Issue 4 | b-watersmart.eu

# B-WaterSmart magazine

Looking back at the B-WaterSmart project

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# Looking back at B-WaterSmart. What have we achieved?

Time flies by - 48 months of our B-WaterSmart project are now ending. 4 years in which we have worked intensively to promote water-smartness in European coastal regions and beyond. 48 months of research, meetings, testing, success, and failure in which we have not only achieved a significant impact within our six Living Labs but where the world around us has continued to turn and change too.

We have come a long way in our six Living Labs to demonstrate and enable **systemic innovation** toward a more water-smart economy and society through active and sustainable Communities of Practice. By performing specialized training activities, we strengthened the knowledge of decision-makers on **water-smart solutions**. With public events, we raised the **society's awareness** of current and future challenges and our water-smart solutions to deal with them.

We developed a broad portfolio of **cost-effective technologies and water-smart data solutions** to increase the reuse of water and wastewater, to promote the recovery of energy and materials as well as to facilitate a smart management of the water infrastructure. We presented and will continue to present those solutions on the Water Europe Marketplace, the central knowledge portal for water-smart solutions of B-WaterSmart and other European projects.

For each Living Lab, we suggested new or **improved target-oriented governance, policies & regulations** for achieving water-smart solutions. We also developed **practical guidance** on societal and behavioural issues related to their acceptance and implementation.

We created an **assessment framework** that builds on a solid definition of water-smartness and makes it operational. A framework that can assist decision-makers and practitioners in long-term strategic planning toward their vision of a water-smart society.

We explored new business opportunities by systematically assessing all solutions demonstrated within B-WaterSmart for their exploitation potential and supporting solution providers on their route to market.

It is traditionally time for a review at the end of a project. But let's not call it a review. Instead, it is a summary of the first steps of the journey that we want to continue in our Living Labs. Let us continue to learn from each other, to question existing solutions, and to rethink our water systems.

Let's B-WaterSmart!

**Dr. Kristina Wencki**
**Project Coordinator**

# Our path towards a sustainable Living Lab in Alicante (Spain)

## Challenges in Alicante

In Alicante, there are two key water-smart challenges: water scarcity and limitations to water reuse due to high salinity and infrastructure investment needs. While water scarcity is not currently a problem in Alicante, it is expected to become a challenge. This is because the inland supply of fresh water, which is coming from the distant Tagus River basin and makes up to 33% of the total share, is subject to growing limitations, and groundwater resources are also increasingly scarce. Water reuse is one solution to secure a constant water supply in the region, but it is not without challenges. New infrastructure is required to increase water reuse, and there is a lack of knowledge and experience in implementing innovative technologies and circular economy solutions for water reuse and resource recovery at the Wastewater Treatment Plant.

The Living Lab in Alicante aims to boost the circular economy (CE) in the region in line with the eco-factories' initiative fostered by VEOLIA. Through the B-WaterSmart project, Alicante wants to recover energy, nutrients, and salts from Reverse Osmosis brine. Upon successfully demonstrating technical and digital solutions in B-WaterSmart, Alicante wants to scale up tools and pilots in the city, as well as on a national and international level.

Above: B-WaterSmart project meeting in Alicante
Below: Co-Digestion pilot

# The applied tools and technologies in Alicante

The **RE-ACTOR tool** allows users to assess the environmental and economic impacts of upgrading scenarios with different technologies and prioritize them. The tool supports pre-screening general assessment on different scenarios for a later deeper assessment.

The hardware technologies successfully tested in the Living Lab are the following:

**Anaerobic CO-digestion:** Combining sewage sludge and other substrates with higher biodegradability in the anaerobic digester to improve biogas production and lead to higher energy production from a renewable source.

**Electrodialysis and electrochlorination** were used to recover reclaimed water while transforming concentrated brine water into sodium hypochlorite (NaOCl) for water disinfection.

**CEVAP** is a low-thermal cartridge evaporator technology used to recover ammonia from reject water generated during sludge dehydration. Ammonia is then used as a nitrogenated fertilizer for agriculture. CEVAP operates at low temperatures and recovers nutrients sustainably.

**Microturbines** enable the recovery of electric energy through the vortex flow of water effluents in Wastewater Treatment Plants (WWTPs).

Left: Nutrient recovery pilot plant in Alicante
Right: Microturbine site

# How does B-WaterSmart impact society in Alicante?

## Environmental impact

The B-WaterSmart project has a positive impact on society as it contributes to the regional government's "Zero Discharge" project for the city of Alicante and its WWTPs. The goal of the project is to reach 100% water reuse. The co-digestion pilot's success has resulted in the upscaling of the technology to full scale. Furthermore, a LIFE proposal (LIFE MERLIN) aimed at further enhancing biogas production in co-digestion at the WWTP of AMAEM, based on the results of B-WaterSmart, has been recently approved. The successful results of the brine valorization pilot through electrodialysis/electrochlorination will allow the use of the sodium hypochlorite produced for the disinfection of reclaimed water at full scale.

## Social, governance, and policy impact

Stakeholders from Alicante have been included in the project work through the Community of Practice and training actions. Social acceptance considerations, drivers, and barriers at the local/regional level have been identified through interviews with experts and stakeholders, leading to policy recommendations at regional and national levels. The Innovation Agency of Valencia (AVI) approved a grant to Aguas de Alicante in July 2023 for the "Urban Water Sandbox in Alicante" project, which will support the continuation of the Living Lab activities for the sustainability of the water cycle with the involvement of technological and administration stakeholders in the period 2023-2026. A general dissemination event was held in 2023 at the WWTP of Rincón de León, with the collaboration of the Consumer's Association of Alicante.

Community of Practice meeting

## Economic impact

The technologies tested in Living Lab have proved their positive impact on the availability of resources (reclaimed water, energy, disinfectant) and are also expected for nutrient recovery solutions. Aguas de Alicante has decided to upscale the co-digestion pilot to full scale, moving forward in collaboration with the industry waste providers that have taken part in the Living Lab pilot. The results of the pilot so far show that the co-digestion has the potential to double biogas and energy production, which could lead to energy savings higher around 70.000 €/year and even higher 300.000 €/year depending on the availability of external waste as co-substrates. Local fertilizer producers have also shown great interest in the acquisition of the ammonia produced by the CEVAP technology.

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### Partners of the Living Lab

# Our path towards a sustainable Living Lab in Bodø (Norway)

## Challenges in Bodø

Bodø, a city in Northern Norway, has a population of 55,000 people. The city is aiming to become a low-emission society and adapt to climate change. However, it is facing several challenges that affect its water resources, including a growing population, increasing pollution, and an untapped efficiency potential. The relocation of the airport now enables new sustainable city development with research-based solutions. Norway has a national average leakage rate of 30%, this is coupled with an increasing backlog of needed infrastructural upgrades and investments in the water sector. Due to climate change, Bodø is also preparing for increased rainfall events.

The B-WaterSmart project has selected tools and technologies that cater to the local environment's needs. The Bodø Living Lab's ambitions for the project include testing technology to achieve improved water use efficiency, raising awareness of water usage habits among homeowners, developing technologies that assist homeowners and municipalities in leakage detection, inspiring and educating stakeholders regarding the use of blue-green structures, and assisting the development of a sludge biogas reactor for energy recovery from sludge.

The ambitions beyond the project are to develop a plan for the new district using blue-green infrastructure with no non-potable use of drinking water and to continue its work with the implementation of a biogas reactor.

Above: Sludge to energy feasibility study workshop
Bellow: Bodo Community event with B-WaterSmart

# The applied tools and technologies in Bodø

Our **smart water meters** are self-powered water meters equipped with flow, pressure, temperature, and battery sensors that send out data when in use.

**Various detectors:** Sewer flow meters installed in the smart water meter pilot area were paired with municipal water meter data and utilized for the development of the Environmental Dashboard and additional studies by NTNU and SINTEF.

**Sludge to energy:** A study of alternative methods for handling the remaining biowaste post biogas production from sewage sludge.

The **Environmental Dashboard** is a dashboard displaying water consumption habits on a municipal level through water zones.

The **Nessie platform** is a dashboard displaying water consumption habits on a homeowner level.

Leakage simulation

# How does B-WaterSmart impact society in Bodø?

## Environmental impact

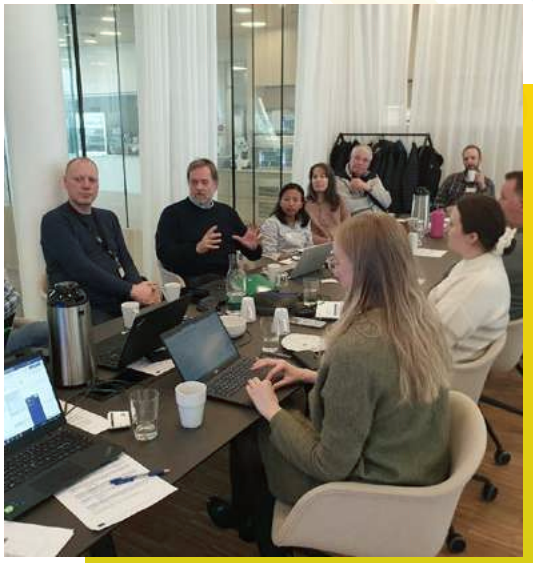
The municipal staff of Bodø kommune has been educated and inspired through the Community of Practice meetings. As a result, they now support the implementation of the first Surface Water Plan and a feasibility study of a large blue-green structure in the new city development area. They also show interest in biogas production because of the B-WaterSmart sludge feasibility study.

## Social impact

B-WaterSmart has raised awareness about challenges and solutions related to domestic water demand, leakage detection, localization algorithms, data protection, and managing large data volumes. This has been achieved through training events and directly engaging in the development of tools and technologies. The local water industry, students, and household owners have benefited from this increased awareness. Through direct interaction between the water and waste department and the public, awareness was also raised of the secondary costs associated with water systems.

## Economic impact

The Environmental Dashboard provides a quick and effective method to calculate and verify leakage rates on a daily, weekly, or monthly basis. This is particularly crucial in Bodø where water meters are not mandatory, and current leakage estimates rely on costs and consumption estimates. The Smart Water Meters allow Bodø kommune to see the true water consumption habits of inhabitants.



Community of Practice meeting

## Governance and policy impact

B-WaterSmart has had a significant impact on governance and policy. Areas within the water sector lacking critical monitoring data were identified through the InAll assessment. This helps the municipality to prioritize investments through awareness. Valuable perspectives on how building developers perceive and interpret the blue-green factor legislation were gained through interviews with stakeholders. This information is critical as the blue-green factor legislation has been implemented for the first time in northern Norway and needs to fit the local requirements.

Blue-green structures and surface water workshop

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# Our path towards a sustainable Living Lab in East Frisia (Germany)

## Challenges in East Frisia

The Oldenburg East Frisian Waterboard (OOWV) is a large water supplier in Germany, covering an area of 7,480 km². It provides drinking water from groundwater resources to public, private, industrial, and agricultural customers, and treats wastewater in approximately 50 % of the area. Climate change is causing hotter and drier summers, increasing the demand for water in various sectors (domestic, industrial, and agricultural), and putting more pressure on groundwater resources. The objective of OOWV is to identify untapped water resources and promote the reuse of process water or treated wastewater in water-intensive sectors. The methods and instruments developed in B-WaterSmart aid in achieving this objective.

Community of Practice Meeting at DMK Dairy

# The applied tools and technologies in East Frisia

A **cow-water treatment plant** was operated on pilot scale at the Living Lab to test improved treatment of process water (combined treatment of vapour condensate) for reuse in the water intense sector of dairy production. The successful implementation of the B-WaterSmart pilot project at DMK dairy shows that process water recycling is possible and that more than 50% of drinking water can be replaced by process water. This will set an example for dairies and the entire food industry in the region.

The **Urban Water Optioneering Tool (UWOT)** was used to simulate the water flows (water demand and supply points). It was applied to investigate alternative scenarios based on different climatic and demand change conditions or with the implementation of partially decentralised technologies. Further information: mp.watereurope.eu/d/Product/25

The **regional demand-supply matching GIS tool (RDSMG)** was used to identify possible water consumption hotspots and areas of water shortage. Furthermore, alternative water resources or areas with available water sources and water drains from one region to another could be identified. Further information: mp.watereurope.eu/d/Product/35

The **Short-term demand forecasting tool (SDFT)** was used to generate water demand forecasts for the next (or current) day, which can be used to identify high peak loads in certain regions that require actions by the water utility. More info: mp.watereurope.eu/d/Product/58

Visit at the cow-water treatment plant

# How does B-WaterSmart impact society in East Frisia?

## Environmental impact

The B-WaterSmart technologies help to identify and implement alternative water supply concepts and sources. The pilot plant has demonstrated that process water can be recycled as a substitute for drinking water. By utilising alternative water resources, groundwater resources are conserved and a long-term supply of water to the region is ensured.

## Social impact

Project results were made accessible to a broad public through events and presentations, thus helping to raise awareness. In the Communities of Practice, a vision for water smartness was developed with stakeholders.

Above: Installation of flow measurements
Below: Day of the Open Door at OOWV in July 2022

## Economic impact

The B-WaterSmart technologies developed are helping to further boost the utilisation of alternative water resources in the region. The circulation of cow water to reclaimed water in the form of a large-scale plant enables an increased production with the same water requirement and therefore leads to an increase in revenue if realized. In addition, the water management tools can help to reduce groundwater use and enhance water-use efficiency.

To further accelerate the process, the subsidiary IWAG was tasked in 2021 with developing decentralized water supply concepts for the industry. The aim is to establish standardised methods for water-smart solutions that are applied in a demand-driven manner. It is assumed that 1.6 Mio. $m^3$ of drinking water will be replaced by treated process water by 2026.

In addition, three projects on alternative water resources have received funding from different European and national funding instruments. These include a pilot project on water recycling for paper and board mills, guideline development of an integrated water management for hydrogen production, and a Horizon Europe project called DEvelopers of CIrcular SOlutions (DECISO), which supports European cities and regions in developing financing schemes for circular economy initiatives.

## Governance and policy impact

The pilot plant demonstrated the effectiveness of cow water treatment in dairies. These findings can support authorisation practices and potentially lead to changes in legislation.

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### Partners of the Living Lab

# Our path towards a sustainable Living Lab in Flanders (Belgium)

## Challenges in Flanders

Flanders faces significant water challenges due to its dense population, agricultural demands, groundwater overexploitation, water quality degradation, and water availability due to climate change and land use change. These challenges have led to high water demand and water availability issues. To address these problems, key water-smart opportunities that involve establishing regional circularity within the water system are being explored to build a more robust water system, with a particular emphasis on safe water reuse. This circularity approach includes exploring alternative water resources for drinking water supply, enhancing existing drinking water production methods, and securing irrigation through links with urban reuse cycles (e.g. stormwater reuse). Living Lab Flanders' general aim is the assessment of alternative water sources and increasing freshwater availability for drinking water and agriculture.

Visit at the Living Lab Flanders

# The applied tools and technologies in Flanders

The **smart stormwater reuse system for agriculture** is used to control the outflow from a buffer basin and the water distribution for irrigation to optimize the functioning of the basin for flood prevention and availability of water for irrigation during dry periods.

Water availability and demand (including potential alternative water sources) is modeled using the **Urban Water Optioneering (UWOT)** Tool to develop a strategy to increase water system robustness at the regional level and promote sustainable water supply solutions while considering environmental and societal aspects.

A critical success factor for water reuse is the assessment and control of microbial safety risks. The **Quantitative Microbial Risk Assessment (QMRA+) tool** is developed to support the design and assess the required treatment needed for water reuse. QMRA+ can be used to assess existing purification systems and to help determine the design requirements of purification systems (e.g. for alternative water sources) concerning microbial safety requirements. Within B-WaterSmart, QMRA+ is used to help design the effluent reuse demonstration system by back casting the required removal rate.

The **Surface Transport and Removal (SuTRa) tool** builds on microbial risk assessment to specifically model (plant) pathogen removal during subsurface passage of managed aquifer recharge and infiltration schemes. This helps determine the minimum design parameters and residence time required for pathogen removal. The outputs from SuTRa support the regional analysis or similar studies in related projects by providing input parameters on subsurface passage.

Above: CCRO pilot for drinking water production at De Blankaart
Below: Site visit to De Blankaart

# How does B-WaterSmart impact society in Flanders?

## Environmental impact

The demonstration activities in the B-WaterSmart project show a decrease in the use of freshwater resources at a local scale. Secondly, wastewater reuse and Closed-Circuit Reverse Osmosis improve water security if regional water demands remain at reasonable levels. However, the effectiveness of the measures is limited when regional demands become high (>30000 m3/day). The results indicate that the most efficient way to secure the system against future stresses is to combine both, wastewater reuse and Closed-Circuit Reverse Osmosis, without (over-)relying on one solution. Last but not least, the retention basin in Mechelen contributes strongly to the goal of flood-proofing the area, as it leads to runoff reduction rates that range from 22%-94% (depending on the month of reference).

## Social impact

Through the communities of practice (CoP) and citizen engagement a few lessons were learned. Firstly, better awareness of water treatment costs improves the level of acceptance of the implementation of different treatment solutions. Secondly, the degree of social acceptance depends on the type of water being used but the behaviour of stakeholders changes positively when a solution is already being implemented. And last, cooperation and communication ensure good engagement of citizens, and everyone benefits from that.

## Governance and policy impact

During a meeting with the Flanders Environmental Agency (Vlaamse Milieumaatschappji, VMM) about water reuse (among other things) the BWS project was presented, with a focus on stormwater management in Mechelen. The government officials showed interest in upscaling the project's stormwater reuse concept to other basins in Flanders as well and making them multifunctional for the entire region. A lot of potential forms of governance and possible financing structures were determined during a dedicated Community of Practice meeting on the Mechelen case. In parallel with other initiatives (Blue Future Limburg and Deeper Blue), the relevant data was provided for the risk assessment and monitoring that demonstrates the possibility of providing the required assessments to the Flemish drinking water regulator to comply with the new drinking water regulation from January 2022.

Site visit to the buffer basin in Mechelen

## General impact

The ambitions beyond the B-WaterSmart project are to use the experiences from the demonstration sites to identify the potential valorisation and replicability of the applied technologies at a larger scale at those locations and/or at other locations identified in the regional water system model. The assessment of the regional water system for Mechelen and De Watergroep will enable systemic innovation in the region and form the basis of a roadmap for systemic smart water management in Flanders in 2040. The long-term goal is to work towards a "water smart" region with innovative technologies, multi-stakeholder partnerships, and a stronger integration of water management in the region.

Left: Local event: Pumpkins for citizens
Right: Construction of the buffer basin in Mechelen

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# Our path towards a sustainable Living Lab in Lisbon (Portugal)

## Challenges in Lisbon

Challenges faced by many European regions and cities, such as Lisbon, are increased concentration of the population in cities and growing economies; climate change effects, namely heat waves and droughts; and the need to increase urban green areas to guarantee the quality of life of citizens and the sustainability of urban life. Thus, the objectives for Lisbon are to reduce potable water consumption in non-potable uses, such as irrigation, and to increase water reuse, a rainfall-independent water source, that is more resilient to climate change. To do so, the actions of the Living Lab (LL) in Lisbon include the improvement of water supply/demand management and the city's water-energy-phosphorus footprint while increasing green areas, promotion of climate-ready housing (water-energy efficient, climate-change proof) and promotion of safe urban water reuse. These water-smartness activities are in line with the city's strategies for key areas of urban development.

Public event in Lisbon at World Water Day 2024

# The applied tools and technologies in Lisbon

Within B-WaterSmart, the Lisbon LL contribution to a water-smarter society to secure water for all is accomplished through the development of an integrated set of solutions.

A sequence of four applications for water-smart allocation was designed to jointly provide the ability to match water supply and demand while managing water volume, cost, energy, nutrients, and risk:

- **Water-energy-phosphorous balance planning** is a tool for formulating and assessing candidate combinations of two or more supplies, including reclaimed water, in satisfying non-potable water demands in urban or regional contexts, to enable prioritizing strategies and actions.
- **Urban water reuse risk assessment tool**, a user-friendly risk assessment framework for water reuse in non-potable uses based on the relevant ISO standards and the European regulation on water reuse.
- **The reclaimed water distribution network water quality model** is a tool that implements a new, innovative algorithm for modelling chlorine decay, as a function of key water quality parameters, on top of a standard hydraulic model.
- **Environment for decision support and alternative course selection tool** is an intuitive numerical and visual decisional environment that enables non-experts to easily understand the decisional problem, rank the candidate options, and ultimately make a decision based on factual evidence/data.

**Urban Water Cycle Observatory** for building awareness, engaging, and empowering citizens on smart-water use. This tool is a visualization instrument for monitoring and communicating performance, supporting urban planning and decision-making. It includes two types of approaches: top-down (city level, annual data, infographics) and bottom-up (single user level, smart metered data, data analysis).

**Climate Readiness Certification Scheme** for evaluating three dimensions (water efficiency, water-energy nexus, and climate adaptation) in a 3-scale analysis (household, building, and neighbourhood) and with three moments of certification (design phase, construction, and use).

Above: Field trip to the Living Lab Lisbon
Below: Public park irrigated with reclaimed water

Looking ahead at water reuse and resilience under increased water-scarcity, a pilot demo of reverse osmosis-based reclamation schemes allowed the development of a **Water Reclamation Protocol for Safe Potable Water Reuse in the Beverage Industry** (craft beer), and via the special events where this beer is offered, to build the public trust on safe water reuse.

# How does B-WaterSmart impact society in Lisbon?

## Environmental impact

Lisbon LL solutions were designed to mitigate the city's water scarcity through a fit-for-purpose water allocation, water efficiency, and safe water reuse, contributing to the feasibility of the ongoing 15% increase of public green areas to tackle climate change challenges (heat mediation and C sequestration) – such as the WYD 2024 main green area.

providing society with information on water consumption, wastewater treatment, and fit-for-purpose water use, e.g. safe water reuse, via the Lisbon Urban Waters Observatories increases public awareness of water scarcity in a local context and public engagement with water-smart solutions. Actions on citizen engagement were based on the Community of Practice of key stakeholders and on sessions with children for discussion of the future of water smartness in Lisbon.

## Social impact

A circular economy chain of capital importance for Lisbon (the use of reclaimed water for non-potable municipal uses) was developed and implemented. In addition, presenting to society artisanal beer produced with reclaimed water contributes to public awareness of water scarcity and public engagement and acceptance of water reuse. Also,

## Economic impact

New business opportunities were created via the new digital solutions made available for smart-water allocation and the protocol to increase (alternative) water sources for industry. The climate-readiness certificates for the built environment were tested in affordable housing buildings (owned by the Lisbon Municipality).

Above: B-WaterSmart presented at the Innovation Pathway 2023 conference
Below: Children of Lisbon share their water-smart ideas to present to the Mayor of Lisbon

## Governance and policy impact

The work undertaken by B-WaterSmart formed the basis for establishing a water-oriented Living Lab (WOLL) in Lisbon – it is one of the new WOLLs featured in the European Atlas of Water4All partnership. The water-smart strategy of the Living Lab in Lisbon encompasses strategic, governance, and social frameworks, along with digital tools and technological solutions, to advance water circularity. Notably, its strategic agenda and the deployment of digital tools for safe water reuse mark significant strides towards sustainable urban water management. The creation of the Lisbon WOLL was celebrated in the Lisbon Water World Water Day 2024 public event.

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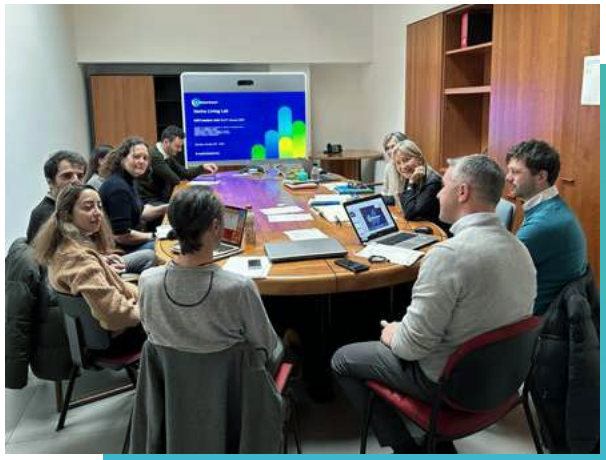
## Partners of the Living Lab

# Our path towards a sustainable Living Lab in Venice (Italy)

## Challenges in Venice

In the Venice Living Lab the application of resource recovery and circular economy in the field of water, especially wastewater, are strategic to achieve climate change resilience. Currently, the pursuit of these goals is slowed and prevented due to several issues (technical but mainly regulatory) related to wastewater process management. The limits and slowdowns are also linked to a lack of shared and transparent knowledge on the quality and opportunities connected to water reuse and to an over-evaluation of risks, which leads to low social acceptance. Therefore, there are several goals for Venice:

1. Resource recovery from wastewater processes for high-quality fertilizer production and carbon footprint reduction.
2. Completion of reuse goals envisaged by the Integrated Fusina Project (PIF) which, alongside other important reclamation goals for the industrial area, aims to reuse Fusina's municipal treatment plant effluent for non-potable purposes.
3. Valorisation of sludge produced by municipal wastewater treatment plants (WWTPs), often limited by inadequate knowledge and vision hindering sustainable management pathways (such as physiological destination to the environment and the soil).
4. Promotion of effluent reuse for agriculture/urban purposes on a regional scale by analysing the state of the art to identify opportunities and conveniences.
5. Spreading knowledge about the safety of water reuse and raising acceptance of those solutions.



Meeting at the Living Lab in Venice

# The applied tools and technologies in Venice

A **combinatory pilot plant** was tested on Fusina WWTP effluent for industrial water reuse. This pilot technology (constituted by a combination of Ultrafiltration, Reverse Osmosis, and Electrodeionisation) is selected to demonstrate the opportunities for reusing effluent for industrial purposes. The rationale behind this choice is twofold: a) to showcase a concrete example of water reuse in an industrial setting, and b) to contribute to the goals of another funded project, thereby fostering collaboration and achieving mutual benefits.

The **Nitrogen Recovery Technologies** are dedicated to nitrogen recovery from concentrated streams of WWTPs. The selection is based on the need to explore and demonstrate the convenience and feasibility of recovering the valuable resource nitrogen. By addressing this specific aspect, the technologies contribute to sustainable nitrogen management in the wastewater sector and a possible carbon footprint reduction for the overall system.

The **IT platforms for water reuse** aim to foster general effluent reuse. The choice of these tools is driven by the desire to create a virtual environment that facilitates discussions and collaboration among key stakeholders in the water supply chain. This addresses the challenge of creating a stable context in terms of knowledge to permit resource valorisation and value extraction from water, minimizing risks.

The choice of **IT Tools for Sludge Management Valorisation** is driven by supporting and promoting the best practices for sewage sludge. These tools play a crucial role in creating a mediated environment for discussions among stakeholders. The aim is to minimize risks associated with sludge management and ensure effective valorisation practices. Both IT tools have dedicated user interfaces for updating the data through simplified procedures.

Above: Combinatory Pilot Plant in Venice
Below: Nitrogen Recovery Pilot Plant

# How does B-WaterSmart impact society in Venice?

## Environmental impact

Treated wastewater industrial use increases by 29% (reused water/supplied water) and globally the reuse of treated effluent increases by 32% (reused/total treated). At the nitrogen level, both, the Sludge IT tool and the ammonia stripping technology, support the recovery of nitrogen as fertilizer, under a traceable guarantee of safety. The total recovery potential is low compared to the total nitrogen applied in agriculture at the regional level (<2%) but it implies the complete exploitation of sludge potential, and it allows a significant reduction of carbon footprint linked to mineral fertilizers production and wastewater treatment plants.

## Social impact

The social impact of the Venice Living Lab encompasses increased awareness, cross-collaboration among stakeholders, expansion of the Recycling Day initiative, and local events targeting broader engagement and knowledge sharing with external stakeholders. These contributions extended the project's influence and benefits beyond its immediate participants.

## Economic impact

An economic impact was realized through the development of two Decision Support System (DSS) platforms. These platforms reduce freshwater use, enhance water-use efficiency, increase water reuse, and quantify potential negative impacts of overexploitation. The deployment of the DSS also facilitates the identification of incentive schemes and promotes knowledge sharing. There is also a new, general potential for cost adjustments in concessions, the facilitation of governance actions through evidence-based solutions, and additional investments driven by the attention brought to the Fusina site by the B-WaterSmart project. These contributions align with the project's sustainable water use and resource management goals.

Public B-WaterSmart event in Venice in 2023

## Governance and policy impact

A significant governance and policy impact has been the integration of the Living Lab Venice objectives on sludge valorisation into the update of the Regional Management Plan for Urban and Special Waste (DGR n. 988 del 09.08.2022). This is a reference point supporting the regional strategy for sludge agricultural reuse. There also have been notable contributions to governance and policy impacts by fostering collaboration, providing feedback to public consultations, and influencing regional management plans. The project's integration into policy frameworks reflects its relevance and effectiveness in addressing local water challenges.

Public B-WaterSmart event in Venice in 2023

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B-WaterSmart

# The Water Europe Marketplace for Circular Economy

**The Water Europe Marketplace is an online platform for Circular Economy solutions and systems in the domains of water, energy, and materials that matches supply with demand.**

Through the Water Europe Marketplace you can launch and promote your market-ready innovative solutions by uploading them in the products section. You also can express your need through the Calls for Solution - be it a technological innovation, collaboration, or a service. You furthermore can enhance your product's visibility with targeted searches and benefit from the seamless integration of related content and promotional events in Europe and beyond. Additionally, you can delve into many available technologies, products, and case studies from related European projects. Engage with other stakeholders to share ideas, explore opportunities, and forge collaborative efforts! All these features are free and can be cancelled at any time!

## The Water Europe Marketplace

- **Products** – Discover market-ready products and Circular Economy tools
- **Calls for Solutions** – Reach out for a solution to your challenges
- **Technologies** – Discover Circular Economy technologies
- **Networking** – Connect with stakeholders, partners, clients, and investors
- **Events** – Explore events focused on Circular Economy.
- **Case Studies** – Read of technologies, results, and best practices
- **EU Products** – Explore Circular Economy outcomes of EU-funded projects

Register here for the Water Europe Marketplace and upload your product or call for solution
**mp.watereurope.eu**

Parts of the Marketplace were developed within the B-WaterSmart project
**b-watersmart.eu**

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