AVEVA

No gaps in your data, no leaks in your strategy

An executive guide to realizing intelligent water

Table of contents

Turn pressure into progress 3

Challenges across the water lifecycle 5

How to drive intentional innovation 6

Data in action: From pipes to plants 8

Scaling for the future 10

Conclusion 12

Turn pressure into progress

As a water professional, you're already looking to tackle the industry's challenges head-on: reduce costs, boost asset reliability, meet sustainability targets, and adapt rapidly to climate and regulatory changes—all while protecting public health.

Aging infrastructure and rising demand require swift action. Yet traditional approaches fall short. To address these growing pressures, forward-thinking water operators now turn to advanced technology and industrial intelligence to achieve results and stay resilient.

Research confirms what you already know—the time to act is now. Consider these insights from industry leaders:[1]

69%	66%	52%	72%
69% of leaders plan to make investments in industrial intelligence solutions a priority in the next 12 months.	66% acknowledge their organizations are making key business decisions without access to reliable, real-time data and insights most of the time.	52% see difficulties sharing data with trusted suppliers, customers, and partners as a top obstacle to maximizing efficiency and impact.	72% have yet to adopt industrial AI across the full organization.

Addressing these challenges has stakeholders calling for immediate, intentional innovation, and their message is clear:

"Transformative change in water and wastewater companies starts with data-driven action—those who innovate now will shape a resilient, efficient, and sustainable future."

This eBook helps you maximize your existing investments and go beyond SCADA with digital twins and AI, highlighting proven approaches to building smart, sustainable water systems.

Read on to get a complete picture of the sector's current state-of-play, as well as practical solutions that are easy to understand —and easy to implement and scale—for water and wastewater operators of all sizes and maturity.

By the numbers: Water and wastewater

83%

83% of municipalities now cite EU support and funding as being essential for planned investments.[2]

40%

The world is projected to face a 40% shortfall in freshwater availability by 2030 if current consumption and management practices continue.[3]

24%

The European Environment Agency estimates around 24% of all treated water is lost through leaks, with losses exceeding 40% for some Member States.[4]

≥10%

New EU-wide targets require Member States to increase water efficiency by at least 10% by 2030.[4]

These numbers illustrate three mega-challenges that are driving change in the industry:

Beyond compliance: Challenges across the water lifecycle

Whether you are small or large, rural or city-based, the unique issues you face daily most likely stem from major industry-wide challenges like:

Climate resilience and sustainability: Climate adaptation is no longer a future concern—it's a present-day operational challenge. Droughts and floods, blue-green algae, and "forever chemicals" such as PFAs. The ability to monitor and adapt to unforeseen conditions is critical to maintaining safe supply.

Aging infrastructure and investment: Securing sufficient investment for the renewal and modernization of water infrastructure has emerged as a leading challenge for water operators across the EU—surpassing even source water protection—as Member States work to comply with evolving regulations and meet escalating water demands.[5]

Complexity and skillset gaps: Currently, 80% of employers in the EU report difficulties in recruiting people with the right skills and qualifications for their needs, with the water sector being particularly affected by shortages in digital, engineering and environmental expertise.[6]

Fortunately, the tools you need to solve these problems not only exist but have already been proven by water leaders to deliver significant positive returns. In the next section, we'll cover the key use-cases behind early adopters' success.

Get ahead of the flow: How to drive intentional innovation

The future belongs to those who embrace integrated, data-driven ecosystems in which real-time insights empower proactive decision-making. Leaders who invest in technology now—driving collaboration, operational efficiency, and new value streams—will reap compounding benefits as the industry undergoes its transformation.

Industry challenge	Business goals and outcomes	Digital strategy
Operational efficiency and agility	Streamline operations, reduce waste, and improve responsiveness.	• Unify operational data across systems with context • Deploy digital twins for asset and process optimization • Automate routine monitoring and reporting • Empower teams with role-based data visualizations • Apply AI for predictive maintenance and resource optimization • Scale modular solutions across all facilities
Resiliency and emergency response	Withstand climate shocks, respond to disruptions faster, maintain service continuity	• Integrate real-time monitoring across critical assets • Establish an emergency operations center with central monitoring and control • Use digital twins for scenario simulation and risk forecasting • Enable predictive alerts and automated response protocols • Centralize emergency dashboards and communication channels • Capture and reuse emergency playbooks
Asset health and optimization	Extend asset life, reduce unplanned downtime and risk, and prioritize investments.	• Centralize real-time industrial information management as a foundation for asset intelligence • Implement digital twins for critical infrastructure • Apply predictive maintenance and risk-based prioritization • Use dashboards to visualize asset health and lifecycle costs • Standardize and scale best practices

Get ahead of the flow

Industry challenge	Business goals and outcomes	Digital strategy
Quality, reporting, and compliance	Safeguard public health and transform compliance from a reactive burden to a proactive capability.	• Centralize quality and compliance data into a unified data infrastructure for full visibility • Automate data collection and reporting workflows • Enable real-time monitoring and alerts • Apply analytics and simulations for contaminant forecasting • Standardize templates and reporting formats • Maintain historical records and audit trails • Empower cross-functional collaboration
Sustainability and decarbonization	Reduce carbon footprint, lower operating costs, and preserve vital water resources.	• Deploy real-time energy monitoring across assets • Apply predictive analytics for optimization • Integrate sustainability KPIs into enterprise dashboards • Enable cross-team collaboration via hybrid cloud • Capture and share best practices
Workforce transformation	Cultivate a data-driven culture through industrial intelligence	• Establish a unified data foundation that bridges the IT/ OT gap • Democratize data with role-based dashboards • Launch targeted digital pilots to build momentum • Embed analytics into daily workflows • Invest in training and change management • Capture and share best practices • Align leadership and strategy around data • Technology as a strategic investment, not cost

Data in action: From pipes to plants—smarter every step

Data isn't just the byproduct of operations, it's the engine driving new growth, agility and resilience. When water organizations adopt industrial intelligence solutions, the benefits amplify across the lifecycle.[7]

Improve energy efficiency: Use real-time data to optimize proactively.

Acciona digitally transformed its water treatment and desalination operations with a focus on efficiency, sustainability and real-time decision-making. With cloud-enabled information sharing, they improved pump energy consumption by ~4.6%, lifted plant output by ~16.3m3/h, and lowered chemical usage across their network.

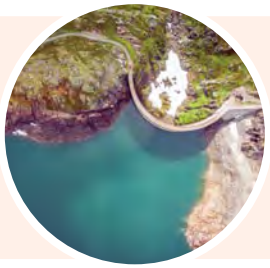
Tackle water leaks: Digital twins integrate live sensor data, historical records, and predictive analytics to detect anomalies and pinpoint leaks before they escalate.

Yorkshire Water unified its live network data to move from reactive fixes to proactive interventions. Leak repair turnaround was reduced from ~30 days to less than 10 days, with maintenance alerts ~4.5 days sooner than before. Helping to contain costs and improve service continuity for customers.

Ensure regulatory compliance: AI and analytics enable utilities to move from reactive to proactive compliance.

Colorado Springs Utilities integrated lab data with live operational metrics to enable real-time quality control. With results in minutes, not weeks, they enabled immediate quality adjustments, reducing overtime by 58% and remote travel by 30% for safer, more efficient compliance.

Protect water quality: Use real-time data, AI, and cloud-based platforms to monitor water quality continuously, anticipate risks, and respond swiftly to protect public health



When a harmful green algae bloom threatened the **City of Salem's** water, the utility integrated satellite, weather, and lab data through a cloud-based platform to predict and prevent cyanotoxin contamination. This proactive approach protected public health, showcasing the effectiveness of predictive analytics and unified data in water quality management.

Optimize processes: From simple alerts to predictive models, AI and simulation tools help utilities optimize performance, reduce costs, and anticipate problems.

White House Utility District combined real-time GIS and sensor information into a central data infrastructure to enable rapid leak detection. Within 3.5 days they identified a hidden leak draining 147 million gallons per year, saving $300,000 annually and postponing $15-20 million in capital projects.

Improve asset health: Use real-time data, digital twins, asset information management and predictive analytics to monitor, maintain, and prioritize assets across the water network.

Roslagsvatten unified asset data and operational controls on a digital platform, gaining real-time visibility into asset health. This transformation cut handover costs by 40%, reduced energy and operating expenses by up to 20%, and enabled faster upgrades and smarter decision-making across its multi-municipality water utility network.

Prepare and respond to emergencies: Integrate digital twins, AI-powered analytics and centralized data management to enable real-time visibility, predictive scenario planning, and coordinated emergency response.

EPCOR uses real-time data to drive situational awareness and improve resiliency. The updated system allowed people to discover process interdependencies and enabled dynamic management of stormwater systems during flood events. Response times were cut from days to minutes, ensuring public safety, and environmental releases have been avoided, saving thousands in regulatory fines.

Scaling for the future: The industrial intelligence advantage

Scalable digital infrastructure isn't a luxury. It's a necessity. The ability to adapt to evolving business needs, manage distributed assets in real-time, and leverage emerging technologies sets leaders apart—and will play an outsized role in determining future success.

What defines top-tier scalable digital infrastructure?

Adaptable systems

Across the entire water lifecycle, digital tools must accommodate the varied operational demands that systems of different ages and complexities require.

Open, agnostic, scalable, and flexible

Agnostic platforms integrate seamlessly with new and existing systems, delivering unmatched scalability and fostering agility and growth.

Hybrid-cloud enabled

The best of both worlds, a hybrid-cloud approach delivers all the security of on-prem data management, and the flexibility, ROI, and advanced analytics capabilities of cloud-based SaaS offerings.

What does industrial intelligence deliver sector-wide?

Industrial intelligence transforms water companies into proactive, data-driven organizations—delivering measurable value across operations, compliance, and community trust.

Intelligent water? Start today.

Digital transformation in water utilities is no longer aspirational—it's essential. The tools are proven. The value is real. The time to act is now.

1. Embrace data-driven decision-making

Turn insights into action for strategic advantage

2. Foster collaboration and innovation

Invest in technologies that accelerate digital transformation, build agility and resilience, and scale in tandem with your evolving business needs

3. Build resilience

Create systems capable of withstanding market volatility, security threats, and environmental challenges

The journey to resilient, sustainable water operations isn't just paved with new technologies—it's driven by bold, data-led decisions.

Will you lead the flow?

References:

1. Wakefield Research. “Solving Tomorrow’s Challenges, Meeting Today’s Goals: A Look at Industrial AI in Power, Chemicals, Manufacturing, and Infrastructure.” 2024. Independent survey commissioned by AVEVA.
2. https://managenergy.ec.europa.eu/publications/state-local-infrastructure-investment-europe-eib-municipalities-survey-2024-2025_en
3. AWWA. 2025 State of the Water Industry Report.
4. European Water Resilience Strategy 2025. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52025DC0280
5. European Parliament, 2025. https://www.europarl.europa.eu/topics/en/article/20250428STO28142/europe-s-waters-key-challenges-and-eu-solutions
6. EURES, European Union, 2025. https://eures.europa.eu/skills-we-need-jobs-we-want-2025-04-28_en
7. AVEVA. www.aveva.com/en/perspectives/success-stories/

For more information, please visit:
www.aveva.com/en/industries/infrastructure/water-wastewater/

linkedin.com/company/aveva

@avevagroup

About AVEVA

AVEVA is a global leader in industrial software, driving digital transformation and sustainability. By connecting the power of information and artificial intelligence with human insight, AVEVA enables teams to use their data to unlock new value. We call this Performance Intelligence. AVEVA’s comprehensive portfolio enables more than 20,000 industrial enterprises to engineer smarter, operate better and drive sustainable efficiency. AVEVA supports customers through a trusted ecosystem that includes 5,500 partners and 5,700 certified developers around the world. The company is headquartered in Cambridge, UK, with over 6,500 employees and 90 offices in over 40 countries.

Learn more at www.aveva.com

AVEVA and the AVEVA logo are a trademark or registered trademark of AVEVA Group Limited in the U.S. and other countries.
All product names mentioned are the trademarks of their respective holders.

© 2025 AVEVA Group Limited or its subsidiaries. All rights reserved.