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EurEau Recommendations on Regulating Water Reuse

The water services sector contribution to discussions on future reuse policy



Key messages

The wastewater treatment sector stands as a strategic partner in promoting water reuse in line with the spirit of and commitments under the Water Resilience Strategy while protecting drinking water resources.

Given the variety of local situations, reuse should remain voluntary and driven by the local opportunities for water for reuse and nearby economic demand.

The Water Reuse Regulation (WRR) reflects the principles of subsidiarity, proportionality and flexibility, which remain essential strengths of the framework. At the same time, its implementation has highlighted operational challenges.

The priority should be to strengthen the enabling factors for promoting water reuse under the current WRR and relevant sectorial legislation, as well as control of pollutants in wastewater (including PFAS) at the source.

Wastewater treatment operators must be able to recover the cost for the production of water for reuse in order to justify the investment. This can either happen through an appropriate price per m^3 to be paid by the beneficiaries, or through economic incentives;

The water services sector does not see the need to extend the scope of the WRR to additional uses, including for industrial water reuse.

1. The water services sector and water reuse

The water services sector recognises the growing importance of water reuse as a tool to strengthen Europe's water resilience, support the circular economy, and contribute to climate adaptation. Through its long-standing responsibility and expertise in collecting and treating urban wastewater before its discharge into receiving water bodies, water service providers are uniquely positioned to enable the production of reclaimed water that can be safely used for a range of applications while protecting human health and drinking water resources.

Reclaimed water is an essential resource for maintaining agricultural production in water-scarce areas or during prolonged droughts. It is also valuable whenever there is a need to reduce abstractions from natural sources, thereby limiting the ecological and environmental impacts of productive activities on both the quantity and quality of water in natural ecosystems.

This contribution is becoming more important as the combined effects of increasing demand, climate change and pollution intensify the scarcity of usable water resources, and the deterioration in water quality across Europe. In this context, water reuse is recognised as an important component of the EU Water Resilience Strategy and forms part of the 'water efficiency first' hierarchy, which prioritises reducing water demand, improving water-use efficiency, and reusing water before considering measures to increase water supply[1].

[1] Water reuse is considered as an important element in the EU Water Resilience Strategy according to the "water efficiency first" hierarchy: reduce water demand > enhance efficiency > **reuse** > increase supply.

According to latest EurEau data[2], the **total volume of reclaimed water** across Europe produced **by the wastewater treatment plants** amounts to 663.7 million m^3 per year[3], representing 1.22% of the wastewater generated. At the aggregate European level, the purposes of water reuse are fairly evenly split between **agricultural irrigation** (34.4%), **urban and leisure purposes** (33.7%) such as watering public parks or sports fields, and **industrial uses** (27.2%)[4]. While the overall level of water reuse in the EU remains relatively low compared to the amount of treated wastewater produced, reclaimed water is already used across a wider range of sectors (even in those where reuse is not regulated at EU level). However, this does not exclude the need for innovative solutions to promote further the implementation within the current EU regulatory framework on reuse considering especially that, according to the Commission[5], the technical potential for increasing the production of reclaimed water is around six-fold comparing to the amount currently reused.

Water abstraction has been increasing since 2010 in agriculture, manufacturing and public water supply. Future climate change and socioeconomic trends will further increase water demand[6]. As trusted operators, wastewater service providers play an important role in balancing public health protection, environmental objectives, and water availability. **The wastewater sector stands ready, therefore, as a strategic partner in promoting water reuse further in line with the spirit of and commitments under the EU Water Resilience Strategy**.

2. Water Reuse Regulation: Lessons learned

The Water Reuse Regulation[7] (WRR) entered into force in June 2023. It has provided a common Union framework for agricultural water reuse, by ensuring harmonised standards on reclaimed water quality, monitoring and risk management. **These provisions apply to those Member States who apply water reuse for agricultural irrigation, underlining the importance of subsidiarity, proportionality and flexibility**. The WRR (recital 10) justifies harmonised EU criteria for water reuse in agricultural applications by the need to protect food hygiene and the internal market in relation to such products.

Regulatory compliance experience shows that operators face a variety of practical challenges. **Validation monitoring, risk management, permitting procedures, allocation of responsibilities and, in particular, financing of water reuse, can be complex and uncertain**.

[2] EurEau. 2026. Europe's Water in Figures.
[3] Figures for CZ, DE, DK, HR, HU, LU, SI not available.
[4] It is also important to emphasize that some municipal wastewater treatment plant operators have extensive experience in utilising treated wastewater for their own use. For example, in Poland, 72% of operators report savings in water consumption from the water supply network thanks to the use of treated wastewater for internal treatment plant purposes.
[5] European Commission, Water reuse.
[6] EEA. 2025. Water savings for a water-resilient Europe.
[7] Regulation (EU) 2020/741.

Validation monitoring

The validation of the treatments required by the WRR is mandatory for facilities producing Class A water. This validation consists of demonstrating that the installed treatment achieves the required logarithmic reductions for certain microbiological indicators. The Commission Joint Research Center is working on the development of a specific validation protocol and it is acknowledged that these requirements are highly demanding, requiring very intensive and energy-consuming treatments, with only a limited number of technologies capable of meeting them. In addition, the required reductions were not based on health impact studies and, due to variability in the measurement of microbiological parameters, minor non-compliances in the validation process with no health significance may occur.

The Regulation provides that "at least 90% of validation samples shall reach or exceed the performance targets". At the same time, it allows compliance with the performance targets to be established not only through direct analytical control, but also by taking into account the performance attributed to individual treatment steps where this is supported by scientific evidence.

This provision appears to provide some scope for addressing isolated or atypical validation results[8]. Therefore, the validation requirements should be based on demonstrated health risks, and the validation system should allow limited deviations where the overall health risk remains adequately controlled in order to protect health without unnecessarily increasing the cost of reclaimed water reuse.

Risk assessment process

The complexity of the risk management framework can slow down project development. The WRR requires a comprehensive risk management plan, involving multiple stakeholders and detailed assessments of water quality, quantity, and impacts on human health and the environment. Moreover, water normally used for agricultural purposes needs lighter quality controls than those required for reclaimed water, creating a regulatory gap that discourages farmers from using it. While this approach aims to ensure safety, it also requires significant coordination, data collection, technical expertise, resulting in significant costs. EurEau members highlight that organising such risk management processes in practice is challenging, particularly because many actors must be involved[9]. In addition, differences in the implementation of the relevant WRR provisions by Member States may lead to varying risk assessment and monitoring requirements, resulting in increased costs and administrative burdens where more stringent measures are applied.

[8] For example, where the concentration of a microbiological indicator at the treatment outlet is already very low but falls marginally short of the applicable performance target, the operator may be able to demonstrate, through scientifically established evidence, that the treatment process was operating effectively.

[9] Ramm, Klara, Francesca Pizza, Gerardo Scibilia, and Rita Binetti. 2024. An Update on Water Reuse in the European Union Considering the Regulation 2020/741. In *Water Reuse and Unconventional Water Resources: A Multidisciplinary Perspective*, edited by M. Minella, A. Bianco Prevot, and V. Maurino, 591–615.

Permitting procedures

Water infrastructure projects often require multiple permits under different EU environmental frameworks (Environmental Assessments Directive, Habitats Directive, Water Framework Directive). This can be especially challenging for setting up the infrastructure and processes for the use of reclaimed water. In this respect, the WRR implementation has illustrated procedural complexity, as the preparation of comprehensive risk management plans requires extensive site-specific assessments and coordination among numerous actors, in the absence of harmonised templates or clear sequencing with discharge permits. These challenges have increased regulatory uncertainty and affected also the marketability and scalability of water reuse schemes.

Responsibility allocation

Responsibilities and roles along the water reuse chain can differ across Member States, particularly between wastewater operators, regulators and end users. Risk management plans and monitoring obligations may also place disproportionate responsibilities on wastewater operators. The introduction of new actors under the regulatory framework requires stakeholder agreements and complicates governance. Investments in reuse infrastructure may also depend on the participation of several farmers or other end users, requiring coordination mechanisms that can create additional hurdles. Experience from wastewater service providers involved in the EU LIFE ACLIMA project highlights governance challenges, including questions of system ownership and management responsibilities.

Financing of water reuse and other barriers

In addition to the compliance and governance challenges identified above, the uneven and limited uptake of water reuse in the EU can be explained by economic and pricing barriers. The high capital and operational expenditure coupled with the farmers' access to cheaper groundwater or surface water sources reinforces unprofitability and limits the market uptake of reclaimed water[10]. Who pays for the water reuse is one of the main (if not the main) barriers to further uptake water reuse, not just something that exacerbates other challenges.

Since water can be one of the main input costs for farmers in water-scarce regions, the decision to use reclaimed water largely depends on the economic value of the agricultural products being cultivated. Farmers producing higher value crops are generally better able to absorb the additional costs associated with reclaimed water, whereas for lower value crops these costs may become prohibitive. Practices vary in different countries and regions in Europe[11].

[10] Ramm, Klara, Francesca Pizza, Gerardo Scibilia, and Rita Binetti. 2024. An Update on Water Reuse in the European Union Considering the Regulation 2020/741. In *Water Reuse and Unconventional Water Resources: A Multidisciplinary Perspective*, edited by M. Minella, A. Bianco Prevot, and V. Maurino, 591–615.
[11] Simón, Pedro, and Isabel Oller. 2024. Water Reuse in Spain: Drivers and Barriers in Murcia and Almeria Region. In *Water Reuse and Unconventional Water Resources: A Multidisciplinary Perspective*, edited by M. Minella, A. Bianco Prevot, and V. Maurino, 617–641.

In Spain, the price of reclaimed water varies depending on the required quality and treatment processes, typically ranging from €0,06 to €0,20 €/m^3. In regions such as Murcia and Almería, where agriculture is highly profitable, farmers are more capable of accommodating higher water prices, sometimes sharing these costs with other end users. At the same time, insufficient availability or poor quality of irrigation water can reduce agricultural productivity and profitability, which may further influence decisions regarding the use of reclaimed water.

Conversely, cost estimates for small scale projects in Belgium that have to start from scratch and receive a permit for only 10 years are 1,50 to 2,70 €/m^3, of which a substantial part (about ⅓) is for the permit request. Having multiple farmers to cooperate can reduce prices but requires setting up a cooperation with shared responsibilities or another kind of management system, which represents an additional hurdle.

In Italy, costs have been estimated for adapting urban wastewater treatment plants (UWWTPs) to produce Class A reclaimed water under the WRR. UWWTPs already equipped with disinfection systems, serving agglomerations of ≥2,000 PE (population equivalent), for a total actual of 48 million PE, against a total design capacity of 70 million PE, and treating approximately 4 billion m^3 of wastewater annually. The estimated total investment (Capex) ranges from €18 billion to €21 billion, with annual operating costs (Opex) estimated at €35.5 million. Capex assumes a 20-year plant lifetime, while Opex is calculated as a percentage of Capex plus the energy costs of additional components, based on an electricity price of €0.15/kWh. For UWWTPs equipped with primary treatment only (requiring secondary treatment and filtration), the average investment range per plant is €450,000 for plants serving 2,000–10,000 PE, to €4 million for plants serving 100,000–150,000 PE. Conversely, for plants already equipped with secondary treatment (requiring the filtration stage only), considering the same size classes, the average investment range is €100,000–€7.2 million.

Last but not least, knowledge, skills, and institutional capacity, public perception and acceptance have also been identified as hindering factors limiting water reuse in agriculture. In some Member States, there is a lack of practical experience in addition to insufficient institutional support structures. Finally, emotional reactions (disgust factor), distrust, fear of health risks, and lack of genuine political will are often diverting resources from reuse projects[12].

[12] European Commission. 2025. Envisioning future systems for water reuse: An exploratory project from the EU Policy Lab.

Finally, the uptake of water reuse depends also on the quality of the wastewater entering treatment systems. Effective EU policies preventing pollution at source, including PFAS and other persistent contaminants, are therefore a prerequisite to meet the objectives of water reuse. By reducing the pollutant burden in the wastewater influent, source-control measures can improve the safety of reclaimed water while lowering treatment requirements and associated costs. This can make water reuse projects more affordable, energy-efficient and economically viable, thereby facilitating their wider deployment where appropriate.

3. Water reuse beyond the WRR: Regulating reuse in sectors other than agriculture?

Based on current experience, **the water services sector does not see evidence for regulatory needs at EU level that would justify extending the scope of the WRR to additional uses**. Non-agricultural reuse, like reclaimed water for industrial processes, urban applications, irrigation of public green spaces or certain recreational uses, street cleaning, and others, is already taking place under national legal frameworks and project-specific contractual arrangements.

Unlike for agricultural products, these applications do not have a cross-border health or EU internal market impact, hence European regulation is more difficult to justify. Managed aquifer recharge is already covered by EU level guidance[13], which allows solutions to be tailored to local hydrological, environmental and economic conditions.

For water reuse applications other than agriculture, technical guidelines would be preferable instead, leaving to Member States the opportunity (or not) to develop specific rules based on local and/or case-by-case needs and conditions.

Industrial water reuse

Industry is a major water user. Enhancing the use of reclaimed water can significantly reduce its water footprint, supporting the Water Resilience Strategy water efficiency goal. In particular, emerging water uses such as data centres, semiconductors, hydrogen or battery production are increasing the pressure on local water resources including those used for drinking water production.

In its Water Resilience Strategy, the Commission underlines the importance of the recast Industrial Emissions Directive (IED) as a tool that will ensure that large industrial actors progressively reduce demand, enhance efficiency and improve reuse across production processes.

[13] European Commission. 2024. Managed Aquifer Recharge, Guidance Document No. 39.

Through integrated permitting and best available techniques (BAT)-based performance levels, the IED enables competent authorities to require resource efficiency improvements tailored to specific installations. When achievable, these techniques must be reflected in the permit conditions. In water-stressed regions in particular, **this framework can effectively drive industrial demand for reclaimed water without imposing prescriptive reuse obligations**. The IED therefore functions as a demand-side driver for industrial water reuse while preserving flexibility at national and local levels. It enables case-by-case solutions adapted to sector-specific processes, water quality requirements and local hydrological conditions[14].

The practices of industrial water reuse are already increasing across Europe, without sector-specific EU regulation. A prime example of water reuse in practice is the AITASA project in Tarragona (Spain). Due to its Mediterranean climate, combined with significant tourism and industrial activity, the province of Tarragona has faced water scarcity challenges over the years. To address these issues, a project was launched to reuse treated water from the Tarragona and Vilaseca-Salou urban wastewater treatment plants to supply industries in the Tarragona Chemical Hub, thereby freeing up this volume from the Ebro River for exclusive use in public water supply. With nearly 43.5 km of industrial water networks and over 10 Hm^3 of capacity, the AITASA water regeneration plant stands as a clear example of the value of water regeneration processes and the need to continue promoting such projects, which enhance supply security for industrial users without compromising the population's water needs.

Other examples of water reuse in the Mediterranean region can be found in Italy, where a 2025 study carried out by Utilitalia highlighted that 94 UWWTPs produce, or are designed to produce, approximately 200 million m3 of reclaimed water. Of this volume, 17%, (i.e. around 34 million m3), is used for industrial purposes. For example, in Tuscany, the Fenice UWWTP produces reclaimed water intended to enable the reuse of treated water for the Piombino's steelworks; while, in Emilia-Romagna, thanks to the co-location of the UWWTP and the waste-to-energy plant in Modena, reclaimed water is used for machinery cooling and process applications in both plants, thereby reducing the demand for drinking water.

[14] It should be noted, however, that in the current legislative procedure on the Environmental Omnibus Package, the IED driver of industrial reuse could be weakened, though probably not removed entirely.

Industrial water reuse is highly site-specific. Water quality requirements differ substantially between sectors and even between individual plants, meaning reuse schemes are typically developed through bilateral agreements between water service providers and industrial users, based on risk assessments for the company-specific needs. Introducing harmonised EU minimum quality standards for industrial reuse would risk being either overly prescriptive or insufficiently adaptable to the diversity of industrial processes, thereby questioning the feasibility of their application and potentially impacting negatively on the competitiveness. We therefore see many caveats in incorporating quality requirements for industrial water reuse into the WRR. **EurEau does not believe that binding EU-level criteria would be appropriate**.

4. Concluding remarks

The water services sector supports the promotion of water reuse as part of a broader European strategy on water resilience.

While considering future policy solutions to boost water reuse uptake, a thorough assessment of implementation experience and operational impacts of the current WRR should be factored in. **Priority should be given to promoting reuse through unlocking the potential of enabling factors intrinsic to the existing water reuse**, such as compliance and governance challenges and especially pricing (who pays the costs?). In addition, controlling pollutants, including PFAS, at the source can reduce the cost of producing reclaimed water and, hence, facilitate its uptake.

Finally, we maintain that **expansion of binding EU regulatory requirements beyond agricultural irrigation is not currently justified, including for industrial reuse**. We favour non-binding measures over new prescriptive regulation with a view to improving legal certainty and removing of administrative obstacles, while taking due account subsidiarity, proportionality and the diversity of water conditions across Member States.

That way we could ensure that water reuse becomes a practical and trusted cross-sectoral component of Europe's integrated water management systems.

About EurEau

EurEau is the European Water Services Association, representing 38 national organisations from 33 countries and the public and private water services they bring together.

We work with EU institutions and international organisations to shape policies that protect water quality, strengthen resilience and ensure sustainable, affordable water services for more than 500 million Europeans.

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