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Unlocking water reuse in Europe

From individual projects to mainstream practice to build a Water-Smart Society

Water Europe (WE) is the recognized voice and promotor of water-related innovation, research, and technology development in Europe. W E 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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Unlocking water reuse in Europe

Europe has the technologies and expertise to make water reuse a cornerstone of water resilience, but deployment remains too fragmented and too slow, with only 2.4% of its treated wastewater being reused. What we need now is to turn Europe's existing framework into investment and implementation at scale, and where the legislative framework is revised, it should actively drive the mainstreaming of water efficiency, recirculation, cascading and fit-for-purpose reuse across sectors, including industrial and municipal, and river basins. The ambition is clear: move from individual projects to a Water-Smart Society and Economy.

Water Europe
Technology & Innovation

Introduction

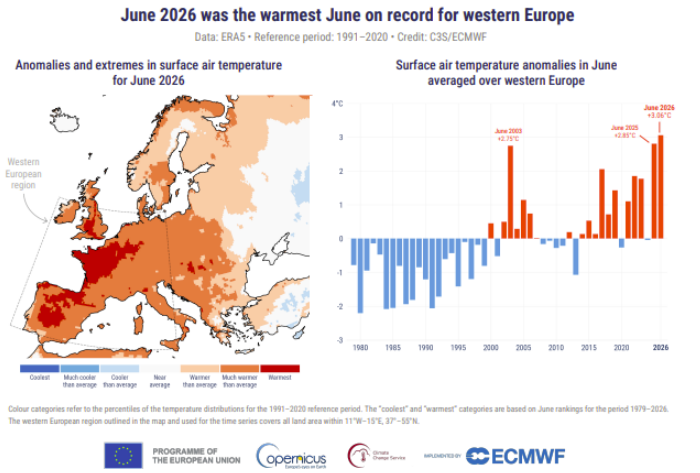
Europe is facing a structural water resilience challenge, driven by increasingly severe floods and droughts, that is already affecting ecosystems, citizens and the economy. The summer of 2026 provides a stark illustration. In France, more than 85% of the country was under drought warning or alert conditions by mid-July[1]. By 9 July, official French data already showed 79 departments subject to water-use restrictions beyond the vigilance level, including 40 at crisis level, translating into 43% of small and medium-sized French watercourses with no or interrupted flow at the beginning of August[2].

The consequences extend far beyond water supply as low river flows and high temperatures are increasingly creating tensions between environmental needs, drinking-water supply, agriculture, industry and energy production. On 14-15 July 2026, drought and high river temperatures affected the availability of France's nuclear fleet, up to 20.4% of energy production [3], illustrating how water stress can translate directly into constraints on strategic infrastructure and economic activity.

These pressures extend across Europe. Low-flow conditions observed across the Danube, Vistula and Baltic catchments already in spring 2026 illustrate the geographical scale of the challenge. June 2026 was the second-warmest recorded in Europe, at 1.78°C above the 1991–2020 average, with Western Europe's warmest June at 3.06°C above average[4]. Many June records, and some all-time records, for daily maximum temperature were also set across Europe, including in Germany, Czechia, Poland and Hungary and the UK, seeing an acceleration since 2019[5].

Against this backdrop, strengthening Europe's water resilience cannot rely solely on securing additional water supply or managing scarcity during periods of crisis. It requires a structural transformation in how water is valued, allocated and used across the economy. Europe already possesses world-leading technologies and expertise in water efficiency, recirculation, cascading, reuse, resource recovery and digital water management. Technology availability is increasingly no longer the principal systemic bottleneck; deployment is constrained by economic viability, administrative complexity and risk-sharing frameworks, stakeholder acceptance and health safeguards[6].

Europe's water regulatory framework was predominantly developed around a linear model of abstraction where water was something to use once



[1] https://eu-space.europa.eu/components/earth-observation-copernicus/image-of-the-day/severe-drought-affects-france (consulted 12.08.2026)

[2] https://www.eaufrance.fr/observatoire-national-des-etiages (consulted 12.08.2026)

[3] https://www.lemonde.fr/en/energies/article/2026/08/12/one-fifth-of-france-s-nuclear-capacity-offline-due-to-extreme-weather-and-jellyfish_6756421_98.html?srsltid=AfmBOootPZp_c6lKx5JEz7IP0OSKgBqCj7G8aEmylLnGVwLMtPpu2si1 (consulted 12.08.2026)

[4] https://climate.copernicus.eu/surface-air-temperature-june-2026? (consulted 12.08.2026)

[5] Eight out of the nine warmest Junes for Europe have occurred since 2019. (source: Copernicus)

[6] Boost-in and NextGen

and throw away. Europe is now moving toward a circular water economy favouring reuse, recovery and efficiency. Important progress has been achieved through the Reuse Regulation [7], which established a harmonised framework for the reuse of treated urban wastewater for agricultural irrigation, and through the recast Urban Wastewater Treatment Directive (UWWTD) [8], which strengthens reuse and resource recovery. The 2025 Water Resilience Strategy [9] has gone further by establishing the ambition of a Water-Smart Economy and an EU objective to improve water efficiency by at least 10% by 2030.

However, water reuse is still too often approached as an end-of-pipe wastewater solution and not systematically considered in the River Basin Management Plans despite the 2016 EU guidance [10] . A Water-Smart Economy requires a broader approach in which water is efficiently used, recirculated, cascaded between applications and, where necessary, treated and reused.

The challenge is moving from pilots and individual projects to deployment at scale. International frontrunners such as Singapore, or within the European Union, the Region of Murcia in Spain[11], as well as Cyprus and Malta, have integrated alternative water resources into broader water-security strategies, combining long-term planning, clear responsibilities, appropriate quality requirements, infrastructure investment and identified demand.

Europe should draw from these experiences while developing an approach suited to its own multi-level, river-basin-based governance model and unlock the conditions for water reuse to scale sustainably.

Water should be reused where it delivers a positive contribution to water resilience, taking account of local availability, environmental flows, energy requirements, water quality, demand and river-basin conditions. Water reuse should contribute to the integrated and effective management of water resources, strengthening the resilience of water users, the environment, society and the economy.

Water Europe's ambition is to position Europe among the global leaders in water reuse by making water efficiency, recirculation, cascading and fit-for-purpose reuse mainstream components of a Water-Smart Society and Economy.

[7] Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse (Water Reuse Regulation)
8 Directive (EU) 2024/3019 of the European Parliament and of the Council of 27 November 2024 concerning urban wastewater treatment (recast), OJ L, 2024/3019, 12.12.2024.
[9] European Commission, European Water Resilience Strategy (2025)

[10] European Commission, CIS Guidelines on Integrating Water Reuse into Water Planning and Management in the Context of the Water Framework Directive (2016)
[11] Murcia is widely recognised for its leadership in water reuse, with approximately 97% of treated wastewater being reused in agriculture. This experience demonstrates how long-term planning, investment, governance and stakeholder engagement can enable large-scale water reuse deployment.

RECOMMENDATIONS

1. Build the water intelligence needed to guide investment and collective action at river-basin level.

Water users cannot invest effectively if they cannot determine what constitutes sustainable water use at a specific location. In synergy with the Digitalisation Action Plan, two evidence gaps need to be addressed:

- Reliable, catchment-level data to determine what constitutes sustainable water use and where reuse delivers the greatest resilience benefit[12].
- Second, robust cost-competitiveness analysis comparing water reuse with conventional and alternative water sources would significantly strengthen the case for investments, including by quantifying avoided externalities such as drought damage and the value of preserved ecosystem services.

A single source of truth should be established to provide the confidence to invest. Companies are ready to reduce their water dependency, but individual actors cannot deliver catchment resilience alone. To identify and stimulate demand, river-basin authorities should provide accessible water accounting combining water reuse availability, environmental flows, abstractions and demand, enabling users to assess risks and target investments where they generate measurable basin-level benefits.

2. Strengthen the Water Reuse Regulation as the EU standard for agricultural reuse by simplifying permitting and risk-management requirements, particularly for small-scale and decentralised projects.

The Water Reuse Regulation already provides the Single Market framework for safe agricultural reuse through common quality, monitoring, risk-management and permitting requirements. Europe should preserve this harmonisation while pursuing risk-proportionate simplification, standardisation and administrative streamlining without reducing health or environmental protection[13]. The need is clear: the EU treats around 40 billion m^3 of wastewater annually, but reuses only around 1 billion m^3, while around 97.5% is returned to receiving waters rather than directly reused[14]. Europe should also extract lessons from the implementation of the UWWTD to be able to progressively extend water reuse processes to industrial, urban and domestic water uses.

[12] This approach aligns with the position established by Water Europe on the benefits of the Digitalisation Action Plan. The lack of valuable data at the river basin level constitutes a barrier to unlock and support public and private investment with the highest benefit for our society, economy and environment. Water Europe, *Digitalisation Action Plan: Towards Water-Smart Management in Europe* (2025)

[13] GEORGIA, Policy Brief: Building a Water-Smart Agriculture – transforming water management for resilient farming (2025) EU-funded Project.

[14] Water Europe, *Socio-economic study on the value of the EU investing in water*, Brussels, September 2024, Appendix 4 - Page 41.

3. Prioritise full implementation of the recast UWWTD, using its provisions to accelerate reuse, develop reuse-ready wastewater infrastructure and strengthen resource recovery

The EU and Member States should accelerate the implementation of the following articles of the UWWTD in coordination with other water-related and sectoral frameworks:

- Article 15 requires Member States to systematically promote the reuse of treated wastewater where appropriate, particularly in water-stressed areas, while protecting ecological flows.
- Article 20 also requires recovery of valuable resources, notably phosphorus and nitrogen.
- Article 30 will assess mandatory national reuse plans and targets by 2033.

The priority should be to turn these recently agreed provisions into investment and infrastructure on the ground, rather than reopening the legislative framework before its effects can be assessed. In line with the WRS, the priority should be to ensure alignment of the implementation of the other EU legislation with this new ambition, avoiding conflicting interpretation and overlaps.

4. Use the Circular Economy Act (CEA) to accelerate circular water use and the valorisation of resources embedded in water, without creating an additional or competing regulatory framework for water reuse.

The CEA should particularly enable industries and industrial clusters to value water, heat, energy, nutrients and materials across value chains, turning residual water streams into resources, fostering industrial symbiosis and reducing dependency on freshwater abstraction[15] [16]. It should complement, rather than duplicate, the existing regulatory framework for water: water quality, permitting and environmental safeguards should remain governed by the EU water acquis, the IED and relevant national frameworks.

The CEA represents an opportunity to provide regulatory certainty for materials recovered from wastewater. By establishing minimum quality standards for recovered resources and treated sewage sludge, the benefits of water reuse can be further enhanced. The EU can ensure these materials are suitable for industrial reuse, build market confidence and reduce reliance on virgin inputs. This directly supports soil water retention, increases the effectiveness of reclaimed water, enhances resilience to drought while further supporting other EU strategic objectives such as the RESourceEU Action Plan.

[15] Water Europe, Closing the loop: Water a Strategic Resource for the Circular Economy Act and Competitiveness (2025)

[16] RESURGENCE, Unlocking Industrial Water Reuse and Resource Recovery to build a water-smart industry, 2025; iWAYS, Building a Water-Smart Industry, 2025. ULTIMATE, Supporting Water-Smart Industrial Symbiosis

5. Systematically mainstream water efficiency, recirculation, cascading and reuse into European water governance and river-basin planning, while enabling clear national frameworks for non-agricultural reuse and promoting synergies in the implementation of the relevant EU policies.

The WFD already recognises water reuse as a supplementary measure for our river-basin governance, but it is too often undeployed. Clear frameworks and standards should be developped for industrial and urban reuse. Spain's water reuse framework provides a relevant example of how national rules can complement the EU agricultural framework[17]. These standards should also be complemented with support for other circular practices (such as Managed Aquifer Recharge or greywater recycling systems in buildings), environmental performance being monitored, and barriers to wider deployment being identified and reported.

Moreover, this must be coupled with synergies and clarification in the implementation of the different EU legislation related to water efficiency, paired with technical convergence to facilitate water reuse across society[18]. For example, European industry should reduce its dependency on freshwater resources through efficiency, recirculation, cascading and fit-for-purpose reuse. The IED and BAT/BREF framework should become a key implementation vehicle, integrating water circularity into industrial performance requirements and enabling proven solutions to move from individual sites to mainstream industrial practice[19]. Lastly, voluntary European standards from CEN (European Committee for Standardization) can support the implementation of the EU water acquis, the Water Resilience Strategy (WRS), and give market actors a common basis.

6. Create a level economic and regulatory playing field between reclaimed water and conventional freshwater sources.

Reclaimed water should be treated not merely as an emergency supply, but as a viable and predictable source within an integrated and sustainable approach to water-resources management. Reuse will not become mainstream while conventional freshwater remains structurally underpriced and new abstractions are authorised without a robust alternatives assessment. Member States should use one common method to assess the true cost of water, applying the polluter-pays, user-pays and cost-recovery principles to reflect the environmental and resource costs of abstraction, particularly for non-potable uses and in water-stressed basins. Tariffs should be introduced in phases, to avoid sudden price shocks and abstraction charges should be progressively differentiated by basin scarcity, source vulnerability, season and use, with part of the revenues earmarked for water-efficiency and reuse

[17] Exception for agricultural purposes due to the reuse regulation EU) 2020/741.

[18] Water Europe analysis found major differences between national reuse standards, uses, parameters and monitoring requirements that create investment barriers. Water Europe, *White Paper on water reuse : Possible effects of EU regulation 2020/741 on minimum requirements for water reuse on the agri-food value chain and strategies for its implementation* (2022) https://watereurope.eu/wp-content/uploads/2024/01/White-paper-on-water-reuse-on-the-agri-food_online-2.pdf

[19] Solutions developed through EU-funded projects, such as AquaSPICE and iWAYS, should be more effectively deployed in European and global markets.

investment (cf. current activities under CEN/TC478). Permits for new abstractions or increases in licensed volumes should demonstrate that demand reduction, efficiency, recirculation, cascading and fit-for-purpose reuse have first been assessed and are not technically, environmentally and economically preferable.

7. Stimulate safe and fit-for-purpose water reuse in buildings and domestic applications

The European Commission should stimulate the deployment of solutions for water reuse in buildings and domestic applications. This approach should promote the harmonisation of practices for fit-for-purpose reuse, while taking account of different intended uses and exposure pathways in domestic uses. It should build on existing European and national experience, including greywater recycling systems, and support the development and uptake of common European standards (e.g. EN 16941-1 and EN16941-2).

BEST PRACTICES

RESURGENCE

The RESURGENCE project is an EU-funded project that aims to make industries use resources like water and energy more wisely and reduce waste. At the core of RESURGENCE is the concept of Seeds of Hubs for Circularity (S4Cs): strategic and replicable industrial ecosystems designed to integrate water, energy and resource circularity. S4Cs act as a foundational instrument to pave the way for future large-scale Hubs for Circularity, driving climate neutrality, enhancing industrial competitiveness, and fostering sustainable resource use across water, energy, and feedstock.

RESURGENCE is contributing to the development of more flexible industrial water supplies in regions facing increasing scarcity, as showcased by its case study in Spain, by:

- Fostering treated wastewater recirculation within industrial facilities
- Providing an alternative supply for nearby industries via treated municipal wastewater
- Assessing how different treatment and recovery processes can be combined to promote circular water reuse

URBANM2O

The URBANM2O is an EU-funded project that aims to create solutions to generate the crucial information that is needed to develop and implement risk-based urban water quality management plans at the city scale. URBANM2O will achieve this objective by:

- Developing and benchmarking AI-enhanced, resource-effective monitoring technologies
- Developing fit-for-purpose water quality models and harmonised data management systems
- Demonstrating open-access urban water digital twins assimilating monitoring data to identify hotspots and prioritise pollution control actions under current and future climate scenarios
- Providing tailored guidance to end users and stakeholders for the effective development of urban water management policies.

URBANM2O contributes to the promotion of alternative water resources, as showcased by its case study 1 Sant Adrià de Besós, Spain:

- **Challenge**: Facing critical water scarcity due to climate change, the city must rely on alternative water sources (like groundwater and urban runoff). However, these sources are themselves threatened by pollution from the Besòs River, ageing sewer networks, and industrial discharge
- **How will URBANM2O intervene**:
  - **Assess** how pollutants travel from the river into the groundwater that is used for the city's water supply
  - **Investigate** how leakages from the urban drainage network impact groundwater quality across the catchment.

MARCLAIMED

MARCLAIMED is an EU-funded project aimed at integrating Managed Aquifer Recharge (MAR) solutions with Alternative Water Resources (AWR) to mitigate water stress and proactively manage droughts. This integration is essential for the sustainable use of both surface and groundwater resources.

Demo site 3 of Marclaimed in the Wadden Region, Netherlands, showcases how an Aquifer Storage and Recovery system can support agricultural water reuse. Such systems will

- Preserve aquifer water quality by controlling nutrients and pesticides in the tile drainage water.
- Enhance the cost-effectiveness, optimisation, and minimal footprint of the large-scale ASR – Aquifer Storage and Recovery system.
- Increase the reliability and acceptance of Managed Aquifer Recharge.
- Promote farmer engagement to support the necessity of Managed Aquifer Recharge, investment in these systems, and proper operation to meet potentially stricter future water quality standards