



Reaching the Final Five Percent

How Utilities Can Go Beyond 95% Coverage and Achieve Full AMI Connectivity

For utilities, the benefits of Advanced Metering Infrastructure (AMI) are clear. No more sending work crews out month after month for costly, time-consuming, and polluting truck-rolls to collect readings from AMR devices. Instead, utilities can upgrade to a networked fleet of smart water meters with reliable connectivity, which streamlines billing and delivers powerful, near real-time, high-resolution data insights.

The benefits of AMI meters can also be passed on to customers, with consumer-facing apps and web portals giving property owners and residents a far deeper understanding of how and where they're using water. When end-users realize what their usage habits cost them, they naturally reduce water consumption: research shows that after a property migrates to AMI metering, total water usage can fall by [as much as 12%](#), making it far easier for utilities to meet their conservation goals.

Given the upsides, many utilities are surging resources to build out new AMI infrastructure. Across Europe and North America, the total number of AMI water-meter endpoints is [expected to double](#) by 2027 as utilities push forward with plans to upgrade their metering technology.

But there's a catch: despite making costly AMI investments, few utilities are connecting anywhere close to 100% of their new meters to their central data systems.

Challenges building out the expensive, radio-based infrastructure needed to upload data from AMI meters means that at least 5% of properties typically can't be connected in a cost-effective way. Those "missing meters" need to be read manually, further increasing operating costs for utilities, and frustrating customers who've been promised access to detailed, up-to-date water data.

Metron solves that problem with plug-and-play cellular water-metering solutions that dovetail seamlessly into any AMI network—working alongside existing smart meters, back-end software, and customer-facing apps to deliver 100% connectivity at little cost, and with no need for any additional network infrastructure.

Using dedicated cellular smart-meters and innovative cellular registers that can be quickly and cheaply retrofitted to existing meters, Metron helps utilities to do more with less—and achieve full AMI connectivity without breaking the bank.

Why is 100% AMI coverage so hard to achieve?

An AMI network is a bit like the mesh WiFi network found in many homes, with routers and signal amplifiers working together to provide connectivity across an entire house or apartment. Utilities install collectors and repeaters across their area of operations to capture readings from AMI meters, then transmit that data back to a central hub for analysis and billing purposes.

Just like home WiFi, however, AMI networks can be glitchy and prone to developing dead spots or areas of intermittent connectivity. That's because most AMI meters rely on radio frequency (RF) transmitters that operate at 30 MHz or greater—also known as “line of sight” systems, because they send a straight-line radio signal that can be [easily disrupted](#) by obstacles such as trees, fences, buildings, and many common construction materials.

To manage such headaches, utilities typically use stronger transmitters, additional gateways, or repeaters capable of routing signals around an obstruction. They might also need to install additional radio towers, or expensive two-way AMI systems to help troubleshoot connectivity problems.

That's an expensive process. At least 20% of the cost of an AMI network is attributable to network infrastructure—and adding more infrastructure only increases the total cost.

Exacerbating the challenge, the “final five percent” of hard-to-connect properties aren't usually neatly parceled in a single corner of a utility's network. Instead, they are scattered along the edges of the coverage area or located in built-up areas where adding new network infrastructure can be costly and complex.

Investing in new connectivity infrastructure for such areas brings diminishing returns. At a time of tight operating budgets and limited capital for new investments, many utilities balk at the idea of spending an additional \$50,000 on a new radio tower or gateway that will only enable connectivity for a handful of hard-to-reach households.

In fact, while most RFPs for AMI deployment require 98.5% connectivity, the reality is that utilities often settle for connectivity rates of 95% or less. In many cases, that means hundreds or even thousands of “missing meters” are never effectively connected to AMI infrastructure—leaving utilities and their customers unable to access current water data.

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5 ways that missing meters hurt utilities

Weighed against the benefits of transitioning to AMI, the impact of a few missing meters might seem trivial. The reality, though, is that missing meters have an outsized impact on utility opera-

tions, driving up costs, souring customer relationships, and degrading utilities' ability to manage vital maintenance and billing processes.

Here are five ways that missing meters impede utilities' operations:

1. Spiraling infrastructure costs

When an AMI meter isn't connected to the network, the most obvious solution is to build out new connectivity infrastructure. But with new towers costing \$50,000 or more, and also requiring utilities to lease space, provide power, and pay installation and maintenance fees, relying on new infrastructure to boost a struggling network can prove extremely expensive.

There's also no guarantee that any given infrastructure investment will actually deliver the results that are needed. At some point, pouring more and more money into trial-and-error investments designed to capture a few additional meter reads stops making business sense.

2. More admin—and more work orders

To capture data from missing meters, utilities have to send work crews to conduct manual readings. Since meter connectivity can fluctuate, it isn't possible to generate a fixed list of meters that require manual reads. Instead, the billing clerk creates a report listing the missing meters for the cycle, then generates hundreds or thousands of work orders for manual reads—all of which need to be completed in just a few days in order to bill on schedule.

For work crews, inspecting all those meters is a time-consuming process. It's also an expensive one: conducting ad-hoc readings for missing meters costs utilities up to \$5 per meter—markedly higher than the \$1-per-meter cost used as a rule of thumb for traditional drive-by meter reading.

3. More truck-rolls

Since missing meters are scattered across the utility's operating area, especially in outlying areas with fewer towers and gateways, more drive-time is needed to reach them. Workers might be possible to cover 90% of a utility's operating area in an hour of driving—but driving the fringes of the city to reach the last five percent of meters can take far longer.

Adding to the burden, AMI meters aren't configured for drive-by reading, so crews need to park and physically inspect each and every missing meter. That significantly increases the cost and environmental impact of taking monthly meter readings—and leaves work crews with less time for other vital maintenance and improvements.

4. Billing delays and inaccuracy



New neighborhoods require new AMI. Metron's cellular meters make it easy.

Often, work crews struggle to collect every single reading in time to send out bills. That forces utilities to issue estimated bills—a stopgap solution that creates additional administrative hassle for billing clerks, finance leaders, and other stakeholders across the organization.

Estimated bills also annoy customers, reducing their trust in the billing process. That leaves utilities dealing with a spike in complaints from frustrated property owners—and further increases the cost of managing a fleet of AMI meters. Finally, some utilities' policy is to apply minimum billing for meters that can't be read, leading to reduced revenue capture.

5. Wasted marketing spend

Many utilities are committing significant resources to educating consumers about the benefits of AMI, and to encouraging them to sign up for apps or online portals. When meters aren't connecting properly, however, such efforts can quickly backfire.

If AMI connectivity is hovering around 90%, for instance, companies can suddenly find that one in 10 customers are calling to complain that their data isn't in the app. That means extra work for customer support agents—and a lot of frustrated customers who'll be skeptical about AMI offerings going forward.

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How to reach the “final five percent”

Until now, water utilities have had only two real options: spend large sums on new infrastructure to bolster their AMI network, or resort to costly and time-consuming manual reads in order to plug the gaps.

Now, there's a third path forward.

Using Metron's advanced cellular smart meters, utilities can bring the final five percent of their metering network online almost instantly, achieving 100% connectivity with no need for additional infrastructure investments.

Here's how it works:

- **Cellular tech delivers reliable connectivity** — for every meter. Any location, anywhere, can be integrated into a utility's AMI network, with 100% read-rates and no need for additional infrastructure. Meters ship with cellular connectivity activated and configured and start streaming data directly to the utility as soon as they're installed.
- **High-resolution data ensures full AMI compatibility.** Metron's industry-leading 1-minute-resolution water data is automatically downsampled to provide hourly reports via our data access API, enabling seamless integration into existing data platforms that don't support 1-minute data. That enables bulletproof, zero-cost integration with any back-end billing software or customer-facing AMI portal.
- **Futureproofed AMI networks—with no need for new infrastructure.** As cities grow and the built environment changes, utilities often need to add meters—or deal with new connectivity issues at existing locations. Instead of spending tens of thousands of dollars on new connectivity infrastructure, utilities can add cellular meters to quickly and cheaply manage connectivity gaps or expand their network area.

- **Registers enable low-cost AMI upgrades.** Metron's Prism registers clip can be attached to existing meters—regardless of the original vendor—to deliver cellular connectivity in a matter of minutes. That enables utilities to rapidly extend AMI networks or plug connectivity gaps at low cost, with minimal disruption, and no need to replace existing hardware or invest in new radio towers.
- **Streamlines workflows for administrators and field teams.** Billing clerks and other managers can access 100%-complete billing information and consumption data via existing software tools, with no need to worry about missing meters. Work crews, meanwhile, can stop wasting time on manual meter reads, and can get back to performing vital maintenance and improvement tasks for their employer.
- **Customers get a metering experience that just works.** From the customer's perspective, there's no difference between a properly functioning AMI meter and Metron's cellular solutions. A property owner with a Metron meter gets the same fast, accurate billing and rich water-use insights as every other customer—all delivered via the utility's own customer-facing AMI portal.

Helping utilities to unlock the power of AMI

The AMI revolution has brought enormous benefits for utilities—but providers aren't yet capturing the full benefits of their investments. With 5% or more of meters failing to deliver dependable data, utilities are left dealing with inefficient billing, a flood of work orders, and frustrated customers.

Metron helps fill the gap—without requiring any additional infrastructure.

We bring decades of experience partnering with utilities of all sizes to implement cellular metering solutions—and connect real-time data seamlessly into existing billing and customer data solutions. From small utilities troubleshooting a handful of stubbornly misbehaving meters, to larger providers whose AMI migration costs have ballooned, we're able to deliver rapid, low-cost, and utterly dependable solutions at scale.

In today's challenging environment, utilities need to start doing more with less—and ensure they're capturing the full value of their AMI investments.

Get in touch with Metron. It's time to get the final five percent of water meters connected to your company's AMI network.

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