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BOOST-IN

Uptake of innovative and circular solutions for water

Policy Brief on social perception for water and circular economy solutions

Deliverable 5.5

WP5

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ABSTRACT	This policy brief, developed under Task 5.2 of the BOOST-IN project, synthesizes the key findings of Work Package 2 (WP2) on *social perception and public engagement* for circular water economy solutions. Based the outcomes of co-creation workshops held across six Regions of Opportunity (Spain, Italy, Greece, Bulgaria, France, and Germany), the brief identifies behavioural, cultural, and governance barriers to the uptake of Water and Circular Economy Solutions (WACES). The results show that public trust, transparent communication, and participatory governance are decisive for enabling innovation adoption in the water sector. The document includes recommendations to improve the implementation of the European Water Resilience Strategy (2025), the revised water acquis, and the forthcoming Circular Economy Act (2026) by promoting early citizen participation, regional co-creation platforms, and the integration of *societal readiness indicators* into EU funding and policy frameworks.		

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EXECUTIVE SUMMARY

This deliverable presents the first policy brief focusing on the project's Work Package 2. Findings from the BOOST-IN project demonstrate that the acceptance of water reuse, resource recovery, and circular business models depends on three mutually reinforcing dimensions: knowledge and education, communication and awareness, and governance and policy support. Therefore, public perception is a decisive factor in determining whether innovative circular water economy solutions are successfully adopted across Europe.

Through a series of co-creation workshops conducted in Spain, Italy, Greece, France, Germany and Bulgaria, BOOST-IN has identified the significant behavioural and institutional barriers to public acceptance, and co-developed regionally tailored solutions. The lessons learned provide contributed to develop policy recommendations within the framework of the objectives set in the European Water Resilience Strategy (2025), and the revised water acquis (UWWTD, DWD, WFD). These recommendations can also support the debate for the foreseen Circular Economy Act.

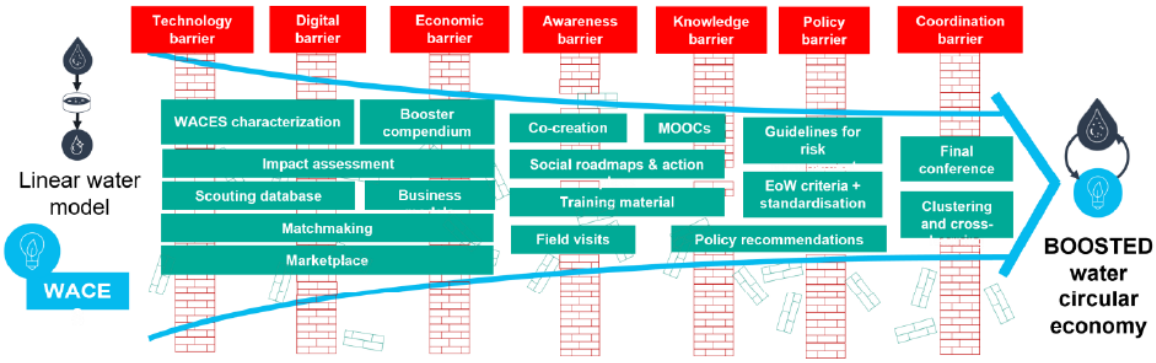
Key Takeaways

- **Education and knowledge** are the most effective long-term levers for building trust in water reuse and circular water systems.
- **Transparent and continuous communication** with local communities enhances trust and mitigates the "yuck factor" associated with water reuse.
- **Participatory governance mechanisms**, involving citizens, industry, and public authorities, enable social legitimacy for innovative solutions.
- **Social perception indicators** should be mainstreamed in EU and national water planning and funding schemes to ensure "societal readiness" for circular solutions.

1.0 Overcoming Social Perception Barriers to the Uptake of Circular Water Economy Solutions in Europe

BOOST-IN is an EU-funded project dedicated to implementing a successful strategy to promote technological changes, governance schemes, shifts in mindset and organizational structures the water sector needs to become circular. The project will help the transition from a wasteful, linear way of handling water to a circular economy. This means seeing water not just as something to use and discard, but as a precious resource that can be reused, recycled, and valued in many ways, from powering our homes to growing our food. Through a multi-actor co-creation approach, BOOST-IN is being implemented in six Regions of Opportunity across Europe, where social perception, governance readiness, and regional policy frameworks are tested to support innovation uptake.

Figure 1: BOOST-IN concept overview



BOOST-IN shows that technical innovation alone is insufficient without societal embedding. By integrating behavioural insights, participatory foresight, and region-specific co-creation, BOOST-IN builds a new model for just and inclusive circular water transitions. This brief presents the key lessons from WP2, which explored social perception barriers and co-creation practices across Europe[1].

Table 1: BOOST-IN main recommendations

Main Recommendations
• EU policy instruments must include social readiness criteria in funding, implementation, and impact assessments. • Regions need support to establish or join inclusive platforms for experimentation and trust-building aligned with the topics that they want to address.

[1] BOOST-IN, Deliverable 2.1, *Method and best-practice recommendations for co creation of strategies to address social perception in the frame of water and circular economy*, December 2024, BOOST-IN-D2.1_Method-co-creation-of-strategies._final.pdf

- Behavioural, emotional, and cultural aspects of water reuse must be considered alongside technical feasibility.
- Citizen participation should begin before technology deployment, starting from shared problem framing, ensuring education and knowledge dissemination.

1.1 BOOST-IN's Contribution to a water-smart economy and resilient Europe

BOOST-IN's Water and Circular Economy Solutions are assessed across six policy performance dimensions aligned with EU goals, using the OECD-DAC[2] criteria (relevance, coherence, effectiveness, efficiency, impact, sustainability), offering a comprehensive analysis of the barriers.

The project could directly support the implementation or development of several directives and strategies. Considering the current EU political agenda[3], the project activities could particularly contribute to the following directives' implementation or revision that have been identified by the project[4] :

- **The implementation of the Water Resilience Strategy**: This communication of the European Commission will aim at repairing the water cycle, build a water-smart economy as well as provide access to water and sanitation for all.
- **The implementation of the recently revised *water acquis***: namely the Water Framework Directive, the Urban Wastewater Treatment Directive, the Water Reuse Regulation as well as the Drinking Water Directive.
- **The development of the EU Circular Economy Act**: this legislative instrument is expected in 2026 with a public consultation this year

Table 2: BOOST-IN potential contribution in the EU policy agenda 2025

EU Legislative Instrument	Status	BOOST-IN Contribution
Water Framework Directive (WFD)	Ongoing implementation	Contributes to water quality improvement, sustainable abstraction, and ecological restoration.
Urban Wastewater Treatment Directive	Revised (2024)	Promotes advanced wastewater reuse and sludge valorisation.
Drinking Water Directive	New standards applied	Ensures safe reclaimed water for non-potable and indirect potable uses.

[2] Organisation for Economic Co-operation and Development – Development Assistance Committee. For more information please look at OECD (2021), *Applying Evaluation Criteria Thoughtfully*, OECD Publishing, Paris, https://doi.org/10.1787/543e84ed-en. Understanding the six criteria: Definitions, elements for analysis
and key challenges, https://www.oecd-ilibrary.org/.

[3] EU Commission Work Programme 2025: Commission work programme 2025 - European Commission

[4] BOOST-IN, *Deliverable 3.1: Assessing the contribution of selected WACES for meeting EU- and National Policy Targets,* March 2025, BOOST-IN-D3.1_Policy-assesment-framework.pdf

Water Resilience Strategy	To be published (2025)	Informs governance models and cross-sectoral links (e.g., agriculture, energy).
Circular Economy Act	Contribution. Forthcoming (2026)	Prepares ground for integration of Water and Circular Economy Solutions into Circular Economy indicators and funding.

1.2 Lessons from the Workshops: Co-creation for societal Readiness

Flexibility and collaboration are central for stimulating societal readiness. BOOST-IN's WP2 co-creation workshops, implemented between March and August 2025, engaged over 120 stakeholders across four Regions of Opportunity. The process applied a common methodology based on Deliverable 2.1's co-creation framework, focusing on *vision building*, *transition pathways*, and *roadmap definition.* The table below summarises the main barriers identified the lessons learnt.

Table 3: Main barriers identified, and lessons learnt per area.

Country	Main Barriers Identified	Lessons Learnt
Spain (Andalusia)	Distrust of reclaimed water use in agriculture; limited consumer confidence	Transparent information and certification schemes increase acceptance
Italy (Emilia-Romagna)	Cultural resistance and low awareness of reuse benefits	Education and early engagement foster long-term behavioural change
Greece (Peloponnese)	Weak regulation and fragmented communication between industry and authorities	Participatory governance builds credibility and compliance
Bulgaria (Srednogorie)	Limited awareness of mining water reuse potential; regulatory gaps	Inter-ministerial coordination and community inclusion improve legitimacy
France (Mediterranean coast region)	Public resistance to reclaimed water in urban settings and limited cross-sectoral dialogue between municipalities and industry	Demonstrated the value of transparent local governance and joint communication between utilities, citizens, and SMEs
Germany (Baden-Württemberg)	Fragmented responsibilities between Länder and municipal levels; perception that water reuse conflicts with existing high water standards	Showed that coordinated governance frameworks and demonstration projects enhance confidence in reuse without compromising quality

Across all workshops, consistent trends emerged. Firstly, social trust is a precondition for circular innovation uptake. Secondly, Communication must be continuous, not event-based. Lastly, Education transparency and governance must reinforce each other to sustain acceptance. Therefore:

- **EU policy instruments must include social readiness criteria in funding, implementation, and impact assessments.** This aspect is particularly relevant for achieving the objectives of the *water acquis,* as an estimated €255 billion will be needed (EU-27) by 2030 to meet the Drinking Water and Urban Wastewater Treatment Directives, particularly in infrastructure for water reuse[5]. For example, the recent recast of the UWWTD included a compliance rate to stimulate this approach[6].
- **Regions need support to join or establish inclusive platforms for experimentation and trust-building in line with the topic that they aim to address**. For example, based on the Water-Oriented Living Lab (WoLL) concept, Water4All[7] partnership – a related project of BOOST-IN - looks at involving local stakeholders to achieve the United Nations' Sustainable Development Goals, starting from the definition of the challenge. This type of platform also provides technical and upskilling options for local stakeholders, a key request in the conclusions of the Malaga workshop.
- **Behavioural, emotional, and cultural aspects of water reuse must be considered** alongside technical feasibility. Deployment of water-reuse solutions should avoid as much as possible the "Yuck effect". *Co-creation methodologies* such as BOOST-IN's one can accelerate adoption of innovative water reuse solutions while avoiding this effect.

Table 4: Emphasised explanation of the Yuck Effect for the designed policy brief

What is the Yuck Effect?
The "Yuck" factor is the instinctive aversion some people feel toward reusing treated wastewater[8]. In the water community, Cranfield University and KWR conducted surveys involving over 2,500 citizens in the Netherlands, Spain, and the UK to assess public acceptance of wastewater recycling for drinking purposes. The findings revealed that the anticipated "yuck factor"—the instinctive aversion to consuming recycled wastewater—was less pronounced than expected. Specifically, 75% of respondents in the Netherlands, 73% in Spain, and 67% in the UK were in favour of reusing water as drinking water[9].

- **Citizen participation should begin before technology deployment**, starting from shared problem framing. Knowledge gaps and ineffective communication emerged as critical barriers to implementation, requiring adaptation to the different cultural gaps. It demonstrates the benefits of a low-context, explicit communication approach, particularly in culturally diverse contexts where trust and transparency are crucial to acceptance.

[5] This element stressed in the Malaga workshop paired with the required investment to comply with the EU water acquis will need strong societal readiness. Water Europe "Socio-economic study on the value of the EU investing in water", Brussels, 2024, Water-Europe-Socio-Economic-Study-1.pdf

[6] Directive (EU) 2024/3019 of the European Parliament and of the Council of 27 November 2024 concerning urban wastewater treatment (recast) (Text with EEA relevance), article 24. https://eur-lex.europa.eu/eli/dir/2024/3019/oj

[7] https://www.water4all-partnership.eu/pillar-d-demonstration-activities

[8] Schmidt CW. *The yuck factor: when disgust meets discovery*. in Environ Health Perspect. 2008 Dec; 116(12):A524-7. doi: 10.1289/ehp.116-a524.

[9] NextGen D4.2 Final report on societal acceptability (2021).

2.0 CONCLUSIONS

The transition to a water-smart and circular Europe requires not only technological innovation but also social innovation. BOOST-IN demonstrates that societal readiness is anchored in trust, awareness, and inclusive governance, and hence is a fundamental condition for the adoption of circular water solutions.

Across six European regions, the project has shown that early co-creation, transparent communication, and culturally sensitive engagement approaches can overcome the behavioural and institutional barriers that hinder the uptake of water reuse and resource recovery technologies. These findings confirm that citizens must be co-designers of water solutions, not passive recipients of innovation.

For policymakers, the implications are clear:

- Integrate social perception metrics into EU and national water programmes.
- Involve citizens at early stage to overcome knowledge and cultural gaps.
- Support local co-creation platforms to translate policy objectives into region-specific action.
- Mainstream societal readiness in investment frameworks to ensure that innovation deployment is inclusive, trusted, and sustainable.

By embedding these principles into the implementation of the Water Resilience Strategy, the European water acquis implementation, and the forthcoming Circular Economy Act, Europe can ensure that technological progress in the water sector is matched by public confidence, turning circularity from an ambition into a shared reality.

The quantity and quality of water resources are serious problems in many European areas, mostly being a joined result of climate change and anthropic influences. The BOOST-IN project aims to develop a successful strategy that promotes technological changes, governance schemes, shifts in mind-set and organizational structures to solve these problems through a better management of the water sector and application of the circular economy principles, enabling water reuse and recovery of different materials (e.g. energy, nutrients). However, implementation of these changes still faces several barriers (e.g. technology, economy, knowledge, social perception) that need to be overcome. BOOST-IN will achieve these goals by an effective identification, selection (through a specifically designed dynamic funnel method) and transfer of innovative Water Circular Economy Solutions (WACES) to further close and improve the water cycle.

The project will develop and apply its approach in six Regions of Opportunity evenly distributed across Europe (Spain, Greece, Germany, France, Italy and Bulgaria) by organization of co-creation workshops to increase public awareness and support for WACES implementation, barriers overcoming as well as by the specific risk management plans design.

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