



# Smart Cities Start with Smart Utilities

**A Sensus e-Book**

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## The Role of Smart Communications

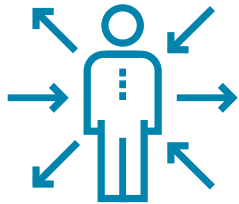


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## Primary benefits of a smart utility



Optimized operation



Enhanced customer engagement



Conservation

Communities around the globe are clamoring for utilities that provide improved safety, better efficiency and a dedication to sustainability. Citizens want smart utilities. According to Randolph Wheatley, Sensus' VP of communications solutions marketing, "At its foundation, a smart utility has integrated capabilities that enable it to effectively gather information about the resources it provides and the network it uses."

Ultimately, there are two primary benefits of a smart utility: optimized operation to reliably deliver services and enhanced customer engagement. These enable more intelligent resource and conservation decisions. From these two outcomes spring myriad advantages impacting both the utility and the consumer. But smart can't happen without utilities implementing a communications network that can enable all that potential.

## Action requires communication

There are all kinds of devices, meters and sensors in the marketplace that proclaim to be smart—perhaps providing drive-by collection, outage determination or leak identification. And although this data collection is necessary, Wheatley explains that "a device isn't actually smart until it can provide that data to the utility, so the utility can then make informed decisions to optimize operations."

It's the communication network that gives utilities the ability to glean meaningful intelligence and make relevant application for the consumer and the utility. "It's the difference between flying a plane blindly versus flying with a variety of tools such as radar and an altimeter," says Wheatley. The communication network allows the utility to see where it has been and where it is going and to keep the customers informed.

"Utilities are one of the last marketplace goods predominantly paid after use," explains Wheatley. "But consumer expectations are changing, prompting a need for better usage visibility and understanding. And this change is impossible without the right communications to gather the right information at the right time."

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*The communication network allows the utility to see where it has been and where it is going and to keep the customers informed.*



## Communication network features



### Spectrum

Is the network private and FCC licensed, or is it shared so devices compete to deliver data?



### Reliability

Can the network be counted on in an emergency, and will the system effectively support restoration efforts?



### Security

Does the network provide protection from security breaches?



### Bandwidth

Can the network handle ever-increasing volumes of data and support expansion and new applications?

## Network options

There are four key features that dictate the efficacy of utility communication networks, each impacting the quality and quantity of data: spectrum, reliability, security and bandwidth (see the list at left). And within the current marketplace, five primary network options—mesh, LoRa, cellular, NB-IoT and FlexNet®—are vying for the utility vertical. Although some parallels exist, the differences are significant—and can be costly.

### Mesh

- **Spectrum:** Operates on an unlicensed, shared spectrum network crowded with noise from outside devices like baby monitors and microwaves.
- **Reliability:** It takes hours to reform post-outage; the network view is incomplete, so deployment priority decisions are challenging.
- **Security:** Consumer data can be transmitted to or received by non-secured points via the shared spectrum.
- **Bandwidth:** All applications are shared across a single channel, and investments in CapEx and OpEx are required to expand.

### LoRa

- **Spectrum:** Operates on an unlicensed spectrum network built for transmitting data from sensors, but it is not built for utility-grade large data loads.
- **Reliability:** While it has a long range, it has very low transmission power. Battery life can drop rapidly based on higher data rates and channel loading.
- **Security:** Consumer data can be transmitted to or received by non-secured points via the shared spectrum.
- **Bandwidth:** An ultra-narrowband spectrum with only one channel, so traffic increases on the network lead to range decreases.



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*“Today’s available applications are just a fraction of what is coming down the road. The network must be expandable to ever-new apps and devices.”*

RANDOLPH WHEATLEY

Vice president of communications  
solutions marketing  
Sensus

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## Cellular

- **Spectrum:** Operates on a licensed, public carrier network that is shared with others and receives a wide range of data—not solely utility data—across billions of apps.
- **Reliability:** Dead zones in the network affect utility data. Consistent coverage is not guaranteed.
- **Security:** Although a cellular network is licensed, it’s not licensed specifically for utilities, which creates the potential for security breaches.
- **Bandwidth:** Upgrades are required as technology improves. With each new leap in performance, assets are stranded and costs passed to the utility.

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## NB-IoT

- **Spectrum:** Operates on a shared, public carrier network designed for data coming from low-power sensors.
- **Reliability:** Not designed for extensive battery life. Endpoint devices are rated for only 10 years.
- **Security:** Consumer data can be transmitted to or received by non-secured points via the shared spectrum.
- **Bandwidth:** Architected for low-power sensors and is not a utility-grade network. Service Level Agreements (SLAs) are not available to guarantee coverage.

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## FlexNet®

- **Spectrum:** The only FCC private-licensed spectrum network dedicated to transmitting critical utility data, interference-free.
- **Reliability:** The industry’s only private, storm-hardened network designed for 100% coverage, even during major storm events. Delivers two times the redundancy compared to the competition.
- **Security:** Provides secure, AES 256-bit encrypted data delivered over the only private, FCC-licensed spectrum specifically for utility data.
- **Bandwidth:** Scalable and upgradable, a single network can be securely used for multiple utility applications. Each application has a dedicated channel to prioritize applications and critical messages.



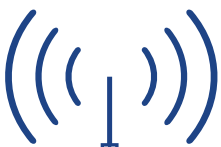
All four features—spectrum, reliability, security and bandwidth—must be considered when looking for the right communication network. But reliability and resiliency are foundational elements for any utility. “For utilities to operate and deliver resources with reliability, the network itself needs to be reliable,” asserts Wheatley. After all, regardless of data capabilities, the resources must ultimately be delivered to the community—in normal times and during storms and crises.

Of course, given the rapid pace of technological advancements, expandability is key. “Today’s available applications are just a fraction of what is coming down the road,” says Wheatley. “The network must be expandable to ever-new apps and devices.” Moreover, as customer demands change and grow, the network has to adequately expand to handle the latest applications without compromising current services.

## Communications and the smart city

Urban areas are attracting residents with the promise of being a “smart city”—providing digital connectedness, automation, safety and conveniences. A smart communication network is absolutely imperative to fulfill these promises. “A smart city can’t be smart without access to basic resources,” explains Wheatley. “So, if the community is not getting basic resources, the city simply cannot consider being smart.”

A robust smart utility network will have many of the characteristics smart city apps need, including being secure and reliable, and covering a broad geographic scope. “Smart utility services and applications must reach all constituents, not just the affluent,” says Wheatley. The network also needs to provide the information to help the utilities operate and maintain the services over time.



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RANDOLPH WHEATLEY  
Vice president of communications  
solutions marketing  
Sensus

## Building the case for smart communication

According to Wheatley, utilities typically have a core set of desired applications in mind when determining if an investment in a smart communication network makes sense. As previously noted, whatever network is investigated must be capable of expanding beyond the current business use case—even to applications not yet in existence. The most common aspects currently used to establish a business case are the following:

- Data capture for billing efficiency and accuracy
- Theft and loss reduction
- Management asset optimization to identify infrastructure weaknesses in advance of crisis
- Customer service enhancement, response improvement and user conservation

## What’s trending?

The digital age is here to stay. Utilities, municipalities and citizens alike must recognize that the Internet of Things (IoT) is rapidly evolving, creating unheard-of connectivity among and between machines, devices, animals and humans. With IoT come new breeds of utility applications that require a network to be well-suited for existing and future applications.

“Utilities are pushing for greater automation and better visibility of their networks. This requires connectivity to a broader range of smart devices covering a larger geographic area and capturing data more frequently,” says Wheatley, “so it’s imperative for utilities to keep the long game in sight when choosing the right communication network. In fact, if a network cannot enable broad—and rapidly expanding—applications, it should not even be considered as a smart utility solution.”





# FlexNet: The Smartest Smart City Network

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*FlexNet is a point-to-multipoint, fixed-base communication network that utilizes private, FCC-licensed spectrum.*

Among the smart communication network options available, FlexNet® from Sensus is the one that takes utility intelligence to a new level. Smart cities start with smart infrastructure. And smart infrastructure starts with FlexNet.

FlexNet is a point-to-multipoint, fixed-base communication network that utilizes private, FCC-licensed spectrum. As a fundamental part of an overall smart utility solution, FlexNet supplies the reliable two-way communication network needed to deliver more data more often from devices to utilities. This data, in turn, becomes meaningful insights for utilities and their end users.

The benefits of FlexNet over competing networks are substantial. This robust, reliable network increases the operational efficiency across utility verticals, improves resource sustainability and enhances customer service—all while growing your utility's value and revenue.



## **FlexNet provides reliable data**

It's vital that a communication network delivers the data utilities need when they need it. FlexNet is a purpose-built network specifically designed for utility data and fully compatible with Internet Protocol Version 6 (IPv6), ensuring interoperability of all applications. FlexNet ensures reliable, secure data transmission on one of the industry's only protected, storm-hardened networks. Providing the highest signal power and range among competitors, our private network eliminates transmission interference typical of shared frequencies. FlexNet continues to operate during critical times, able to accurately pinpoint outages for faster recovery and effectively support power restoration efforts when needed most.



## **FlexNet delivers fast transmission**

The world seems to be spinning more rapidly, requiring immediate processing of big data to create meaningful insights. Direct connections are key to efficient and effective data processing, and our point-to-multipoint network eliminates hops to simplify communication for quicker results. Plus, FlexNet transmits at six to eight times the power of competitive systems—systems operating in crowded, unpredictable, unlicensed spectrum environments. This power means our network operates over a greater distance without losing speed. The data speed with FlexNet is significantly higher than the speed of other technologies. And with bidirectional communication, utilities can transmit and receive data at the same time—quickly.



## FlexNet allows for remote management

Moving from manual reads to AMR (Automatic Meter Reading) was a significant change for the industry. But with AMI (Advanced Metering Infrastructure), the power of remote management goes well beyond gathering usage information. The two-way communication of FlexNet provides customers with billing information, outage notification and even monitoring for tampering and utility theft. Fast transmission, real-time data and meaningful analysis provide the visibility and control to proactively manage the entire network. Customers can remotely update and upgrade services, conduct on-demand readings, identify non-revenue water, restore power and more. The FlexNet communication network makes life easier at every point.



## FlexNet supports scalability

The FlexNet communication network scales to meet customers' current and future communication needs within multiple utility applications. As new standards and protocols are adopted by the industry, FlexNet can support expanded applications and data requirements. Demand response, distribution automation, smart lighting and new applications can easily be incorporated into existing operations over the FlexNet communication network. Utilities can simply upgrade firmware over the air, without additional infrastructure and without stranding existing assets. And because our base stations can cover more area than competing infrastructures can cover, utilities can also spend less as they expand geographically.



## FlexNet is more efficient

With FlexNet, less is more. One tower can efficiently communicate with meters very far away. And, with the ability to leverage open standards and APIs, FlexNet can easily interface with third-party applications and platforms. Frequent collection of customer data ensures accurate billing and improves operational efficiencies, allowing customers to conserve energy, reduce waste and prevent higher bills.



## FlexNet lowers cost of ownership

FlexNet requires less infrastructure to provide more coverage than a mesh network, resulting in lower total cost of ownership. As a mesh network grows, the increases in coverage and speed require more backhaul and more money, so CapEx and OpEx must grow as well. With FlexNet, a single base station can do the work of five to 10 mesh collectors. Having fewer base stations results in lower cost to grow the network reach. And the hardened infrastructure and longer battery life result in fewer replacements. As new standards and protocols are adopted by the industry, FlexNet can support expanded applications and data requirements with simple, over-the-air firmware upgrades.



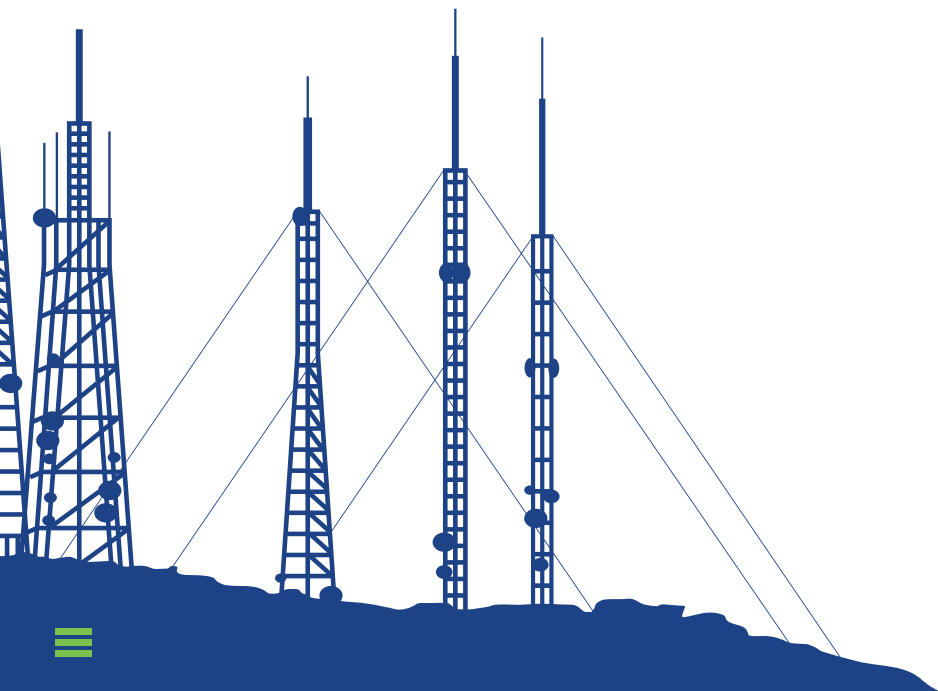
## FlexNet ensures security

A security breach could be catastrophic for a utility and its customers. FlexNet provides secure, AES 256-bit encrypted data delivered over the only private, FCC-licensed spectrum. This means our network is licensed specifically for utility data and that data is protected against hackers.



## FlexNet creates a future-proof network

An investment in FlexNet means having the best communication network in the utility space today—and for years to come. As new standards and protocols are adopted by the industry, FlexNet can support expanded applications and data and security requirements. And as a utility's footprint grows, the network can easily grow to meet the community's needs—with less infrastructure and lower costs than other networks options.





## Utility Verticals in the Smart City

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## Primary concerns

as smart utilities advance



Safety



Automation



Cost-effectiveness



Customer  
satisfaction

Information technology impacts the way we live, and smart technologies influence the utility industry in exciting ways. According to Randolph Wheatley, vice president for communications, solutions marketing, for Sensus, "Smart utility is about leveraging communication technology to enhance the effectiveness and efficiency of operations and, ultimately, improving interactions with the end customer."

## Utilities get smart

Utilities continue to evolve not only to keep up with the latest technology and customer expectations, but also to respond to an outcry to be more environmentally friendly. For example, public service providers are incorporating distributed renewable energy resources into the traditional energy delivery paradigm.

"Each utility—water, gas, electric and lighting—has a different nuance in the smart space," Wheatley says, "but they all have the same primary concerns in light of advancement: safety, automating manual functions, increasing cost-effectiveness and improving customer satisfaction."

Most utilities within a community are siloed, although crossover can occur where utilities are combined under the same provider, such as gas and water. Smart solutions enable smart utilities to interconnect with other smart city services by leveraging a common network infrastructure that can support all the applications.

## Communication network is key

"The communication network is the underlying foundation of any smart utility," Wheatley says. He explains that it's vital for the network to have the capacity to support multiple uses—gas metering, pipe corrosion testing, water metering, light control, etc. It has to be able to expand to uses not

*"The communication network is the underlying foundation of any smart utility."*

RANDOLPH WHEATLEY

VP for communications, solutions marketing  
Sensus



## Each utility will have a unique set of devices

that read and collect relevant, real-time, on-demand information.



Lighting



Electric



Water



Gas

even conceived of today. He adds, “The system must consistently function and be readily available when it’s needed most, such as during weather events. The communication network must be as reliable as the network the utility uses to deliver its resource, be it water or energy.”

Once the network is in place, a mechanism is established that can support a single utility or multiple utilities. Each of those utilities will have a unique set of devices that read and collect relevant, real-time, on-demand information. The network serves to gather data and issue control commands for those devices. However, data for data’s sake is not necessarily useful. “We need to make sense of the data with specific analytics,” Wheatley adds. “These analytics programs can be an inherent part of the underlying communication system, a separate offering from the smart utility solution vendor or part of the utility’s own internal analysis tools created to work in concert with their systems for billing, customer service, operations and more.”

Regardless of which utility initially implements the communication network, that utility can become a “friendly neighbor” to smaller utilities serving that area by offering the shared use of the network for a fee. Although there is still a cost to the smaller utility, it is a significantly smaller investment than if it had installed the network. So the secondary users benefit by getting smart for less, while the installer benefits by gaining some income from its utility neighbors.

## Focus on customer service

“At the end of the day, the purpose of smart utility is all about a better overall customer experience,” Wheatley says. “Customers want to be better informed, and a smart utility provides them with more information when and how they want it.” Smart utilities also inform customers about their personal resource consumption, and the data helps the respective provider’s sustainability effort. “Processes and activities that once necessitated onsite service are automated with smart utility,” Wheatley says, “and these improved operations efficiencies are just some of the ways utilities improve environmental sustainability.”

A high-quality customer experience always reflects back positively on the delivering organization—and not just in reputation alone. Providing a better customer experience also impacts the bottom line of a utility or municipality. Water is a great illustration. Traditionally, consumers receive their monthly bills but no further information about their water usage. So, when an unusually high bill arrives, the customer will pick up the phone to complain. With no other recourse, the utility will often issue a refund. However, with a smart utility communication network and the ability to retrieve granular data from that customer’s meter, the utility has an immediate answer without an onsite visit. The utility discovers through the data that on a specific date during that



month of service there was a huge spike, and the customer recalls, “Oh, that’s right. That’s the day I accidentally left the sprinkler on all day.” The utility keeps its revenue, and the customer feels heard and understood.

Across all utilities, consumer expectations are rapidly changing and driving the smart utility industry. “Consumers are becoming more and more engaged,” Wheatley says, “and they want to have more control over the information that impacts them.” Implementing a smart utility network, with its ability to collect specific data and analyze it, results in more efficient operations and enhanced delivery. It may be the perfect equation for creating happy customers.

## Save time and money

Smart utilities impact more than just the customer experience. A trending focus across all utilities is the efficiency of operations. Traditionally, utilities respond to problems using onsite manpower. There’s a truck roll, which costs money, and then time to discern the issue. The problem may or may not be determined or even repaired at that time. However, with a smart network, the utility can pinpoint the problem and determine the exact location and timing of the issue—all without needing to go to the site.

As federal regulations continue to increase, utilities have a great opportunity to proactively meet and even exceed requirements using smart solutions. Look at gas line corrosion prevention as an example. The government requires annual reports. Data collection using manpower is highly inefficient, as measurements are made at singular spots along lines. Taking into consideration the length of pipelines, the number of measurements can be enormous. With a smart utilities solution in place, pipe corrosion is automatically and granularly measured, markedly increasing utility efficiency. The provider saves money, and this improved efficiency ultimately leads to improved safety, which benefits everyone.

Each utility area has specific driving factors that affect the future of smart utilities. Wheatley explains that the electrical vertical is experiencing “a true redefinition of roles that is changing everything.” For example, with so many renewable energy resources in the marketplace, a customer not only consumes electricity but now also can generate it. “Consumer/producer roles are blurring,” Wheatley says. “The electrical distribution network historically defined by a one-way flow of energy from the utility to the consumer is becoming a two-way network.”

Smart utility solutions are indeed changing the way we receive our public services. The model of utility delivery and consumption is shifting with the application of technologies that advance daily. Smarter utilities will lead to smarter consumers and a cleaner planet.

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RANDOLPH WHEATLEY  
VP for communications,  
solutions marketing  
Sensus





# Smart Water

## Smart water application

is pertinent to everyone.



Consumers



Businesses



Utilities



Municipalities

Water sustains life. We just can't live without it. Water's value comes from its cleanliness and its delivery. Simply put, if it's not clean, water can be detrimental to health and life. If water is not available, it remains out of reach, whether it is clean or not.

The purpose of today's water industry is to create and sustain the water production process—extraction, cleanliness, delivery for consumption and reclamation. As the global population continues to grow, it's imperative that the industry better manages water processing to ensure that existing water resources effectively and efficiently reach all of us.

## Expand the smart water cycle

There is a global call among utilities to embrace a "smart" approach. Water providers are challenged to use the rapidly evolving technology to improve processes and sustain associated resources.

"Most utilities and municipalities define smart water in terms of manageable elements within the flow from storage to consumption," says Travis Smith, director of smart water strategy at Sensus. "But as an industry, we need to expand our perspective to the entire processing cycle, considering more of a smart water cycle."

Water utilities serve four primary purposes: to provide clean drinking water; to manage the flow of water through the system for consumption and firefighting; to sustain water and the water system; and to oversee the account service, including both customer service and financial aspects. Smart water application is pertinent to everyone and benefits consumers, businesses, utilities and municipalities, significantly impacting each of these four areas.

*"The bottom line for a true water cycle solution is collecting the right data at the right time, integrating it through the right communication system and applying the right analytics—all focused on specific improvement."*

TRAVIS SMITH

Director of smart water strategy  
Sensus

## The four components

of a smart water cycle solution



Accurate  
measurement  
devices



Communications  
path



Data storage  
and structure



Data  
applications

## The right data matters

In the current narrow scope of smart water standards, the prevailing cry is, “It’s all about the data.” Although there is a kernel of truth in this statement, it is not completely accurate. According to Smith, “We have to get the right data at the right time to make the right decisions. Data for data’s sake doesn’t necessarily lead to the best actions.” Smith explains that the water system differs every day, throughout the months and years. “Consumer use and weather patterns vary every hour,” he says, “so we need to view the water cycle and manage water systems based on an hourly utilization. We can’t measure for three weeks in July and use that data to predict use and system function for the next three years.”

To execute valid smart water cycle application, the effort must be founded on accurate and timely data measurement. Better measuring devices yield a solid foundation. Truly accurate data, when collected, communicated and analyzed properly, will ultimately:

- **Decrease costs and increase efficiency**
- **Grow potential revenue**
- **Optimize assets used in the water cycle process** (plants, pipes, etc.)
- **Reduce risks** (water main breaks, contamination, public health hazards, etc.)
- **Enhance customer service and consumer quality of life** (cleanliness, reliability, water pressure)

## Data beyond data’s sake

“The bottom line for a true smart water cycle solution,” Smith says, “is collecting the right data at the right time, integrating it through the right communication system and applying the right analytics—all focused on a specific improvement.” So, once accurate measurement devices are in place and data collected, how can that data then be purposefully and effectively used for specific improvement? According to Smith, there are four vital components to a strategic smart water cycle solution:

- Accurate measurement devices for data collection that establish application parameters
- Communications path from the points of data collection to a hub via radio, Ethernet, cellular or fiber optics
- Data storage and structure to precisely relate data per geography and time
- Applications that take data, present it to the user for actionable solutions and then validate that action

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*“The future of smart water cycle solutions must directly impact every portion of the cycle, from sourcing and delivery to consumption and reclamation.”*

TRAVIS SMITH  
Director of smart water strategy  
Sensus

## A smart water cycle taps more revenue

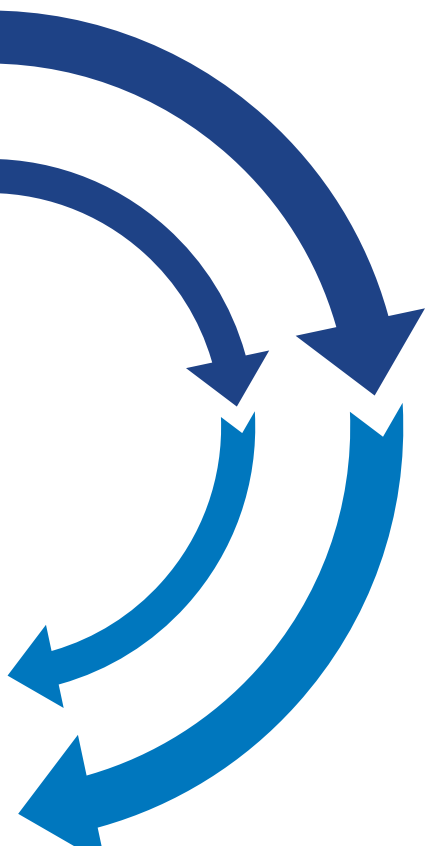
For the average municipality, revenue from water and sewer services is the second largest source of funding behind only taxes. A sizable amount of water does not produce revenue, whether it is unmeasured, unbilled or uncollected. With revenues related to the cleanliness and delivery of water, improvements in the water cycle will have an impact on the bottom line. Between cost savings and increased revenue, municipalities can redirect funds to buy more water assets, improve transportation, create public parks, etc. Moreover, implementing a smart water cycle improves resource sustainability through advanced leak detection, energy management and drought management.

Once implemented, the smart water communications network, which is the underlying foundation of this smart solution, can also be used within other utility areas, elevating other infrastructure resource management. With better water quality, more accurate account management and faster problem resolution, as well as municipal revenue growth, citizens' quality of life is greatly enhanced.

Smith emphasizes a key piece of advice for municipalities and utilities wanting to implement a smart water cycle. “It is essential,” he says, “to choose a communication system that will be a long-term asset, one that can be maintained, upgraded and controlled to be used at their discretion.” Many of the currently available systems, although a significant investment, actually risk quickly becoming obsolete.

Although many municipalities and utilities globally are utilizing advanced metering infrastructures (AMI, or a communication network), such networks primarily are used for billing. Data is captured, but its accuracy is questionable, and the information is not used to its full potential. “AMI can be utilized for better design and modeling of distribution,” Smith says. “The future of smart water cycle solutions must directly impact every portion of the cycle, from sourcing and delivery to consumption and reclamation.”

What's the bottom line for utilities and municipalities? Smart providers and smart municipalities must view the entire water processing cycle in order to improve water delivery and ensure cleanliness. This overall, big-picture approach will ultimately boost the value of water for everyone.





Smart Gas



## A smart gas system

expands your capabilities.



Pressure measurements



Pipe corrosion protection



Remote disconnection for  
leaks and nonpayment



Improved  
customer service



Quicker response times



Real-time intelligence  
from data

The use of natural gas within homes and throughout commercial industries is growing at a rapid pace all over the world. Affordability, stable pricing and reliability make natural gas an ideal choice, especially within North America. As natural gas continues to improve the quality of life for residents and businesses alike, the industry is also becoming part of the technological connectedness that is the norm today.

## The rise of smart gas

Smart communication network systems used increasingly within water and electricity are also being applied by gas utilities, primarily to implement automated meter reading. The impacts are positive and include improved employee safety, more efficient operations and fewer truck rolls. However, a smart network system for natural gas has the potential to exceed these important features. A smart gas system enables expanded capabilities within gas distribution, including pressure measurements, pipe corrosion protection and remote disconnection in response to leaks and nonpayment.

The benefits of a smart gas system for utilities are many, going well beyond the foundational impact to cost of doing business. According to Chris Wykle, senior director of global gas marketing for Sensus, “Smart gas enables improved customer service and quicker response times, with some devices taking decisive, necessary action before the customer—or utility—even identifies that there is a problem. Currently, cutting-edge technology is taking safety to levels we’ve never been able to establish.”

Utilities can also gain real-time intelligence from data within the network. That data, in turn, allows utilities to evaluate performance and elevate the customer experience.

*“Smart gas enables improved customer service and quicker response times, with some devices taking decisive, necessary action before the customer—or utility—even identifies that there is a problem.”*

CHRIS WYKLE

Senior director of global gas marketing  
Sensus

## The best smart gas solutions

should have networks that:



are upgradeable for new technologies



allow for growth in meter usage



are private for safety and security

## The foundation for a smart network

For utilities or municipalities to maximize the potential of smart gas, they need to see beyond the gas meter to the entire solution. “A secure and private communication network must serve as the foundation of any smart utility, including gas,” Wykle says.

Once the communication network is in place, devices and sensors enable utilities and municipalities to gather data—even from existing residential and commercial meters—that helps them better serve customers by understanding usage patterns and improving operational efficiencies. Currently available sensors can also monitor pressure and temperature levels, as well as transmit alarms to the utility or customer, enabling rapid issue resolution.

“An exciting aspect of smart gas is the ability to monitor corrosion around the clock,” says Wykle. The federal mandate is to test lines for corrosion once per year, and this is typically done at various points along the line. It’s a very time-consuming and manpower-intensive process. Plus, a lot can happen throughout a single month, let alone a single year. “With real-time corrosion monitoring, utilities get daily readings,” continues Wykle, “so they can prepare instead of react, which has always been the traditional approach.” In addition to time and cost savings is the benefit of allowing for highly skilled corrosion specialists to focus on maintenance, not data collection. “A crew can perform a day’s worth of work in less than five minutes,” says Wykle.

## Making the most of smart solutions

Clearly, the benefits of a smart gas solution are worth the investment made by a utility or municipality. But before a choice is made from among the available smart offerings, what factors should be considered to ensure the best investment?

According to Wykle, “Utilities must invest in a network that is upgradeable and allows for growth in meter usage. Additional applications will continue to be developed, and you don’t want new technology to outdate—or outgrow—your established network.”

A vital aspect that weighs heavily on the minds of decision-makers is information privacy. For consumer safety and municipality security, the utility communication network should be private. Even when a communication network is private but is being shared among utility “neighbors,” it’s imperative that security firewalls are impenetrable and the system is able to handle ever-growing use.

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*Implementation of a smart gas solution gives utilities the ability to access more data more often, ultimately optimizing service, operational efficiency and system safety.*

## Smart gas in the smart city

Because cities and municipalities don't typically own gas, smart gas is very much out on the edge of the smart city movement. But this shouldn't be the case. Smart cities that start with a smart infrastructure to deliver clean water, dependable power and outdoor lighting can then leverage this network to "share" with gas. In fact, this sharing is an opportunity to recap investment through usage fees paid by the gas utility. Any fears of customer data being intentionally or unintentionally "shared" can be alleviated by ensuring that the network is both private and sufficiently firewalled.

The immense benefits of smart city infrastructure have only recently been recognized in North America, whereas our global neighbors are already realizing the impacts. Implementation not only is good for the utility producers and deliverers but also significantly enhances the quality of life for residents, attracts more businesses to boost local economies and improves the city's bottom line.

As exciting as the current smart gas elements and impacts are today, the future is even brighter. "Ultrasonic meter technology will soon be introduced, and it is unlike anything else that currently exists in the marketplace," says Wykle. With a footprint about the size of a computer tablet and a battery life of 20 years, the newest solid-state gas meter coming soon from Sensus is truly the ultimate multitasker. This single meter not only measures use but also monitors pressure, detects theft and provides for remote shutoff. Wykle emphasizes, "We are incredibly excited to reveal this next-generation meter for smart gas."

Data and analytics continue to evolve the way business is conducted in today's technology-driven environment. Implementation of a smart gas solution gives utilities the ability to access more data more often, ultimately optimizing service, operational efficiency and system safety. There is no doubt that, sooner rather than later, smart will be the new norm.







# Smart Grid

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*"The communication network for smart grid should be made to collaborate with other utilities so lighting, gas, water and electric can work together."*

GREGORY MYERS

Vice president, global electric marketing  
Sensus

For generations, the delivery of electricity has been a one-way operation. The utilities obtain, process and supply. Consumers receive and use. As utilities adopt "smart" technologies, processes become increasingly automated.

"Renewables are changing everything," says Sensus Vice President of Global Electric Marketing Gregory Myers. From renewables like solar panels or through micro grids, electricity gets injected into the distribution system. "Electricity flowing onto the grid from consumers changes variances," Myers continues, "so the future must be about handling injection into the grid."

## The rising complexity of electricity

The state of California exemplifies this growing complexity. Utilities are still delivering energy to people, but consumers are also generating power and being paid for the power they inject. Although consumers are generating their own power, the utility still maintains the grid, meters and operations. So how can the utility be equitably paid for those services? Consumer-generation also creates power inconsistencies, unlike power from the utility, because of weather events and other disruptions, so even the self-generating customers will still require power from the grid at some point.

## Creating a smart answer

The key to addressing this modern grid intricacy is smart grid. According to Myers, "Smart grid allows us to manage these new complexities of electricity: we get more data and make better decisions to maintain the quality of services customers are used to. Today's distribution grid must be enabled to provide data, communicate more information and optimize energy delivery to customers."

Transformers and power lines make up the traditional distribution infrastructure. But a smart grid system is also comprised of a communication network, meters and sensors. Smart meters take information management and operations to incredible new heights. Utilities have more control and can collect voltage data, measure usage and monitor quality of service. The latest devices and sensors obtain real-time data, so they know what's going on and what's going wrong.

But even the latest, greatest meters and sensors cannot perform as designed without an effective communication network as their foundation. "The smart grid network must be secure," Myers explains. "With a private network owned outright by the utility, the utility data is not mixed with public data, so that hacking risk is eliminated."



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## Smart results are the bottom line for smart grid utilities:



Better management of the grid



Collection of real-time quality data



Continual improvement in services



Decrease in operational costs

An ideal smart network should be high-capacity and able to grow with both technology and user quantity, allowing additional utilities to share the network. According to Myers, “The communication network for smart grid should be made to collaborate with other utilities, so lighting, gas, water and electric can work together.” Here’s where network privacy is imperative. “Without a private network, the system can be hacked and the hacker can take control of the grid,” Myers warns. Even when multiple utilities are using the same network, data from the respective utilities and municipalities must never cross the firewalls.

## Smart grid yields smart results

Utilities are primed to implement smart grid systems with mandates from both the US Department of Energy and state-level public utilities commissions. The powerful impact of a secure, efficient smart grid is beneficial to both the utility and the consumer. “The bottom line for utilities is that they are able to better manage the grid and collect real-time data needed for continual service improvements,” says Myers. As the quantity and quality of data increase and service automation grows, operation costs decrease, creating a more efficient system.

Although the operational and fiscal advantages to utilities are motivational, according to Myers it’s consumers who really benefit from smart grid. “With the system in place, consumers have the opportunity to add solar power to their homes and know that the utility will still maintain power when necessary.” With the automation and information resulting from the smart grid, real-time data is able to drive decisions on how and when the utility provides support. The benefits also extend to environmentally-conscious electric vehicle owners. These vehicles create high stress points on the grid, but instead of these consumers paying excessive costs, the smart grid allows utilities to manage their use with the renewable sources being injected onto the grid.

## Choosing smart wisely

When utilities are ready to move forward with smart grid or expand their current AMI networks, there are many options. Myers advises, “As the environment continues to change, utilities must be sure to consider four key elements as they implement smart grid: network infrastructure, interoperability, integration and cybersecurity.”

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## Consider these key elements when implementing a smart grid:



Network infrastructure



Interoperability



Integration



Cybersecurity

### Network infrastructure

- **EXPANDABILITY:** The system needs to support growth, new applications and new data requirements.
- **EXTENSIBILITY:** The network needs to add new standards and protocols as adopted by the industry.
- **COMPATIBILITY** (backward-compatible and future-ready): The network must keep pace with an evolving grid without stranding existing assets.
- **RESILIENCY:** The communications system must continue to operate during critical times and support power restoration efforts.

### Interoperability

- **VALUE:** Application-level interoperability ensures every device communicates regardless of the generational changes in communication protocols.
- **OPPORTUNITY COST:** Beware of lowest-common-denominator technology, as this creates security risk, eliminates agility to adapt to generational changes, and necessitates extensive and expensive integration efforts.
- **SYSTEM SUPPORT:** The network must have proven additional application support and plans for the future.

### Integration

- **PROVEN ABILITY:** The solution should have been tested and evaluated for end-to-end performance, able to drive customer satisfaction and add value throughout the organization.
- **DETERMINING SUCCESS:** Define goals and understand the technology required to connect old and new technologies, as well as integrate with evolving devices.
- **FUTURE OPPORTUNITIES:** Determine how to leverage integration to extend asset life, expand equipment possibilities and engage multi-utility communication opportunities.

### Cybersecurity

- **PROTECTION:** Ensure that all points of entry to the network are protected.
- **VULNERABILITY:** Make reconnaissance difficult from the inside and limit points of vulnerability.
- **DATA SAFETY:** Thwart attempts to misuse or compromise the network and the data it transmits.

As the management and delivery of electricity changes, so do all the surrounding factors—population, consumer needs and choice, regulations and the technology landscape. So utilities must remain flexible as they implement smart grid applications.

“Smart grid is continuing to evolve,” Myers says, “and we are seeing progression from utilities as they check the ‘tech’ boxes of auto-billing and auto-shutoff. But the vision must now expand to include prepayment, renewables, additional storage and an overall greener perspective.”





# Smart Lighting

## Lighting consumption

is a global and local issue.



# 19%

Energy consumed by  
outdoor lighting globally



# 40%

A city's energy load  
from streetlights

Outdoor lighting provides visibility and a safer environment within our communities. It also beautifies streetscapes to make our landscapes prettier. Municipalities and utilities provide lighting for the public good.

But serving the public with this highly visible infrastructure can be costly. Globally, outdoor lighting consumes 19 percent of energy use. On a local level, up to 40 percent of a city's energy load can be attributed to streetlights. That percentage is high because a majority of streetlights today are inefficient, and they are not controlled or managed. Providing this key public good creates increased maintenance, decreased air quality and potentially high costs. Municipalities must get smarter when it comes to outdoor lighting.

## A smart solution

As technology rapidly advances, cities are shifting toward smart utilities, or as Charlie Nobles, director of lighting product marketing at Sensus, calls them, "smart public goods." Nobles says smart lighting sets the groundwork for the establishment of smart cities. "I define smart cities a bit differently," he says. "Smart is about being dependable and reliable, plus cost-effective in terms of management." Smart lighting is the anchor because it is the most visible solution a city can deploy—and it immediately impacts the consumer.

Where this technology has been embraced, the public is connected to smart utilities through a communication network along with meters and sensors that can monitor activity within the network's parameters. In a smart lighting system, sensors equipped with GPS, alarms and measuring capabilities are placed on light poles and used to monitor various activities.

*"The sensors offer more control over the use of lights, which allows for less energy usage, lower maintenance costs and improved safety."*

CHARLIE NOBLES

Director of lighting product marketing  
Sensus

## The significant impacts of smart lighting

A better quality of life and customer experience



Lower energy usage and maintenance costs



Cost savings that provide money for other community needs



A sense of security and increased safety



These systems can assess attributes like air quality and temperature as well as detect sounds such as increased traffic noise. These factors are measured and analyzed so the system can adjust the light being emitted by the light fixture. “The sensors offer more control over the use of lights, which allows for less energy usage, lower maintenance costs and improved safety,” Nobles says.

The smart lighting system incorporates the activity and conditions monitored by the sensors. The result is a positive cause-and-effect relationship. Public lighting being provided truly as needed—instead of being based solely on timers or outdated definitions—creates significant energy savings. Lower energy usage generates a decrease in costs for the municipality. As a result, cities or towns have the ability to allocate more money toward other maintenance needs or improvement projects.

The impact of smart lighting on the community is also quite significant, because condition- or event-driven illumination creates inviting public spaces for citizens. Overall quality of life is also improved because a dependable outdoor lighting system provides a greater sense of security in neighborhoods and around public venues. “Improved and controlled lighting helps pedestrians and drivers see better, with light levels based on current conditions such as weather or traffic,” Nobles says. “Smart lighting also offers increased security since public safety officials and emergency responders have the ability to control or flash light fixtures under certain circumstances.”

## Smart value

Outdoor lighting concerns vary depending upon the light asset owner and customer base. Utilities may focus on maintenance costs, while municipalities target customer experience. Universities, which are additional stakeholders, are concerned about campus safety. Smart lighting offers the best solution for everyone—suppliers and consumers—because it can be tailored to the needs of any event or situation and addresses the four primary categorical concerns: safety, energy consumption, maintenance and customer service.

One of smart lighting’s greatest values is that the system lowers energy consumption. This is important to all users because it ultimately means lower costs. Expenses can also be decreased by improved maintenance efficiencies. Cities often dispatch repair crews only after roving crews find outages while patrolling the streets. But a repair crew does not know what is wrong with an assigned light, nor do they know if they have the correct tools and replacement parts on their truck to make the repair without yet another visit to the pole.



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*“The benefits of smart utilities and solutions within a city should not be limited to certain classes. The advantages of a smart city should reach the entire community.”*

CHARLIE NOBLES

Director of lighting product marketing  
Sensus

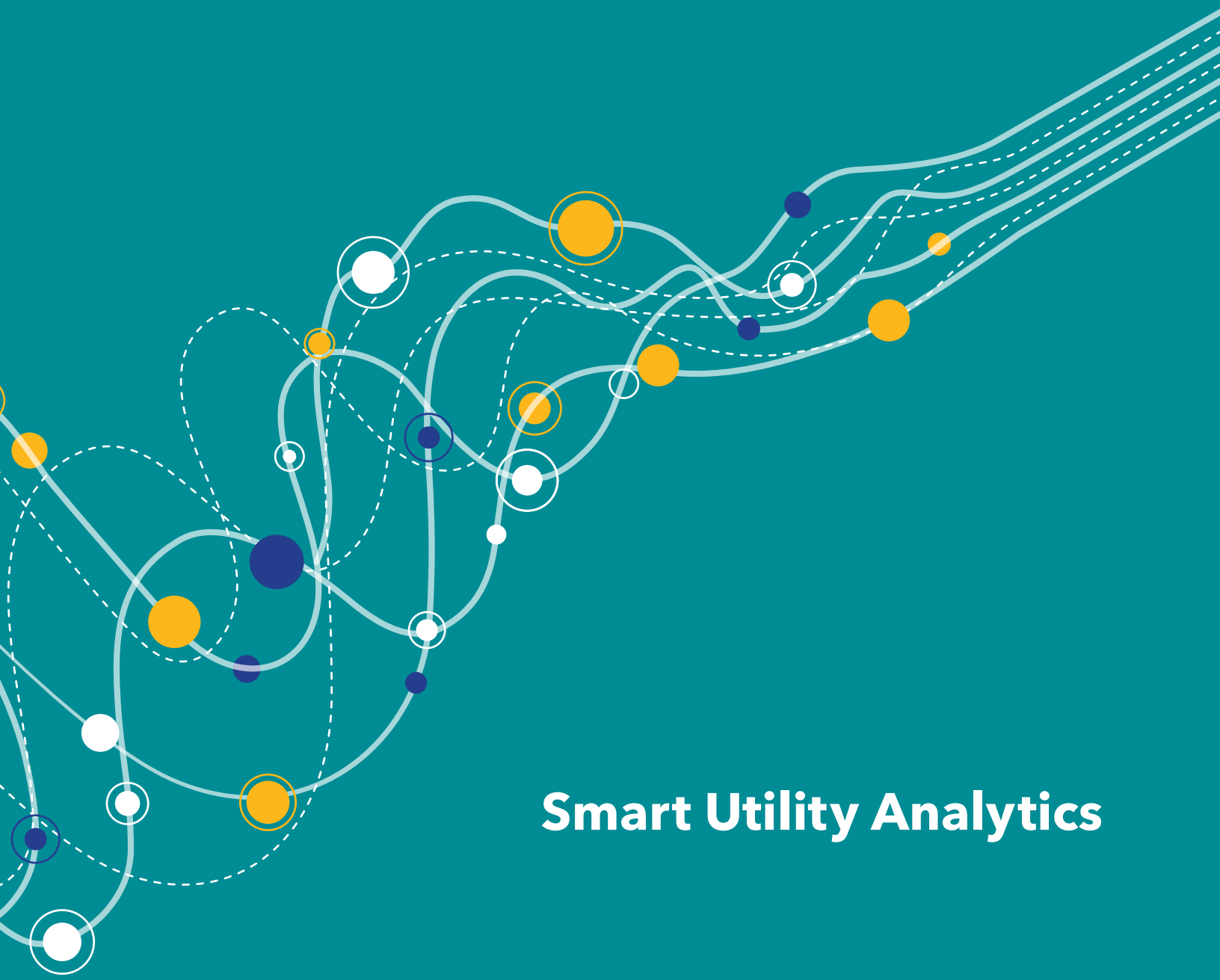
Alternatively, cities manage light fixture outages through customer complaints, but often these calls do not indicate the exact light that failed or what caused the failure. Significant delays in repairing the fixtures can result, as customers typically wait three weeks or more after a light goes out before they finally call to complain. With the capabilities of smart lighting sensors and control devices, a light is able to communicate its own location and what is wrong. This removes the need for truck patrols and eliminates complaints before they can even be made.

Outdoor smart lighting provides a means to program the light level applied to events and conditions. According to Nobles, “With smart lighting, the sensors allow for the appropriate amount of light to be aptly emitted, so the level of light varies with function, traffic, weather, time of night, etc. Appropriate lighting and fewer outages make public areas safer because light is being properly distributed.”

## The digital divide

With smart lighting as the obvious value-producing solution for smart cities because of its visibility and immediate impact, Nobles uses his platform to educate utilities and municipalities on what he calls the “digital divide.” Ideally, he asserts, smart city solutions need to bring value to *all* residents and groups within the city. Although utilities are mandated to provide these public goods to every resident, many smart city services being promoted by vendors are targeted to specific areas within a town or to just the largest cities. Most often, these smart city boundaries are located where the highest-class citizens work and reside. “The benefits of smart utilities and solutions within a city should not be limited to certain classes,” Nobles says. “The advantages of a smart city should reach the entire community.”

The management and delivery of public goods along with smart public infrastructure underpin the advancement of a city, and smart utility solutions bring significant benefits—economic, environmental and experiential—for every community. With smart lighting, the payback is fast and notable, so it’s a great place to start the smart utility conversation. Because soon “smart” will be the new public goods expectation.



# Smart Utility Analytics

**SENSUS**  
a xylem brand



## Top benefits of an analytics solution for smart utilities



“Big data” is a buzzword used across almost every industry to describe the massive amount of digital information collected in order to discover business or customer patterns, trends and connections. But data for data’s sake doesn’t provide much significance to the collector. Value is created by real-time processing and sorting of this information to deliver actionable insights.

As technology continues to transform the way essential resources are delivered, monitored and billed, utilities are growing increasingly smarter. Data collection from smart meters and sensors, transmitted across a smart communication network, provides an incredible opportunity to optimize operations, improve the customer experience and grow revenue. But the same “data dilemma” exists as in other industries: this smart data must be sorted for relevance and application—or all that technology-generated potential goes to waste.

## Analytics software enables smart

Aggregating, sorting and dispensing utility data to generate actionable insights is the purpose of analytics software. According to Ryan Roberts, software product manager at Sensus, “As communication network technology provides the capacity to deliver real-time, two-way data, utilities can implement analytics software to harness the power of all this information, creating smart value that goes well beyond customer usage.”

Because most utilities don’t have a data scientist or statistician to analyze the incoming data, an analytics software solution should provide actionable data without the utility needing experts on staff—or the associated expenses. Analytics software provides value across the utility, from the meter shop to billing to customer service. According to Roberts, the top benefits fall into three main categories: data timeliness; resolution and accuracy of data; and alarm/alert expediency. “With an analytics solution in place, granular data is immediately available to make well-informed, timely decisions,” Roberts says. “Plus, if something is going wrong, that information shows up on the customer’s cellphone right away—not a day later.”

Whether they’re using gas, water or electricity, utility customers want to know usage data by the hour in order to have the ability to assess efficiencies, be notified of problems and plan for future needs. The entire business benefits, as meaningful data drives expansion planning, rate analysis and customer engagement. Plus, utilities can identify vulnerabilities in infrastructure or distribution design, implementing improvements before break-fix situations occur. “Some utilities have a single customer that generates 80% of their revenue,” explains Roberts, “so it’s imperative to see even slight pattern shifts. The smallest changes equate to a lot of money.”

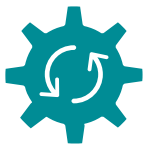


## Five key factors to consider

when choosing utility analytics software:



Flexibility



Interoperability



Scalability



Customization



Simplicity

Until about 15 years ago, obtaining utility data could be, well, dodgy. Whether due to human mistakes, mechanical errors or network insufficiencies, data corrections had to be made to ensure the data was usable. Typically, this entailed a meter data management (MDM) system. But today a network, especially a point-to-multipoint communication network, brings in much more accurate data. "Because coverage is better and the data is more accurate and timely, data management has to be more refined as well," says Roberts. When combined with the right network, analytics software significantly reduces operations costs. "A utility only needed MDM to fill information gaps when their network is not reliable and robust."

A key example is legacy VEE (validation, estimation and editing). According to Roberts, "A utility can invest \$1 million to \$2 million a year to sustain a VEE that covers gaps in accuracy. Or they could spend the same amount of money on improved infrastructure and get 99.5% accurate reads. It's kind of a no-brainer."

## Evaluating analytics software

When it comes to choosing among utility analytics software on the market today, there are five key factors to consider among vendors.

- 1. Flexibility:** Utilities must be able to choose software functions that meet their unique needs by offering prescriptive and custom reports to view various data relationships based on areas, meters and more.
- 2. Interoperability:** This is the ability to collect and process data from systems and sensors outside of meters. A perfect example is the implementation of stormwater sensors on dams to assess lake-level data.
- 3. Scalability:** The solution should have the capacity to grow with utility complexity, customer increase, area expansion, etc., as well as scale with feature advancements and smart city applications.
- 4. Customization:** The ideal solution offers just the right fit for the customer's requirements. The utility should be able to purchase just what the customer needs, no more.
- 5. Simplicity:** Is the solution usable right out of the box? An analytics software solution should be user-friendly, easy to install and deployable with minimal expense.



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*"A city can have meters and sensors on everything and get data from all of them. But if that data is not being aggregated in a relevant way, it is not actionable. Actionable data is the key to a smart city. And analytics is the key to actionable data."*

RYAN ROBERTS

Software product manager  
Sensus

## Making the case for analytics software

Municipalities and utilities need an analytics solution to optimize their incoming data. But how can a case be built to convince key stakeholders? "Simply put, it's a matter of looking back and then looking forward to present the facts," says Roberts. "When you assess issues that have already occurred, you can evaluate the ROI of having the right data, formatted the right way. The financial, safety and customer service impacts can be clearly presented based on what could have been."

Usage can be segregated by service, by user and by consumption. So when looking ahead to future decisions, utilities can customize reports for the necessary data to justify rate changes or tiered billing. The customer service team can have all the aggregated data at their fingertips, so when calls come in, they can point directly to a day—and hour—and immediately remedy the concern. The reports also provide the ability to be proactive with customers, which markedly improves customer satisfaction.

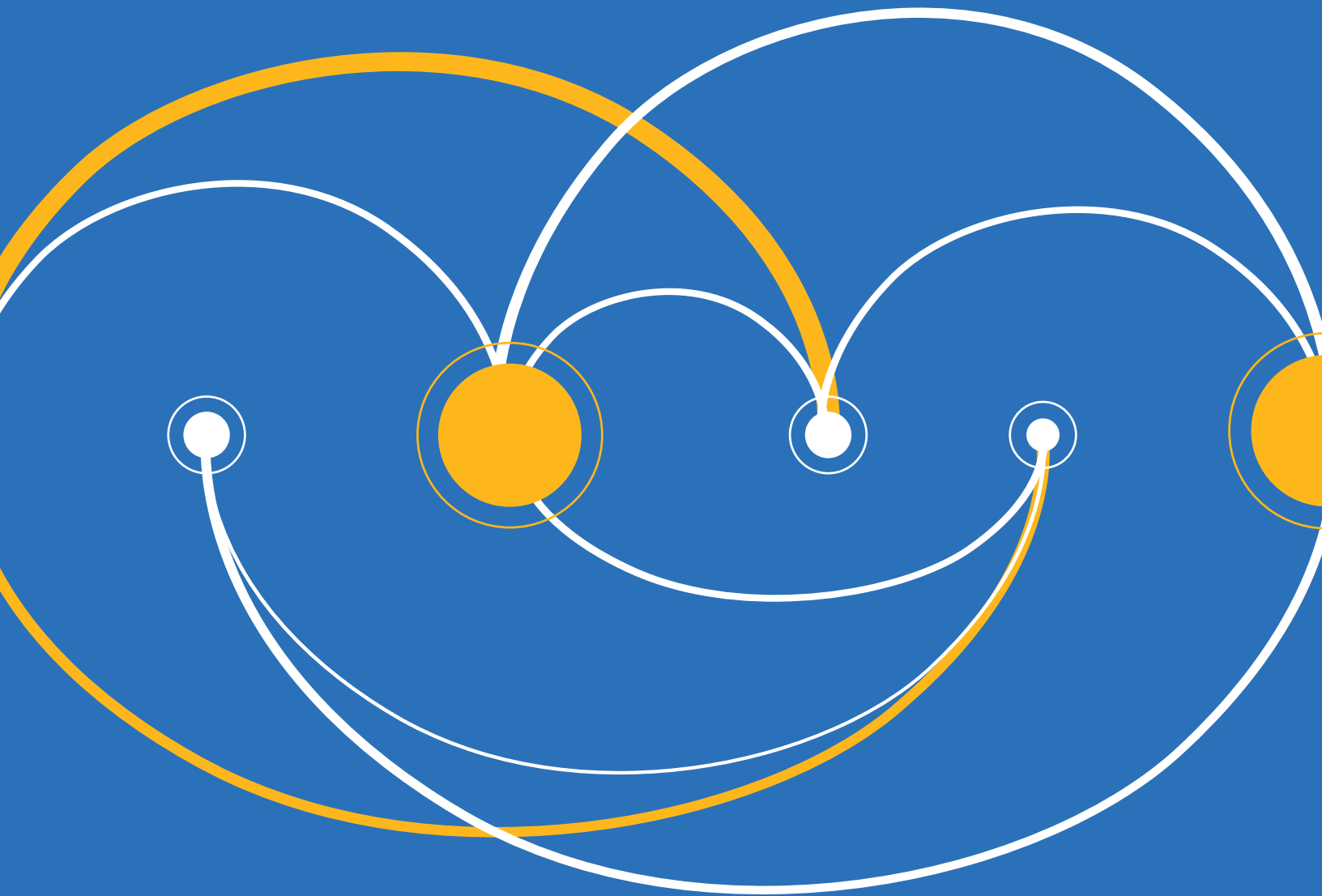
"Most communities are now crying out for smart city applications, and analytics software is the backbone for the success of smart," says Roberts. "A city can have meters and sensors on everything and get data from all of them. But if that data is not being aggregated in a relevant way, it is not actionable. Actionable data is the key to a smart city. And analytics is the key to actionable data." Because the right analytics solution can sort and report on data from across utilities and break down the typical silos, every aspect of a community's infrastructure can work together for a truly smart city.

## Data trends for every utility

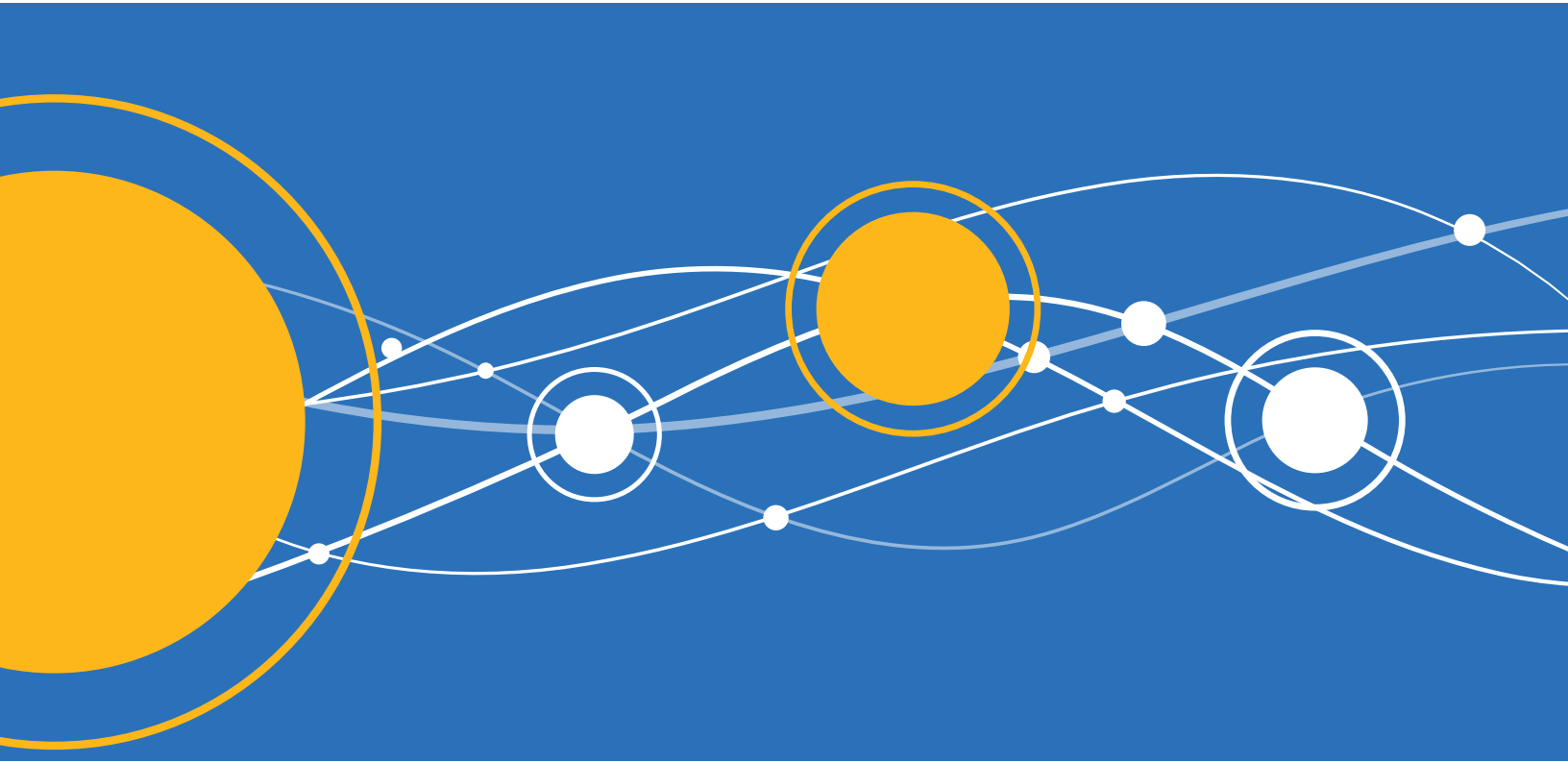
Big data is here to stay. And utilities must take advantage of the information that comes from processing their data in relevant ways. Customers—utilities and end-users—want to better manage their resources. So moving actionable data into their hands aligns with our current technology culture and consumer expectations. And it simply creates a better customer experience at all levels.

The other issue that is growing rapidly across utilities is compliance. "Government regulations are changing, and compliance is becoming mandatory," explains Roberts. "Utilities have to know their data in order to remain in line with federal and state directives."

Finally, whether it involves the grid, water or gas, disaster preparation and planning is at the forefront for every municipality. Using data from a municipality's smart utility network, an analytics software solution is the ideal foundation for better asset utilization when crisis strikes—and for everyday efficiency and customer service.



# Customer Portal



Twenty-first century consumers want control. They want easy, digital access to product and service information. And they want to be empowered to make immediate decisions that affect them without sitting on hold or battling language barriers. In many cases, “customer service” has become “customer self-service”—and that’s just the way we like it.

In the e-commerce space, Amazon is a household name because customers can shop, order, track and return online with no hassles. And although “hassle-free” doesn’t exactly describe most cellphone carriers, users can still go online to monitor device usage and even cut off data when a family member has been monopolizing it (think teenager). Within medical practices and hospital groups, patient portals are becoming the norm, allowing healthcare consumers to access records, pay bills and communicate with their doctors. Across the board today, industry leaders have risen to the top because they know the key to success: **Customer experience matters.**



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*"A customer portal provides virtually everything a customer needs to correct current issues and make better-informed decisions about future usage."*

RYAN ROBERTS

Software product manager  
Sensus

## Engaging the utility customer

Natural resources are among the few remaining products that customers pay for after consumption. Couple that with a regulated environment, and some may say the utilities industry doesn't need to be as concerned about customer experience. But this is not the case. Regardless of industry, customer satisfaction is king and impacts the reputation—and ultimate success—of any company. Even when a utility is the only game in town, the relationship it creates with customers is reflected in the way the entire community is perceived by commercial businesses, residents and visitors.

According to Ryan Roberts, software product manager at Sensus, "Implementing a customer engagement strategy is now a major goal of many utility CEOs. Whether it's for reducing churn in competitive markets, increasing customer satisfaction in regulated markets or meeting new conservation regulations, utilities need to enable customers to make informed decisions."

The key is to put account management at the fingertips of the utility's customers—the end users. This requires having sorted, actionable data. And the key to actionable data is analytics software.

"Once the raw data is collected via a robust and reliable smart communications network, it has to be organized for the respective utility departments," Roberts says. "And when that data is further sorted for use by the end users (the consumers), they no longer feel like they're being held hostage by the utility. They feel in control of their accounts."

## A portal to customer satisfaction

So how can utilities empower consumers with the service they want? "A customer portal provides virtually everything a customer needs to correct current issues and make better-informed decisions about future usage," Roberts explains. "This interactive web-based application creates easy-to-read usage charts, graphs, usage alerts, tips and more to put relevant data at customers' fingertips."

For this customer engagement approach to be successful, the utility must be able to customize the portal to highlight useful information, and customers need 24/7 access. When this is done right, utilities can reduce call volumes and provide greater customer control over water and energy use. Roberts adds, "When people gain awareness and control, they not only reduce usage and lower expenses, they become happier customers."



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*“The most important factor is the timeliness of data. ... Customers want data access hourly. They don’t want yesterday’s data today.”*

RYAN ROBERTS

Software product manager  
Sensus

**A customer portal provides value to the utility and the consumer while unifying the two through improved communication.**

#### **FOR THE UTILITY**

- Provides a huge asset for the customer service department.
- Improves billing and usage relationships.
- Decreases customer calls and high-bill complaints.
- Enables utility to be proactive, initiating alerts and calls to consumers about unusual use.
- Allows customization and manageability without need for a web developer.

#### **FOR CONSUMERS**

- Provides alarms and problem notifications to prevent or minimize a disaster.
- Decreases the need for calls to customer service.
- Allows for usage assessment and control.
- Helps keep bills low through usage alert settings and targets—preventing billing surprises.
- Allows for remote monitoring of rental and vacation properties.
- Provides peer comparisons to better gauge normal usage.

## **Choosing the best portal**

The potential benefits made possible by a customer portal depend on the actual product—and there are many options in the marketplace today. “The most important factor,” Roberts says, “is the timeliness of data. It must be available quickly and frequently. Customers want data access hourly. They don’t want yesterday’s data today.”

Another aspect to success is data resolution, or accuracy. The actionable information is only as good as the data being delivered to the consumer. Moreover, the data dashboard must be customizable to meet the specific needs and purposes of the utility customer.

“Immediate and direct alarm notifications not only prevent would-be crises, but they go a long way to building trust between the utility and consumers,” Roberts says. “And when there are issues that impact a particular area within the utility coverage, the portal allows for zone notifications to create segmented and targeted communication.”



## Rolling out the customer red carpet

When a utility chooses to activate a customer portal, it's vital to effectively communicate to consumers the what, why and how factors in order to maximize usage. According to Roberts, there are definitely "best practices" for implementing a customer portal. "Just as the tool (portal) itself establishes a means for efficient communication, a utility must create a definitive plan to inform customers about the portal, when it's being launched and how it can be optimized."

In today's technology-driven, self-serve world, it's actually pretty easy to get people excited about another cool "customer self-service" gadget—especially one with money-saving potential. And when that mindset is coupled with the cultural focus on environmental sustainability, a customer portal becomes even more attractive.

"A customer portal is a great way to take the action-ready data provided to the utility by way of analytics and make it consumer-friendly and actionable on their level as well," Roberts says. "It's a win-win situation for everyone."

## Create a portal roll-out plan.



Memorable  
URL



Bill insert/  
mailer



Sign-ups at  
community  
events



Media  
coverage



Social  
media



Door  
hangers



Email  
campaign



Video



# Conclusion


## Change your perspective on smart

There are definitely some impressive applications that transform communities into smart cities. Typically, the applications with the most buzz are highly visible to residents and local businesses. But the key to creating a smart city is for stakeholders and decision-makers to look below the surface to realize the most impact from smart.

Utility infrastructure is the largest budget item for every community. But when cities consider how to become smart, infrastructure may be overlooked. Smart cities start with a smart public infrastructure to deliver clean water, dependable power, safe gas and efficient public lighting. And as they free up resources by intelligently delivering essential services, they are able to invest in other services to improve quality of life.

## The impact of smart across utilities

Smart infrastructure saves resources, enhances customer service, improves operational efficiency and grows income across all utility verticals. These benefits establish a solid foundation of available revenue—and confidence—for community stakeholders to push smart city applications even further. And a truly smart city entices new business, invites relocating residents and establishes a fresh vibrancy. Now, that's just smart.



**Smart cities start with smart utilities. When cities know more, they save more. Small savings on utility expenditures can add up to millions of dollars for high-visibility projects and programs that citizens can get excited about, like new schools, parks and community centers.**



## Smart gas solutions save:

### **MONEY**

Up to 50% on operation and maintenance expenses

### **TIME**

90 seconds to disconnect gas service remotely

### **LIVES**

Quick response to temperature, pressure or seismic events



## Smart water solutions save:

### **MONEY**

Up to \$1M saved per year in leak forgiveness, bad debt and collections

### **TIME**

300 man-hours saved per year with improved stormwater management

### **LIVES**

15B gallons used each year to put out house fires in the U.S.



## Smart grid solutions save:

### **MONEY**

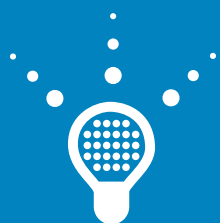
Over \$15M saved by reducing restoration efforts by 3 days

### **ENERGY**

3% reduction of energy consumption when used with prepayment programs

### **ENVIRONMENT**

Millions of pounds of CO<sup>2</sup> emissions reduced by remote service operations



## Smart lighting solutions save:

### **MONEY**

80% or more in savings in maintenance costs with managed streetlights

### **LIVES**

21% decrease in nighttime crime with lighting in key areas

### **ENERGY**

30% or more in savings through dimming and trimming

## Smart infrastructure starts with Sensus

Sensus provides smart utility solutions that enable cities to realize all their smart potential.

Our FlexNet® smart communications network and cutting-edge meters, sensors and utility-specific devices deliver operational efficiency, customer satisfaction and greater revenue—all while pursuing resource sustainability.

Citizens today love technology, pine for efficiency in all things and are adamant about protecting the environment. And they want to live in a smart community. Sensus sets the foundation for cities to dream smart—and make those dreams a reality.

## About Sensus

Sensus, a Xylem brand, helps a wide range of public service providers—from utilities to cities to industrial complexes and campuses—do more with their infrastructure to improve quality of life in their communities. We enable our customers to reach farther through the application of technology and data-driven insights that deliver efficiency and responsiveness. We partner with them to anticipate and respond to evolving business needs with innovation in sensing and communications technologies, data analytics and services. Learn more at [sensus.com](http://sensus.com) and follow us on Facebook, LinkedIn and Twitter through @sensusglobal.

## Sensus by the numbers

