



# Every drop counts: Smart meters conserve water

- **Business needs** – New ways to improve sustainability, efficiency, reliability, and savings for its customers.
- **Networking solution** – AT&T IoT connectivity enables Badger Meter to give customers valuable data and analytics.
- **Business value** – Optimized operations, enhanced sustainability, and customer satisfaction.
- **Industry focus** – Utilities
- **Size** – \$425 million annual sales

## About Badger Meter

With more than a century of water technology innovation, Badger Meter is a global provider of industry-leading water solutions. Their technologies deliver flow measurement, quality, and other key indicators. These offerings provide customers with the data and analytics to optimize their operations and contribute to the sustainable use and protection of the world's most precious resource.

## The situation

Badger Meter became the first major meter provider to offer cellular-enabled “smart” meters. The company needed a wireless provider with reliable connectivity, security, and coverage to deliver the benefits of its newest solution to its customers.

## Solution

Badger Meter uses AT&T LTE-M to connect its radio endpoints, delivering data from its smart meters with a highly secure, cost effective, reliable IoT network. It also uses AT&T NetBond® for Cloud to provide a private connection between its AT&T Virtual Private Network and its cloud resources. These solutions help the company provide the data and actionable information needed to decrease water waste, increase efficiency, and support long-term reliability for its customers.

## Conserving a precious natural resource and addressing climate change

Badger Meter offers smart water solutions for a wide range of customer applications. It has a global network of manufacturing facilities, innovation centers, sales offices, and distribution centers. With more than a century of innovation and strong, stable growth, the company works to optimize the use of and minimize waste of one of the world's most precious resources.

"Every drop counts. That's our tagline," said Karen Bauer, Vice President—Investor Relations, Corporate Strategy, and Treasurer at Badger Meter. "The phrase has dual meaning. Certainly, it's the conservation and protection of the world's most precious resource. Additionally, for municipalities, the meter is a type of cash register to bill its customers for the service. So, the word 'counts' can mean capturing that data for billing purposes."

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Vice President of Investor Relations, Corporate Strategy and Treasurer, Badger Meter

Badger Meter's leading smart-water solutions help customers optimize the way they manage water. Smart-water metering helps save water by enabling greater conservation through the quicker identification of wasteful leaks and arming users with real-time consumption data. "What can be measured can be managed," Bauer said. "Measuring water usage and other parameters enables you to manage it effectively."

And because the process of treating and pumping water to customers requires energy, lower water usage also reduces energy consumption. This helps reduce greenhouse gas emissions. That makes water efficiency a tool that communities can use to address climate change.

## A century of innovation

It was 1905 when Badger Meter introduced the first frost-proof water meter that solved the problem of meters freezing in cold Midwestern climates. A century later the company has become a global provider of industry leading smart-water solutions with a laser focus on sustainability.

"It's really integrated into our business strategy," Bauer said. "It's a central element of how we help customers efficiently use and conserve resources, predominantly water." The philosophy has led to numerous innovations over the years. One of these was the first connected meters in 1988, which used inbound telephony to improve meter-reading efficiency.

That breakthrough was followed by Automated Meter Reading (AMR). It's often referred to as drive-by, where meters are read automatically by receivers inside vehicles. Both systems improved efficiency, however they didn't improve the pattern of reading meters only quarterly—and only for billing purposes.

"It really wasn't until the industry moved to Advanced Metering Infrastructure or AMI in the 2000s that the needle really began to move on having real-time data delivered multiple times per day," Bauer said. "Having actionable data readily available opened the floodgates, so to speak, to a variety of benefits."

## The move to cellular

The move to AMI delivered many benefits to customers, but some solutions required heavy investments. "AMI network solutions require a utility to finance upfront the buildout of a proprietary dedicated network, and then maintain it," Bauer noted.

Municipalities faced significant costs in building and maintaining network towers and repeaters to transmit meter data. "If I'm spending millions of dollars to erect my own infrastructure, I'm going to want to change out the meters and the endpoints in my city immediately so I can start to get a return on that investment," Bauer said. "And that can cause a lot of operational challenges for a utility to be able to do that."

Building private networks to communicate meter data can also waste valuable natural resources, since erecting towers requires steel, emissions from construction equipment, and potentially clearing land of trees.

## Revolutionary technology

In 2014 Badger Meter introduced a cellular endpoint to connect to its water meters, which proved to be a game changer for utilities. "What we heard from customers was that cellular technology, which had grown to be a reliable, secure, and—importantly—an infrastructure-free solution, would provide them with a myriad of benefits," Bauer said.

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In addition to the negligible upfront and maintenance investments, a cellular endpoint allows for much greater flexibility in AMI deployments from a timing standpoint. "It can easily accommodate a city's growth and expansion," Bauer noted. "It wouldn't need to put in place additional fixed infrastructure to accommodate that."

To launch its cellular endpoints, Badger Meter needed a connectivity provider with the Internet of Things (IoT) expertise, leading-edge platforms, and flexible solutions that could help its customers realize the promise of the new technology.

## A network optimized for IoT

Badger Meter's longtime, rewarding relationship with AT&T Business made it a clear choice to connect cellular endpoints. The company had long used an AT&T Virtual Private Network and counted on AT&T NetBond® for Cloud to securely connect its network with its cloud resources. "AT&T Business has been a great partner for us," Bauer said. "We've worked together to provide expert advice to utilities considering cellular AMI. AT&T brings our solution a lot of credibility."

Badger Meter became one of the first companies to choose the cutting-edge AT&T LTE-M network to power its latest smart meters. The low-power wide-area network is designed and optimized for IoT deployments. It powers a host of IoT applications and features lower costs, compact modules, and longer battery life.

"From our first generation of cellular endpoints back in 2014 through our LTE-M cellular technology for the current generation, we've worked hand in hand with AT&T Business; they keep us abreast of technology advancements," Bauer said.

**"AT&T helps us understand the cellular technology roadmap. That helps us to have the best, most efficient cellular endpoints for our customers."**

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AT&T Business has assisted Badger Meter in extending the life of its endpoints' batteries while also supporting more frequent communication of actionable data and providing the ability for two-way communication.

"The AMI solution is more expensive for a municipality than a classic, manually read meter," Bauer said. "So, the final decision-making often takes place in the office of the mayor or the city CIO or CFO. Bringing the combined resources of Badger Meter and AT&T Business adds credibility. It has really been beneficial for the advancement and acceptance of cellular AMI."

## A host of benefits for customers

Badger Meter values AT&T Business keeping the company abreast of communications technology developments. "From the days of 2G and 3G to the current generation of LTE-M, AT&T helps us understand the cellular technology roadmap," Bauer said. "That helps us to develop and plan for the best, seamless, and most efficient cellular endpoints for our customers."



## Expanding acceptance of a world-class solution

While the company's first 115 years have focused on measuring water quantity, recent innovations and acquisitions will enable Badger Meter to monitor water quality, temperature, and pressure in real time. "Combining data for water quantity and quality gives a more in-depth, holistic picture," Bauer said. "This helps a water utility or wastewater treatment facility really understand and manage the overall water distribution system."

Bauer was careful to explain that there will not be water quality sensors at every meter, but that there will be multiple points within a utility distribution system at which water quality monitoring would occur, along with a cellular-based radio component to deliver that data.

As the company continues to introduce new ways to make every drop count, it will continue to depend on the reliability, resiliency, and range of AT&T networks to support its operations in the U.S. and around the globe. "AT&T Business is a great provider," Bauer said. "We've worked well together to expand the acceptance of cellular as a world-class solution for U.S. water utilities and municipalities in particular."

Customers can use Badger Meter's BEACON® software and EyeOnWater® consumer app to improve billing, customer service, identify potential leaks, and drive conservation behavior among their residents. "We offer a plethora of data now available to us through the efficiency of the cellular endpoint," Bauer said.

Bauer continued: "There's a whole host of benefits beyond the financial. Efficiency, resiliency, security, data availability, and conservation—all these are wrapped up into the solution."

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