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F R O S T  S U L L I V A N

Excellence in Energy
Resourcefulness
Award:

Grid Intelligence

Americas

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BACKGROUND AND COMPANY PERFORMANCE

Industry Challenges

Frost & Sullivan estimates that 60% of the global population will be living in cities by the year 2030. The combined effects of urbanization and the growing threat of climate change will create heavy strain on not only energy and water demand, but also on cities' critical infrastructure and finances. To effectively address these issues, municipalities are looking to become much more energy efficient and sustainable. Some have even set up goals to become carbon neutral as early as 2040. In fact, more than 15 cities, 17 regions, and almost 200 companies have declared their intent to achieve net-zero carbon emission.

In response, cities have introduced positive investment cycles for distributed energy resources, grid modernization, and smart city initiatives. Frost & Sullivan estimates that nearly \$850 billion will be invested globally in new distributed energy capacity alone within the next ten years.

Cities across the country that were early adopters of bi-directional grid network infrastructure are now looking for ways to optimize existing communication infrastructure by digitizing and connecting it to other city operations and assets, such as street lighting, environmental sensors, electric vehicle (EV) charging, parking meters, and traffic signals. Frost & Sullivan estimates that 574 million advanced meter infrastructure (AMI) and 319 million distribution sensors were installed worldwide in 2019.

Street lighting, in particular, has emerged as a follow-on application to existing AMI networks and has become a leading smart city application. Frost & Sullivan estimates that replacing existing street lighting with smart networked LED solutions can reduce electricity costs by 50%.

This Excellence in Resourcefulness award recognizes the ability of either an investor-owned utility (IOU) or municipal utility to successfully implement technology and behavioral changes to significantly reduce electricity waste.





**FOCUS ON THE FUTURE AND
BEST PRACTICES IMPLEMENTATION**

This award recognizes CPS Energy's achievements in energy resourcefulness. Located in San Antonio, TX, the seventh-largest city in the United States, CPS Energy is the largest municipal utility in the country. This city-owned utility's motto is People First, which is meant to ensure that its energy services are affordable, reliable, resilient, secure, and safe. Today, of CPS Energy's 7,000 MW total capacity, 1,000 MW is wind energy and 600 MW is solar.

In response to the growing threat of climate change, the city has set a plan to reduce carbon emissions by 80% by 2040 and become 100% carbon neutral by 2050. It has created a strategy called Flexible Path aimed at diversifying its energy mix to include more renewables, distributed energy, long-duration energy storage, and carbon-free vehicle incentives.

To ensure the successful implementation of the city’s Flexible Path strategy, CPS Energy had to consider how to optimize existing resources and critical assets. It began with forming a partnership with Itron to upgrade its grid network with an IPV6-based energy network. The utility aimed to implement and roll out energy-efficiency programs, automate distribution, and lay out a common communication platform for all city assets, including energy, street lighting, and water. Throughout this evolution, CPS Energy has fostered an instrumental technology advisory partnership with Itron.

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The following table lists the key criteria used to measure CPS Energy's success in achieving Energy Resourcefulness Excellence Best Practices.

	1-3 Poor	4-6 Fair	7-8 Good	9-10 Excellent
SOCIETAL IMPACT				
Improving customer awareness and participation				✓
Enabling behavioral change for reducing waste through customer engagement and technology-driven programs				✓
Yielding impressive waste reduction that benefits the overall community served				✓
BUSINESS IMPACT				
Drafting a clear vision to address excessive waste through technology implementation				✓
Achieving operational efficiency as a result of a successful sustainability strategy				✓
Strengthening a utility’s brand image as a leader in sustainability				✓

Societal Impact

Improving Customer Awareness and Participation

Before proceeding to initiate a live project, the utility started with a smaller-scale AMI pilot project of 40,000 units. This was a crucial step of the implementation process, particularly for ensuring successful customer participation. Through this program, CPS Energy learned early on the importance of communicating with its customers and making sure they clearly understood the benefits of accessing meter data.

The utility conducted neighborhood association meeting, intimate smaller group meetings, and real-time demonstrations of customer usage data that can be accessed throughout the month and not just once a month. This high level of transparency resulted in successful implementation and achieved an opt-out rate of less than 1%. Since then, CPS Energy has rolled out communication infrastructure throughout its entire gas and electric territory.

Enabling Behavioral Change for Reducing Waste through Customer Engagement and Technology-driven Programs

The utility has a passion for educating its communities about resourcefulness. Earlier this year, CPS Energy announced an Energy and Water Literacy program in collaboration with Itron. Details are available at www.smartenergyeducation.com

Since AMI network deployment, the utility has been able to leverage data analytics to deliver better services to its customers. Specifically, customers can monitor their consumption throughout the month and make adjustments accordingly to avoid a high electricity bill. The utility is also able to pinpoint fault locations and improve power restoration time after a storm.

Yielding Impressive Waste Reduction that Benefits the Overall Community Served

Satisfying customer needs is a priority in every decision the utility makes. Particularly during the COVID-19 pandemic, CPS Energy has been on a mission to help its community. For instance, the utility started and contributed to a small non-profit to help customers pay their bill.

CPS Energy CEO Paula Gold-Williams stated, "When you are a municipal, you have a passion for your customers, and we treat them like they are investors. Investors are the community. We bring the best solution to our customers." Gold-Williams continued, "We are a friendly city, and when we bring innovative suppliers to help us: people are first." Hence, early investments were aimed at driving energy efficiency, automating energy distribution, and improving overall grid reliability.



Business Impact

[Drafting a Clear Vision to Address Excessive Waste through Technology Implementation](#)

Frost & Sullivan characterizes the visionary municipal as a pioneer and innovator for modernizing its existing grid infrastructure and setting an example for other cities to follow. The utility has been on a path to incorporate renewable power, which started more than 20 years ago. In addition, it has added a number of distributed energy resources and has introduced energy-efficiency programs dating as far back as 2008. All alternative solutions are measured based on their effectiveness when replacing base load duration. Furthermore, because approximately 15% of these energy resources are fed back to Electric Reliability Council of Texas (ERCOT), every decision for decarbonizing must take a look beyond San Antonio city limits.

Itron plays a major role as a technology advisor and smart city architect partner for CPS Energy. Together the companies have partnered on pilot projects to evaluate smart street lighting, and, more recently, a smart water project. The projects are designed to consider security issues and asset optimization. For instance, when architecting street lighting angles and positioning sensors, adjustments are made accordingly for parks, residential areas, and commercial buildings. Itron helped CPS Energy understand the complexity of sensors, where to place them, how to triangulate them, and how to train staff on operating these new systems. Most recently, the utility initiated a new smart street lighting project in collaboration with San Antonio Water System (SAWS), the city's transportation company, and the River Authority. The goal is to create three innovation zones: one in downtown San Antonio, one in the Southwest side, and one on the North side. The downtown project is focused on optimizing urban living, whereas the Southwest side is focused on addressing flooding issues and economic development to support the area's growing population.

[Achieving Operational Efficiency as a Result of a Successful Sustainability Strategy](#)

Achieving operation efficiency has been a key part of the utility's sustainability strategy. Through careful planning and project execution, CPS Energy continues to far exceed its targets for achieving energy efficiency. It has saved upward of \$100 million and more than 800 MW through its energy-efficiency programs. To build on these programs, the company plans to add an additional 900 MW of solar, 50 MW of battery storage, and 500 MW of additional DR capacity. It is also seeking solutions for FlexSTEP in its next wave of energy-efficiency savings and conservation programs.

Strengthen the Utility's Brand Image as a Leader in Sustainability

CPS Energy has had tremendous success and garnered respect for achieving its sustainability goals. The utility is constantly evolving and thinking outside of the box to guarantee successful implementation of carbon-free technology by evaluating data analytics and Internet of Things (IoT)-enabled strategies. Often, its RFPs are translated into 10 different languages to ensure the widest possible reach for evaluating and implementing advanced technology. Through its Flexible Path strategy, CPS has seen a downward trajectory in carbon emissions. According to its recent sustainability report, the utility has lowered its CO₂ emission rate from 2,000 pounds (lbs.) per megawatt hour (MWh) of generation down to just 827 lbs. per MWh.



CONCLUSION

CPS Energy exemplifies a living innovation lab. In response to climate change, the utility made the sound decision to invest early in a smart grid-enabled IPV6-based network, which has been the foundation for optimizing critical assets and integrating flexible energy resources, including renewable and distributed energy. Frost & Sullivan recognizes that CPS Energy is on a steady path to architect a city of the future in collaboration with its city and technology partners, such as Itron. For its overall strong performance, CPS Energy has earned Frost & Sullivan's Excellence Award for Energy.

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