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PUBLIC POWER MAGAZINE

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EMERGING TECHNOLOGY AND RATES

Managing virtual power plants p. 12

Developing battery storage p. 24

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The American Public Power Association is the voice of not-for-profit, community-owned utilities that power approximately 2,000 towns and cities nationwide. We represent public power before the federal government to protect the interests of the more than 55 million people that public power utilities serve across the United States and its territories. We advise on electricity policy, grid technology and operations, and workforce development in support of safe, modern, and resilient utilities.

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PREPARING PUBLIC POWER FOR GRID TRANSFORMATION

BY SCOTT CORWIN, PRESIDENT AND CEO, AMERICAN PUBLIC POWER ASSOCIATION

Huntsville Utilities staff giving a tour of their newly opened operations center. Photo courtesy Huntsville Utilities.

Across our diverse array of utilities there is a broad spectrum of approaches to managing transformation and innovation. The rapid changes and challenges facing utilities create an environment where predicting and managing the evolution of energy assets in the system has become a practical and economic imperative to serve our broader mission of affordability and reliability in communities.

In addition to adopting technology for a singular purpose, utilities are considering how technology can connect with other utility systems, how people across the utility will use it, and how it opens up opportunities for engaging with the community. Of course, innovative use of technology is impacting how utilities can send signals and incentives to customers for energy use, affecting costs and pricing.

APPA's purpose is to help community-owned utilities deliver superior services. That includes helping you stay ahead of the curve and overcome barriers to deploying advanced technologies. We're pleased to have a partnership this year with Lawrence Berkeley National Laboratory focused on helping public power speed up adoption of advanced grid technologies (see page 6). We've long supported research and development in public power through the DEED program, which has provided millions of dollars in funding to support hundreds of public power projects big and small and funds student scholarships. Our APPA Academy offers in-depth examples, events, and trainings that highlight how utilities are approaching technology projects, and venues for you to connect with industry partners that have the platforms and expertise to help move you ahead. Several groups on APPA Engage, our online community platform, including an Energy Innovation group, help keep the knowledge exchange going between members year-round.

This issue of *Public Power* magazine also explores how utilities are approaching specific technology efforts, including managing virtual power plants (page 12) and deploying battery storage (page 24), and how they are moving to more dynamic rate designs to support technology adoption (page 30). Your customers are also adjusting to change, and so educational materials such as the simple explainer graphic on time-of-use rates (page 36) or other templates on our promoting public power webpage are there for you to reuse as you see fit.

We are always looking for you to share your stories of projects that will help your utility adapt and advance into the future. And, please let us know how else APPA can help you prepare and keep up with the ever-changing and innovative technology in our field.

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Getting Started with Emerging Technology

How Public Power Can Overcome Barriers to Innovation

BY SUSAN PARTAIN, DIRECTOR, CONTENT STRATEGY, AMERICAN PUBLIC POWER ASSOCIATION

Amid rapid change, it can seem risky or difficult to be among the earlier adopters of emerging technologies or innovative practices. From resource constraints to public scrutiny, public power utilities may feel there is little room for error. Yet, in an environment where customer usage and the expectations that come with it are also changing, there is risk to utilities in not developing a foundation for understanding and deploying emerging technology.

To help public power utilities in more rapidly adopting advanced grid technologies, APPA and the Lawrence Berkeley National Laboratory, with funding from the Department of Energy, partnered on an initiative to showcase ways public power utilities can pilot and speed up adoption of advanced grid technologies and other enhancements via sandboxes. The initiative includes a series of webinars and discussions across utilities with the aim of supporting public power utilities in overcoming challenges to testing and deploying advanced transmission and distribution technologies. LBNL will also provide direct technical assistance to a small number of interested utilities following the webinar series.

Gautam Kakaiya, director of grid transformation services at CPS Energy in Texas, presented on the first webinar of the series in July 2026. Kakaiya noted some of the external factors pressing the need for utilities to innovate include a shift from a grid that moves energy in one direction, from the utility to the customer, to a more bidirectional grid. He noted the grid's also changing from an analog grid to a digital grid, meaning there are more control systems, telemetry, and automation.

"We have to manage our assets better, which means more information that needs to be gathered about the assets that we have," he said.

CPS Energy's grid modernization efforts have centered around distribution automation, distributed resource integration, and reliability enhancements.

Peter Cappers, staff scientist and strategic advisor to the energy markets and planning department at Lawrence Berkeley National Laboratory, said the pressure for utilities to stay on top of technologies is threefold: the ubiquity of customer-sited grid-edge technologies, mounting threats to reliability and resilience from storms and other events such as wildfires, and new large loads.

"There's only so long you can hold back the tide. Not only [are these threats] here, the effects are just going to get worse," said Cappers. "All of this speaks to a need for greater visibility and control of what's happening on the grid. And to me, that's where a lot of these advanced grid technologies come in."

Structuring the Process

When looking at its internal culture, Kakaiya noted how CPS Energy recognized that often it had been "innovating in silos" rather than in a way that brought departments and systems together coherently.

He said a siloed, unfocused approach contributes to running pilots that don't scale or that don't offer comprehensive solutions.

"We want to take the expertise that's sitting in disparate areas and then channel it all into a more structured process that results in a higher percentage of success, but also a much more quality output," said Kakaiya. "Interoperability is important in managing those technologies. It is putting on a concert. You are not playing an instrument in one area alone."

"At a broad scale, it looks like a whale. Breaking it down, creating a roadmap, can yield results."

GAUTAM KAKAIYA, DIRECTOR OF GRID TRANSFORMATION SERVICES, **CPS ENERGY,** TEXAS

Other issues arise from not having a clearly defined scope or measurable outcomes to the pilots.

"At a broad scale, it looks like a whale. Breaking it down, creating a roadmap, can yield results. Start with what are you trying to do, then find areas of innovation that support those outcomes," he added. "We've done a good job recently of creating really clear mission statements and exit parameters. Are we on target, are we veering off, etc. Having at least thought out milestones… if I'm not seeing these indicators, then it is time to walk away."

For Kaukauna Utilities in Wisconsin, creating the opportunities for innovation began with an internal task force on emerging technologies. Dave Pahl, engineering and operations director at Kaukauna Utilities, said the task force brainstormed the variety of areas that the utility might get involved with, and then thought through what technology would be required to enable advancement.

That process led the public power utility to prioritize an upgrade to its GIS beginning in 2021. Pahl noted that Kaukauna was among the first cohort of utilities to upgrade to Esri's utility network. The impetus for being an early adopter was not just from the potential in leveraging more of the features and capabilities of the utility's systems, but Pahl said the timing was also right as the utility was preparing for a new wave of staff to start, which comes with staff training on its systems. The utility saw the move as an opportunity to avoid training staff twice.

The smaller scale of the utility's system, which serves about 17,000 electric customers, also made for an ideal test bed and helped form a mutually beneficial partnership.

"We were truly the perfect pilot size for Esri," he said. "We got a lot of support from Esri from the start, because they wanted to see this succeed as well."

Success also involves having an internal champion and constant communication with the team.

"If you take up the mantle of trying to drive innovation, you have to be the friend of the new idea… take it around and get it to make friends with others," said Kakaiya. "Someone needs to be the motivation pump. That's probably 50% of the driver of success."

"You have to continuously communicate that if this was already solved, we could just plug and play and forget it. It really wouldn't be innovation," added Kakaiya.

Connected to Purpose

Kakaiya noted that centering innovation around the shared goals of reliability and affordability are what helps make stakeholders, including its governing council and employees, and partners, like the government, recognize the importance of exploring the technologies.

"Our purpose is service to San Antonio. When we talk about innovation, our community is our north star," he said. "The better, more efficient our system is, that helps us manage our cost and affordability for our community."

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> **"It's not just trying something to try something. It's 'We want to try this to make sure that it achieves the outcomes that we want so that we can then choose to scale it up."**
>
> **PETER CAPPERS,** STAFF SCIENTIST AND STRATEGIC ADVISOR TO THE ENERGY MARKETS AND PLANNING DEPARTMENT, **LAWRENCE BERKELEY NATIONAL LABORATORY**

Pahl said that the GIS upgrade helped Kaukauna clean up its data and create a better connectivity model. That allowed for Kaukauna Utilities to have an easier SCADA upgrade, which it completed in 2025.

"That's giving us spatial awareness to allow us to pull in more telemetry from the field. As we implement smarter devices in the field, like reclosers, we can basically see what's going on at that point in our system, which is visibility that we did not have in the past."

Updating grid technology not only supports Kaukauna's performance and operational insight, it benefits customers, too.

"They get more reliability, better service, greater access to information," said Pahl. "We communicate more with our customers now, utilizing our outage management system, so they're well aware of outages that could be affecting them and potential restoration times."

A Web of Support

LBNL's interest in working with public power utilities on advanced technologies centers around the idea of helping utilities to leverage a process that moves more quickly through the pilot phase, including clear indicators for when something can scale and justify additional time and effort.

"It's not just trying something to try something. It's 'We want to try this to make sure that it achieves the outcomes that we want so that we can then choose to scale it up.'"

Cappers compared the process to how private competitive industries are willing to try new things and "quickly abandon the ones that don't work and more deeply pursue the ones that do seem to be working."

Even though utilities aren't a competitive industry, understanding how companies speed up the process effectively is the whole point. And doing that means having a better defined scope, measuring and tracking outcomes, and building in decision points for continued progress.

"Hopefully, the webinar series provides enough background to illustrate why folks in the public power sector might want to pursue these types of things," said Cappers. "This can really achieve objectives that you, as a public power utility, are inherently interested in."

Cappers hopes the technical assistance LBNL is offering will help the selected utilities overcome some of the staffing limitation barriers and might even help the utilities identify opportunities for financial support through grants or other mechanisms at DOE or other entities.

Kaukauna Utilities' willingness to try new ways of working with technologies is why Pahl believes the public power utility received a Grid Resilience and Innovation Partnerships grant from the Department of Energy in 2025. The funding is helping the utility to explore integrating battery storage into a substation to create an uninterruptible power supply. The idea is for the battery to be able to leverage supply from three hydropower facilities to sustain power to customers in the event of long duration outages. With that comes more distribution technologies, like reclosers, to allow it to sectionalize circuits and better manage load.

> **"It's pretty cool what we can accomplish being that small and utilizing the help and the experiences of others."**
>
> **DAVE PAHL,** ENGINEERING AND OPERATIONS DIRECTOR, **KAUKAUNA UTILITIES,** WISCONSIN

"It allows us to actually switch load on and off to control the amount of load that the battery would see if there was an outage," said Pahl. "In the event of an outage, the battery, ideally, if we're at a net zero load condition, we could run indefinitely, as long as we had water in the river."

Having a culture that supports these endeavors starts at the top for Kaukauna Utilities.

"The commission challenges us on the leadership team to come up with these projects that are cost effective but meaningful," shared Pahl. He said connecting the exploration of technologies with the utility's mission helps provide a solid reason and focus for the commission, staff, and the community to get behind. Innovation is also baked into its organizational values. Pahl said the utility defines its value of continuous improvement as "innovating with intention."

That means finding the right balance between using staff and resources to maintain existing infrastructure and improving upon it.

Part of this balance is built into the governance of public power. Pahl noted how the regular reporting to and transparency with the commission around Kaukauna's innovation projects keeps the utility's leadership on top of the financials and other project details.

Pahl mentioned a geothermal project for heating and cooling the utility's offices that had to be scrapped due to significant cost increases between the proposal stage to when it would have been time to proceed.

Even with plans in hand and grant funding lined up, "the numbers didn't make sense anymore," Pahl shared. After much discussion, the utility proceeded with a more traditional system.

"Utilities have to be willing to walk away or change directions," he said.

Another barrier to innovation, in Kakaiya's view, is complexity, both in terms of technical knowledge and business risk. Building technical knowledge means supporting learning and sharing opportunities for staff, which CPS Energy does by partnering with local universities and interacting with groups like EPRI and state and federal agencies.

"We have a lot of knowledge transfer activities we give our engineers opportunity to be part of. We're continuously learning from the conglomerate of utilities," which Kakaiya said involved looking at how peer utilities have operationalized technologies or updated workflows. Kakaiya also said having a solid ecosystem of vendors that can supplement internal expertise and ideas enables innovation.

Kaukauna's willingness to innovate gets it attention from people at other public power utilities, whom Pahl said often have questions or seek advice in pursuing similar projects or technology systems.

"That information sharing is just as important as getting the technology itself," added Pahl. To support knowledge exchange, Kaukauna Utilities participates in industry conferences as well as R&D collaboratives including EPRI and APPA's Demonstration of Energy and Efficiency Developments, or DEED, program.

"Like many [public power utilities], we're all wearing multiple hats. But it's pretty cool what we can accomplish being that small and utilizing the help and the experiences of others."

Finding Flexible Capacity

How Public Power Sees the Promise in Virtual Power Plants

BY LISA COHN, CONTRIBUTING WRITER

As more distributed energy resources and smart devices join the grid, utilities are looking at how to engage customers to be able to manage these assets as a virtual power plant.

Virtual power plants, or VPPs, are aggregated resources — thermostats, electric vehicle charging, rooftop solar systems, batteries, smart appliances, and other devices — that utilities can manage as grid capacity, especially during periods of peak demand. These adjustments, taken together and controlled through a software system, can reduce peak demand and lower the costs of investing in new infrastructure to meet peaks. That, in turn, can reduce rates for customers.

The proliferation of customer-sited resources, along with the advancement of management software and capabilities, has translated to big numbers for VPPs. The Department of Energy estimates that there are 30–60 gigawatts of capacity in VPP programs across the U.S.

"VPPs give utilities access to this flexible capacity and reduce the need for new generation," said Zach Borton, distributed energy resources manager at Platte River Power Authority, a joint action agency serving public power utilities in Colorado. "This creates a new opportunity for us to manage our cost to serve."

AI rendering of Longmont, CO, courtesy Platte River Power Authority

Getting Started

To create VPPs, utilities need to invest in distributed energy resource management systems, or DERMS. These software systems serve as the "brains" that help VPPs connect distributed energy resources across the system to the power grid. They provide real-time visibility into the grid's edge to "see" what the distributed resources are doing in the moment. The systems also tap into technologies on the distribution grid, such as traditional metering, and obtain information from the broader market on real-time prices, peak-demand timing, and which renewables are on the system, Borton explained.

The infrastructure and technologies required for VPPs include customer-connected devices, communication networks, data-integration systems, VPP software platforms, and operational data platforms that provide a view into demand and generation in real time.

"It's really not as simple as saying, 'It's a VPP software that you just open up and press start.' The goal is to get all of these systems to end in one single pane of glass," Borton said.

To address this issue, Platte River has an EnergyHub DERMS that allows it to bring all customer devices into the program and dispatch them.

Seeing Benefits

Public power providers deploying VPP programs often have ambitious goals of slicing their peak demand.

Austin Energy in Texas aims to create 270 megawatts of flexible load by 2035 through all its demand response programs, said Hammad Chaudhry, director of energy efficiency at the public power utility. Central to this strategy is transforming its demand response programs into a more formal VPP that includes batteries, smart thermostats, EV managed-charging, and commercial demand response.

Demand response is not new to the utility. It began its smart thermostat program, Power Partner Thermostat, in 2016 and now has about 38,000 participants. As of July 2026, Austin Energy said it had called about five events in the summer through its DERMS partner, EnergyHub, during which thermostats are turned up on hot days.

The utility also operates a managed-charging program, Power Partner EV, for approximately 1,000 EVs on its system. As part of its EV program, Austin Energy also manages the charging for 250 electric vehicles in the city's fleet.

"It's really not as simple as saying, 'It's a VPP software that you just open up and press start.' The goal is to get all of these systems to end in one single pane of glass."

ZACH BORTON, DISTRIBUTED ENERGY RESOURCES MANAGER, **PLATTE RIVER POWER AUTHORITY,** COLORADO

Borton noted that implementing a VPP takes numerous steps and considerable time to ensure that the programs and processes are working correctly and as efficiently as possible for both end use customers and the utilities involved.

"Our organization is looking ahead to a time when the VPP helps to better align available renewables, supports peak reduction, and enables customer engagement in the energy transition," Borton said. "The VPP essentially better aligns electricity demand with the available renewable generation at that time. It will help reduce the peak demand during periods where renewables aren't available, or are less available, and try to shift that energy to times where that renewable is available."

Platte River's VPP will help maintain dispatchability for reliability, affordability, and financial sustainability as the JAA's renewable generation options increase, he said. The JAA aims to create 20 MW of flexible customer load by 2030, in addition to 20 MW of distributed utility batteries in each member community. That would require 15,000 to 20,000 devices to participate. The authority offers advisory services as well as rebates for thermostats and incentives for electrical panel upgrades and public charging equipment.

As it builds its VPP, Platte River wants to help the larger grid by absorbing excess renewable energy that would otherwise be wasted. Through the VPP, that renewable energy could be absorbed by a water heater, an EV's battery, or other technologies.

Smart thermostats and EVs are the most proven and scalable technologies for VPPs, Borton said. Smart thermostats are most helpful during grid emergencies and EVs can provide flexible capacity.

Platte River has about 15,000 EVs in its service territory, representing roughly 10-14 MW of peak demand on any given day and roughly 60,000 megawatt-hours annually. The goal of the VPP, through managed charging, is to align charging with lower-cost renewable production periods.

"We want to enable both that emergency lever and that flex to then understand, 'What are the operational experiences and the lessons learned that allow us to create this foundation for future programs?'" Borton said.

Encouraging Participation

Public power shines at partnering with customers — and that's exactly what's needed to make a VPP program successful, Borton said.

Platte River's goal is to acquire capacity through the VPP while maintaining affordability and financial sustainability in alignment with other dispatchable resources.

To aid the recruitment process, Platte River is focusing on making it as easy as possible for customers to sign up, and understanding what's driving their behaviors, from when they enroll to when they opt out, override program controls, and take other actions.

"We want to find out what the right amount of engagement is that keeps the customer engaged over time and participating," Borton said.

Austin Energy also offers a customer battery program in which it aggregates energy from residential batteries during peak demand periods. The utility offers a $500 upfront incentive to help homeowners purchase batteries and is working with customers who already have them. An additional $500 incentive is available for people to participate in demand response events. The utility also offers a performance incentive of $75 per average kW that batteries shave off of the utility's peak. That can add up to about $325 a year in payments for customers, Chaudhry said.

Launched in late March, the battery program has more than 100 participants and nearly 200 battery systems. A demand response event conducted in June with the 200 batteries shaved nearly 1 MW off the utility's peak demand, he said.

Qualifying batteries include Tesla, FranklinWH, Generac, and SolarEdge. In the future, Austin Energy hopes to use the batteries to perform energy arbitrage, using stored energy to reduce customer prices when energy is most expensive.

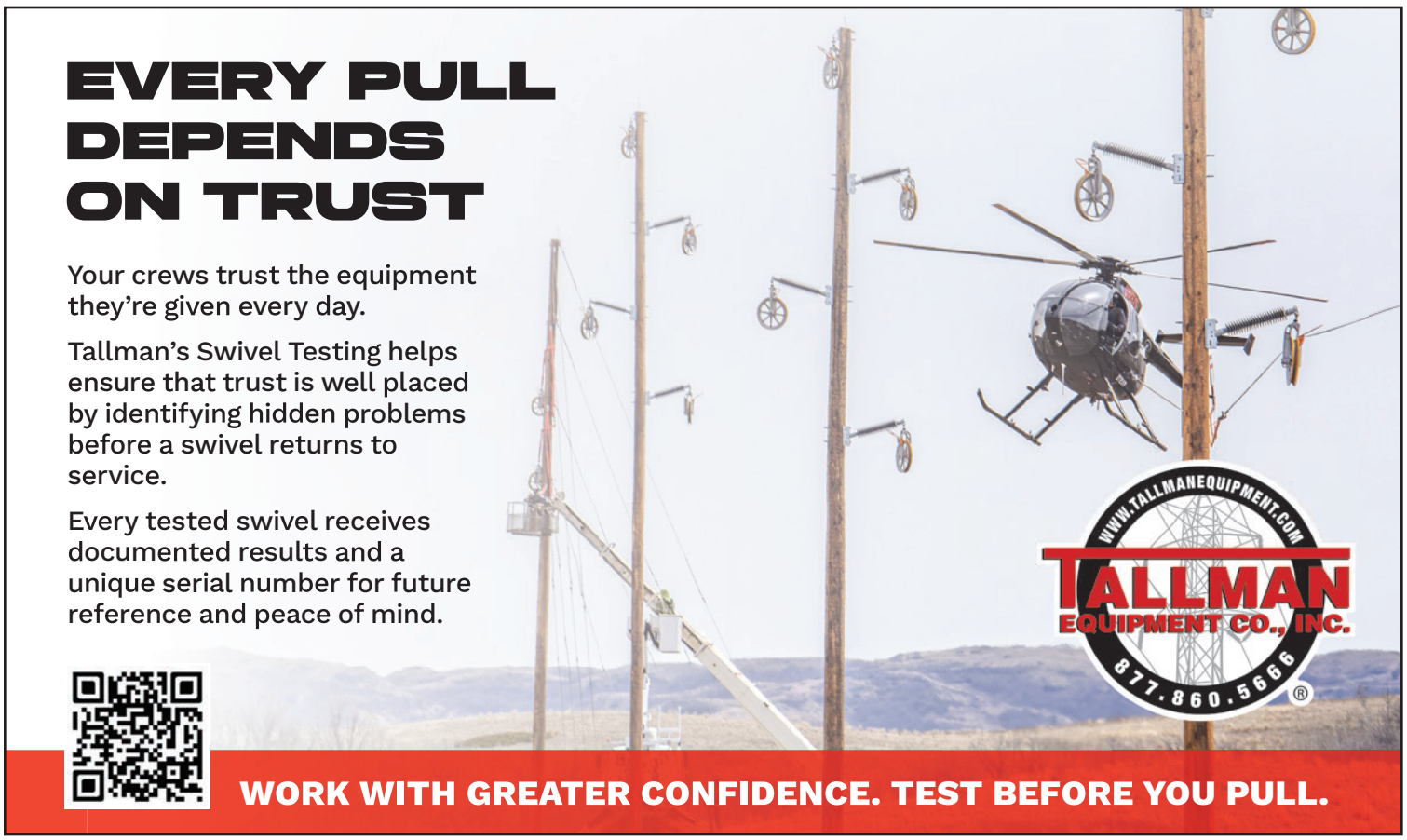
One challenge to expanding the battery program is working with manufacturers whose systems can communicate with EnergyHub. Another is finding original equipment manufacturers to participate in the EV program. Right now, only General Motors and Tesla are participating. The utility is using telematics in their vehicles to automatically collect and send live data from EVs to the DERMS, said Chaudhry.

"There's quite a bit of work in the back end that needs to happen before we can enroll a manufacturer," Chaudhry said.

He shared there are a variety of considerations and logistics involved as Austin builds its VPP program. "Our stakeholders are very energy savvy. They have a lot of expectations of us," he said.

In addition, the utility is experimenting with how to market its programs to customers, including which marketing channels to employ.

"We want to make sure that the technologies can bring value to the customers, utility, and community. We do market



"We want to make sure that the technologies can bring value to the customers, utility, and community. We do market research, investigate whether the technology is good enough, and if the market exists for it."

HAMMAD CHAUDHRY, DIRECTOR OF ENERGY EFFICIENCY, **AUSTIN ENERGY,** TEXAS

research, investigate whether the technology is good enough, and if the market exists for it," Chaudhry said. And because the programs are ratepayer funded, it's critical that every dollar invested is cost-effective, he added.

Still, he sees VPP programs as helpful means to public power utilities achieving their goals and moving toward a cleaner energy future, he said.

Connecting More

In Massachusetts, the Massachusetts Municipal Wholesale Electric Company launched its VPP program in 2020, said Zoe Eckert, sustainable energy program and policy senior manager. The Connected Homes program allows Massachusetts public power utilities to enroll customer Wi-Fi thermostats, EVs, EV chargers, and residential batteries, among other devices.

MMWEC now has over 4,500 devices enrolled, including more than 15 batteries; 1,000 EVs and EV chargers; 3,000 heating, ventilation, and cooling devices; and 75 water heaters. This adds up to more than 10 MW available for each demand response event across the state, Eckert said. Residential batteries and EVs contribute most to the Connected Homes program.

Under its battery program, which added an integration for Tesla Powerwalls in December 2025, MMWEC aggregated 15 residential batteries for 18 public power utilities participating in the program.

"We're dispatching those to either cover the home's load or cover the home load and then push any excess to the grid during peak demand times," she said.

From January through May 2026, MMWEC had 15 batteries enrolled that reduced peak demand by 600 kW.

To date, those customers have all enrolled Tesla Powerwalls in the program, but the program also includes integrations with Emporia and Duracell batteries, with Franklin and Enphase coming soon.

MMWEC has also helped Massachusetts public power utilities participate in the Massachusetts Clean Energy Center's bidirectional pilot program, in which EVs are used to send power to the grid or to homes. The participating public power utilities set their own policies on bidirectional charging interconnection, net metering, and demand response incentives, and MMWEC serves as a resource.

"EVs are probably the most powerful bucket that we've got in Connected Homes, just with the number of EVs we have enrolled and the amount of energy they're using on the grid," Eckert said.

Depending on the utility, customers can earn $5–$30 per month by enrolling in the Connected Homes program. Batteries receive $30 a month.

If a battery is sending energy to the grid, the battery owner is compensated through individual utilities' net metering programs.

MMWEC runs its Connected Homes program through a DERMS provider to manage participating devices.

A manufacturer like Tesla must have an application programming interface, or API, integration with the DERMS provider for MMWEC to reach each device via Wi-Fi.

"We have to be able to reach this technology in some way in order for us to be able to control what it's doing with its energy, whether it's just simple curtailment or movement of energy to and from the device to the grid," Eckert explained.

A VPP can help solve local constraints, Eckert noted. Some utilities install batteries in parts of town that would otherwise require new infrastructure, delaying upgrades.

As public power utilities pursue such efforts, engaging with the community is critical, she said.

> **"Customers really have to trust the utility if they're offering up their devices."**
>
> **ZOE ECKERT,** SUSTAINABLE ENERGY PROGRAM AND POLICY SENIOR MANAGER,
> **MASSACHUSETTS MUNICIPAL WHOLESALE ELECTRIC COMPANY**

"VPPs lend themselves well to the community engagement portion that public power really excels at," she said. "Customers really have to trust the utility if they're offering up their devices."

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How Technology Changes Energy Use

As people gain access to technologies and devices that generate, store, and use electricity, how and when they use electricity also changes. Here are a few ways technologies change how people use electricity.

The average U.S. household used **10,791** **kilowatt-hours** of electricity in 2022.[1]

Electric Vehicles

Households with EVs used an average of **2,363 kWh** for EV charging in 2020.[2]

A Pecan Street analysis found that most EV drivers charge overnight, but almost a third charge during evening peak hours.[3]

17%	30%	53%
6:00am – 3:00pm	4:00pm – 9:00pm	10:00pm – 5:00am

Smart Devices

Smart devices shift usage patterns and aim to improve overall energy efficiency.

- Smart thermostats reduce HVAC use by **8%-20%** [4,5]
- Smart lighting, that dims or adjusts bulbs in high-use areas of the home can reduce energy use for lighting by **7-27%** [6]
- Smart appliances, such as washers and refrigerators, don't use less energy but shift usage to off-peak hours and can reduce electric bills **2-9%** for customers [6]

Solar and Storage

While installing solar panels can lead to using less energy from the grid, installing solar panels tends to have a "rebound effect" where homes consume about **18%** more electricity than they used before having onsite generation.[7]

Homes with solar who also add battery storage typically increase their total usage by **324-591 kWh**.[8]

1 Residential Energy Consumption Survey. U.S. Energy Information Administration. www.eia.gov/tools/faqs/faq.php?id=97&t=3
2 Department of Energy Transportation Technologies Office. www.energy.gov/cmei/vehicles/articles/fotw-1307-september-11-2023-electric-vehicle-charging-consumed-less-energy
3 "Charging Data Shows How EVs Can Ease the Grid," Pecan Street. www.pecanstreet.org/2025/05/evcharging data/
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PUBLIC POWER COMMUNITIES

SPENCER, IOWA

POPULATION: **11,218**
UTILITY FORMED: **1901**
ELECTRIC CUSTOMERS: **6,384**
UTILITY EMPLOYEES: **34**

The foundations of civic life in Spencer, Iowa — the town's first school, flour mill, and post office — were built before the town was officially founded in 1871. Steven Pick, general manager and CEO at Spencer Municipal Utilities, said the basis for the town's electric system followed soon after, when an electric light plant was formed in 1891. A decade later, in 1901, the city officially took over the electric system. When the town voted to move the utility under a separate board of trustees in 1942, they christened its electric system Spencer Municipal Utilities, which has retained its structure and charter through today.

Spencer quickly became a hub for commerce and industry upon its founding, and the town remains the economic heart of Clay County over 150 years later. This vitality is interwoven with the town's welcoming, civic-minded spirit. "We have a supportive community with the city, chamber, economic development, education, and healthcare systems that all work together to make Spencer shine," Pick said.

The local hospital continues to work toward improving access to healthcare for the surrounding rural communities, including adding Abben Cancer Center, which partners with the University of Iowa to provide specialized oncology treatment.

Spencer is also home to the Clay County Fair, a gathering that has been held in September each year since 1918 and stands as one of the largest county fairs in the U.S., drawing over 300,000 attendees annually. The fair is a frequent stop for presidential candidates in election years.

The connection SMU's employees feel to the community informs their work, which Pick described as driven by a spirit of civic engagement and dedication to the town's well-being. "Working for a community-owned utility each day brings a sense of pride in the work that our team here at SMU does for the community. We really make it possible for the community to live, work, and play."

This dedication was especially important in the wake of flooding in 2024, caused by heavy rainfall that led to water surges from Little Sioux and Ocheyedan Rivers. The flooding, which the National Weather Service described as "historic," was abrupt and jarring for Spencer's residents, and Pick noted that electric staff worked overtime with assistance from other utilities under the APPA Mutual Aid Agreement to get power back online.

"One of the most impactful things we did for the community of Spencer was our response to the 2024 flood. Our staff worked diligently to get services restored for customers, even while their own homes were also affected by the flood."

While SMU staff see themselves as stewards of the town's culture and safety, they are also focused on developing a future-forward energy grid.

"We are in the planning stages to replace our local electric generation plant," shared Amanda Gloyd, SMU's marketing and community relations manager. "We are also working on a battery energy-storage project to benefit from periods of low-priced market energy."

This commitment to ensuring Spencer's grid will support future generations ties back to the public power utility's core mission, which Gloyd summarized as "making sure we are prepared for our community's continued success."

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Public Power Leaders: **Edwin Porter**

Edwin Porter has served as the executive director of infrastructure for the city of Hamilton, Ohio, since 2021. He first joined the public power utility as a supervising mechanical engineer in 2017. He previously worked at CH2M, where he specialized in engineering consulting around critical infrastructure projects. Porter holds a Bachelor of Science in mechanical engineering from the University of Cincinnati and is a 2025 recipient of the Mark Crisson Leadership and Managerial Excellence Award from the American Public Power Association. Under Porter's leadership, the city of Hamilton won APPA's E.F. Scattergood System Achievement Award in 2022.

WHAT BROUGHT YOU TO YOUR CAREER IN PUBLIC POWER?

I spent the first 10 years of my career in engineering consulting and was educated as a mechanical engineer. That experience provided me with the opportunity to work on a diverse set of projects across a range of innovative companies, which I really enjoyed. After having a conversation with the Hamilton infrastructure leadership team, I was blown away by the complexity of the work that the city was responsible for. It was clear that the team was driven by the importance of their work and how much it directly supported the community. The position offered me new opportunities to grow and aligned with my values as well.

The number one thing I enjoy most about public power is serving people. I put my heart and soul into everything that I do and working in public power gives me great satisfaction, because I know that the outcome of my efforts is directly benefiting others.

WHAT HAS BEEN YOUR LEADERSHIP PHILOSOPHY AT THE CITY OF HAMILTON?

I believe that every individual contributor has their own talents, which is a principle all of Hamilton's leadership follows. We work to remove barriers and empower each individual to contribute at their highest level while defining ahead of time what the end product should look like and how each team member's specific talents and experience can work toward that shared goal. We've found this goes a long way for delivering exceptional results.

WHAT KIND OF IMPROVEMENTS HAS HAMILTON IMPLEMENTED UNDER YOUR LEADERSHIP, AND HOW HAVE ANY TECH UPGRADES HELPED?

In terms of reliability, our most impactful program has been a comprehensive tree-trimming initiative. Hamilton has a significant overhead distribution system, and we've spent the past 10 years trimming around that system circuit by circuit. This program reduced outages from drooping and broken branches, wind, fallen trees, and wildlife. Other reliability upgrades have included SF6 breaker implementation, lead cable replacement, and direct buried cable replacement.

We've also overseen the implementation of a drone program to inspect distribution and transmission lines, pole conditions, and vegetation issues. This program has saved time and money and shortened the recovery time when there are outages. Five members of the Hamilton team have gone through extensive training and licensing to support this initiative.

On the grid modernization side, the team started with data collection through devices such as lidar, and we used that information to identify and prioritize the most impactful projects, such as SCADA and outage management system upgrades and improvements to our underground network. In addition, our team invested in peak-shaving assets to support the system and lower consumption during peak demand hours.

Hamilton also built a new substation to support our enterprise park, and the vast majority of the construction was performed by Hamilton employees. Our new substation, along with our underground duct bank, gave us the reliability needed to support existing industrial customers while attracting new customers to the complex. On the safety side, we've developed a strategy to temporarily adjust the arc flash safety settings in the protective relaying. These settings lower the trip threshold in the circuit when work is being completed in the system.

Our team has implemented several initiatives that are aimed at improving customer service. One has been developing an electrical outage map and accompanying text notifications. We fully understand that an interruption to electric service is frustrating and undesirable, and it became even more frustrating when our community members would call us and experience call drop due to high volume. Bill Hudson, our director of utility operations, and Ken Carrier, our director of information technology services, partnered to develop outage communication tools. Now, when there's an outage, our customers who choose to sign up for communications are notified via text that there's an outage at their property. This debuted alongside an outage map that shows predicted and known outages. A lot of the time, people just want to know that we're aware of the outages and working to get everything restored.

WHAT ARE YOU PROUDEST OF HAVING ACHIEVED AT HAMILTON SO FAR?

I'm especially proud of how our team has worked to provide the highest level of service possible and how this earned us both the Diamond designation under APPA's Reliable Public Power Provider program as well as the E.F. Scattergood System Achievement Award. We're foremost proud of the work we've put into our system and the quality of service that allowed us to earn those awards, and how that work has supported Hamilton itself.

I'm also proud of the work that has gone into building financial stability across all of Hamilton's utilities. There needs to be a balance between operations and maintenance cost, capital investment, debt service, fund balances, and utility rates. While Hamilton is strategically focused on moving toward rate plans that support the cost of service, we've also established the necessary support for our capital projects. That's going to provide the expected level of service now and for Hamilton's subsequent generations. Looking to the future, my goal is to support continuous organizational improvement through developing a strategic plan, executing that plan, checking the results of that execution, and adjusting as necessary so our team can continue providing the highest level of service at the most economical rate.

Leveraging Storage for a More Flexible, Resilient Grid

How Public Power Is Getting Involved in Battery Storage

BY ADAM PATTERSON, CONTENT SPECIALIST, AMERICAN PUBLIC POWER ASSOCIATION

Danville, Virginia, energy storage facility. Photo courtesy Sanjay Suchak/Lightshift Energy

Energy storage has become a considerable part of the U.S. capacity picture over the past decade, bolstered by a combination of technical advancements, transmission cost, and policy support mostly focused on battery storage.

According to the U.S. Energy Information Administration, utility-scale battery storage capacity has increased 70% in each of the past three years, jumping from 9 gigawatts in 2023 to nearly 52 GW in operation at the end of June 2026. Another 54 GW of battery storage is anticipated to be brought online by the end of 2029.

As of 2024, systems owned by public power represented about 0.5% of all utility-scale energy storage capacity across the U.S., though many public power utilities contract with third parties to leverage storage assets. As the battery market and tax credit landscape continue to shift, public power, including smaller municipal departments, have been increasingly exploring whether direct ownership of battery storage systems will yield greater benefits for peak shaving and reliability.

Finding Stability

Virginia's Blue Ridge Power Agency supports nine smaller municipal and cooperative utilities throughout the state. BRPA recently announced a partnership with Lightshift Energy to deploy a portfolio of five individual 5-megawatt battery storage facilities across Central Virginia Electric Cooperative, Craig-Botetourt Electric Cooperative, and the Salem Electric Department.

The joint action agency has taken a coordination and project planning role in the development of rural battery storage to get ahead of rising cost pressures.

"The number one reason we began looking into it was rising transmission costs, which have skyrocketed in the last decade or so," said BRPA General Manager Alice Wolfe.

Wolfe noted that the rise in transmission costs has been "well beyond the pace of inflation" and estimated that BRPA, which serves utilities within the PJM interconnection, has seen these expenses quintuple over the past 15 years.

When the BRPA members first began looking at battery storage, several members were under contracts that prohibited them from bringing new generation online.

"The plan was that the batteries would be fully charged by [Appalachian Power Company], we would just discharging them at different times," Wolfe said, "So, we wouldn't be generating new megawatt-hours, we'd just shift when those megawatt-hours are being used."

BRPA put out a request for proposal in 2021 that would support these five battery projects together. The RFP drew multiple industry submissions, and the JAA ultimately settled on Lightshift Energy.

"We went through serious negotiations with three different parties," she said. "The battery market has been in flux over the last few years, especially with the release of the tax credits for standalone battery storage, which kind of threw a bomb into the middle of our negotiations."

Wolfe said Lightshift Energy showed a willingness to take the projects on in part because working with public power is a strategic focus area for the company.

"Other developers were looking for larger installations, but Lightshift has a history of working with public power and already came with good recommendations from a nearby project in Danville, Virginia," Wolfe explained.

"The number one reason we began looking into it was rising transmission costs, which have skyrocketed in the last decade or so."

ALICE WOLFE, GENERAL MANAGER,
BLUE RIDGE POWER AGENCY, VIRGINIA

The batteries are expected to go online before the close of 2026 and are forecast over their lifetimes to save BRPA's member utilities around $100 million.

Wolfe sees the support BRPA has marshaled behind these smaller, rural battery installations as also being helpful in mitigating capacity costs, which have increased substantially in the PJM region.

"I've worked in public power for 15 years now, and we have always had the same message: We want our members to stabilize their rates, we want them to be looking at everything, and we try to get our rates as low as we can. We also want them to look ahead and make purchases that will help them stabilize their rates regardless of anything else going on. It's just the right thing to do," Wolfe said.

A Cost-Conscious Choice

Princeton, a town of 3,500 residents in central Massachusetts, is one of a handful of public power utilities in the state in the process of building its own energy storage.

Sean McKeon, general manager at Princeton Municipal Light Department, said the utility first began considering battery storage as a means of sustaining its low rates. "In 2020, we had a tight budget due to paying down debt on our two wind turbines. We had gone a few years without raising rates at that point, and we made it a goal to go as long as possible without changing that."

PMLD previously rented a 2-MW peak-shaving generator that brought considerable returns over the summertime but would have been expensive to rent long-term. The utility was cautious about exploring capital-intensive projects after having recently invested in the turbines.

"We didn't have a big war chest of cash, and we understood taxpayers in Princeton wouldn't be tolerant of another big capital project like the wind turbines. So, I had to find solutions that wouldn't cost us money," McKeon said.

PMLD's JAA, Massachusetts Municipal Wholesale Electric Company, began offering competitive solicitation models in 2022 that would allow the public power utility to bring battery storage online.

"[MMWEC] offered two ways to do it. One was a capital project where you bought the battery. The second was a shared-savings model, which all of the participating utilities — us included — went with," McKeon said.

MMWEC also chose Lightshift Energy as its development partner, with both entities providing the support and resources needed to bring battery storage to six participating utilities.

"I didn't have all of the technical knowledge, which MMWEC was able to provide. They also took care of the legal side of things as well, so we didn't need to draw up our own contracts, either. It handed considerable cost and time savings to all of us," McKeon said.

He added that PMLD does not have the expense of developing the project, since the way the model is set up means Lightshift develops, owns, and operates the assets, "while

Photo courtesy Sanjay Suchak/Lightshift Energy

PMLD captures a portion of the savings without carrying the capital cost or the operating risk."

The expectation is that adding the battery storage will help Princeton to sustain its "nine-year record of rate stability by reducing the transmission and capacity charges that make up a significant portion of our wholesale power costs," McKeon said.

While PMLD is waiting for an accompanying transmission study to conclude before proceeding with the project, McKeon was confident the results will prove beneficial for the town's rates and service quality.

"At the end of the day, we're doing this to make sure our customers can continue to enjoy the same affordable rates we pride ourselves on," he said.

Evaluating Opportunity

Other public power utilities are looking not only at utility-developed large-scale batteries, but also how to encourage

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> **"We didn't have a big war chest of cash, and we understood taxpayers in Princeton wouldn't be tolerant of another big capital project like the wind turbines. So, I had to find solutions that wouldn't cost us money."**
>
> **SEAN MCKEON,** GENERAL MANAGER, **PRINCETON MUNICIPAL LIGHT DEPARTMENT,** MASSACHUSSETTS

organic distributed storage development in their service territories.

Newark, Delaware, was awarded a $250,000 grant in 2025 to study opportunities around public-private partnerships and the development of community-wide renewable energy and battery storage. The public power utility used the grant to consider how distributed battery storage could be integrated within its system, including the best financing and project management approaches.

A portion of Newark's grant funding was used to conduct a study to determine the technical and economic impacts of distributed energy storage, and what kind of battery program could be feasibly developed to incentive customer installations.

As a first step, Newark examined how other municipal utilities had successfully offered battery incentives to their customers. "We looked at other utilities around the country at what kind of battery programs they had, specifically focusing on municipal utilities that were of a similar size," said Lucas Beidler, distribution engineer at City of Newark.

The city also oversaw a wholesale regulatory analysis of the federal, state, and local-level battery landscape while modeling how the grid might accommodate, and benefit from, various levels of battery penetration. This culminated in financial planning evaluation to determine how the utility could benefit from distributed storage as well as how the utility could help customers fund installations.

As Beidler outlined, prior to the implementation of Federal Energy Regulatory Commission Order 2222, which will enable aggregated distributed storage to participate in the PJM ancillary services market, the greatest return on investment from distributed batteries would come from peak shaving. "So much of the power of energy storage lies in its potential for utilities

"So much of the power of energy storage lies in its potential for utilities to peak shave, especially as peak costs continue to climb amidst grid electrification, data centers, and other pressures. Doing an analysis to figure out how much money you can save from peak shaving is essential to understand when planning these projects."

LUCAS BEIDLER, DISTRIBUTION ENGINEER
CITY OF NEWARK, DELAWARE

to peak shave, especially as peak costs continue to climb amidst grid electrification, data centers, and other pressures. Doing an analysis to figure out how much money you can save from peak shaving is essential to understand when planning these projects."

Other than a distributed storage program, Newark is also pursuing utility-scale storage and is in the stage of evaluating a project with support from joint -action agency Delaware Municipal Electric Corporation, which has experience advising on similar projects.

"DEMEC just finished a battery project in Milford, Delaware, that went online this year. It's got a solar soaking application and is doing peak shaving, and DEMEC is using their experience to help us as well," Beidler said.

The city has settled on an initial investment in a substation battery it hopes will support both peak shaving and grid resilience.

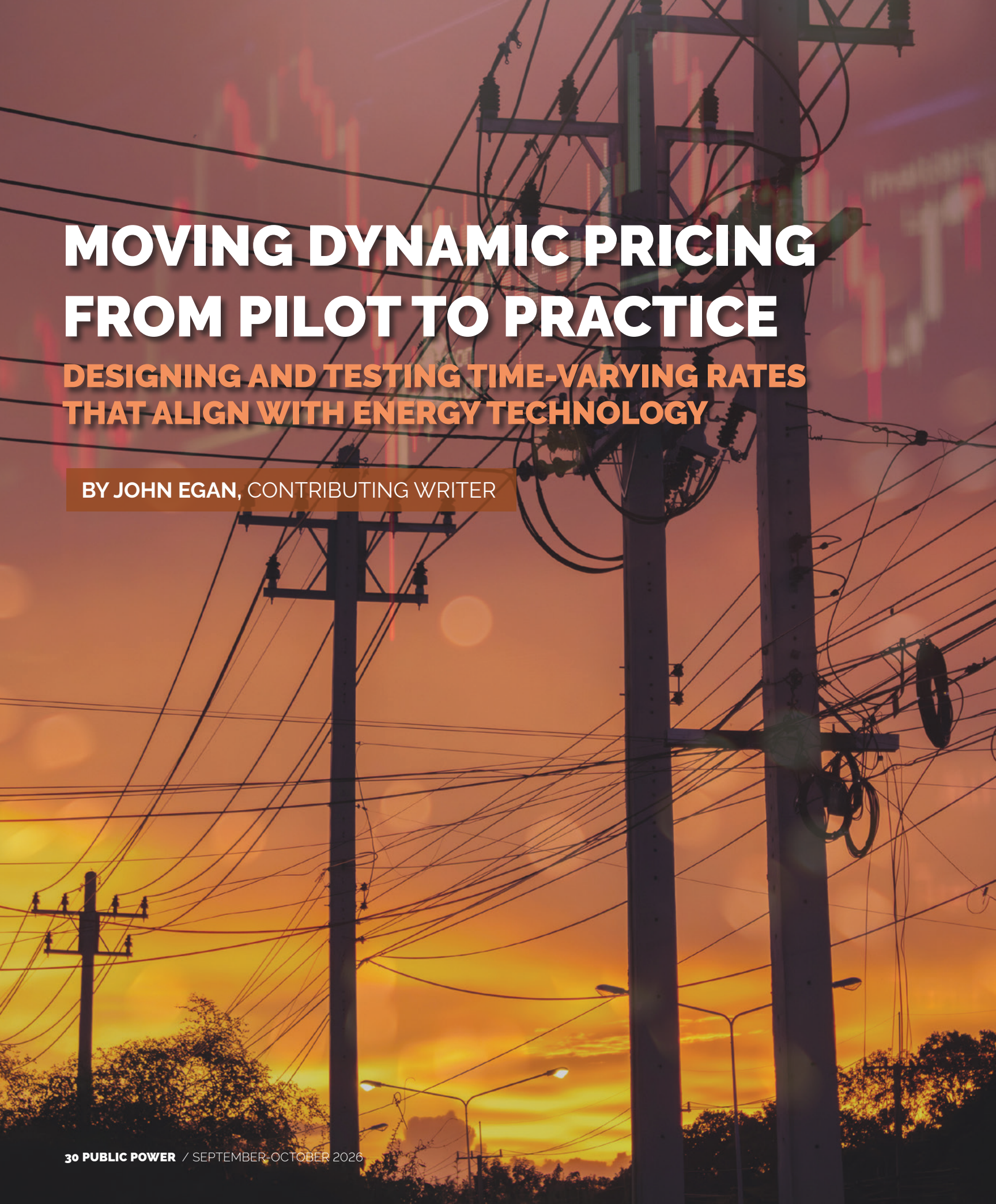
"We're in the early stages, but I would guess we're looking at a 5-MW battery as our pilot," he said.

As for financing, Newark is exploring the possibility of a performance contract where debt service on the corresponding loan is paid for by energy savings, which would mean little or no net cost for the utility.

Beidler sees this exploration of battery storage not just as an endpoint unto itself, but as a crucial step within a broader program of innovation that will help the public power utility to keep pace with technical and regulatory developments while allowing customers to participate. Beginning to encourage and utilize a portfolio of distributed storage today will enable future energy savings for the utility as the smart grid evolves.

"Some of our customers want to get involved with virtual power plants, and we want to support our customers being able to do that with things like bidirectional electric vehicle chargers. With FERC Order 2222 being implemented in our region by 2028, it will enable virtual power plants to participate in the PJM market. So, that's the kind of timeline we would like to meet," Beidler said.

Utilities developing energy storage can also review APPA's Public Power Energy Storage Project Plan Guide, a step-by-step overview of how to compile a comprehensive implementation plan for energy storage projects. The guide is the latest among APPA's catalog of publications on energy storage.



MOVING DYNAMIC PRICING FROM PILOT TO PRACTICE

DESIGNING AND TESTING TIME-VARYING RATES THAT ALIGN WITH ENERGY TECHNOLOGY

BY JOHN EGAN, CONTRIBUTING WRITER

Time-varying electricity prices are not new. Certain electricity providers have offered residential customers some form of dynamic pricing for decades. But a growing number of utilities are turning to time-of-use, real-time, variable peak, or critical peak pricing models in response to changing market conditions and to accommodate or shape usage patterns related to new technologies.

According to the Energy Information Administration, about 860 utilities reported having customers enrolled in a dynamic pricing program in 2024. Of those, more than 620, including over 230 public power utilities, had a time-of-use rate. The most common TOU pricing is for commercial customers, but utilities that offer a residential TOU rate are on the rise. Research from The Brattle Group estimated that 15% of U.S. households were on time-variant electricity plans in 2025, up from just 4% in 2018.

Often, implementing these price plans requires utilities to deploy, upgrade, or replace grid technologies, from meters to the customer billing system. For many utilities, these investments provide returns in terms of delivering customer savings, reducing peak demand, and leveraging distributed and variable assets.

Encouraging Electrification

Concord Municipal Light Plant in Massachusetts first introduced opt-in TOU prices in 2008, shortly after installing advanced digital meters, to support customers who wanted to buy electric vehicles or install heat pumps or rooftop solar panels. Its initial enrollment drew fewer than 100 participants from its 8,300 customers.

In 2020, the town of Concord elevated the importance of electrification in its first Climate Action and Resilience Plan. But the increased use of electricity as an alternative to gas- and oil-fueled stoves, heating, and cars has an unwelcome side effect: higher electric bills.

CMLP, which serves the community about 15 miles northwest of Boston, also faces growing costs stemming from transmission and generation constraints. When peak demand increases, ISO New England often falls back on diesel generators to meet the need, which conflicts with the town's environmental goals.

"Like many utilities, we had long relied on inclining block prices," said Jason Bulger, director of CMLP. "We introduced TOU rates in 2008 as part of our effort to support customers and achieve our electrification goals. But as customers increasingly chose electric technologies over ones powered by fossil fuels, their electric bills rose. Those customers said they were feeling punished for doing what we asked them to do, which was use more electricity because it was a cleaner and more efficient energy option."

Earlier this year, CMLP introduced a three-part time-of-day, or TOD, residential pricing plan that includes peak hours from 3–7 pm and "super off-peak" hours from 1–5 am.

"Overall, our goal is to encourage load shifting and provide greater benefits to customers with electric vehicles and heat pumps," Bulger said.

The idea behind super off-peak periods is to persuade customers with EVs to charge their vehicles when demand, and wholesale electric prices, are lowest.

"Our hope is that our new TOD prices, which became effective in April 2026, better aligns incentives," explained Laura Scott, assistant director for power supply and energy management at CMLP. "We want to continue promoting electrification while ensuring fairness, reducing peak demand, and supporting the town's climate action plan."

"Our goal is to encourage load shifting and provide greater benefits to customers with electric vehicles and heat pumps."

JASON BULGER, DIRECTOR,
CONCORD MUNICIPAL LIGHT PLANT, MASSACHUSETTS

Jason Bulger and Laura Scott, Concord Municipal Light Plant, Massachusetts

The public power utility decided to make the new prices opt-out rather than opt-in because its experience, as well as the experience of utilities across the country, had shown that few customers take the effort to enroll in a new program.

Now, nearly all CMLP's 6,500 residential customers are on the TOD plan — only about 10 have chosen to opt out so far. CMLP priced the opt out rate 4% higher than the TOD rate to account for the tendency of high peak users to choose the opt out rate.

Transitioning to TOD prices required replacing all 8,300 customer meters with advanced digital meters and upgrading the utility's billing software to more accurately track when electricity is used. Plans are underway to extend TOD pricing to the utility's nearly 2,000 commercial and industrial customers.

In light of the success of this first phase of the TOD rollout, CMLP is also planning to refine its rate structures to create a greater difference between peak and off-peak prices, a move intended to more accurately reflect actual transmission costs. These might go into effect as early as 2027 and would represent a more finely tuned approach to time-variable rate design.

Providing Choice

In South Carolina, Santee Cooper has explored time-varying price structures for over three decades. The state-owned public power authority first introduced a residential TOU price in 1995 that required changing the customer's meter and came with a higher monthly customer charge. There was no demand

component in that price plan, and most residential customers stayed on the standard flat-price rate structure.

In 2022, Santee Cooper introduced a voluntary, opt-in pilot price plan for EV owners. About 100 customers signed up, and the plan helped EV owners pay far less for power when charging their vehicles during super off-peak periods.

In 2025, the utility ended its flat-price option, migrating residential customers to a demand billing option, with the choice of moving to a TOU rate. The demand billing plan included a demand charge based on the customer's peak, while the TOU plan charged a higher price per kilowatt-hour during the system's peak usage period.

The overwhelming majority of Santee Cooper's residential customers, about 96%, are enrolled in the demand billing plan.

Some customers faced a learning curve on how demand charges work. The demand charge was set by multiplying a customer's highest demand for electricity during one three-hour peak period each month by $8. Under this plan, a 3-kilowatt peak demand resulted in a monthly demand charge of $24, and a 6-kW peak cost $48. This charge was coupled with a reduced energy charge, in addition to the monthly customer charge, taxes, and fees.

Recognizing how important electric bill predictability is to customers, the public power utility has proposed a revised suite of time-variant residential price plans that, if approved by its board of directors, will go into effect in early 2027. A new version of the demand billing plan, called Balanced Demand Billing, will average peak demand over multiple days (instead of just one) so customers won't see a disproportionate spike from one-off events, like throwing a party.

The utility developed the new pricing plan based on the usage patterns of two residential customer clusters: Year-round residents, who typically use a lot of energy fairly consistently throughout a month, and part-time residents, such as owners of

"People don't like to be told when to eat dinner. Instead, they need to be provided tools and options on what they could do, so they don't feel boxed in."

DEVIN RITTER, PRICING MANAGER,
SANTEE COOPER, SOUTH CAROLINA

vacation homes, who tend to use less electricity each month but have greater variability month to month.

"Reducing customer demand is an important strategy for us, so our goal was to get customers to lower usage during peak periods," said Devin Ritter, pricing manager at Santee Cooper. "But we also wanted to be fair to customers. We needed to align prices with costs. Customers who are using a greater proportion of their energy during peak periods need to pay those extra costs."

As it developed its new pricing proposals, Santee Cooper held customer focus groups, convened several open house meetings, and launched a comprehensive and award-winning communications plan, "Defeat the Peak. Bank the Savings," that included a humorous video in which two families, the Santees and the Coopers, engage in friendly competition to see which can lower their peak demand — and electric bill — the most.

The public power utility also posted a price calculator on its website to help customers assess which of the two available plans was best for them.

Ritter expects that the new balanced demand plan will reduce residential customers' billed peak demand by about 20%, from an average of approximately 5.2 kW to about 4.1 kW.

Ritter said this year's effort to change prices incorporates an important lesson from Santee Cooper's earlier forays into time-variant prices. "People don't like to be told when to eat dinner. Instead, they need to be provided tools and options on what they could do, so they don't feel boxed in."

Automating Actions

Customers of all kinds are seeing how energy technologies and electric prices can work in concert.

MCE is a community choice aggregator providing clean electricity to an estimated 600,000 accounts in four Northern California counties — Marin, Contra Costa, Napa, and Solano — in and around the Bay area. It serves a peak load of about 1,400 megawatts with a mix of 60%–100% renewable energy.

MCE has offered time-differentiated prices for many years. Its business model is partly driven by the unusual circumstances of the wholesale electric market in Northern California, where an oversupply of solar generation during midday summer pushes wholesale prices below zero. Over a year, below-zero prices occur an estimated 5%–10% of the time.

In MCE's experience, "TOU prices are a strong starting point for helping customers avoid higher-cost peak hours," said Jenna Tenney, director of communications and community engagement.

Most of MCE's TOU plans align with a peak period between 4 pm and 9 pm, though some plans have slightly different weekday peak hours.

"TOU rates provide a clear signal that electricity costs more during the 4 pm to 9 pm peak, when demand is high and solar production is low," continued Tenney. "But the greatest impact comes when customers have simple tools, education, and incentives to shift their energy use easily."

"The greatest impact comes when customers have simple tools, education, and incentives to shift their energy use easily."

JENNA TENNEY, DIRECTOR OF COMMUNICATIONS AND COMMUNITY ENGAGEMENT, **MCE,** CALIFORNIA

Tenney said MCE's focus has been on keeping programs simple. "Pair price changes with clear education and meaningful cost-based incentives, and make sure data and billing systems can support them," she shared.

In 2021, MCE piloted MCE Sync, in which participating customers could download a smartphone application that automated EV charging decisions. The program was opened to all customers in 2022. When electricity prices are lowest, typically during the middle of the day during the summer, the app automatically begins charging registered EVs that are plugged into its system. Roughly 6,000 customers are now on the program.

By automating the EV charging decision, Tenney said, MCE is following a set-it-and-forget-it approach that spares customers the need to track changing electricity prices or make decisions on a daily basis. "That makes MCE Sync a practical example of how dynamic pricing can turn a price signal into an easy customer action," she said.

When California ISO, the state's grid manager, needs extra electric capacity, MCE Sync can pause EV charging during peak hours as well. During one September heat wave, Tenney noted that participants shifted about 5 megawatt-hours of charging out of the 4–9 pm window, roughly equal to a day's electricity use for 300 households.

"TOU strengthens MCE's role in the community by turning local energy values into a customer-facing price signal," Tenney said. "It helps customers see when electricity costs more, helps them shift use when they can, and connect everyday choices to affordability, reliability, and cleaner energy. That is the value of local control — prices and programs are designed around community priorities."

WHAT ARE TIME-OF-USE RATES?

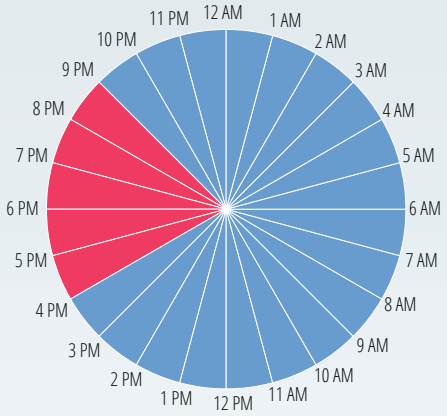
The cost of delivering electricity through the grid varies depending on how much people are using at a given time. Higher use, or demand, is associated with higher costs to generate, transmit, and deliver energy to customers.

Time-of-use, or TOU, rates are a simple type of time-varying rate that aim to better align the price of electricity with the cost to serve as it changes throughout the day.

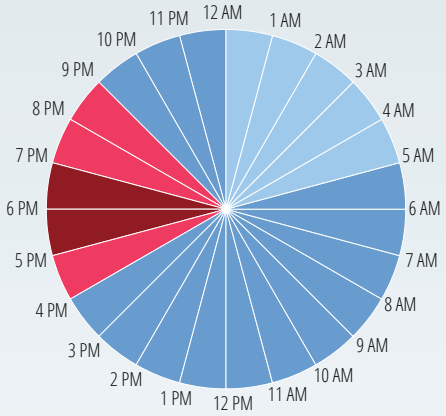
As of 2024, more than **620 utilities**, including **230 public power utilities**, offered a TOU rate.[1]

STRUCTURE

A typical TOU rate has distinct peak and off-peak periods, where the price is higher during peak hours, often weekdays during the late afternoon/early evening, and a lower price off-peak period that includes other hours when use is often lowest.



Some TOU rates include additional tiers, such as for the highest peak times or an even lower price for the lowest usage hours, such as late night.



TOU rates can also vary between weekdays and weekends, or between seasons.

Off hours= Lower price | Peak= Higher price | Lowest use hours = Lowest price | Highest peak= Highest price

PROS OF TOU RATES

Customers who can shift use to off-hours can reduce their electric bill.

When customers shift usage away from peak periods, peak demand goes down, enhancing grid resilience and reducing utility costs to serve.

On average, TOU rates see a 3%reduction in on-peak usage and a 1% increase in off-peak use.[2]

Customers with technologies such as smart appliances, electric vehicles, or energy storage can program or manage these assets to shift usage from the grid to lowest cost hours.

CONS OF TOU RATES

Customers who are unable to shift their usage to off-hours might see their electric bills increase.

Requires utility to do customer education to adapt to the change.

TIP: Allowing customers to opt out might help them avoid higher bills.

1. Annual Electric Power Industry Report, Final 2024 data, Energy Information Administration. www.eia.gov/electricity/data/eia861

2. "Different Prices for Different Slices: A Meta-Analysis of Time-Based Electricity Rates," Feb 2025. Resources for the Future. www.rff.org/publications/working-papers/different-prices-for-different-slices-a-meta-analysis-of-time-based-electricity-rates

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