Issue 3 | b-watersmart.eu

B-WaterSmart magazine

Enabling water-smart European societies and economies

Content

The Road so far

B-WaterSmart aims to accelerate water-smartness in coastal Europe and beyond. The concept of a water-smart society and economy has become increasingly famous during the past few years because the need for a holistic approach to future-proof water has been widely recognised. Not least because of the huge challenges ahead of our society; climate and demographic change being not the only but just the most prominent ones. There are different definitions of water-smartness around, but this is not the time to start an academic dispute about subtle differences between definitions, but to actually "get into the water" with this concept, make it operational and enable actual change in the water sector, in the industry, and society as a whole.

Within B-WaterSmart we are ambitious to demonstrate in six Living Labs that systemic innovations towards a more water-smart economy and society can be achieved. During the first three years of the project, we have been working hard to develop:

An assessment framework that builds on a solid definition of water-smartness and makes it operational. The framework assists decision-makers and practitioners in long-term strategic planning toward their vision of a water-smart society.

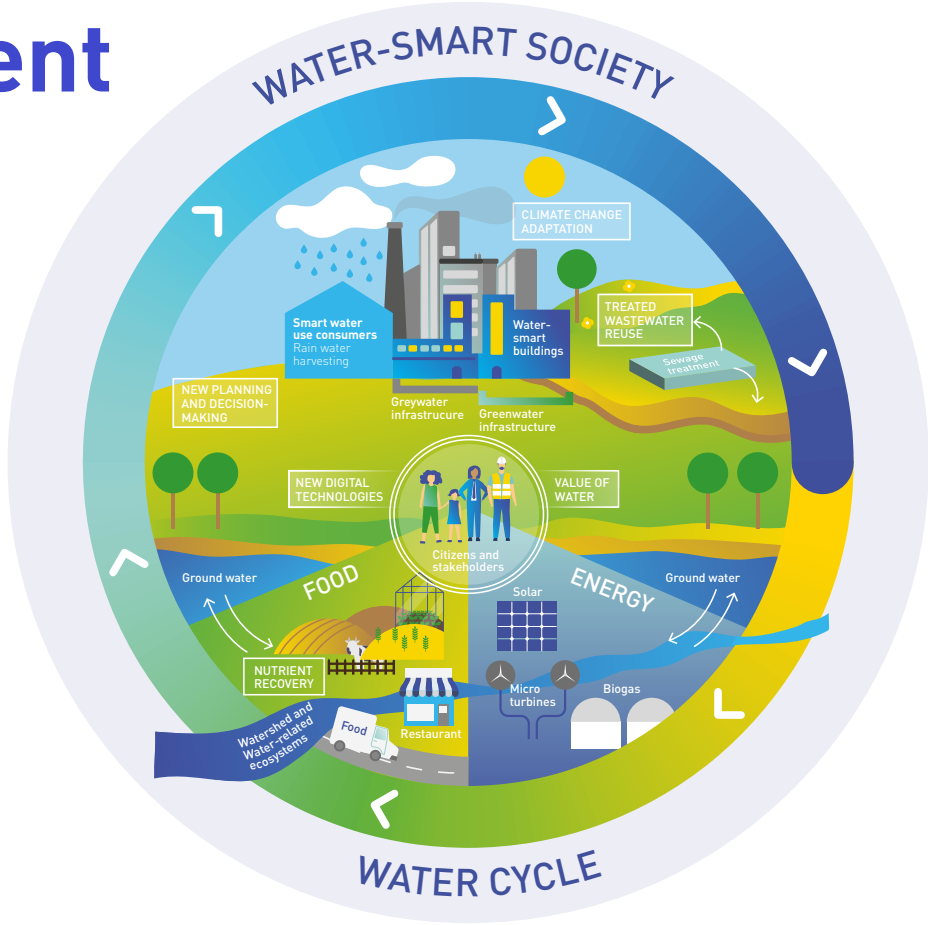
A broad portfolio of technology and digital solutions that are now all up and running, ready to demonstrate the contribution that innovative technologies and tools can make to achieve more water-smartness.

Active and sustainable Communities of Practice in our six Living Labs, where all relevant stakeholders are working together to enable systemic change. This is particularly relevant as many innovative solutions and new circularity approaches go across established competence fields of policy implementation. An alignment of ambitions and approaches of different authorities and actors therefore is key for approval and acceptance of new solutions and concepts.

A short glimpse into some of these activities is given in our third magazine. With all technology demonstrations up and running, we have achieved an important milestone, but this is not yet the end of our journey. During the final year of the project, we will put more focus on the development of new circularity-driven business models, and towards the exploitation of the validated technologies. So there is soon more news to come from us! The best way to stay tuned is to visit our website at www.b-watersmart.eu and subscribe to our newsletter.

David Schwesig
B-WaterSmart Coordinator

Repair, re-use and recycle: Circular Economy and the B-WaterSmart assessment framework



Everyone is talking about Circular Economy but what exactly is this? According to the European Parliament "...circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible."

In other words, circularity involves a loop that uses waste, and in this context wastewater, as a source for something new, therefore creating more value. The concept is a departure from the consume-and-throw-away pattern and instead relies on the re-use of materials of all kinds, reducing real waste to a minimum.

A circular economy recognizes the full potential of water because it is a valuable resource, a source of energy, an input to processes, and a carrier of nutrients and other materials, among other things. Strategies to achieve a circular economy in water include the optimization of water use in agriculture, industry and municipal use, matchmaking between different industries (e.g. the water effluent or nutrients from an industry could be an input for another), recovery of rainwater, recovery of nutrients from wastewater and even the use of reclaimed water for irrigation, urban or even drinking purposes.

All these objectives and definitions of a water-smart society are directly reflected by our B-WaterSmart assessment framework.

To become a water-smart society we need to:

Acknowledge that change is needed

Be sustainable and careful with the environment

Enable citizens and other actors to be included in the change

Be flexible and adapt to complex and changing conditions (e.g. climate change)

Carry out a radical system change from a linear into a circular economy

Conserve ecosystems and resources in the long run

Generate regional strategies with the B-WaterSmart assessment framework

The B-WaterSmart assessment framework

To shape a water-smart society, the B-WaterSmart project developed an assessment framework for multi-stakeholder and strategic decision-making for the transition towards a water-smart society.

The framework allows the active participation of a varied set of actors. It puts focus on the multiple essential values, benefits and risks of water while also including its economic, social, and ecological dimensions as well as its diverse cultural meanings.

Why should you use the B-WaterSmart assessment framework?

The B-WaterSmart assessment framework assists decision-makers and practitioners in long-term strategic planning toward the realisation of their water-smart society visions. The framework guides them in the selection of their strategic objectives and in performing the assessment of how well they score versus their set targets.

How does the B-WaterSmart assessment framework work?

The framework features a list of strategic objectives with specified assessment criteria. Each criterion in turn is described with a set of metrics which assess the distance from a set target.

"The B-WaterSmart Assessment Framework is perfectly suited to support the implementation of our vision of achieving a Water-Smart society where the value of water is recognised and realised to ensure water security, sustainability, and resilience"

Durk Krol
Executive Director, Water Europe

Strategic Objective	Assessment Criteria
A. Ensuring water for all relevant uses	A.1 Safe and secure fit-for-purpose water provision
	A.2 Accessibility and equity (for people and for other uses)
	A.3 Financial viability
B. Safeguarding ecosystems and their services to society	B.1 Safeguarded water ecosystems
	B.2 Enhanced ecosystem services to society
	B.3 Resource efficiency
C. Boosting value creation around water	C.1 Circular policy making
	C.2 Circular economy growth
	C.3 Resource recovery and use
D. Promoting adaptive change towards resilient infrastructure	D.1 Enabling planning to promote adaptive change towards circularity and resilience
	D.2 Implementing adaptive change towards resilient infrastructure
	D.3 Effectiveness of the adaptive change towards resilient infrastructure (diagnosis)
E. Engaging citizens and actors across sectors in continuous co-learning and innovation	E.1 Awareness and knowledge
	E.2 Multi-sector network potential
	E.3 Stakeholder engagement processes

The framework does not help identifying specific technical solutions, but rather highlights areas of improvement and opportunities for more circularity. It also covers the technical, economic, environmental, social, and governance dimensions needed to be successful. This also means promoting public acceptance on innovation and creating the finance and policy mechanisms supporting the innovation uptake and ultimately circular economy.

The B-WaterSmart assessment framework dashboard will be available online by the end of the B-WaterSmart project (in autumn 2024).

The successful Community of Practice in Venice

Venice in Italy and its nearby lagoon zones are very sensitive areas, with 1 million citizens and around 42 million tourists per year. Due to the intensive human activities and climate changes the environmental equilibrium of the region is at risk. A solution to improve the situation is the application of Resource Recovery (RR) and Circular Economy (CE) logics for resources valorisation. A regional/national plan for lagoon protection (PIF) has already introduced technologies and nature-based solutions to foster the reuse of treated municipal wastewater at the industrial level, but several barriers have hindered its implementation so far.

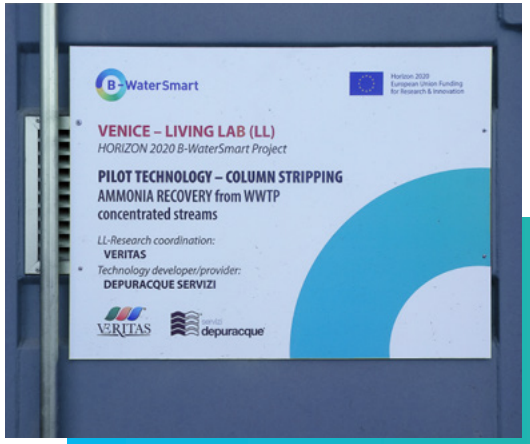
The B-WaterSmart project is aiming to remove these barriers and one of its most promising tools in this is the successful Community of Practice (CoP). Living Lab leader Patrizia Ragazzo and Giulia Moretti from B-WaterSmart project partner Veritas tell us about their approach.

What is the main water-related problem in Venice?

The focus of the Living Lab Venice within the B-WaterSmart project is the promotion and valorisation of water reuse in three directions:

1. Water reuse for industrial purposes at municipal level,
2. Ammonia recovery from wastewater treatment plant (WWTP) concentrated streams at regional scale, and
3. Sludge produced from urban WWTPs.

However, beyond the identification of innovative techniques for extracting value from water, the real challenge is to overcome barriers that prevent the transformation of the water value into a usable product. In this sense, the role of the established Community of Practice (CoP) is the foundation towards the transition to a water-smart society.



Who are the partners in the CoP of Venice and why did you choose these specific partners to join?

The CoP of Venice perfectly depicts a participatory governance model including all strategic interest groups/stakeholders connected to the water chain. Technological solutions alone are not enough to foster the transition towards a water smart society and economy: building a shared governance model involving all the competencies and roles along the whole water chain is the key to start paving the road towards a stable change. This is why all actors that are playing a role along the water chain have been involved, from regional and local authorities to water utilities, end-users' associations and research institutes and universities. Among the stakeholders of the Venice CoP there are several environmental related Departments of the Veneto Region and of the Regional Environmental Agency (ARPAV), "Acque Risorgive" Reclamation Consortium, all water utilities of the Veneto Region (coordinated by the Viveracqua consortium), different research institutes and universities (Venice and Verona) and trade associations of different sectors.

Why is it so important to have a well-functioning CoP?

The CoP provides the opportunity for dialogue, awareness creation and problem solving. A well-functioning CoP breaks silos across responsibilities and knowledge and therefore allows more meaningful contributions to the regional water-related goals than a single stakeholder could address alone. By gathering all the relevant stakeholders of the water value chain different perspectives, competences and responsibilities are shared to overcome the existing barriers identified in: i) the complexity of the regulatory system and the variety of subjects involved, which should be aligned and coordinated; ii) the lack of transparency and access to knowledge on the actual risk associated with valorisation and reuse; iii) the balance and prioritization between long-term planning and immediate needs; and iv) the understanding of the economical convenience of fostering circularities of resources.

What is mainly being discussed during the CoP meetings?

The participants of the CoP of Venice are engaged and have already shown high motivation to actively share their experiences and knowledge in creative ways that foster new approaches to problems, identify solutions and promote progress on the following crucial topics:

- Addressing issues related to wastewater process management which in fact have so far prevented or slowed the resource enhancement associated to wastewater (nutrient and sludge),

- contributing to a shared knowledge on risks linked to each specific reuse to investigate potential opportunities, and
- supporting the building of the decision support systems (DSS) evaluation tools, to identify the state of the art and the most sustainable and suitable opportunities of reuse/valorisation (for water and sludge).

The two decision support tools and the Water Reuse and the Sludge Management Platforms are strategic instruments that will be used to share and transfer knowledge about risks and opportunities and to co-design strategic plans about reuse in a medium and long-term perspective.

What do you already have accomplished together?

The maintaining of a high engagement throughout time inside the CoP is something we already achieved. Especially because we are now in perfect synchrony of intents on complex challenges, where until now there has been a substantial immobility.

An actual co-development of the decision support (DSS) platforms for water and sludge reuse: This is another important accomplishment we already reached by working in dedicated focus groups to analyse needs and availabilities of data and help in finding the right source or alternative solution to fill eventual gaps between availability and needs.

Thanks to a perfect coincidence of intents and objectives right from the start (summer 2021), the agenda of the Venice case study has been cited in the waste management plan of the Veneto Region (published in 2022) and in other official documents for strategic plans (Viveracqua Position Document), as one of the milestones for the choice of the sludge valorisation strategies in our region.

Last, but not least: the CoP cohesion has also emerged in this last period in which technical experts and citizens were called to give feedback on the suitability of the new national legislation on water reuse - currently in working phase - in application of the EU Regulation 741/2020, starting at national level from next June.

It is also worth to mention that creating and keeping an active CoP requires a dedicated core team, whose members focus on maintaining the health of the community by ensuring clear communication, fostering trust, and promoting the valuable use of the knowledge developed in the CoP. The team of VERITAS, coordinator of the Venice CoP, considers the establishment of the CoP as one of the most valuable outcomes of the B-WaterSmart project. It is an outcome that will be maintained beyond the end of the project.

Uptake of B-WaterSmart innovations in Lisbon

In urban areas, inland and paradoxically also in coastal regions, water constitutes an increasing challenge, due to possible scarcity and increased demand, driven by economic and population growth, and quality of life. It is therefore necessary to accelerate the transformation into water-smart economies, reducing the consumption of potable water through the reuse of water in non-potable uses, among other aspects.

To support urban management institutions and water utilities in making smart and climate-resilient water decisions for an efficient water-energy-nutrient balance in the cities, including safe water reuse, the Living Lab Lisbon of the B-WaterSmart (BWS) project developed methods, algorithms, and software for a smart allocation of water, delivering the following tools, designed for integrated use:

1. Water-Energy-Phosphorus balance planning: A user-friendly solution for matchmaking water sources (potential supplies) and water demands, enabling the design of supply chain solutions (the shorter and more circular the better) to a set of potential users of non-potable water, namely, reclaimed water and other water sources alternative to those currently in use. The supply/demand alternative combinations (matches) over a target period are assessed through a range of performance and cost metrics, for supporting strategic and tactical (aligned) planning. Examples of these metrics are satisfied demand, reclaimed water used, carbon footprint of energy consumption, phosphorus fertilizer production avoided, and total cost.

2. Reclaimed water quality model in the distribution network: A complete hydraulic and water quality simulation model for pressure flow networks. By modelling the (bulk and wall) decay of the residual chlorine, the key barrier for water microbial stability, it aims primarily at mapping and quantifying risk in reclaimed water distribution networks.

3. Risk assessment for urban water reuse: A user-friendly solution for carrying out human health and environmental (groundwater and surface water) risk assessments, requiring a basic knowledge of risk management and the legislation applicable to water reuse. The process adopted for the qualitative risk assessment is based on relevant ISO standards and EU Regulations. A methodology for building hazard exposure scenarios was developed from scratch.

4. Environment for decision support and selection of alternative courses of action on non-potable water supply: The supply/demand alternative combinations are assessed and prioritized through a subset of standardized, user-selected key metrics, extracted from those employed to qualify the initial selection in the other three tools.

This year, the World Youth Day (WYD), which is an international encounter with the Pope, was celebrated in Lisbon, on August 1-6, 2023. Over one million pilgrims participated in this event.

The main event took place in a **new green area** specially developed for this occasion. This 38-ha park (built on a landfill site decommissioned in the 1990s), located near Parque Tejo (an initial Lisbon Living Lab pilot) and Beirolas Water Resource Recovery Facility, was irrigated with reclaimed water to promote faster meadow growth. Therefore, it was used as an additional pilot for demonstrating the use of three of the above mentioned BWS tools. The Lisbon municipality intends to now use all four tools to support urban management in making smart and climate-resilient water decisions for an efficient water-energy-nutrient balance in Lisbon.

But the citizens of Lisbon can do their part to make Lisbon a water-smarter city too. This includes the involvement of different stakeholders in the provision and use of water, and citizens being key players in water efficiency and use.

Citizens need to know their water consumption and where can they save water, and they need to know and accept that several types of source waters exist to safely satisfy the city's needs. Sound information easily accessible and initiatives to build the citizens' trust and acceptance of water reuse are pillars of the right decisions the citizens need to make to improve urban water sustainability. Thus, the Living Lab of Lisbon is focused on the development of software tools to facilitate safe water reuse and improve water-energy-phosphorous efficiency in non-potable uses, improving Lisbon's climate resilience to water scarcity. Additionally, with the Lisbon Urban Water Cycle Observatory, citizens' awareness is being increased by providing easy-to-read information on the city's water cycle. Furthermore, the use of the Climate-Ready Certification Tool will provide improvement measures that leverage the development of water-resilient and climate-adapted buildings, contributing to the sustainable climate transition of cities. Finally, the citizens' trust on water reuse safety is being worked out by offering VIRA beer in AdTA's events, a beer produced with reclaimed water, and for which a protocol is being developed within B-WaterSmart. With this action we intend to help change the mindset and the perception of water reuse safety.

The information in this article were given by Pedro Teixeira (Lisbon Living Lab owner) and Maria João Rosa (Lisbon Living Lab mentor).

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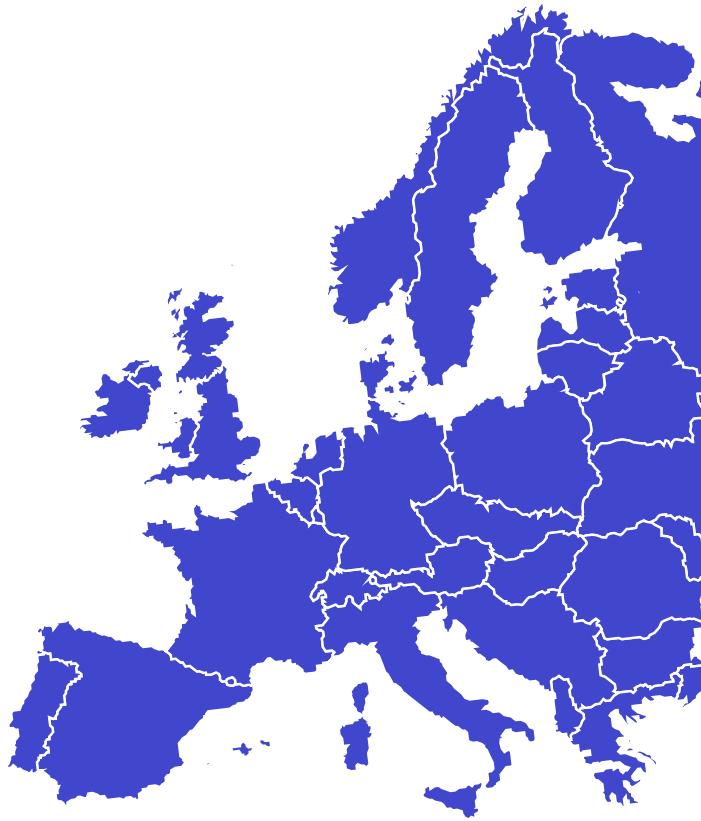
Join the Water Europe Marketplace



Join the Water Europe Marketplace - a marketplace for problem owners, solution providers, investors, and other stakeholders in the Circular Economy!

Water Europe Marketplace - a flexible platform for finding and sharing innovative solutions and systems in the domains of water, energy, and materials that support the market uptake of innovation.

The Water Europe Marketplace

Technologies – Discover technologies of the circular economy

Case studies – Find solutions and best practices to real-life problems

Products – Browse products, tools and services related to circular economy

Networking – Connect with stakeholders, partners, clients, and investors

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