

# FOR A GREEN, CIRCULAR & SMART URBAN WASTEWATER TREATMENT DIRECTIVE



Water Europe (WE) is the voice and promoter of water-related innovation and RTD in Europe. WE are a membership-based multi-stakeholder organisation representing over 200 members from academia, industry, technology providers, water users, water service providers, civil society, and public authorities. WE activities and positions are guided by its Water Vision "The Value of Water: Towards a Future-Proof European Water-Smart Society".

# MASTERING WATER EFFICIENCY AND REUSE CHALLENGES

## Water Europe Vision

Water Europe has set out a blueprint for a society in which the true value of water is recognised and realised, and all available water sources are managed in such a way that water scarcity and pollution of water are avoided, water and resource loops are largely closed to foster a circular economy and optimal resource efficiency, while the water system is resilient against the impact of climate change events.



Multiple Waters



Digital Water



Value in Water



Grey-Green Infrastructure

## Urban Wastewater Treatment Directive

[The Urban Waste-Water Treatment Directive](#) (UWWTD) has set an international reference case in the global effort in wastewater management, exemplified in the UN Sustainable Development Goal indicator 6.3.1. Today, 95% of the EU's urban wastewater is collected and over 85% is treated according to the Directive's requirements<sup>1,2</sup>.

Water Europe welcomes the conclusion of the European Commission to update the UWWTD to address today's challenges in line with the Green Deal and the digitalisation of Europe. **The revision must master the complexity of the topic by signing up for a resource-oriented approach and an energy-driven one<sup>3</sup>. A well-designed UWWTD must embrace the circular economy, achieve carbon neutrality by 2050, digitalise water management and integrate new technologies.**

This holistic perspective is the key driver for energy-performance, resource recovery and water reuse. With its high return on investment, the water sector can maximise the impact in several sectors to make effective sustainability. Particularly, climate neutrality measures taken without considering the effects on water management run the risk of intensifying water crises, ultimately defeating their purpose. Climate neutrality goals and attention to water resources can however be developed in a mutually reinforcing way by achieving a Water Smart Society<sup>4</sup>. Therefore, WE suggests:

# 1

## CARBON NEUTRAL AND CIRCULAR WATER MANAGEMENT

A better and holistic management of wastewater treatment plants must make the best of the resources (e.g. nutrients) and the energy embedded in water streams. Without water-saving technologies, including reuse of water, the European Union estimated an increase of 16% of water abstraction in Europe by 2030<sup>5</sup>. A resilient and smart wastewater treatment plant shall:



**Exploit energy embedded in water and wastewater flows** to promote carbon-neutral wastewater management in line with the Green Deal objectives.



**Achieve carbon neutrality by 2050 at the latest.** The water sector is ready to embrace its societal responsibility and lead by example.



**Catch economic opportunities into its interconnection with other sectors** such as agriculture, construction, and energy ones to fully achieve the circular economy (article 14).

1. <https://ec.europa.eu/environment/water/water-urbanwaste/pdf/UWWTD%20Evaluation%20SWD%20448-701%20web.pdf>

2. [https://ec.europa.eu/environment/water/water-urbanwaste/implementation/pdf/COM\\_2020\\_492-final.pdf](https://ec.europa.eu/environment/water/water-urbanwaste/implementation/pdf/COM_2020_492-final.pdf)

3. 'Making Water Fit For Life' LIFE water platform meeting, January 2020 - <https://watereurope.eu/future-urban-waste-water-treatment-directive-under-the-spotlight/>

4. Water Europe's reply to the feedback for the roadmap on the 2030 climate target plan

5. [https://ec.europa.eu/environment/water/quantity/building\\_blocks\\_prev.htm](https://ec.europa.eu/environment/water/quantity/building_blocks_prev.htm)



**Exploit nutrients and substances embedded in wastewater stream** to turn waste into resources such as phosphorus and nitrates, whether recovered or as properly treated sewage sludge.



**Fully implement water reuse**, as provided in the article 12. Only 2.4% of the treated urban wastewater effluents and less than 0.5% of annual EU freshwater withdrawals is reused annually<sup>6</sup>.

## 2 SPECIFIC MEASURES TO ADDRESS CONTAMINANTS OF EMERGING CONCERN (CECs) & ANTIMICROBIAL RESISTANCE

**Specific measures and investment are needed to address CECs** such as Endocrine Disrupting Compounds (EDCs), pharmaceuticals and microplastics to reach the objectives of the zero-pollution strategy. Between 129 and EUR 206 billion will be needed to mitigate contaminants of emerging concern in the EU by 2040<sup>7</sup>. These investments should focus on both upstream and downstream measures.

**Consideration on the fate and management of antimicrobial resistance (AMR) through wastewater treatment and collection must be included** to cover both bacteria (ARB) and genes (ARGs), paired with a pharmaceutical strategy that considers the environmental AMR challenge. Within the water-health nexus, utilities can also include wastewater-based monitoring to assess people health and disease status (e.g. to support pandemic management).

## 3 DIGITALISATION FOR ENERGY AND WATER EFFICIENCY

**The UWWTD must encourage digitalisation to a much higher extent.** Digitalising can be a solution to survey the infrastructure and achieve full transparency on water quality and quantity. Paired with adequate adaptation and training to new skills, it can also improve the monitoring and reporting, ensure stronger compliance and optimise infrastructure use to maximise resilience including solutions to shift the energy loads and intermittency for balancing the energy grid. It also eases off the necessity for renovation investments and reducing the pressure on water resources.

Furthermore, digital water can offer additional flexibility in water pollution management by switching from emission to an imission approach, focusing on controlling the integrated sewer-WWTP system dynamics to minimise the impact on the ecology in the receiving water<sup>8</sup>.

## 4 BRING BACK NATURE FOR BETTER STORM AND SMALL AGGLOMERATION WATER MANAGEMENT

**A better legal framework should be incorporated in article 10 for urban run-off and extreme events management, to ensure continuous and sufficient performance.** Uncollected urban runoff flow is a source of pollution which directly degrades both inland aquatic and marine<sup>9</sup> environment. Moreover, floods are the largest source of GDP losses from natural disasters in Europe, causing a loss of EUR 150 billion between 2002-2013<sup>10</sup>.

6. [https://ec.europa.eu/environment/water/blueprint/pdf/BIO\\_IA%20on%20water%20reuse\\_Final%20Part%20I.pdf](https://ec.europa.eu/environment/water/blueprint/pdf/BIO_IA%20on%20water%20reuse_Final%20Part%20I.pdf)

7. <https://www.oecd.org/environment/financing-water-supply-sanitation-and-flood-protection-6893cdac-en.htm>

8. The WWTd is not managed as an entity in itself, but as an integral part of the system sewer-WWTD-receiving water. During heavy rains, an emission-based system (setting targets at the discharge points of the WWTP) encourages Combined Sewer Overflows (CSOs), which can lead to a greater imission of pollutants. It is therefore better to burden the WWTP a bit more so that net more water is (partly) treated. It matters to build and manage the infrastructure based on what the ecology in the receiving water can handle.

9. In line with the objectives set in MSFD report, better UWWTP is required to tackle litter-related challenges and also contribute to improve the ecological status of the coastal water (46% with good status) - [https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index\\_en.htm](https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm) (page 10, 18)

10. <https://www.eea.europa.eu/data-and-maps/indicators/direct-losses-from-weather-disasters-3/assessment-2>

Additionally, exceptions to the UWWTD should be prevented as much as possible. Appropriate consideration must be included to tackle pollution from small agglomerations and from individual systems such as nature-based solutions.

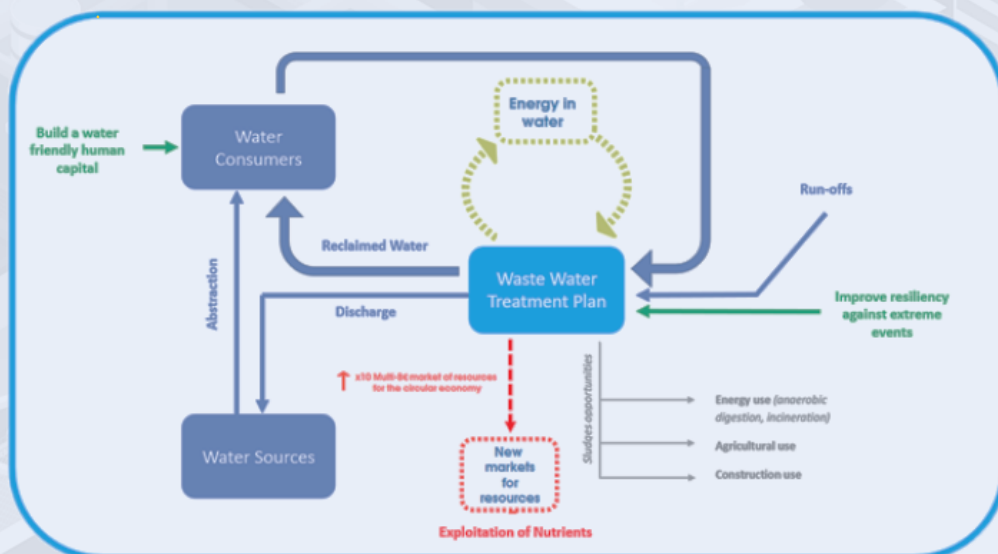
In the triad health-biodiversity-water, **nature-based solutions, whenever feasible, can help to manage water flows in urban areas** such as drought, flood, and rains infiltration while support biodiversity restoration. As a multiple service tool, NBS increase resilience, offer carbon storage capacity, new business opportunities and several other co-benefits.

## 5 A WATER FRIENDLY LEGISLATION BUILT BY AND FOR EUROPEAN CITIZENS

A better understanding of the water sector by citizens shall be supported to improve public trust and maximise the efforts to comply with the green objectives:

- ✓ **Provide incentives to develop and implement innovative treatment technologies** to tackle the pollutant emissions/behaviour associated with the priority challenges of climate change and population growth. A key issue remains the lack of investment and planning. Compliance with the UWWTD needs more than EUR200 billion<sup>11</sup>.
- ✓ **Disclose additional information regarding water management**, particularly on energy and water efficiency, multiple water sources and the opportunities stemming from the circular economy in the water sector to better inform citizens and manage water resources.
- ✓ **Support water-oriented living Labs**<sup>12</sup> as the scope for inclusive governance and innovative solutions. WoLLs are cross-sectoral ecosystems that provide a “field lab” to develop, test, and validate new technologies, inclusive business models and policies based on the value of water.
- ✓ **Enshrine access to sanitation into the UWWTD**, in line with the SDG 6 to ensure effectively access to water and sanitation for all by 2030, as supported in the 10<sup>th</sup> impact assessment<sup>13</sup>.

### CIRCULAR WASTE-WATER TREATMENT



11. [https://ec.europa.eu/environment/water/water-urbanwaste/implementation/pdf/COM\\_2020\\_492-final.pdf](https://ec.europa.eu/environment/water/water-urbanwaste/implementation/pdf/COM_2020_492-final.pdf)

12. <https://watereurope.eu/wp-content/uploads/2019/07/Atlas-of-the-EU-Water-Oriented-Living-Labs.pdf>

13. [https://ec.europa.eu/environment/water/water-urbanwaste/implementation/pdf/COM\\_2020\\_492-final.pdf](https://ec.europa.eu/environment/water/water-urbanwaste/implementation/pdf/COM_2020_492-final.pdf) of the costal water (46% with good status) -



## HYDROUSA

Aims to revolutionize the water supply chain in Mediterranean regions by **demonstrating innovative solutions for water/wastewater treatment** and management, which will **close the water loops** and will also boost their agricultural and energy profile.

**HYDROUSA demonstrates how the UWWTD can contribute to achieve a Water-Smart society for a Digital and Green Europe**

**Duration:** 54 months

**28 partners**

**Website:**  
<https://www.hydrousa.org/>

- ✓ **HOLISTIC AND CIRCULAR MANAGEMENT FOR A WATER-SMART SOCIETY**
- ✓ **BRING BACK NATURE FOR BETTER STORM AND SMALL AGGLOMERATION WATER MANAGEMENT**
- ✓ **WATER & ENERGY EFFICIENCY**
- ✓ **POSSIBILITIES TO SCALE-UP ACROSS EUROPE AND BEYOND**

*Application: HYDRO1 will treat the domestic wastewater of Antissa village WWTP in Greece. It combines anaerobic processes with constructed wetlands and disinfection to treat domestic wastewater as a completely circular solution where water, nutrients and the produced sludge are going to be reused.*



## B-WaterSmart

Aims to accelerate the transformation to water-smart economies and societies in coastal Europe and beyond. The project applies a large-scale systemic innovation approach to select, connect and demonstrate a tailored suite of technology, management and smart data solutions for multiple water users and sectors, and create new business models **based on circular economy and water-smartness**.

**Duration:** 48 months

**35 partners**

**Website:** <https://b-watersmart.eu/>

**B-WaterSmart demonstrates how the UWWTD can contribute to achieve a Water-Smart society**

- ✓ **HOLISTIC AND CIRCULAR MANAGEMENT**
- ✓ **WATER & ENERGY EFFICIENCY**
- ✓ **MULTIPLE DIGITAL SOLUTIONS FOR THE MONITORING, CONTROL AND OPTIMIZATION OF DATA AND PROCESSES**

*Application: Living Lab – Venice: aims to directly and indirectly promote the application of RR and CE logics by:*

- *Boosting the reuse at multiple level of the available treated municipal wastewater;*
- *Fostering the best practices of nutrient/energy recovery from wastewater treatment and sludge management*
- *Sustainability assessments of reuse/recovery opportunities.*



## NextGen

NextGen evaluates and champions transformational **circular economy solutions** and systems around resource use in the water sector.

**Duration:** 48 months

**30 partners**

**Website:**  
<https://nextgenwater.eu/>

**NextGen demonstrates how the UWWTD can contribute to achieve a Water-Smart society**

- ✓ **DEVELOP INNOVATIVE SOLUTIONS FOR AN HOLISTIC AND CIRCULAR MANAGEMENT OF WATER**
- ✓ **WATER & ENERGY EFFICIENCY**

*Application : Water Treatment Plant in Altenrhein, Switzerland  
Energy-efficient sludge management technologies for 300.000 PE of sludge with:*

- *Production of fresh activated carbon reused for micropollutants removal.*
- *Phosphorus in sludge reused on market.*
- *Nitrogen stripping via an novel membrane contactor*





Technology & Innovation