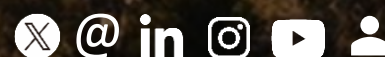

Digitalisation Action Plan

Towards Water-Smart Management in Europe





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TOWARDS WATER-SMART MANAGEMENT IN EUROPE

Water Europe welcomes the development of an EU Digitalisation Action Plan (DAP) for the water sector as a critical step toward achieving resilient, efficient, and sustainable water management. Digital technologies offer transformative potential to improve water quality and quantity management.

However, to unlock this potential, the DAP must establish a robust enabling framework for a secure, interoperable, and economically viable digital transition. The DAP represents a strategic opportunity to enhance EU competitiveness, stimulate green growth, and support the clean transition. By establishing clear incentives, coherent governance, and aligned investment frameworks, the EU can unlock the full potential of digitalisation to achieve water-smart management across Europe.



Introduction

Water Europe welcomes the announcement of an EU-wide Action Plan for the digitalisation of the water sector¹. Digitalisation can play a transformative role in enabling inclusive, resilient and smart governance of water resources and water infrastructures, improving the agile management of both water quality and quantity while significantly reducing leakages. It also offers opportunities to optimise capital and operational expenditure (CAPEX & OPEX) and improve energy efficiency, for instance through real-time monitoring, predictive maintenance and enhanced process optimisation in water and wastewater systems.

However, the success of such an initiative will depend on its ambition. The Action Plan must go beyond simply communicating the value of digital tools and instead establish enabling conditions for a secure, interoperable, and financially viable digital transformation of water management systems across Member States.

Leveraging horizontal policy frameworks relevant to water is essential to foster the adoption of digital tools for the planning, design, construction, operation and maintenance of water-related infrastructure and services². With a fast return on investment and clear benefits for the clean transition, this action plan is also an opportunity to stimulate EU competitiveness and autonomy³.

Moreover, the EU leadership in water-related patents (40% global share)⁴ is an asset and constitutes an opportunity for job creation and green growth in Europe.

Yet, despite this strong digital ecosystem and innovation potential, the water sector has not fully benefited from digitalisation, leaving significant untapped potential for improving water management efficiency and resilience. When looking at the EU Digitalisation Action Plan's main objectives, only two major challenges are mentioned:

- **Monitoring of sources of pollution, water abstraction and reuse, as well as leakages.** Currently, national leakage levels for public drinking water infrastructure vary from 8% to 57%⁵, and the requirement for integrated urban wastewater management plans under the revised UWWTD will further benefit from the deployment of digital solutions.
- **Agile water management:** currently, the lack of electronic reporting and insufficient digitalisation⁶ hinder Member States' capacity to overcome fragmentation and make data easily findable, accessible free of charge, interoperable, and reusable.

¹ EUR-lex, COM(2025) 280 final, [European Water Resilience Strategy](#), June 2025

² Joint statement, Upcoming EU Action Plan on Digitalisation in the Water Sector Should Prioritise Adoption of Digital Technologies Throughout the Entire Water Cycle, 2025

³ DIGITALEUROPE, [Upgrading water management: how to turn digital investment into real sustainability gains](#), 2021.

⁴ European Patent Office, "[Innovation in water-related technologies](#)" (July 2024).

⁵ EUR-lex, COM(2025) 280 final, [European Water Resilience Strategy](#), June 2025

⁶ EUR-Lex, 7th Implementation Report (2024), [COM/2025/2 final](#), February 2025

While the EU water acquis includes several targets for leakage reductions, the legislative corpus does not provide coherent incentives and direction for the digitalisation of water-related infrastructures. Therefore, there is an imperative to set up such a framework in the right legislative corpus, keep it as simple as possible, and ensure this approach aligns with the key principles, namely the subsidiary principle, source-to-sea approach, and FAIR principles.



Figure 1: Current legislation that provides direct or indirect objectives in line with the two aims of the EU Wide-Digitalisation Action Plan presented by the EU Commission, and potential additional actions that should be considered⁷.

⁷ Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption (recast), article 4.3, <http://data.europa.eu/eli/dir/2020/2184/oj>; Directive (EU) 2024/3019 of the European Parliament and of the Council of 27 November 2024 concerning urban wastewater treatment (recast), article 23.1.c ,

<http://data.europa.eu/eli/dir/2024/3019/2024-12-12> ; Commission Delegated Regulation (EU) 2024/1765 of 11 March 2024 supplementing Regulation (EU) 2020/741 of the European Parliament and of the Council with regard to technical specifications of the key elements of risk management, annex I, http://data.europa.eu/eli/reg_del/2024/1765/oj

Recommendations

The Digitalisation Action Plan must tackle these barriers by creating a “Digital Single Market for Water Data and Water Operations”.

1. Support the deployment of digital tools

The Digitalisation Action Plan should support a coherent digital framework for monitoring, planification, maintenance, operation, as well as for customers and citizens’ interface and automatised reporting. Firstly, the large-scale deployment of smart water metering and digital leakage detection technologies across both public water distribution networks and private premises will support anticipation, detection, and reduction of leakages. These solutions (linked with real-time monitoring) enable utilities to identify leaks in distribution systems more rapidly, optimise pressure management, and improve network efficiency. In the same vein, smart meters allow household consumers and businesses to detect abnormal consumption patterns, reduce water losses within private networks, promote more responsible water use and increase awareness of water consumption⁸.

Secondly, this approach shall be embedded in an enabling environment that is completed by multiple digital tools such as earth observation, smart infrastructure inspection tools, modelling technologies, digital twins, improving visualisation and management of water distributions systems and preventing, detecting, and fixing pipes leakages.

Thirdly, Artificial Intelligence (AI) can act as a key enabler of smart water management by transforming large volumes of data to support predictive maintenance, optimise water distribution and treatment processes, and improve demand forecasting and resource allocation. By enabling more proactive, efficient, and data-driven decision-making, AI strengthens the resilience, performance and sustainability of water systems across the entire water cycle.

By generating real-time data on water consumption and distribution performance, digital solutions can significantly contribute to reducing non-revenue water, improving demand management, and supporting the implementation of the WRS’s 10% water efficiency target⁹, under the Drinking Water Directive and the Water Framework Directive.

Digitalisation can support several benefits including in the water infrastructure planning and construction through predictive models, digital twins. The customers’ interface also can contribute to transparency and better communication about the value of water.

2. Align EU financing and procurement frameworks

The DAP should ensure that EU financial instruments (including EIB financing, Cohesion Policy funds (or their successor) and, more broadly, the future Multiannual Financial Framework (MFF) support the deployment of digital technologies across the water cycle. With an estimated €255 billion of

⁸ For example, the introduction of water metering typically reduces household water consumption by 10–25%, with additional savings achieved when digital meters enable real-time feedback, leak detection, and consumption-based billing. WE Data, [Evaluating the Role of Water Metering and Submetering in Reducing Water Consumption in Buildings](#), 2025

⁹ European Water Resilience Strategy (COM/2025/280) <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52025DC0280>

investment needed in the European water sector by 2030¹⁰, digital technologies such as sensors, smart meters, cloud-based analytics, hydraulic modelling, and digital twins can significantly reduce water losses, reduce costs in infrastructure maintenance (predictive maintenance), and improve system resilience and operational efficiency.

As mentioned in our position on public procurement¹¹, EU funding should prioritise outcome-oriented projects that demonstrate the effective use of smart technologies, while encouraging innovative financing models such as public-private partnerships. In parallel, innovation-friendly procurement frameworks¹² and EU guidance on digital water procurement should be promoted to reduce fragmentation, facilitate economies of scale, and accelerate the uptake of digital solutions across Member States¹³.

Particularly, interoperability is essential to address persistent technological fragmentation in the water sector. The absence of open standards and compatibility requirements in public tenders has led to the widespread deployment of closed, proprietary systems, limiting integration across suppliers. Member States shall encourage open standards, interoperable interfaces, and modular architectures in water-related procurement to enable secure and seamless data exchange across systems. EU water projects¹⁴ demonstrate that open platforms and shared standards – as done in other economic sectors – enable multi-vendor integration and innovation and hence should be translated into practical procurement guidance to accelerate deployment and ensure technological compatibility across the water eco-system while avoiding safety and security of the data and businesses.

3. Operationalise the Copernicus Water Thematic Hub

The DAP should support the delivery of the Copernicus Water Thematic Hub by 2026 as a central access point for Earth-observation products relevant to water management across Europe. The Hub should provide integrated and user-friendly access to satellite-derived datasets on hydrology, droughts, floods, water quality, and water use, enabling authorities and utilities to improve monitoring, forecasting and crisis response.

To maximise its impact, the Hub must be fully interoperable with national water data portals, river basin management systems, and operational decision-support tools, ensuring that Copernicus services are routinely embedded in water management practices rather than operating as a standalone platform. This integration – particularly with the Water Framework Directive governance set-up – would strengthen the use of Earth observation for evidence-based water governance, climate resilience, and early warning systems, while enhancing data comparability and accessibility across Member States.

4. Leverage digital water governance

Currently, the WFD does not consider digital tools while several data monitoring and collection are required, particularly through River Basin Management Plans

¹⁰ Water Europe, [Study on the socio-economic value of investing in water](#), 2024.

¹¹ Water Europe, [Public Procurement: Outcomes-Driven Public Procurement to Achieve a Water-Smart Economy in a Resilient Europe](#), January 2026.

¹² Current approaches often prioritise lowest price, disregarding integration, adaptation, and migration costs. Greater use of the Most Economically Advantageous Tender (MEAT) criterion, supported by life-cycle cost analysis, should be encouraged. This should explicitly account for the cost of non-interoperability and technological dependency, ensuring that contracting authorities value flexibility, scalability, and innovation.

¹³ Joint Statement: Upcoming EU Action Plan on Digitalisation in the Water Sector Should Prioritise Adoption of Digital Technologies Throughout the Entire Water Cycle, 2025.

¹⁴ E.g. EU-funded projects: [Waterverse](#), [Universwater](#), [iMERMAID](#), [IDEATION](#).

(RBMPs). A structured digital governance infrastructure should be set up and promoted, with synergies with other directives^{15 16}.

An integrated digital monitoring architecture would support reporting simplification of the water acquis for Member States. Secondly, it would clarify the accountability of such infrastructure and tools, benefiting inclusive governance and transparency for water management across the river basin.

The DAP should be one of the implementation tools of the WFD, reducing administrative burden and providing more updated and accurate data for all the relevant administrations and agencies at all levels. An automatic communication of the data is more than welcome between the different levels (regional, national, and European ones), but also for transboundary and source-to-sea entities¹⁷.

Such objectives could be supported by basin-level hydraulic modelling solutions and digital twins as operational decision-support environments and ensuring interoperability between utility-level and basin-level systems.

The deployment of such tools should be based on a governance architecture that complies with key principles and approaches:

- FAIR principles (aligned with the EU data strategy and the purpose of the EU directives),¹⁸
- Subsidiary principle (accountability in line with the EU treaties)¹⁹,
- Source-to-sea approach (aligned with the nature of water bodies)²⁰.

5. Integrate Artificial Intelligence, cybersecurity, and data protection

The integration of AI into digital water systems offers significant advantages for forecasting extreme events and improving climate-resilience planning. AI-driven models can analyse large, complex datasets in real time to predict scenarios such as floods, droughts or infrastructure failures with far greater speed and accuracy than traditional methods. This enhances preparedness, enables faster response strategies, and supports evidence-based decision-making across water authorities. However, the use of AI also introduces new risks, including potential model bias, lack of transparency in automated decisions, and increased vulnerabilities if systems are not properly secured. Ensuring robust governance, transparent data practices and strong cybersecurity safeguards is essential to fully leverage AI's benefits while preventing unintended consequences.

The Action Plan should explicitly address cybersecurity and privacy requirements for digital water infrastructure, ensuring alignment with the NIS2 Directive, the Cyber Resilience Act, and the General Data Protection Regulation (GDPR). As water systems increasingly rely on connected sensors, smart meters, cloud platforms and operational technologies, robust cybersecurity safeguards are essential to protect critical infrastructure and maintain trust in digital water systems.

The Commission should support Member States and utilities through EU guidance, procurement templates and certification pathways that promote the adoption of secure-by-design digital products, including sensors, gateways, and

¹⁵ At least the directives related to water quality monitoring: Directive 2008/105/EC on Environmental Quality Standards (EQSD), Directive 2006/118/EC on the protection of groundwater, Directive 2007/60/EC on the assessment and management of flood risks, Directive 2006/7/EC concerning the management of bathing water quality, Directive 2010/75/EU on industrial emissions; and provide coherence with the Directive 2008/56/EC (Marine Strategy Framework Directive).

¹⁶ IDEATION, [Integrating Inland Waters into the Digital Twin Ocean: A Strategic Imperative for Europe's Water Resilience](#), 2025; iMERMAID, [Wastewater Management in the Mediterranean sea: Towards Resilient, Smart and Circular Water Systems](#), 2025; Nexogenesis, [Lessons from 5 case studies to scale-up Smart WEFE Nexus Policies for a green and digital world](#), 2025.

¹⁷ iMERMAID, [Strengthening the Marine Strategy Framework Directive to tackle chemical pollution](#), 2025

¹⁸ WATERVERSE, [Fair principles guidelines](#), May 2023

¹⁹ Nexogenesis, [Lessons from 5 case studies to scale-up Smart WEFE Nexus Policies for a green and digital world](#), 2025.

²⁰ iMERMAID, [Wastewater Management in the Mediterranean sea: Towards Resilient, Smart and Circular Water Systems](#), 2025

data platforms. Embedding cybersecurity requirements in procurement procedures and technical standards will help utilities deploy digital technologies safely, reduce compliance burdens and ensure that security and privacy are integrated from the earliest stages of system design and deployment.

6. Mobilise the EU Water Skills Academy to support the deployment of digital water technologies

The successful deployment of digital water solutions requires strengthening digital capabilities across the water sector. The EU Water Skills Academy should play an enabling role in equipping utilities, regulators and river basin authorities with the competencies needed to adopt and operate digital technologies²¹. Training programmes disseminated under the Academy's label should focus on areas such as data governance, smart monitoring systems, digital twins, and cybersecurity. By supporting the deployment of digital skills, the Academy can accelerate the uptake of digital solutions and ensure that the water sector has the expertise required to implement the DAP effectively.

²¹ Water Europe, [European Water Academy : A Catalyst for Skills, Innovation, and Purpose to Empower Europe's Water Workforce](#), 2025

Best Practices

WATERVERSE

WATERVERSE's mission is to develop a Water Data Management Ecosystem (WDME) for making data FAIR (Findable, Accessible, Interoperable, Reusable), improving the usability of data and the interoperability of data-intensive processes. WATERVERSE tackles the fragmentation of data in the water sector by:

- Lowering the entry barrier to data spaces
- Enhancing the resilience of water utilities
- Boosting the perceived value of data and therefore the market opportunities behind it



WATERVERSE enhances the implementation of the Water Framework Directive and shows that digital infrastructure is essential for meeting EU targets on water quality and resilience. Investments in WDME technologies can:

- Reduce administrative burdens
- Improve compliance
- Enable Member States to anticipate risks like algal blooms, floods, or pollution incidents

WATERVERSE shows that supporting digital capacity building and interoperable data platforms is essential for turning policy commitments into measurable results. A dedicated funding to digital water governance would support greater compliance with the Water Framework Directive and promote future implementation of the actions of the Water Resilience Strategy.

IDEATION

IDEATION is an EU-funded project focused on creating a Digital Twin Ocean (DTO) of inland waters, linking rivers, lakes, and wetlands with the ocean. The project's success depends on the collaboration of an experienced consortium of 11 European partners. By combining real-time and historical data across rivers, lakes, reservoirs, and coastal waters, IDEATION enables:

- Early warning systems
- Infrastructure resilience
- Transboundary risk management



IDEATION shows how digital innovation can:

- Reduce economic losses from floods and droughts
- Strengthening cross-border cooperation
- Promote data sharing for real-time monitoring

IDEATION proves the feasibility of scaling digital twins to all Member States, underlining the role of digital tools in the design of climate adaptation management plans.

UNIVERSWATER

The EU-funded UNIVERSWATER project brings together a consortium of 15 partners across six European countries. By integrating innovative portable sensors, earth observation imaging, and advanced AI, the project will:

- Improve water resource use
- Enhance on-farm treatment of dairy soiled water, mitigate soil salinisation
- Optimise fertiliser/pesticide application

This initiative aims to revolutionise agri-water management, paving the way for smarter, more efficient water resource use and environmental stewardship.



UNIVERSWATER project intends to demonstrate its platform through field-testing integrated technologies at three European demo sites in Ireland, Italy and Greece to achieve its goals of:

- **Developing new sensors** for detecting water and soil contaminants (e.g., E. coli in under 1 hour) and validating these across three sites.
- **Combining satellite imagery and sensor data** to create AI-based decision tools, optimising water use and pollution control for three demo sites.
- **Creating a modular Decision Support System (DSS)** that improves response times by under 10 minutes, enhances reliability by 90%, and reduces costs by at least 15%.