

Future thinking in the smart water sector

A smarter future

We've already seen evidence from smart water's early adopters that dedicated network connectivity can make a real difference in the utilities sector.

Improved bill accuracy, leakage reduction and greater efficiency are all on the table, but after proven successes the transformation is only just beginning.

Where are we now?

Those early adopters we're referring to are forging an inviting path for others to follow.

Thames Water has perhaps made the most progress, applying Smart Water Metering solutions to its own infrastructure to ease leakage issues in one of the UK's most water-stressed regions.

Following closely behind is Anglian Water, which has carried out extensive trials to prove the effectiveness of smart metering. Tests in Newmarket in 2018 resulted in leakage reductions of 108,000 litres per day, and the company is understandably working to roll the technology out further.

Other early adopters are now engaging with the market to initiate test and trial programmes. If these are successful they will seek to invest in their own full-scale rollouts of smart technologies in the not-too-distant future.

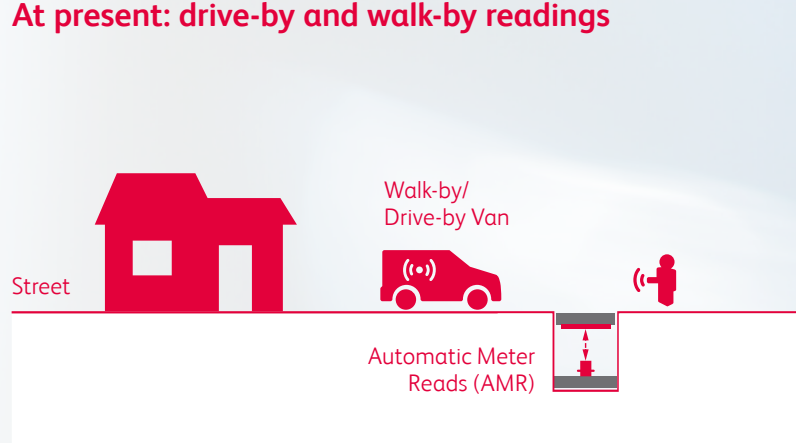
Where are we going?

The smart water journey can be split into three distinct stages, and the companies leading the charge are at the first of those.

Step one: metering

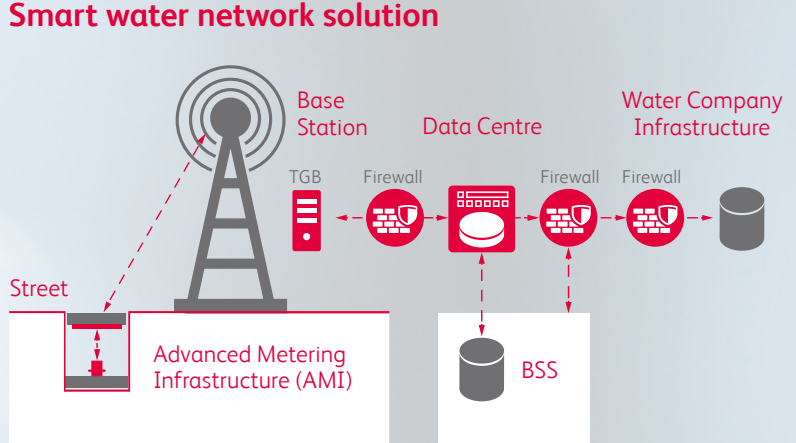
At present, smart metering can provide water companies with accurate and convenient usage data that can be used to generate accurate bills for customers. Those at the beginning of the smart journey are able to perform drive-by and walk-by readings, known officially as Automatic Meter Reads (AMR) – although these are still not particularly effective for early identification of customer supply pipe leakage or internal plumbing losses.

At present: drive-by and walk-by readings



Those who have progressed further along the smart journey are adopting Advanced Metering Infrastructure (AMI), where the meters are connected to a fixed network which provide hourly-read data back to the water company. The availability of timely data enables faster identification and resolution of leakage delivering reductions in water loss. Thames Water is at this point already, with Anglian and others expected to join soon. The improved operational efficiency with this approach becomes immediately apparent as meter connection success is >99%, ensuring automatic hourly reads following the installation of smart water meters.

Smart water network solution



Step two: monitoring

At this point, water companies are able to monitor the performance of their distribution networks by analysing the data provided not only by connected meters but also other devices such as pressure loggers, noise loggers, temperature sensors, and water quality monitors.

The data generated by these devices can be used to inform water companies' decisions, improve operational efficiency and service quality. Water companies today use a range of communications networks to gather their monitoring data. Arqiva is enabling its fixed network to transport monitoring data in near real-time providing water companies with the choice of a single communications solution designed specifically for connecting to devices in hard to reach locations.

Having visibility of the water network performance in near real-time is a very powerful tool for water companies, as it allows them to make better critical business and operational decisions. This is a very crucial step towards the next stage, in which the water network can be proactively and dynamically managed.

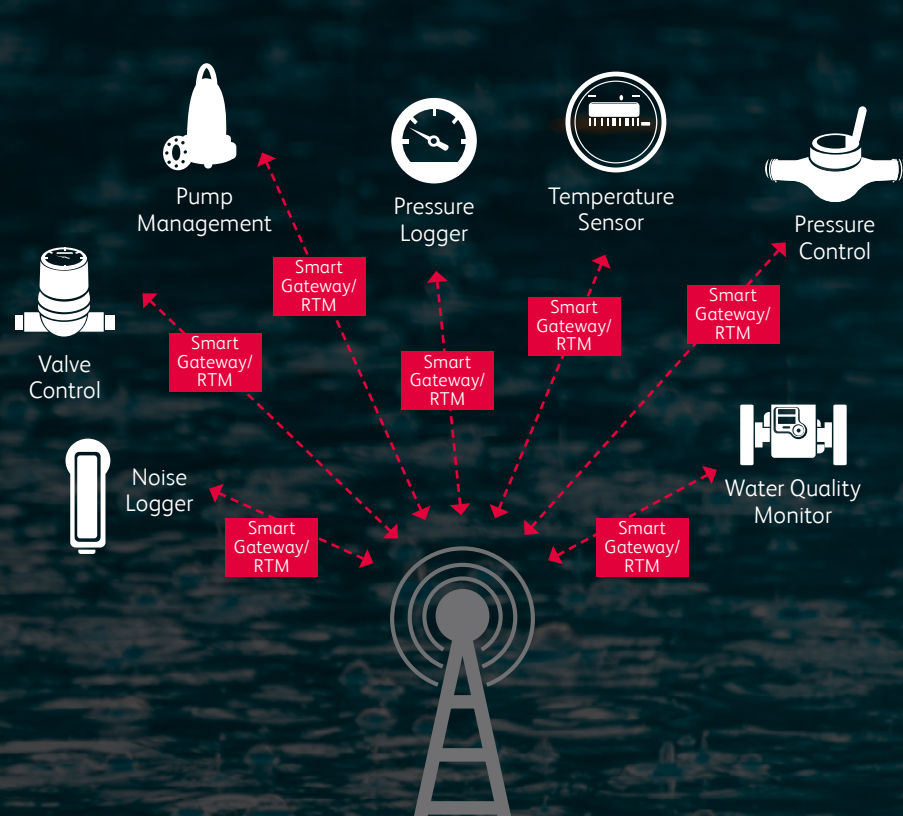
Step three: control

In the longer term, water companies will benefit from a more integrated environment in which devices like pumps, pressure regulators and valves can be controlled remotely – again, with decisions driven by the real-time data being harvested by sensors positioned across the network.

Pressure loggers, noise loggers, temperature sensors, and water quality monitors, + pump management, pressure control and valve control.

The power to manage and optimise pressure in real-time by varying the rate at which water is pumped into a network, for instance, will help to prevent leakage and pipe bursts, two of the biggest causes of water loss.

While the technology exists to start controlling water networks in this way, it's not fully integrated with other sensors, devices and analytics software, so it does not currently facilitate the kind of control and optimisation water companies need.



The need for technological change

The journey towards fully smart water networks will only be successful if certain technologies continue to evolve and a communications solution can provide sufficient levels of security, resilience and availability.

Smart water devices are becoming more intelligent, with some able to process data locally rather than rely on external systems. The electronics being used are also becoming more power-efficient, which is essential if water companies are to justify the costs of burying them deep in their networks – replacing a sensor's battery every five years just isn't cost-effective. The Arqiva Smart Water Network operates in a highly efficient manner

using the Arqiva dedicated private 412MHz frequency and the connected AMI mode meters can support a 15-year battery life. On the data side, the spotlight is on analytics. The sensors being installed are bringing in large volumes of data but in its natural state it means nothing. It must be turned into meaningful information that helps water companies act, and for that they need intelligent processing systems.

As for Arqiva, our focus is on providing device agnostic end-points; with the aim of ensuring different device manufacturers can connect their devices to our network infrastructure, so that water companies aren't so restricted in the ways they can embrace smart technologies.

We're facing challenges

The road from here to where the water industry needs and would like to be has its obstacles.

Much of the investment needed for these changes will come from the water companies themselves, so there must be a strong business case to justify the initial costs – these are businesses operating in stringent regulated markets and they have shareholders after all. Fortunately, the influential smart metering implementations and trials in water-stressed areas have provided real evidence that this technology works well.

New and exciting challenges remain for all water companies to build smart networks that deliver value beyond metering and take us into the new environment of metering, monitoring and control, with a supporting analytics platform.

Pressure from the government and industry regulator Ofwat, as well as strong influencers in DEFRA and the National Infrastructure Commission, will no doubt help to keep the water industry moving towards a smarter future in which companies can provide better value services for consumers.

Working towards a brighter future

Real change takes time, but in ten years we'd certainly expect the water industry to be more efficient at monitoring the performance of its networks, and even starting to control some aspects remotely. Gradual progress will see more companies gaining access to the latest technologies, with which they'll be able to significantly reduce leakage and burst incidents.

All the hard work going on now – the trials, investments and technological developments – is providing the foundations for this efficient future, and it must continue.