A Smarter Way to Future-proof Our Water Supply

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After what has been the driest summer in 50 years—exacerbated by extreme, record-breaking temperatures—the Environment Agency declared drought status across eight regions of England on Friday, 12 August 2022.

In the seven days that followed, drought status was declared in a ninth region of England—Yorkshire—and in several areas of southwest Wales too.

As a result, households across the United Kingdom have been urged to cut their water usage by taking shorter showers, letting their cars go dusty, and learning to love a brown lawn. With a hose pipe ban in place in many parts of the United Kingdom, you can forget about filling the hot tub or the paddling pool too.

While the water industry is working hard on its response to the environmental challenges that currently face us, we know that we can, and must, do more if we are to future-proof our water supply—not just this summer, but for the years and decades to come.

Sir John Armitt, chair of the National Infrastructure Commission, recently called for increased deployment of advanced metering infrastructure (AMI) across the U.K.'s water network. It is a call that we all welcome.

Like many of us in the industry, Armitt believes that this type of infrastructure is the best way to take better control of our water consumption, increase supply efficiency, reduce wastage, and improve the country's overall resilience to drought.

That is because in addition to giving customers greater control over their water use and bills, the detailed, real-time data generated by AMI is a vital tool in our battle to reduce leakage and meet unprecedented—and growing—demand.

Thames Water is already using AMI technology to help optimise their supply and minimise wastage, as part of their "smart water" initiative.

Software developed by the Thames Water data team—a suite of 16 data science products—means that they are now able to make better real-time decisions about the operation of their network, as well as respond more quickly to blockages, leaks, and burst pipes.

By monitoring and responding to intelligent, real-time analytics, they can reduce the number and duration of supply interruptions experienced by their customers. The impact of AMI technology has already been significant, including:

- **Saving 43 million litres of water per day:** Smart meters have helped detect more than 28,000 leaks on customers' private supply pipes. Timely repairs on these leaks have saved a massive 43 million litres of water a day.
- **Dealing with sewage blockages 10 times faster:** Thames Water has significantly increased their response time to sewage blockages. Before AMI, they cleared on average 20 to 30 blockages per month. With AMI technology, they now clear 350 blockages per month.
- **Meeting leakage reduction targets:** Customer-side leaks account for around a quarter of Thames Water's total leakage, and the meter data was cited as playing a large part in meeting the leakage reduction target in 2019-2020.
- **Helping customers have "smarter homes":** Data from smart meters is also being used to support Thames Water's award-winning smarter home visit programme, highlighting higher-consuming households who are then prioritised for a visit by one of their engineers. During the visit, customers receive free water-saving advice and can have gadgets installed in their homes to help reduce their water use, such as water-saving taps and shower heads. Smart-metered customers use, on average, 17% less water than those individuals without a meter. Typically, high-usage households can reduce their usage by around 100 litres per day following a smarter home visit.
- **Reducing supply interruption due to burst pipes in the winter:** Thames Water's freeze-thaw indicator runs simulations and allows them to increase supply availability at reservoirs to mitigate water lost from frozen pipes that have burst.

By 2025, Thames Water will begin the roll out of smart meters across the Thames Valley, and they expect to have meters fitted for all suitable homes by 2035.

They said that they would like to see government, regulators, and the rest of the sector getting on board too, with smart meters rolled out to all homes across the U.K. as a matter of national priority.

This sentiment is indicative of the other conversations with various U.K. water utilities throughout this year. There is an understanding that the real-time status of the U.K.'s water networks has been a top priority for many years but with the recent infrastructure, weather, and economic challenges, and threat of worse to come for the U.K., this topic has never been more important.

With the steady increase in smart meter and Internet of Things solutions throughout the network, the amount of available data has skyrocketed and is on an increasing trajectory. This influx of data provides an incredible opportunity to optimise the business of water through advanced analysis and data-driven decision-making to improve network resilience, reduce nonrevenue water losses, and drive higher quality environments for our consumers.

The increase in digital twin ready projects and drive towards the next generation of data-driven operation centres is connecting disparate data, information, and knowledge. It is providing a wider and more insightful view of a utilities water system to truly enable data-driven decision-making. It is all being done through centralisation and analysis solutions, such as the OpenFlows™, powered by iTwin®. Digital twins are becoming an ingrained part of the U.K. water utility networks work and will soon improve the reliability of water systems, reduce utilities' Capex and Opex, lessen their environmental impact, and provide their consumers with safe and efficient services.