



HOW WATER CAN HARNESS THE POWER OF DATA



Water companies face a myriad of challenges: extreme weather; a changing population demographic; responding to leaks quicker and more accurately; protecting UK agricultural production; reducing water consumption. The need to re-think traditional working methods and digitally transform represents a great opportunity for the sector.

By harnessing the power of data, water companies can make significant improvements to the way they work, service their customers, and protect the environment around them.



Since the opening of the market to competition in April 2017, it's become more important than ever to nurture positive relationships with customers.

Smart technology

Smart end-to-end networks can give water companies the opportunity to improve productivity and efficiency while enhancing their customer services.

For example, by offering customers a smart meter to monitor their own usage and to control their costs, companies can simultaneously improve satisfaction and focus on water-usage reduction targets and sustainability. Smart metering and the ability to book engineers and log faults online are also key examples of how joined-up data can help drive efficiency by empowering customers and bringing them closer to service-providers.

Forward-thinking water companies have already moved from a reactive 'fix-on-fail' approach to proactive maintenance programmes. This helps them improve the resilience of their assets and drive environmental outcomes, while ensuring continuity of supply and lower costs for customers.

"Intelligent" technologies like Microsoft Dynamics 365 Field Service and Power BI applications can work together to deliver these benefits. They deliver real-time, user-friendly data that can provide greater visibility of performance across locations, bringing asset knowledge together in one place to power more informed decisions, better collaboration and higher performance.



There is a human benefit here, as well. Collecting information remotely also enhances Health & Safety for workforces, as assets may not have been visited regularly.

Predicting maintenance, reducing costs

Digital technology gives water companies the ability to analyse massive quantities of data collected by network assets and equipment. This enables proactive, predictive and even prescriptive maintenance scenarios. Knowing ahead about likely component failure reduces costs, increases staff productivity and improves customer satisfaction.

For instance, using geospatial data analytics could assist in locating leaks more efficiently

– and at a noticeably lower cost – than legacy techniques such as acoustics. Another example is flood defence – sensors could detect rising water levels providing insights and solutions.

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“ An average 2,954 million litres of water leaked each day between April 2019 and March 2020. ”

Source: www.statista.com



Gathering data insights

Data analytics and machine learning can help simplify manual tasks, so freeing up employees. But integration with third-party information (from the Met Office, for example) can bring additional benefits such as providing more insight in forecasting scenarios.

Cloud-based data also promises to improve the effectiveness of regulation. Storing information in the cloud could make it easier for OFWAT to see the big picture – detecting trends across the sector. Data could be analysed against various criteria and shared with all the water organisations to enhance collaboration and facilitate joint projects.

Cloud data could also help inform sector-wide initiatives, multi-utility use cases, and Environment Agency programmes.

Targeting sustainability

The sector has shown real leadership on sustainability. For example, Thames Water treats sustainability as a top transformation priority, and at least three UK water companies are due to meet 2030 UN Sustainable Development Goal targets by 2027.

With the need to cut operational costs, drive efficiency and reduce CO2 emissions, water companies are increasingly using renewable energy sources such as solar and wind. By monitoring these via a cloud-based platform like Azure and using weather data and other relevant data sources, renewable energy can be optimised and traditional energy usage dramatically reduced.

Data insights can protect the environment and promote sustainability in other ways. For example, better weather prediction is helping companies anticipate and mitigate the impacts of flooding, while data from storm overflows is invaluable for monitoring and reducing waterways pollution.

The [2030 Net Zero Routemap](#) itself was developed using 10 years of water company data from the Carbon Accounting Workbook, which helps track greenhouse gas emissions. And data analytics will inform every step on the industry's journey to net-zero operations.

2030 Net Zero Routemap

2030 Imagined: our transition to net zero

Expert analysis and consultation with stakeholders confirms there is no single solution that achieves net zero on its own so it's clear that a broad combination of approaches and collaboration between water companies, policymakers and the supply chain will be needed.

By 2030 we aim to see:

1. Low emissions vehicles

100% of fleet passenger vehicles are electrified and 80% of commercial vehicles (LGVs and HGVs) converted to alternative fuels to cut carbon and air pollution.

2. Water and energy saving

New strategies to tackle leakage and help customers save water, alongside smarter and more efficient networks and catchments.

3. Process emissions

Targeting a reduction of up to 60% from our 2018-19 baseline by 2030, with monitoring of emissions to inform research and detailed pathways ahead of PR24.

4. Renewable power

Up to 3GW of new solar and wind power coupled with energy efficiency measures and suitable storage to provide up to 80% of sector demand, relieve pressure on grid generators, and minimise the need for offsets.

5. Green gas

Biomethane from sewage waste is injected into the grid to heat up to 150,000 homes, use in hard to decarbonise sectors, or to generate low-carbon power when generation from renewables is low.

But even those highly challenging actions won't be enough to reach net zero, and our plans also include:

Restoring native habitats 20,000 hectares of owned peatland and grassland are restored and 11 million new trees are planted. These nature-based measures will help achieve a just transition by reducing demand on treatment, providing an important sink for the hard to abate activities like process emissions, restoring habitats, and reducing flood risk.

Targeting innovation — process emissions are highly uncertain and tackling them quickly is a significant global challenge. We don't have all the answers yet and finding efficient retrofit solutions is a big priority for our innovation strategy.



Environment, social and governance (ESG) performance

Data is essential to tracking the effectiveness of all industry ESG strategies. Alongside the key environmental goals discussed above – such as reducing pollution and carbon emissions – the industry also tackles social and governance issues.

Its social goals range from affordable services and customer education to employee wellbeing and skills development, while governance KPIs cover ethical standards and sound financial management.

From training and apprenticeship programmes to water-efficiency advice and responsible finance and innovation, company reports rely on cloud-fuelled data to measure KPIs, provide insights and prompt specific action points. This helps drive operational, employee and service delivery performance.



Sustainability and the market opportunity

The core case for sustainable development is obviously ethical. But it's not all about corporate social responsibility and ESG criteria.

With the water market growing fast, profitable new approaches to sustainability are also emerging as innovative technologies appear. For example, see McKinsey Quarterly, [The business opportunity in water conservation](#). In the UK, for example, ingenious carbon reduction methods already include exploiting ammonia production for fuel, using recovered heat for power,

extracting cellulose from the waste stream, and converting carbon from production exhausts into fertiliser.

The global market is following suit. Water-treatment innovations range from rainwater disinfection with ultraviolet light (for washing clothes) to devices that collect wastewater from sinks (for flushing toilets). New technologies have also cut the cost and energy of desalinating water, while increasing the quality of the final product.

To a large extent, the policies of industry regulators will determine which new technologies prevail and which fall by the wayside.



Forecasting change

A Digital Twin makes it possible to capture aspects of a real-world asset in a digital model. As part of their wider digital transformation plan, Anglian Water are using a Digital Twin to help develop their new strategic pipeline. This data can unlock value by enabling engineers to design and monitor a safer, greener and more efficient infrastructure that will also inform better decision-making.

A further benefit of working with a Digital Twin is that it helps develop human digital skills - people are empowered to carry out higher value tasks.

The water industry is also using AI to identify patterns in data, and to learn and problem solve at pace. By rapidly unlocking insights, AI is driving efficiency by predicting outcomes like the next mains burst or drought.



We use Microsoft Azure Databricks and that has honestly changed the way we work. There was no way that a human would be able to look through that much data... it was a problem that could only be solved by AI. //

Reece Cook, Senior Data Scientist, Anglian Water EIM Alliance

A roadmap for the future

Future-focused organisations are using digital modernisation, coupled with domain expertise, to tackle challenges head-on and achieve solutions.

Going forward, water companies have the opportunity to transform their businesses, improving operational efficiency and driving sustainability. Microsoft can help them scale rapidly and make more use of data, analytics and AI in their working methods.



Digital solutions enable an ability to normalise, standardise, share and secure data to produce business outcomes, particularly through the use of AI and analytics. //

Rik Irons-Mclean, Strategy Director, Manufacturing, Energy & Resources at Microsoft

Ofwat has established a £200 million innovation fund to encourage data collaboration and innovation in the water sector.

Source: www.ofwat.gov.uk



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