and general manager of Fayetteville PWC. Currently, the city flares its wastewater gases rather than releasing the methane into the atmosphere. Methane is more than 25 times as potent as carbon dioxide at trapping heat in the atmosphere, according to the U.S. Environmental Protection Agency.

Along with re-using the methane produced at its water treatment facility, Fayetteville will capture methane from a nearby landfill and poultry and swine farms. "This is one of the nation's first projects to take multiple waste gas streams and run them through a fuel cell to generate clean electricity," Ball said.

The fuel cell installation is part of a planned renewable energy demonstration park that will have two more renewable generation resources and remediate an old manufacturing site.

"This project helps us efficiently meet our renewable energy requirement for poultry waste with self-generation," Ball said. "It also sits adjacent to one of our water treatment facilities and some industrial pollution that we've had a goal of remediating for community health and protection of our watershed."

The fuel cell will also serve as a back-up power source for the water plant and help the utility keep lights on in the event of outages. "We're getting a combination of environmental, operational and regulatory benefits with this one little 1.5 MW generator," Ball said.

Ah'ee'he (Thank you)

BY PAUL CIAMPOLI, NEWS DIRECTOR, AND **MICHAEL PELLS**, DIRECTOR OF DIGITAL & SOCIAL COMMUNICATIONS, AMERICAN PUBLIC POWER ASSOCIATION

PHOTOS BY ALYSA LANDRY


Altec
Altec

AH'EE'HE (THANK YOU)

Public power utility crews extended electric service to more than 137 households on the Navajo Nation this spring through Light Up Navajo III, a joint effort between the American Public Power Association and the Navajo Tribal Utility Authority (NTUA). During April, May, and June 2022, NTUA welcomed workers from public power utilities and organizations from across the country.

"Honestly, this has been an all-around great experience. I truly didn't know what to expect when I got out here. We're linemen. We will take any opportunity to go into line work somewhere other than where we're at. I expected to enjoy that, and it's been a blast. What I didn't expect and didn't know what was coming was just the overall sense of gratification that came from really doing something for somebody else who had never had power before, and never been able to turn on a light turn on a stove. It was a really cool experience that I'm going to remember forever, and I know the rest of the crew will as well."

Travis Helmerichs, Austin Energy, Texas

On behalf of the Navajo people, we want to say thank you. ... We appreciate all the companies who came. I know that many of you left your families, but to also empower families here on the Navajo nation with electricity. And with electricity, that also means we can put other types of infrastructure into the most rural parts of the Navajo Nation: broadband [and] water. And so, you are creating a foundation for infrastructure here on the Navajo Nation. On behalf of all the families that you have connected to the grid, thank you – A'he'hee – to each and every one of you, your families, your companies.

Jonathan Nez, President, Navajo Nation

AH'EE'HE (THANK YOU)

"Public power utilities have shown over the years that they are incredible at stepping up to help each other," said APPA President and CEO Joy Ditto. "We are well-practiced in sending aid in the wake of natural disasters, and we are leveraging these skills to help bring power to those who still don't have it in our country in the year 2022, a situation that must be rectified."

Of the 55,000 homes located in the 27,000-square-mile Navajo Nation – an area roughly the size of West Virginia and covering parts of Arizona, New Mexico, and Utah – approximately 14,000 do not have electricity. These homes represent 75% of all U.S. households that do not have electricity.

I would tell [the volunteer utility workers] first and foremost, we are very prayerful people. I would always remember them in my prayers because it takes a lot to be here, it takes a lot to volunteer your time. Some of them probably have children, they probably have wives, they have a life, and they left all of that behind, to come here and help. I think in some way, they have a belief in doing something good. And I genuinely just appreciate them so much ... that there are people that are thinking about us and the Navajo people like this. ... Hopefully they can take this experience with them and share it and let [others] know there are people that do need help. I'm just so grateful for them, really, to have that kind of a heart to do that.

Tracie Tso, Navajo resident

Three years ago we had a crew that came out for the first Light Up Navajo and we finally were able to send another crew. I offered to come because I wanted to see the terrain, see the people, [and] help get power on to people who've never had it.
Jeremy Douglas, Conway Corp., Arkansas

The lights were really bright because we were used to low light even with our solar. Outside it was even darker. We didn't really go outside in the nighttime. So, we had to adjust to the bright lights.
Elizabeth Whitethorne-Benally, Navajo resident

AH'EE'HE (THANK YOU)

The "Light Up Navajo" effort is a goodwill initiative of the Navajo Tribal Utility Authority — in cooperation with the American Public Power Association — now in its third year to bring electricity to Navajo Nation families who are living without electricity.

Volunteer crews from community-owned, public power utilities from 9 states — including Arkansas, Arizona, California, Connecticut, Delaware, North Carolina, Ohio, Texas, and Utah — donated materials and time to the Navajo Nation to build power lines to homes that previously were without power.

You know what, it's really kind of the same no matter where you go ... this is kind of like a brotherhood. Obviously, equipment and materials may be a little different. But at the end of the day, it's like fraternity. You kind of know what each other are going to do because you've done it for so long.
Gordon Valentine, Conway Corp., Arkansas

The public power utilities participating in LUN III included:

American Municipal Power, Ohio
Austin Energy, Texas
Bountiful City Light & Power, Utah
City of Newark, Delaware
City of Santa Clara, Utah
City of Seaford Electric, Delaware
Conway Corp, Arkansas
Delaware Municipal Electric Corporation
ElectriCities of North Carolina
Greenville Utilities Commission, North Carolina
Northeast Public Power Association
Norwich Public Utilities, Connecticut
Sacramento Municipal Utility District, California
Salt River Project, Arizona
Town of Smyrna Electric, Delaware
Utah Associated Municipal Power Systems
Westerville Electric Division, Ohio

Two investor-owned utilities also participated in LUN III: Arizona Public Service Co. and New Mexico's PNM Resources.

Earlier this year, Peabody Municipal Light Plant in Massachusetts donated surplus equipment to Light Up Navajo to support electrification of Navajo Nation homes.

For more images, videos, and articles about Light Up Navajo, visit https://www.publicpower.org/LightUpNavajo.

Infrastructure Funding and Transformative Financial Planning

BY DAWN LUND, VICE PRESIDENT, UTILITY FINANCIAL SOLUTIONS, LLC

INFRASTRUCTURE FUNDING AND TRANSFORMATIVE FINANCIAL PLANNING

Two federal laws enacted in 2021 provide funding for state and local infrastructure investments. The American Rescue Plan Act, signed into law on March 11, 2021, is the federal government's effort to boost the U.S. economy after the challenging effects of the COVID 19 pandemic. The Infrastructure Investment and Jobs Act, signed into law on Nov. 15, 2021, provides $1.2 trillion in federal funding for a wide range of infrastructure projects.

Both laws offer a potential source of funding for electric system infrastructure improvements. The Rescue Plan Act funds are distributed automatically to state and local governments. Infrastructure Investment funds require applications.

The Rescue Plan monies accord substantial discretion to state and local governments when deciding which infrastructure projects to support. Projects must fit into one of four categories, one of which includes broadband. Utilities considering advanced metering infrastructure may be able to use Rescue Plan funds.

The Infrastructure Investment and Jobs Act is another opportunity to make transformative infrastructure improvements. The IIJA is a $1.2 trillion dollar infrastructure package addressing many types of infrastructure with electric being one of the highlights. The package includes just $550 billion in new spending; with $650 billion normally allocated each year for highways and other infrastructure projects.

The Infrastructure Investment and Jobs Act includes allocation of $65 billion for broadband, with the goal of bringing high-speed connectivity to underserved regions of the country. The law also allocates $7.5 billion to build and operate publicly accessible electric vehicle charging infrastructure and $65 billion to supplement existing power structure work and innovative approaches to grid resiliency and energy improvements. Some of the funds will come with no match or cost-share requirements and some will be in the form of loans with principal forgiveness, or grants. If your utility receives funds under these provisions, be sure the grant funds used for capital investment are properly recorded as contributed capital. Your auditor can help guide you in this area.

The influx of potential funding makes now an important time to set appropriate revenue requirements and to review key financial targets to establish a long-term forecast. Many utilities may need rate increases and bonding beyond federal funding to meet operating and capital needs. For some utilities this planning may be difficult because it will involve a change in practices. Too many governing boards and councils have avoided rate increases, even during strong economic periods. These utilities often operate at a loss, spend down cash, forego capital investments, and remain unprepared for strategic investments in infrastructure.

This unprecedented time is an opportunity to change the way we think about financial planning. Utilities should set their sights on at least three key financial targets and develop a plan to achieve them.

DEBT COVERAGE RATIO IS A MEASUREMENT OF DEBT AFFORDABILITY. The general guideline is to generate sufficient cash flow from operations in each fiscal year to cover the utility's debt payments 1.25 times. Utilities with insufficient mandated debt coverage can technically be in default and considered higher risk, facing higher interest rates for future bonds.

MINIMUM CASH RESERVES IDENTIFY THE MINIMUM AMOUNT OF CASH A UTILITY SHOULD HOLD. Policies that define a minimum cash reserve make for healthier utilities when established and followed. A cash reserve policy does not reference a specific dollar amount, but follows a defendable methodology to give future decision makers guidance and accountability.

OPERATING INCOME IS A MEASUREMENT OF REVENUES LESS EXPENSES IN EACH FISCAL YEAR. If a utility has a negative operating income, current rate payers are not paying their fair share and future rate increases will need to be much higher to recoup the deficiencies.

The plan incorporating these targets should include small, incremental rate adjustments implemented over time and it is important to stick to the plan. Small incremental rate adjustments have a powerful compounding effect for utility revenue recovery and allow customers to prepare for rate changes and avoid rate shock. Small increases advertised well in advance and implemented on schedule are key to maintaining financial health and are typically tolerated for customers of all income levels.

Above all, tried and true financial planning principles are the best strategy for long-term financial sustainability. The unprecedented forthcoming federal funds give utilities a unique opportunity to boost their current financial position and help create a pathway to a transformative future.

How to Prepare For Infrastructure Act Funding

BY SARAH MATHIAS,
GOVERNMENT RELATIONS DIRECTOR,
AMERICAN PUBLIC POWER ASSOCIATION

Federal grants are more than just applying for funding and building new infrastructure. Here are a few tips on how to be part of community discussions on how funding will be applied in your local area.

Focus Your Efforts

- Up to 50 programs in the Infrastructure Investment and Jobs Act are related to energy and grid infrastructure, with many others for broadband, resilience, or electric transportation infrastructure. Identify priority needs for your utility and your community. Potential areas include smart grid technology, broadband infrastructure, hardened assets, and increased efficiency and weatherization support. Applying for and ultimately managing a federal grant can be time-consuming so you must ensure your utility is tackling the most pressing issues or most strategic long-term investments to better serve your local community.
- Three areas to consider: broadband infrastructure (direct grant), state energy program (state funds), something more indirect.

Connect with Potential Partners

- Get to know your state-level officials and community organizations that might be eligible for direct funding, but with whom you could work. Projects like EV charging infrastructure and grid resilience will require working with state officials. Weigh in and offer your expertise on how states, often the state department of transportation or energy, can put together a well-crafted, forward-looking plan to make the most of federal dollars. Your utility also might collaborate with other municipal departments, or schools (efficiency/EV infrastructure), or community-based organizations (LIHEAP, efficiency/weatherization)

Strategize for the Long Term

- The IIJA provides an opportunity to think beyond just shovel-ready projects and ahead to the kind of investments that will secure and strengthen electric grids for decades to come. The law is a five-year funding measure, with many programs continuing well beyond that or ramping up their funding levels in the later years. We've heard from the federal government that, in addition to meeting immediate infrastructure needs, they hope to see innovative and strategic grant applications – so look to the future if you do not have any "shovel-ready" projects today.

Get Back-End Processes Up to Snuff

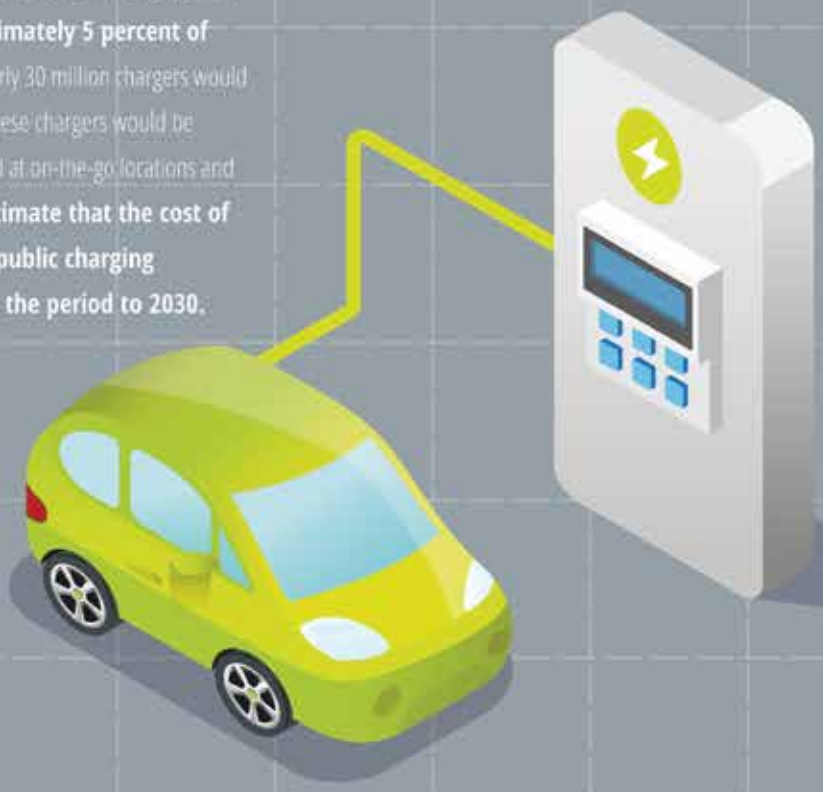
- Preparing ahead of time to ensure you can follow the federal government's compliance and procurement requirements will be vital to a successful partnership between your utility and the funding agency. Putting in place a clear process for procurement, documenting staff time spent on grant-funded projects, and retaining and organizing important records are steps you can take now to prepare for future grant funding.

Infrastructure Needed for a Future Grid

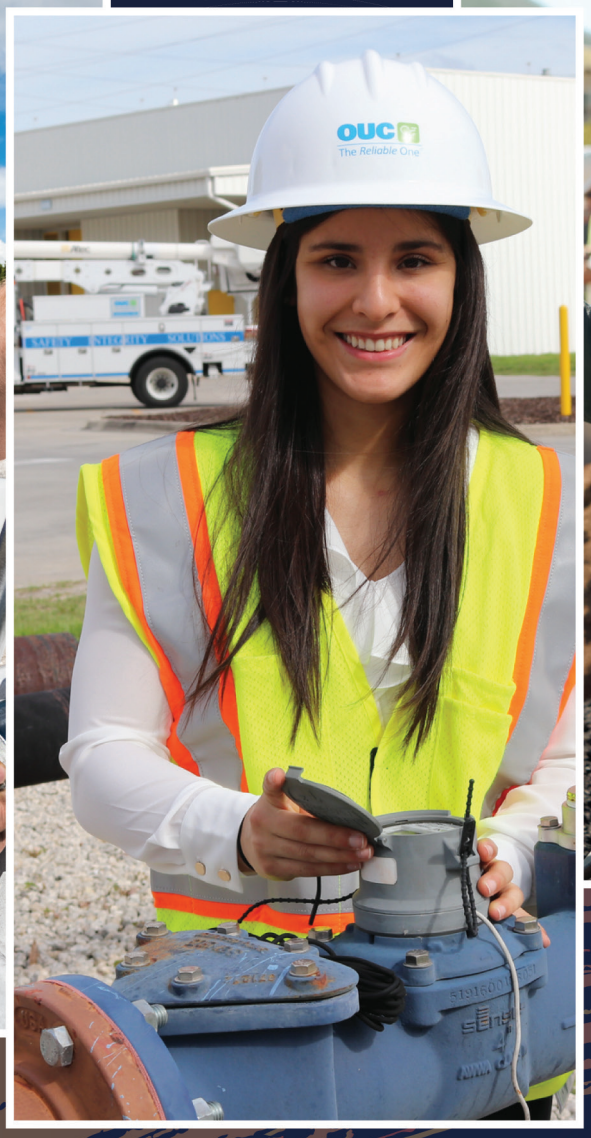
The National Academy of Sciences estimates that **$2.1 trillion** in capital investments will be needed just by 2030 to put the United States on a path to a near-zero emission economy. **Of that total, a significant amount will be needed to accommodate increased electricity load due to EVs and space heating.**

An NREL study of future electrification projected that electricity demand could increase from **4,000 terawatt-hours** (TWh) in 2020 to **5,000 TWh by 2050** in its reference case, or as much as **7,000 TWh** in its high electrification scenario. **In the higher-use forecast, electricity would be as much as 35% of all energy end-use.**

Based on a report from McKinsey, annual demand for electricity to charge EVs based on current projections would surge from 11 billion kilowatt-hours (kWh) now to **230 billion kWh** in 2030. **The demand estimate for 2030 represents approximately 5 percent of current total electricity demand in the United States.** Nearly 30 million chargers would be needed to deliver so much electricity in that year. While most of these chargers would be installed at residences, 1.2 million would be public chargers, installed at on-the-go locations and at destinations where vehicles are parked for long periods. **They estimate that the cost of hardware, planning, and installation for this amount of public charging infrastructure would come to more than $35 billion over the period to 2030.**



No matter what challenges stand in your way, you work tirelessly to keep the lights on.



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