July 2026

EU Ocean and Water R&I Strategy

The Delivery Engine of the EU Water Resilience Strategy

Water Europe (WE) is the recognized voice and promotor of water-related innovation, research, and technology development in Europe. WE is a purpose-driven multi-stakeholder association with over 300 members, representing the entire range of actors in the innovative water ecosystem. WE was established by the European Commission as a European Technology Platform. WE is guided in all its activities by its Water Vision, with the ultimate ambition of achieving a Water-Smart Society.

Water Europe

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Deployment by Design

MAKING R&I STRATEGY THE DELIVERY ENGINE OF EUROPE'S WATER RESILIENCE STRATEGY.

The future Ocean and Water R&I Strategy should adopt a deployment-by-design approach, ensuring that research priorities, funding mechanisms, demonstration activities and governance arrangements are conceived from the beginning to maximize validation, replication, investment, procurement and implementation across Europe.

This requires a fundamental shift in the way European research and innovation programmes are conceived. Deployment should no longer be regarded as the final stage of the innovation journey, but as an objective embedded from the outset in the design of every research and innovation programme. Every major R&I investment should therefore integrate validation, replication, procurement, regulatory uptake and investment pathways from its inception. The strategy must ultimately contribute to the objectives of the EU water acquis and leverage international partnerships and EU competitiveness.

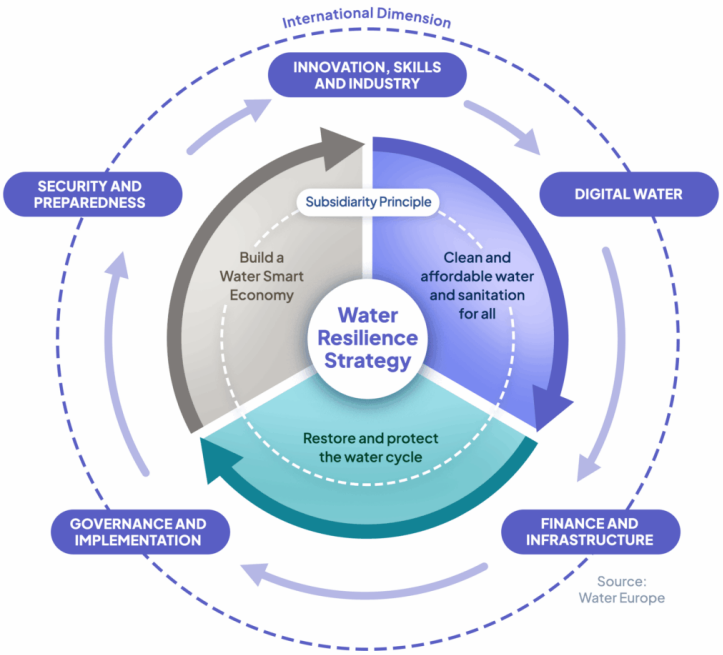
Water Europe
Technology & Innovation

Introduction

Europe's water resources are under unprecedented and interconnected pressures. Climate change, pollution, biodiversity loss, overexploitation and hydromorphological alteration are disrupting the water cycle and increasing risks for ecosystems, citizens and the economy. Today, only 37% of Europe's surface water bodies achieve good or high ecological status, while almost one quarter of groundwater bodies fail to achieve good chemical status. At the same time, insufficient river and stream flows already affect around 20% of catchment areas, a share that could rise significantly by 2050.

These pressures are no longer solely environmental concerns. Reliable and affordable access to water of the right quality, in the right quantity, at the right time has become a strategic condition for Europe's competitiveness, economic security and social stability. Water scarcity, pollution and extreme events can disrupt industrial production, energy generation, agriculture, public services and strategic supply chains, including critical raw materials and defence-related value chains. Conversely, investment in water efficiency, reuse, circularity, pollution prevention and resilient infrastructure can strengthen European competitiveness while reducing pressure on natural resources.

Europe has built a strong scientific and technological base and remains a global leader in water innovation. However, too many solutions remain confined to research projects, pilots and isolated demonstration sites. The central challenge is therefore not only to generate new knowledge, but to create the conditions for proven solutions to be deployed, replicated and integrated into public policy, infrastructure planning and industrial investment. Water Europe's broader policy approach consistently stresses that innovation, digitalisation and investment must reinforce implementation of the EU water acquis and support the transition towards a Water-Smart Society and economy[1].



The future EU Ocean and Water Research & Innovation Strategy must respond to this implementation gap. It should be more than a research agenda, serving as the delivery engine of the European Water Resilience Strategy by connecting scientific excellence with demonstration, deployment, investment and measurable impact. Its success should be assessed by its contribution to repairing the water cycle, building a Water-Smart Economy and ensuring access to safe

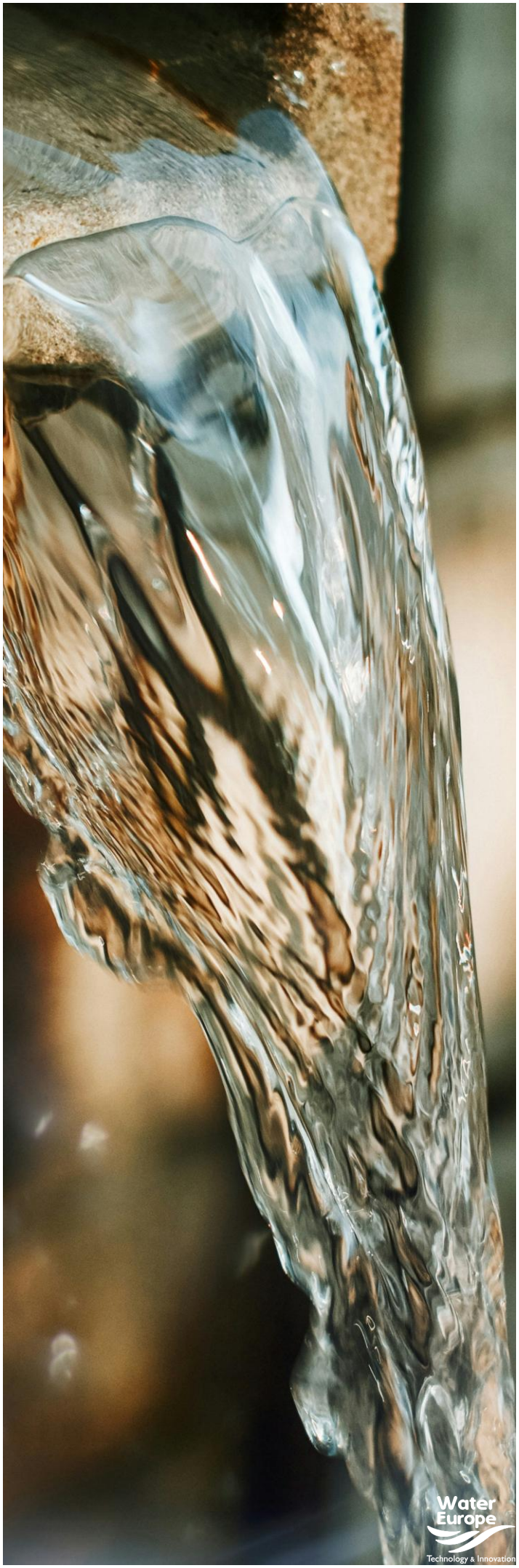
[1] A Water-Smart Economy is an economy in which the full value of water and the integrity of the hydrological cycle are recognised and embedded in decision-making, with water recognised as a strategic asset that enables sustainable prosperity, competitiveness, water security, societal well-being and environmental resilience, thereby contributing to the transition towards a Water-Smart Society.

water and sanitation for all, while strengthening Europe's international leadership and cooperation.

To fulfil this role, the Strategy must systematically connect research with regulation, procurement, investment and deployment. It should support solutions across the full water cycle, from freshwater and groundwater to coastal and marine ecosystems, while preserving sufficient visibility and resources for Europe's specific freshwater challenges. A source-to-sea approach is welcomed and essential, but integration must lead to stronger implementation rather than additional complexity.

Water Europe therefore calls for an ambitious and deployment-oriented Strategy built around five priorities:

1. **Deliver the objectives of the European Water Resilience Strategy**, including a Water-Smart Economy, restoration of the water cycle and universal access to resilient water and sanitation services.
2. **Build a European research and deployment infrastructure**, centred on Water-Oriented Living Labs and long-term support from the MFF particularly through Horizon Europe, the European Competitiveness Fund and Cohesion Policy.
3. **Strengthen international cooperation and European leadership**, using EU research projects and major international processes, including the UN Water Conference, to develop strategic partnerships and promote European solutions and governance through the Global Gateway.
4. **Establish a European digital water intelligence infrastructure**, enabling interoperable and quasi-real-time reporting for legal compliance at all levels, and access to strategic data for European R&I projects and proactive water-smart governance.
5. **Create an innovation-friendly regulatory and investment environment**, particularly through innovation procurement, lifecycle-based public purchasing, regulatory experimentation and improved pathways from demonstration to commercial deployment.



BUILDING THE FUTURE EU OCEAN AND WATER R&I STRATEGY

1. Deliver the objectives of the European Water Resilience Strategy

Every major R&I priority should demonstrate how it contributes to one or more objectives of the Water Resilience Strategy and European Ocean Pact. Research and innovation should particularly accelerate advances in hydrological cycle restoration, water availability under climate change, pollution prevention and remediation, circular water use, resilient infrastructure and digital water intelligence. R&I priorities and funding should ensure an appropriate balance between freshwater and ocean priorities while applying a source-to-sea approach. The Strategy should establish a clear results framework linking publicly funded research to measurable outcomes such as:

- improved ecological, chemical & quantitative status of water bodies;
- reduced pollution loads, particularly through the development of alternatives and remediation solutions to PFAS or CECs;
- new design, validation and replication of solutions such as wetlands, floodplains, water-retention measures – including MAR – and hybrid grey-green infrastructure;
- increased water efficiency and reuse for agriculture, industry and domestic uses as well as resource recovery through water-smart industrial symbiosis (e.g. Data centres, semiconductor production);
- improved resilience of water services, including dual use infrastructure for defence purposes;
- Stimulation of digitalisation as well as robotics and material sciences;
- reduced vulnerability of strategic value chains, including defence and strategic sectors for the green transition and strategic autonomy[2];
- improved implementation of River Basin Management Plans and other relevant planning instruments, including reporting tools and governance through digitalisation.

Possible flagship actions

1. **Launch European Water Resilience Innovation Missions** - Launch mission-oriented R&I portfolios addressing priority challenges such as hydrological cycle restoration, water availability, zero pollution, circular water use and resilient water services.
2. **Establish Water Impact Assessment Framework** - Introduce a common framework linking Horizon Europe and future R&I investments to measurable contributions to the Water Resilience Strategy and EU water acquis.

[2] Water availability and quality increasingly influence investment decisions and the continuity of industrial operations. The R&I Strategy should therefore identify water-related vulnerabilities in strategic value chains and support solutions that reduce exposure to scarcity, pollution and infrastructure disruption. Water Europe issued a Report in 2024 emphasizing the water-dependence of supply-chains and the value of investing in water for semiconductors, data centers, agriculture and energy. Other sectors like pharmaceuticals, food production, critical raw materials, chemicals, defense and security rely on water availability.

2. Build a European Research and Deployment Infrastructure

Europe is a global leader in water research and innovation but continues to face a significant deployment gap. Closing this gap requires a fundamental shift in the way research and innovation programmes are conceived. The future R&I Strategy should adopt a deployment-by-design approach, embedding deployment, validation, replication, procurement and investment pathways from the earliest stages of programme design, rather than treating deployment as the final phase of the innovation journey. This requires a permanent European deployment ecosystem supported by coordinated investment and governance. The Strategy should therefore support:

- **Strengthening the European Network of Water-Oriented Living Labs (WOLLs)** as the permanent European deployment infrastructure for water innovation, providing real-life environments for testing, validation, regulatory experimentation, procurement preparation, investment de-risking and replication across Europe[3].
- **Accelerating large-scale deployment and replication** of innovative technologies, Nature-Based Solutions and integrated water management approaches beyond pilot projects, with dedicated support for first-of-a-kind applications and market uptake.
- **Better alignment of Horizon Europe, the European Competitiveness Fund, Water4All, EIT Water, Cohesion Policy, LIFE, the European Investment Bank and national programmes** through common strategic priorities, coordinated investment roadmaps and shared evaluation frameworks.
- **Capacity and skills development and knowledge transfer** to strengthen the ability of public authorities, utilities and infrastructure managers to procure, implement and replicate innovative solutions across Europe. It should align with the Union of Skills and complement relevant European initiatives, including the EU Water Academy and the Pact for Skills.
- **More Accessible and inclusive participation mechanisms**, including proportionate funding and simplified access, to enable smaller utilities, public authorities and less-developed regions to contribute to and benefit from European research, demonstration and deployment activities.

Possible flagship actions

1. **Strengthening the European Network of Water-Oriented Living Labs (WOLLs)** as a central component of the permanent European deployment infrastructure for water innovation, providing real-life environments for cross-sector Water-Smart Economy demonstration, testing, validation, regulatory experimentation, procurement preparation, investment de-risking and replication across Europe. It should not duplicate existing WOLLs and networks.
2. **Establish European Water Deployment Pipeline** - Create an integrated funding pathway connecting Horizon Europe, the European Competitiveness Fund, Cohesion Policy, EIB financing and private investment from demonstration to market deployment.
3. **Develop a European Water Skills and Deployment Programme** - Develop, in alignment with the Union of Skills, a practice-driven programme linking training providers, skills hubs, WOLLs and demonstration sites to equip water-sector actors to deploy, operate, maintain and replicate innovative solutions. It should complement the European Water Academy and the Pact for Skills.

[3] This recommendation particularly aligns with the EU Zero Pollution Action Plan and the Water Resilience Strategy. It should also be built upon the work done by Water4All partnership.

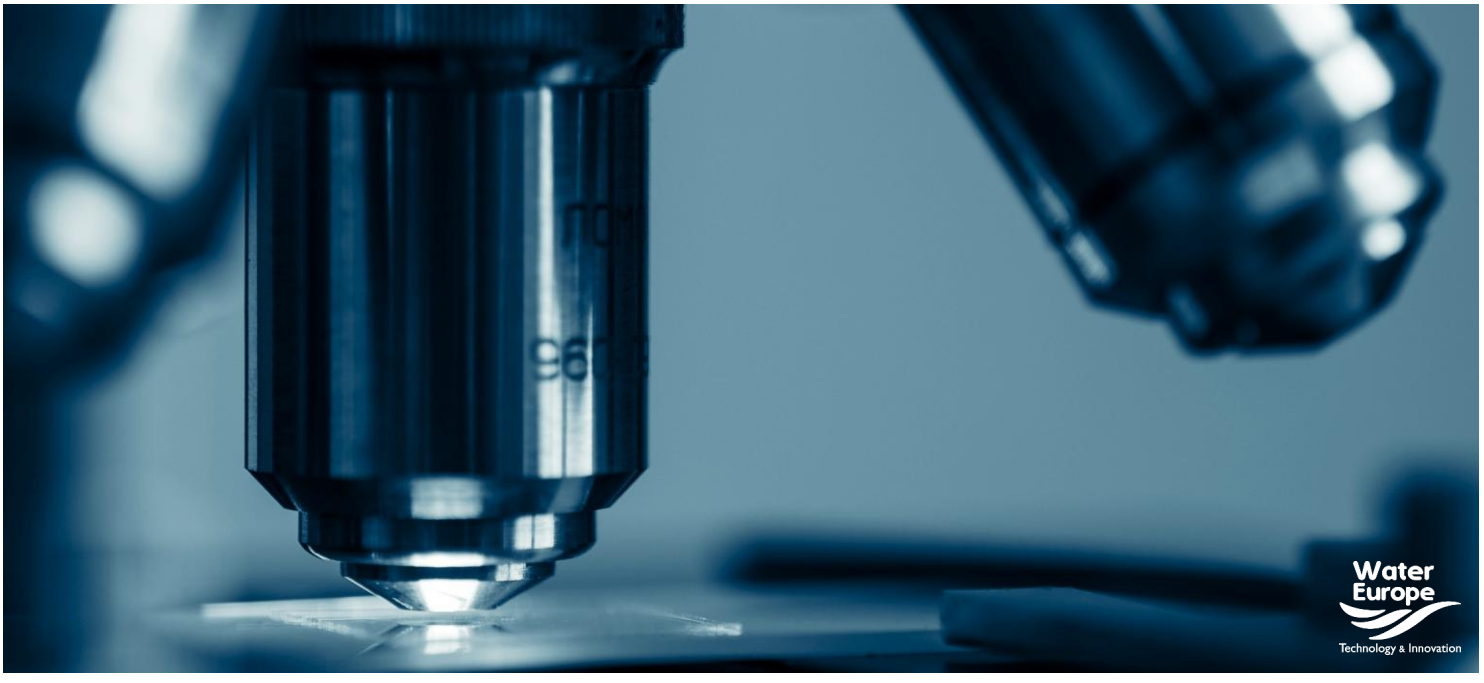
3. Strengthen International Cooperation and European Leadership

Water resilience is a global challenge requiring coordinated action beyond Europe's borders. The future R&I Strategy should reinforce Europe's leadership by promoting scientific cooperation, innovation partnerships and the export of European water solutions, standards and governance models. International cooperation should contribute to the implementation of the European Water Resilience Strategy while strengthening Europe's competitiveness, resilience and strategic autonomy. The Strategy should therefore support:

- **Strategic international partnerships** with neighbouring countries and key global partners to address shared water challenges, promote knowledge exchange and strengthen science diplomacy particularly through Horizon Europe.
- **Leveraging strategic international platforms,** including the UN Water Conference, to demonstrate European innovation, strengthen science diplomacy and promote European regulatory and governance approaches.
- **Better consideration of water aspects in the Global Gateway initiative** to accelerate the deployment of European water solutions, including water technologies, including nature-based and digital solutions, and to promote European standards, policy approaches and governance models in partner countries, thus creating mutual environmental and economic benefits.

Possible flagship actions

1. **Leverage Global Water Innovation Partnerships** - Establish strategic partnerships with priority regions through joint research, demonstration projects and knowledge exchange on shared water challenges.
2. **Build European Water Leadership Initiative** - Use the UN Water Conference and other international fora as flagship platforms to showcase European innovation, standards and governance approaches.
3. **Establish Water Global Gateway Accelerator** - Integrate innovative European water solutions and Nature-Based Solutions into Global Gateway investment programmes to strengthen competitiveness and resilience.



4. Build a European Digital Water Intelligence Infrastructure

Digitalisation is a key enabler of water resilience. The future R&I Strategy should establish a European Digital Water Data Space that transforms fragmented data into knowledge mining, supporting quasi real-time monitoring, agile decision-making, policy implementation and innovation across all governance levels. It should enable seamless data sharing while reducing reporting burdens and accelerating the digital transformation of the European water ecosystem [4]. Reliable, interoperable and trusted data are also essential to reduce investment risks, improve project bankability and increase investor confidence in innovative water solutions, hence accelerating their deployment at scale. The Strategy should therefore support:

- **Establish a European Digital Water Data Space**, ensuring interoperable, secure and FAIR data across freshwater, groundwater and marine ecosystems.
- **Develop common governance, interoperability standards, data quality frameworks and long-term operational support** for European freshwater digital infrastructures, including connection with WISE Freshwater and incorporation of River Basin Management Plans data. It shall provide the evidence base required to de-risk investments, improve the bankability of innovative water solutions and facilitate access to and combination of both public and private finance.
- **Quasi real-time monitoring and reporting**, supporting River Basin Management Plans, the implementation of the EU water acquis and multilevel governance from local to European level.
- **Digital Twins, Artificial Intelligence and advanced analytics** to improve forecasting, climate adaptation, pollution prevention, asset management and operational decision-making. Interoperability with the Digital Twin of the Ocean would be relevant.
- **Open and interoperable data infrastructures**, enabling researchers, public authorities, water operators and industry to access high-quality datasets and accelerate innovation.
- **Strategic European R&I projects** through harmonised data collection, common standards and shared digital infrastructures that facilitate collaboration, validation and replication of innovative solutions across Europe.

Possible flagship actions

1. **Establish a European Digital Water Data Space** - Establish a common European digital infrastructure for freshwater, groundwater and marine data, interoperable with WISE Freshwater and the Digital Twin of the Ocean.
2. **Develop European Water Digital Twin Programme** - Develop interoperable Digital Twins for river basins, utilities and industrial systems to support forecasting, climate adaptation and operational decision-making.
3. **Deploy European Smart Water Observatory** - Deploy harmonised monitoring systems combining Earth observation, sensors, AI and modelling to support near real-time implementation of the EU water acquis

[4] This recommendation should be in coherence with the objectives of the EU Digitalization Action Plan, expected in 2026.

5. Create an Innovation-Friendly Regulatory and Investment Environment

Europe can get the technologies needed to address its water challenges, but their deployment can be constrained by regulatory, financial and procurement barriers. The future R&I Strategy should create an enabling environment where innovation can move rapidly from demonstration to implementation, supporting the objectives of the EU Water Resilience Strategy while strengthening Europe's competitiveness. The Strategy should therefore support:

- **Stronger pathways between research results, European standards, regulatory guidance and commercial deployment, ensuring that successful innovations are systematically integrated into policy implementation.** For example, the revision of the Public Procurement Directive must reward lifecycle performance, environmental outcomes and innovation rather than lowest initial cost.
- **Regulatory sandboxes and adaptive governance**, enabling the safe testing and validation of innovative technologies, digital solutions and Nature-Based Solutions before large-scale deployment.
- **Investment mechanisms that reduce deployment risks**, supporting first-of-a-kind projects, innovative SMEs and scale-ups, and facilitating access to public and private finance.

Possible flagship actions

1. **Deploy European Water Regulatory Sandboxes** - Establish coordinated regulatory sandboxes within the WOLLs framework, enabling the safe testing and validation of innovative technologies, digital solutions and Nature-Based Solutions.
2. **Promote Water Innovation Procurement Initiative** - Promote lifecycle-based procurement and pre-commercial procurement to accelerate market uptake of innovative water solutions across Europe.
3. **Create Water Investment De-Risking Facility** - Create dedicated financial instruments combining EU grants, guarantees and private finance to accelerate first-of-a-kind deployment and scale-up of innovative solutions