

# AQUADVANCED® Water Supply:

A holistic approach to water management and network optimisation



**The real-time water management features of AQUADVANCED® Water Supply (formerly known as AQUADVANCED® Energy) helped Bristol Water achieve record low energy consumption and improve network optimisation.**

Bristol Water, established in 1846, serves 1.2 million customers in the Bristol region. Its supply area covers around 2,400 sq. km, providing an average of 264 million litres of drinking water along 6,700km of pipe mains per day.



## Client issue

Serving Bristol and surrounding areas in the UK's southwest, Bristol Water (part of the Penon Group PLC water utility company) is tasked to provide essential public water services to around 1.2 million customers.

In recent years, Bristol Water increased its resilience and interconnectivity between sources and supply areas.

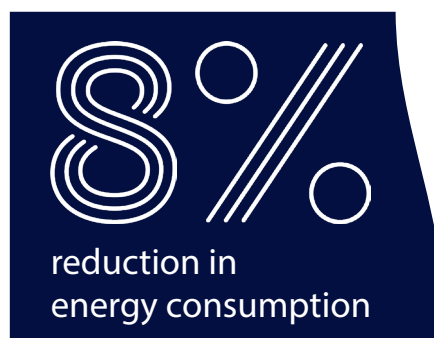
It is complex to fully optimise the operation due to the broad impact and ever-changing needs; trying to reduce cost whilst maintaining resilient supply under pressures such as drought.

Wanting to boost their operational efficiency, Bristol Water had several goals in mind. This included reducing energy consumption and costs, streamlining water

routes for efficiency and cost-savings, improving asset efficiency, and overall consistent network optimisation.

## Solution implemented

To address these challenges, Bristol Water approached SUEZ to implement AQUADVANCED® Water Supply solutions across its entire water distribution network. AQUADVANCED® Water Supply by SUEZ is a real-time water management and optimisation system that works alongside water utilities' SCADA and telemetry systems.



It helps water utilities save energy by:

- Forecasting water demand in different zones and scheduling delivery at the lowest cost.
- Pumping water to storage tanks during low-cost energy periods and releasing it during high-cost periods.
- Using the most efficient way to move water around the network.
- Selecting the most efficient pumps and pump combinations based on flow rates.
- Avoiding tariff peaks through Demand Charge Management.

Among its biggest benefits, AQUADVANCED® Water Supply significantly enhances operations, while also reducing energy costs and minimising environmental impact. Since the technology automates many of the tasks that the controls team would otherwise have to do manually, it allows the team to focus on more strategic tasks, including planning and improving the water supply system's reliability.

Unlike point-to-point optimisers, which address issues or enhancements in isolation, AQUADVANCED® Water Supply assesses operational efficiencies across the entire network, considers interactions between remote assets, and gives an integrated approach to network optimisation.



### Differentiating factors

In contrast to other solutions available on the market, AQUADVANCED® Water Supply stands out with its real-time control and full automation. It offers instant insights for optimised water management and streamlines routine tasks, allowing the controls team to focus on other priorities.

In addition, AQUADVANCED® Water Supply updates its plans within 30 minutes, generating schedules for the next 48 hours, compared to the 24 hours offered by others. This means the controls team always has the latest information to make informed decisions. This holistic approach to water management delivers impressive energy savings and ensures consistent, efficient operations even when faced with unexpected changes in demand.

### How it works

The AQUADVANCED® Water Supply solution involves a comprehensive analysis of various elements to optimise a water utility network's performance. In Bristol Water's case, AQUADVANCED® Water Supply evaluates the entire network, including both raw and treated water. During this process, the software takes a number of factors into account, including reducing energy cost, ensuring water quality, assessing asset availability, and maintaining network calming parameters.

### Implementation

The implementation of AQUADVANCED® Water Supply followed a standard but well-structured process. It involved several key stages: design, build, test, adjust, install, and final sign-off.

It started with SUEZ working with Bristol Water on a detailed design project that:

- Defined project objectives;
- Identified and analysed existing operational constraints; and
- Created a customised solution that met the utility's specific needs.

HAZOP (Hazard and Operability Study) meetings were conducted to identify and analyse existing (and potential) operational constraints, consequences of failure and other safety hazards. SUEZ then submitted a SCADA/HMI design and reviewed existing process control systems with Bristol Water staff. Additionally, they developed a comprehensive IT solution and conducted a hydraulic analysis.

Upon completion of the detailed design, SUEZ began building the network configuration and undertook necessary customisations. Working collaboratively, the Bristol Water and SUEZ team then tested the solution to ensure that it was operating as expected and that it met the utility's needs.

Once the solution was commissioned, the postcommissioning phase began. SUEZ provided

"AQUADVANCED® Water Supply has not only helped us achieve our lowest energy consumption in two decades, but has also transformed our approach and understanding of network operations. SUEZ's innovative approach has empowered us to challenge existing operations, and develop custom solutions to meet specific needs, all requiring no changes or visits to our sites due to the safe test bed it provides. AQUADVANCED® Water Supply was a key tool to managing our operations during the drought of 2022 and helped enable us to stay within our targeted storage and ensure no impact to customers."

– Owen Smith, Water Supply Optimisation Manager, Bristol Water



continued training and support to help the operators get the most out of the newly installed AQUADVANCED® Water Supply platform. SUEZ also monitored the software's performance and adjusted as needed. The process concluded with a formal approval, signifying its completion and readiness for use.

## The results

Having the power to analyse a full year's worth of energy demand data allowed AQUADVANCED® Water Supply to tailor energy packages that perfectly match Bristol Water's specific needs. One of these needs was to simplify water transport from all its sources effectively and economically. AQUADVANCED® Water Supply helped make Bristol Water's vision a reality.

This data-driven approach has produced remarkable results. Bristol Water saw

an 8% reduction in energy consumption, the lowest for Bristol Water in 20 years.

One of the advantages of using AQUADVANCED® Water Supply is its efficient way of managing the water network, which is crucial for maintaining a consistent water supply, especially during periods of high demand. It played a significant role in Bristol Water's supply strategy, particularly during drought conditions. For instance, it helped Bristol Water intelligently limit drought sensitive sources and move water across the network from sources with more available water. Thanks to this strategic approach, Bristol Water has been able to maintain normal operations and ensured a reliable water supply for its customers.

## The future

Bristol Water has gone beyond the initial scope by incorporating additional assets into their network. For instance, the water utility can benefit from using on site generation. Additionally, some pump stations may not provide significant financial savings, but they can still be included in the software for other benefits, such as improved water quality and resilience. AQUADVANCED® Water Supply empowers Bristol Water to adapt to evolving network operations and seize opportunities as they arise.



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