



CPS Energy, SAWS, and the City of San Antonio

Building a cleaner, greener and future-ready San Antonio

CPS Energy, the largest municipally owned electric and natural gas utility in the United States, is supporting multi-commodity Advanced Metering Infrastructure, Distribution Automation, the largest ultrasonic water meter deployment in the country, and city-wide smart lighting – all on a single network platform.

WHY DOES SAN ANTONIO NEED SMART TECHNOLOGY NOW?

CPS Energy is the nation's largest municipally owned electric and natural gas utility, providing service to more than 907K electric and 374K natural gas customers over 1,566 square miles in the greater San Antonio area. CPS Energy is also a U.S. industry leader in delivering low utility rates, wind-energy capacity, solar generation, and technology innovation while demonstrating a proven commitment to investing in innovations that will meet the changing needs of the San Antonio community.

Like utilities and cities across the globe, CPS Energy is facing several growing challenges, driving the need for transformation. The effects of aging infrastructure are being intensified with a growing number of natural disasters. In fact, the Department of Energy notes that up to 92% of all outages occur along distribution infrastructure segments of the grid. A focus on energy and water sustainability goals, as well as carbon emission reductions, highlights the need for tools to accurately measure and manage resources more granularly.

SERVICE TERRITORY

- » SAWS, City of San Antonio Streetlights
- » Largest municipally owned electric and national gas utility in the United States
- » 907k electric customers
- » 374k natural gas customers
- » 1,566 sq mi service territory in south-central Texas

CHALLENGES

- » Aging electric & gas infrastructure
- » Rising operational costs
- » Desire to expand service offerings for customers
- » Desire for a high-performing communications network

ITRON SOLUTIONS

- » Advanced Metering Infrastructure - Electric, Gas meters
- » Distribution Automation
- » Smart Streetlight & Smart City Sensor Pilot
- » Sharing Network Canopy for San Antonio Water System (SAWS)

CUSTOMER BENEFITS

» Need to add a smart lighting benefit

- » Realized immediate operational and customer service benefits from AMI
- » 53% reduction in metering truck rolls in one year
- » ~99.9% read rate for 1.2M electric and gas endpoints
- » Near 100% read rate for SAWS water endpoints read under CPS network canopy
- » Improved grid resiliency & reliability
- » Access to a state-of-the-art multi-purpose IoT network capable of supporting multiple applications simultaneously

To face these challenges, CPS Energy has established its [New Energy Economy](#) initiative, which articulates a vision that shares that a clean energy future requires a technology foundation built on a modern, reliable, secure, and efficient energy infrastructure designed to power both today's and tomorrow's solutions. With such a foundation, CPS Energy is committed to investing in innovative technologies that will:

- » Help customers use energy more wisely and lower their bills
- » Create jobs and educational investments
- » Leverage valuable economic development opportunities for the community
- » Protect the environment

To realize these goals, CPS Energy and Itron have maintained a long-standing partnership to deploy a future-proof industrial IoT (IIoT) network solution capable of supporting multi-commodity AMI, Smart Streetlights, Smart City Sensors, Distribution Automation, Smart Water, Distributed Generation and more as the needs of the community continue to evolve.

SOLUTIONS & RESULTS

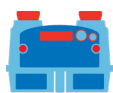
IIoT Network & Multi-Commodity AMI

To maximize deployment flexibility and utility choice, the network solution design integrates a multi-purpose IIoT canopy via multiple third-party electricity meters and gas endpoints.

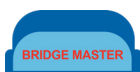
The original contract called for 745K electricity meters, 340K gas endpoints, and 2,000 DA Bridges. With superior, proven performance and an aim to meet CPS Energy's escalating growth, the solution was expanded to now include:



945K electricity meters



387K gas endpoints



2,900 Distribution Automation devices



210 Access Points (AP) with cellular backhaul split between AT&T and Verizon



70 Access Points with Ethernet backhaul



999 Relays

The intelligently connected network is self-configuring, self-healing, and self-optimizing, delivering unmatched resiliency and redundancy. Additionally, by leveraging multiple cellular carriers, backhaul devices can continue to transmit data in case the communications infrastructure fails, ensuring that critical data is preserved.

Itron's network consistently reads and delivers consumption data for CPS Energy's 1.2M electric and gas endpoints at ~99.9%. Further, the utility has extended network access to its sister utility, the San Antonio Water System (SAWS) to support water AMI and advanced applications. To date, the network has also delivered a read rate of near 100% for the SAWS smart water endpoints, demonstrating the reliability of the multi-purpose network.

HOSTED NAAS FOR SMART WATER

In 2020, CPS Energy began collaborating with San Antonio Water Supply (SAWS) to explore the possibility of providing network coverage to read SAWS' water meters under CPS Energy's existing IIoT AMI network canopy. Previously, SAWS used Itron FCS for their meter reading collection with good results, but in evaluating a total projected meter population of 607K water endpoints, SAWS realized that growth was outpacing projections by almost double. SAWS saw the opportunity to take the next step in its water modernization journey and worked closely with CPS Energy to leverage the existing IIoT network canopy to read upgraded smart water meters across their service territory.

"Having [electricity, gas and water] meters on the same network is a testament to the collaborative possibilities between the two city-owned utilities. Since most cities' utilities are privately owned, they likely would not share a network. Because of the connectivity here — both literally and figuratively in San Antonio — we have a great relationship." Jonathan Tijerina, Senior Director of Business & Economic Development, CPS Energy.

The pilot was implemented with a streamlined Network-as-a-Service (NaaS) model and aimed to provide residents with more insight, control and participation in their energy and water consumption. All 2,500 residents included in the pilot were able to access energy and water usage virtually, helping them save money and avoid waste with applications like leak detection.

Upon completing an extremely successful pilot program with Itron, CPS Energy and SAWS agreed to move forward and awarded Itron a contract for the largest rollout of ultrasonic water meters in the nation. The new water meters interface with the CPS Energy network via Itron 500W ERT® water modules. This is a major initiative for SAWS, as it will transform their meter reading operations in every way.

Itron facilitated this shared arrangement under our low-maintenance Hosted Network as a Service Hosted (NaaS) model. CPS Energy's AMI solution acts as the host network and SAWS pays a monthly per-endpoint network access fee. To streamline day-to-day operations for SAWS, Itron provides SAWS with a separate and secure headend system via its Temetra software platform. Temetra provides data analytics, system alerts and a means to manage water endpoints separately from CPS Energy's data, ensuring stringent data privacy and security.

This is a win-win for the community. SAWS benefits by gaining affordable access to a secure, state-of-the-art AMI network to automate most of their water service operations while CPS Energy benefits by monetizing available bandwidth on their AMI network, further leveraging the community's investments in modern utility infrastructure. The solution greatly streamlines SAWS' meter reading operations and opens the door to new possibilities in water resource management in the future.

"This investment in technology is a tremendous step for SAWS and will help us become even more cost-efficient. Not only will customers have more tools to control their bills, but we'll be able to reduce lost water, helping us meet ambitious water conservation goals that ensure plentiful water supplies for our growing city." *Jelynn LeBlanc Jamison, Chairwoman, SAWS Board of Directors*

"Our smart city pilot is a great example of how collaboration can help the City of San Antonio become a smart city. With our customers top of mind, the collaboration with SAWS and Itron allows us to see the potential of how a smart and more resilient city can preserve precious resources while working to maintain excellent customer satisfaction." *Frank Almaraz, Chief Power, Sustainability & Business Development Officer, CPS Energy*

SMART STREETLIGHTS & SMART CITY PILOT

CityEdge solutions help utilities and cities reimagine how they can deliver services to improve efficiencies, lower carbon emissions, create safer neighborhoods and enhance the quality of life for their citizens. To address these objectives, CPS Energy embarked on a pilot project centered around smart streetlights, Itron's industry-leading CityEdge Platform, and IoT sensors deployed within three Innovation Zones in the city.



Installers add smart controllers to streetlights. These can manage lighting and communicate with nearby smart city sensors.

The smart city sensors supported applications in air quality, temperature, ambient noise, parking, and flood monitoring and were deployed under the smart streetlighting network canopy. The streetlight controllers provided the primary RF-mesh used to support the data transmissions returned by the various sensors. This pilot was marked by strong collaboration, open communication, close coordination, and support with CPS Energy, Itron, partners and installation crews. This included coordinating approvals for night installations due to heavy daytime traffic and finding 24x7 power in the downtown area and comprehensive pre-deployment testing for all solutions before to field installation to help make the process efficient.

This successful pilot effectively demonstrated how various sensors and software can be integrated with Itron's intelligent multi-application network and the CityEdge Platform, gathering valuable insights to help the city make better decisions and keep the community brighter, safer, and more enjoyable for residents.

DISTRIBUTION AUTOMATION

CPS Energy also leverages its IIoT network platform to support a Distribution Automation (DA) initiative across the service territory. The DA solution communicates over the existing AMI network's Relays, eliminating the need for a costly and single-purpose DA network. The multi-purpose network is uniquely suited to support both high and low latency applications, such as DA, with optimized performance for a broad range of use cases. Leveraging a common network platform allows CPS Energy to deploy new DA and AMI hardware quickly with little to no new network infrastructure.

PROFESSIONAL SERVICES

The project included a host of professional services ranging from Project Management and Field Network Management to Integration and Testing Support, Training, Endpoint Management and Third-Party Contractor Management.

DELIVERY & DEPLOYMENT SUPPORT

Every large-scale utility modernization project comes with challenges. Two key challenges that the team encountered with the AMI implementation centered around staffing and supply chain and materials availability.

From the start, the project was impacted by staff shortages, which impacted the deployment schedule. This was due to issues around competing local energy jobs which offered a higher hourly rate than what was contracted for meter installers. To tackle this issue, Itron met weekly with CPS Energy and our installation partner, Corix Utilities, to develop ideas and plans to improve our ability to hire and maintain staff. By working closely together, we determined that the best course of action would be to hire a second installer that Itron would train. By training network installation teams to also install electric meters, we maximized field time driving improved performance. Midway through the project, Itron was ahead of schedule.

After catching up to the meter deployment schedule, we were notified of a plastics shortage that would delay the delivery of the 2S electric meter orders. By pivoting to focus on installing approximately 10,000 gas endpoints, we streamlined the gas automation project, kept installation crews on schedule and once again demonstrated our mutual commitment to ensure the project's success. Demonstrating the reliability of the multi-purpose network.



A SHARED COMMITMENT TO COMMUNITY

In addition to bringing state-of-the-art technology to the region, Itron has partnered with CPS Energy, SAWS, and other community leaders to expand and engage STEM-focused educational resources for students and citizens through the corporate social responsibility led Smart Energy Education initiative.

Itron, CPS Energy, SAWS, Webber Energy Group at the University of Texas at Austin, and Disco Learning Media are collaboratively developing program resources and strategic partnerships to improve energy and water literacy, encourage conservation, inspire future talent pipeline, and advance awareness in sustainability. This collaborative provides educational resources comprised of standards-aligned lessons and activities complemented by videos and interactive games tailored for K-12 audiences, as well college student scholarship opportunities through the San Antonio Area Foundation's Smart Energy Education Scholarship Fund.

To date, this program has reached a total combined audience of 3 million citizens, 200k students and educators, and provided more than \$1 million in community grants, creating positive economic impact in the San Antonio region and beyond.



Local students present on "Alleviating Water Waste" as part of the Smart Energy Education initiative.

"Our goal is to demonstrate how Smart Energy Education can not only foster community engagement but also inspire children to implement energy saving practices into their everyday life starting at a young age." *Rudy Garza, President & CEO, CPS Energy*

READY FOR TOMORROW

CPS Energy is living up to its "People First" commitment by investing in technology to help secure a brighter energy future. While it is committed to bringing state-of-the-art technology and new services to the community, it is doing so with its employees and residents in mind.

After adopting new automation technologies to replace dated and manual processes, CPS Energy retrained about 50 meter readers for other positions within the company, successfully retaining the valuable knowledge and hands-on experience of its staff. SAWS plans to offer similar opportunities for retraining and expanded roles within the utility.

CPS Energy has proven itself to be a leader, not only in the community, but on the national stage as one of the most innovative utilities in North America. The utility has been recognized by the Smart Electric Power Alliance (SEPA) as Public Power Utility of the Year as well as by Itron as a winner of the Itron Innovator Award for its innovative use of multiple IoT partner solutions for its smart city application pilot.

In late 2022, Itron and CPS Energy signed an 11 year partnership extension based on a shared vision, demonstrated value, and proven technology performance. This agreement will ensure that the utility and the San Antonio community will continue to share in benefits for years to come.

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