

THE WATER4ALL EU PARTNERSHIP AND THE WATER-ORIENTED LIVING LABS AS KEY PLAYERS FOR INNOVATION IN WATER

Maria João Rosa, Rui Viegas, Catarina Silva

Urban Water Unit, Hydraulics and Environment Department
LNEC - National Laboratory for Civil Engineering, Portugal

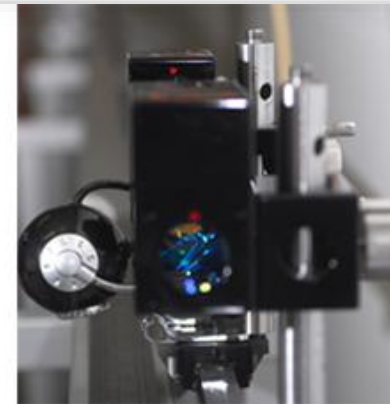


Workshop RECIRCULA – ReWAdd
16 September 2026, Valencia, Spain



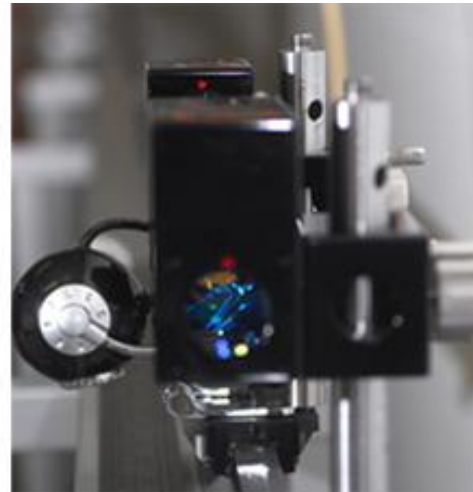
About LNEC

- **National Laboratory for Civil Engineering**
- State-owned R&D institution
- Founded in 1946
- 22 ha campus, in Lisbon
classified as Monument of Public Interest since 2012
- 30+ testing laboratories
- 515 total staff (~50% PhDs)
- R&D • best practices
unbiased and independent advisory body

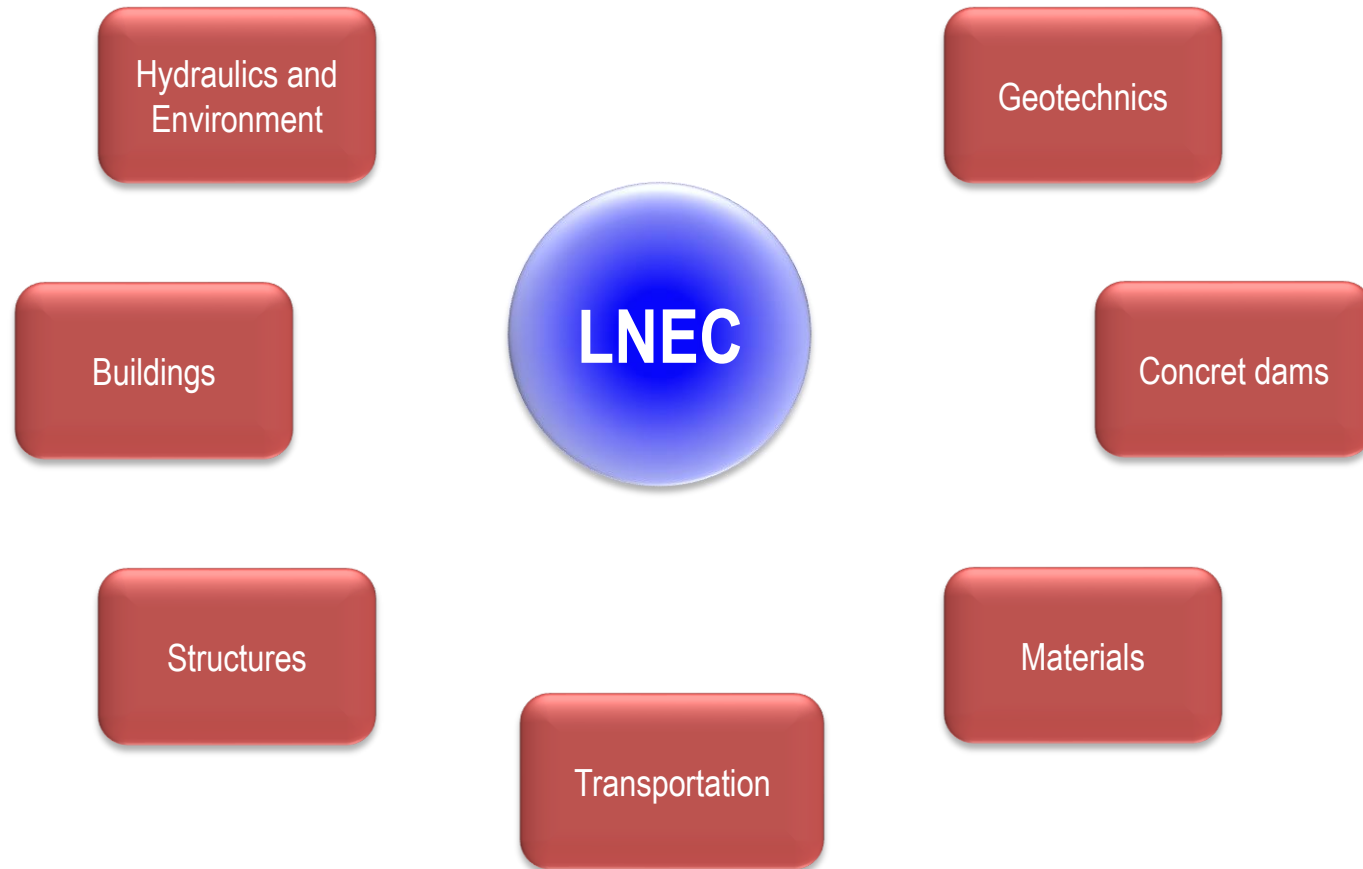


LNEC's mission

- To undertake, coordinate and promote scientific research and technological development
- To serve public interest, providing S&T services to public and private, national and foreign entities
- To assist the Government in public policies
- To provide technical support to Authorities / Regulators in Public Administration



LNEC's departments



Hydraulics and Environment Department



Hydraulics and Environment

Geotechnics

Urban Water Unit

Estuaries and Coastal Zone Unit

Ports and Maritime Structures Unit

Water Resources and Hydraulic Structures Unit

Buildings

- Water cycle – natural waters (rivers, transitional, coastal) and urban water
- Quantity and quality, including ecological systems
- Uses in human activities, water - structures interactions

Structurers

Transportation

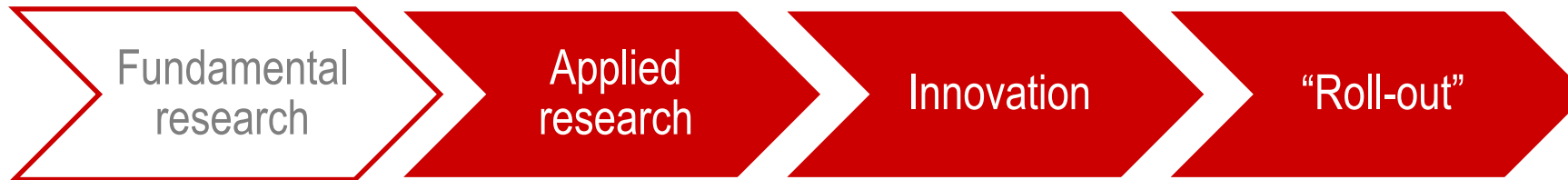
Materials

Urban Water Unit

- Problem-driven **R & D & innovation** on urban water systems and services - **water supply, wastewater and stormwater**
- **EU and national funds** from competitive calls and **industry funds** from **peer-to-peer innovation projects** - **national initiatives**, an in-house developed model of project with researchers, IT providers and utilities
- **Advanced consultancy**
- **Regulation** - policy documents, codes, best practice manuals (ERSAR 2004-...)
- **Standardization** - ISO TC224, TC251, TC282, CEN164, CEN165
- **Capacity building** (institutions and individuals) through **collaborative projects**, advanced courses, **PhD and Master students training programs** for water professionals
- 17 total [staff](#), 13 PhDs



Urban Water Unit strategy

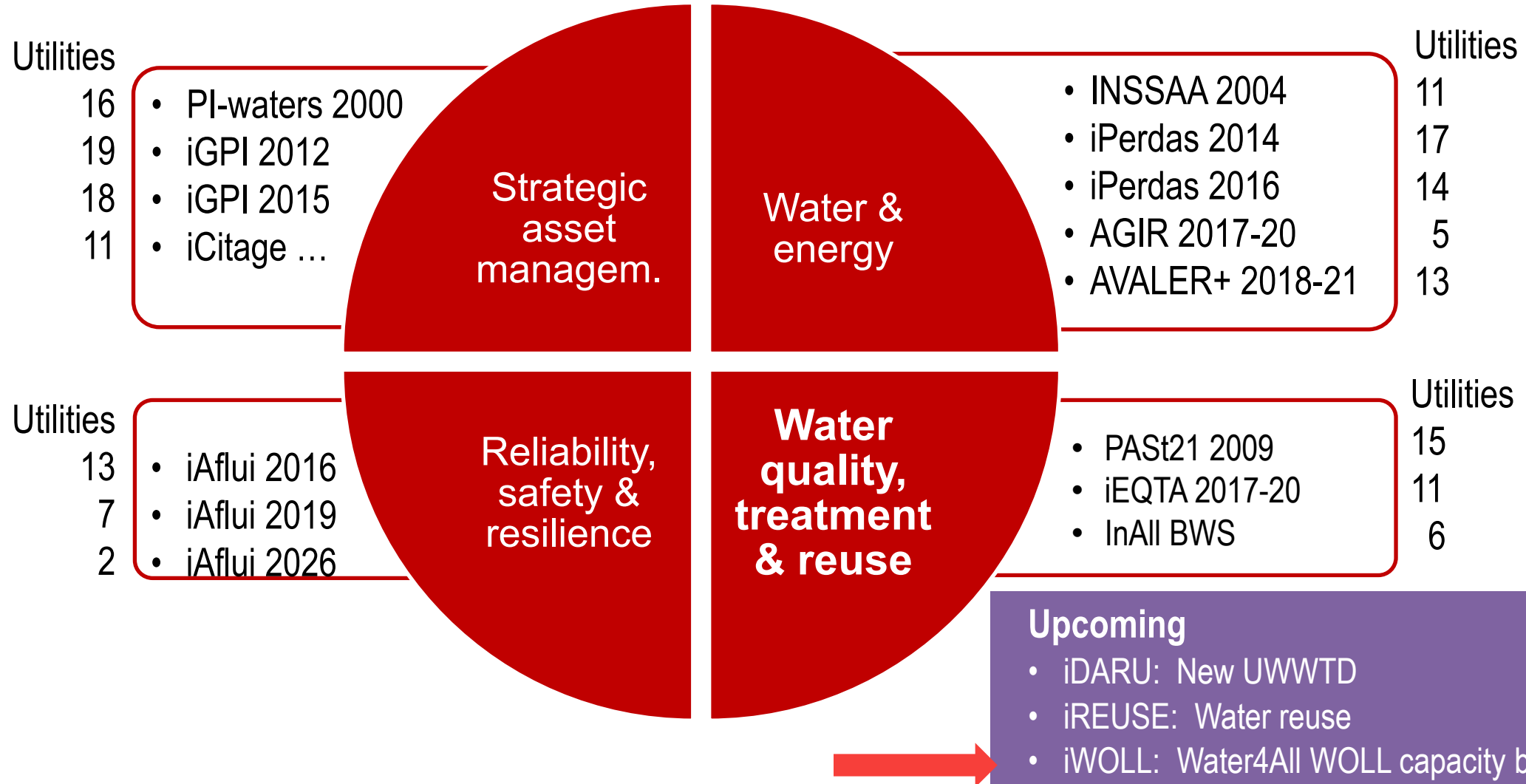


- European funded projects
- National funded projects (FCT, JTC W4All)
- **National initiatives**

- Participation in advisory boards, associations, standardization committees (ISO, CEN)
- Partnerships with consultants and technology providers
- **National initiatives**
- Training/lecturing actions

Urban Water Unit • R&D&I areas

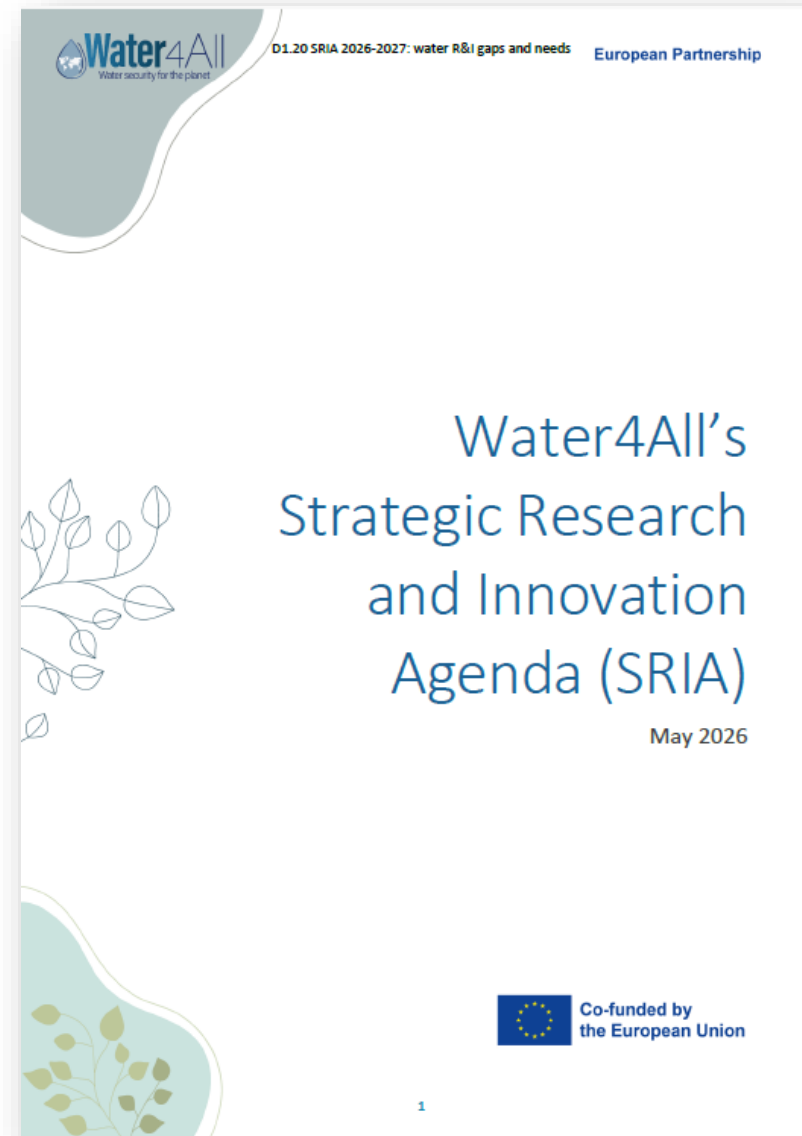
Innovation alliances with water utilities



EUROPEAN PARTNERSHIP WATER4ALL

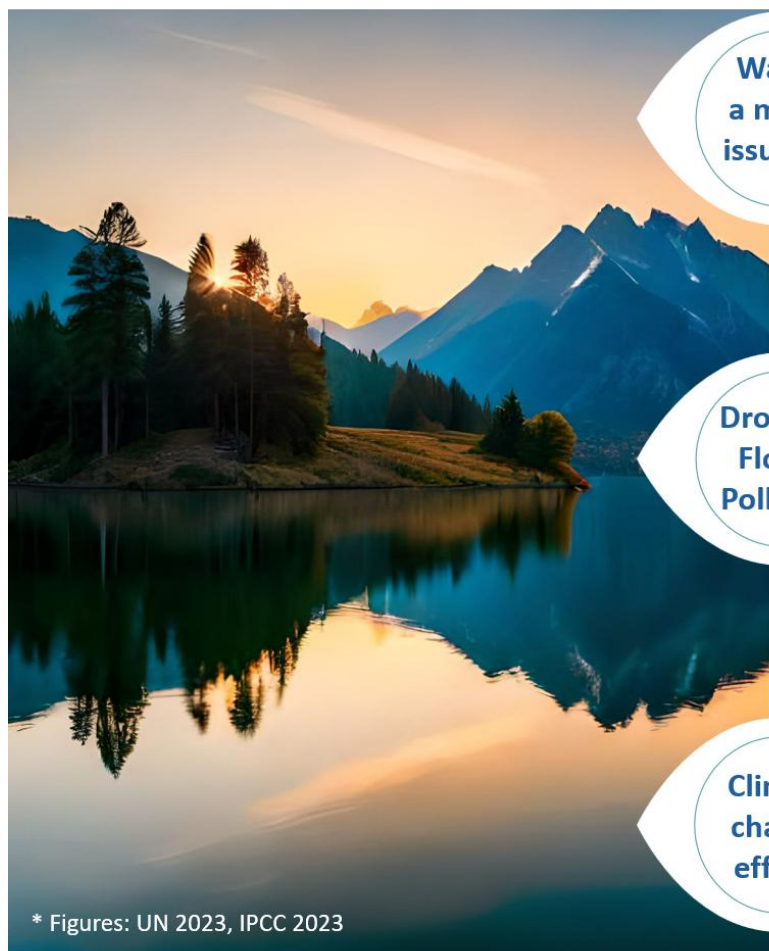
Water Security for the planet

<https://www.water4all-partnership.eu>



<https://www.water4all-partnership.eu/news/water4all-strategic-research-innovation-agenda-sria-new-release>

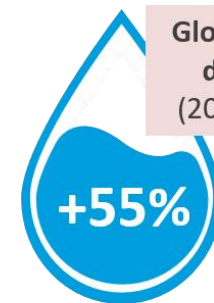
Why?



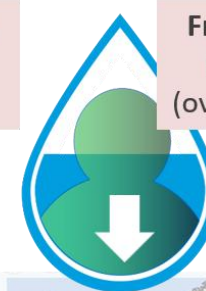
* Figures: UN 2023, IPCC 2023

Water,
a major
issue for

Life on Earth
Ecosystems
Human activities



Global water
demand
(2015-2050)

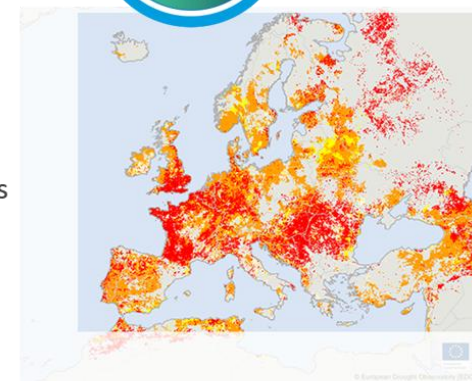


Freshwater/
EU inhab.
(over 20 years)

Spain: - 65%
Malta: - 54%

Droughts
Floods
Pollution

Water Framework Directive 2000/60/EC
60% EU surface water bodies in poor status
30% EU groundwater bodies in poor status



Drought in Europe – August 2022
JRC Global Drought Observatory (GDO) of the Copernicus Emergency Management Service (CEMS) – 22/08/2022

Climate
change
effects

- Increase damage on water resource**
- 90% disasters worldwide are water-related (IPCC)
 - Drought in Europe 2022: 19% of normal annual rainfall on 50% of the territory (Europe) (impact on soil, ecosystems, biodiversity...)



Partners

Start: June 2022

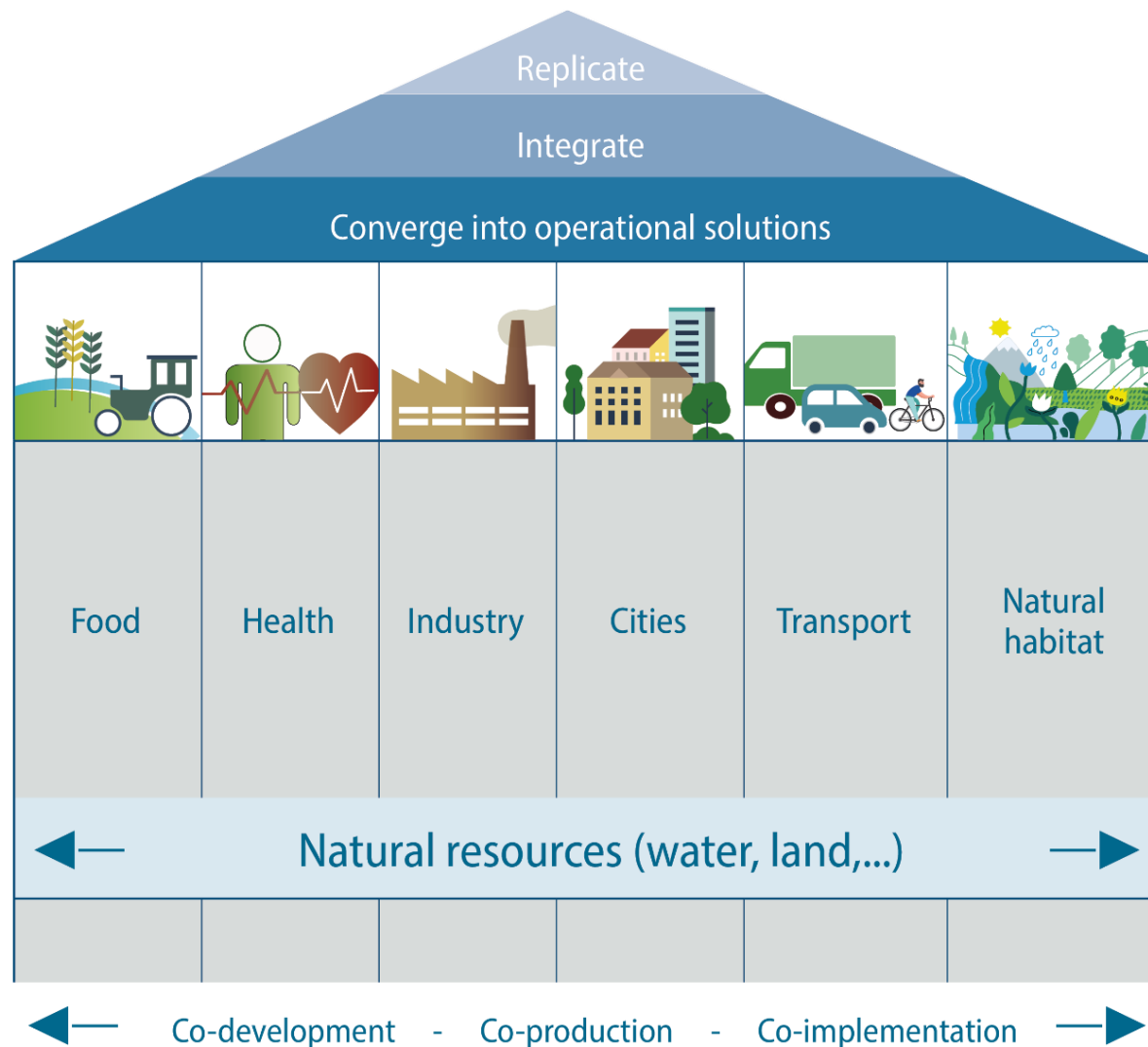


33 countries

23 EU Member States
10 non-EU countries



Holistic approach and objectives



Water4All Outcomes

deliver sound knowledge, tools and evidence basis on waterfor policy and decision making

improve consideration of water impacts in all relevant policies

Enhance the field / market use of innovative solutions to water challenges

Increase citizens awareness and engagement for an inclusive water management



Pillar A - Joint Vision and SRIA →

The aim of Pillar A is to define the thematic strategic orientations of the Partnership.

[READ MORE](#)

Pillar B - Research and Innovation Development →

The aim of Pillar B is to generate knowledge through the pooling of financial resources from funding agencies participating in the programme.

[READ MORE](#)

Pillar C - Science - Policy - End-users Interface →

The aim of Pillar C is to promote the uptake of results from research and innovation activities through science-policy interface actions and capacity building.

[READ MORE](#)

Pillar D - Demonstration activities →

The aim of Pillar D is to support demonstration activities of Water4All and enhance access to the market of research solutions.

[READ MORE](#)

Pillar E - Internationalisation →

The aim of Pillar E is to enhance the international portfolio of Water4All activities.

[READ MORE](#)

Pillar 0 - Coordination & management

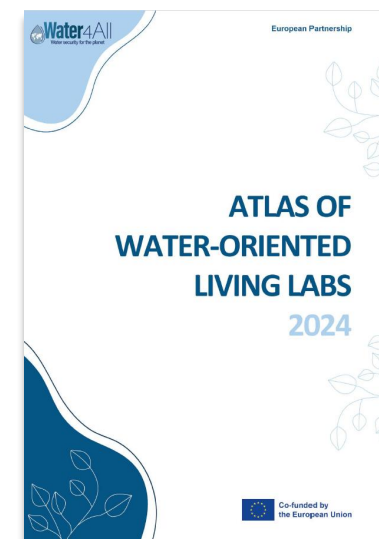
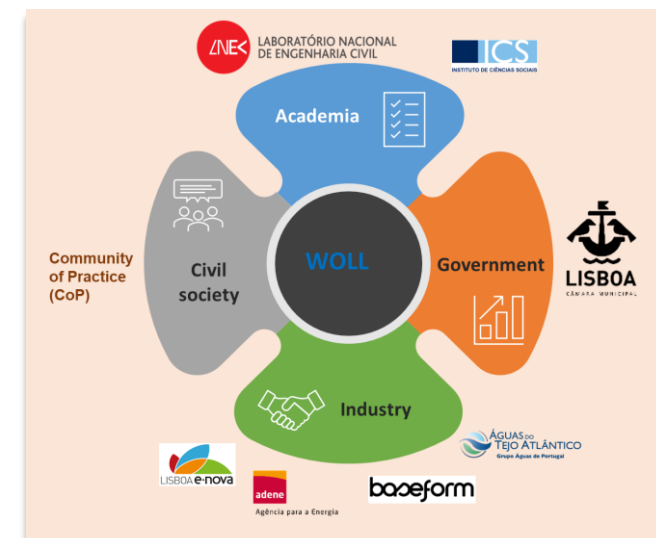
The aim of Pillar 0 is to allow the overall coordination and management of the Partnership.

WOLLs

Water4All

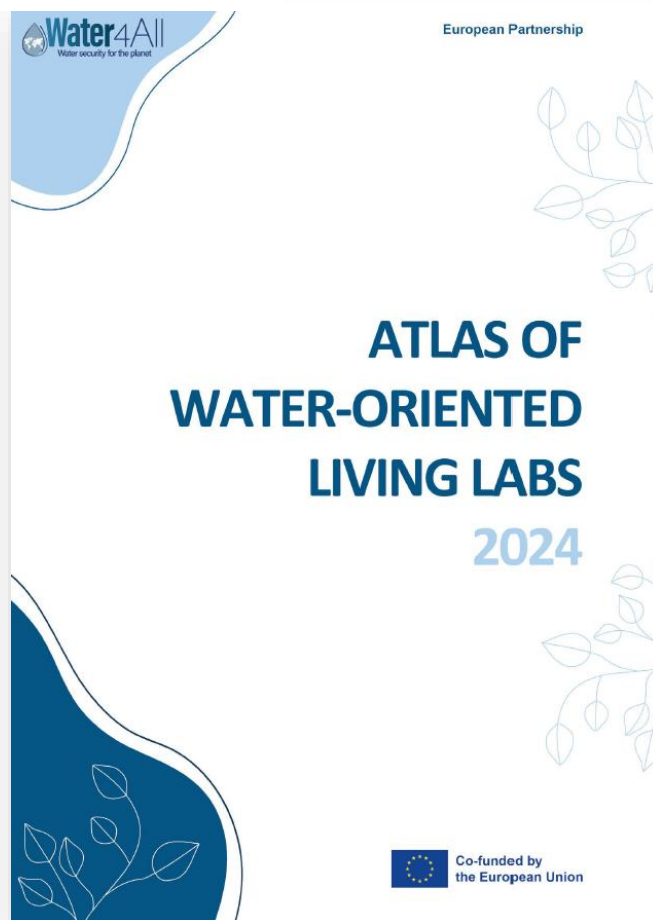
Why being a WOLL?

- + Reach further, wider and faster (stronger “voice” and “muscles”)
- + Have a long-term strategy anticipating likely/emerging challenges and resources to implement the solutions
- + Keep the flow/continuity of the innovation actions to really impact the territory and minimize the actions’ lag-phase
- + Have a well-operating environment gathering all key players needed to identify and unlock barriers on policy/regulation – funds – knowledge – technology – society
- + Be part of an EU network of WOLLs – learn, share, replicate, influence EU policies and funding



<https://www.water4all-partnership.eu/library>

Lisbon WOLL



<https://www.water4all-partnership.eu/publication/water4all-atlas-water-oriented-living-labs>



Water4All
Water security for the planet

ATLAS OF WATER-ORIENTED LIVING LABS 2024

Water4All
Water security for the planet

WOLL
Water Oriented Living Lab

LISBOA
LISBOA MUNICIPALITY

LISBON WATER SMART LIVING LAB

Lisbon, Portugal

Geographical scale Municipal
WOLL Type Urban
Year of establishment 2020

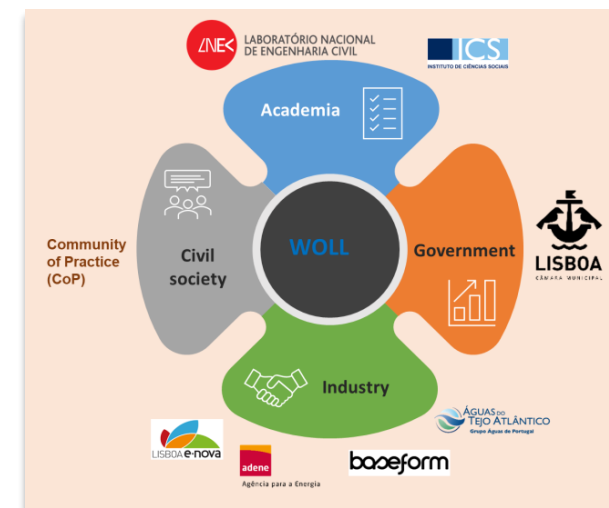
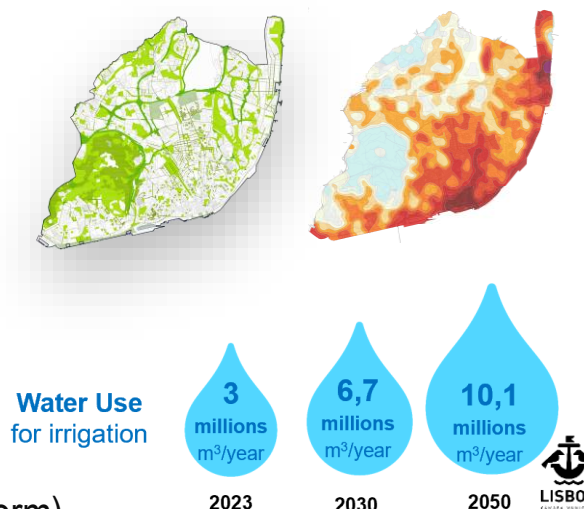
WOLL Introduction

The Lisbon Water Smart Living Lab represents an ambitious initiative aimed at enhancing the quality of life in Lisbon, in the face of climate change challenges such as droughts, heatwaves, and floods, through innovative green-blue infrastructure solutions. Central to its mission is the enhancement of the city's water-smartness, achieved by optimising water demand/supply management for non-potable uses and fostering water-energy-phosphorus efficiency alongside climate-resilient housing.



Lisbon WOLL

- Established in **2020**, within **B-WaterSmart** H2020 project
7 partners, owner **Lisbon Municipality**, mentor **LNEC**
- Focused on **urban water smart allocation** (fit-for-purpose),
safe **reuse** and **efficiency** at **municipal scale**
- For enabling the increase of urban green areas to cope with **climate-change**
– heat waves, heat islands, droughts
- Reducing freshwater** dependency for **municipal non-potable uses**
and introducing standards for **buildings** (short-term)
- Looking ahead to **potable reuse**, anticipating increased water scarcity (mid-term)
and building the **trust and acceptance** of safe water reuse (short-term)



- + **smart water allocation tool set** (4 digital tools)
 - + ranking/selecting **alternatives vs performance-cost-risk** over time
 - + fit-for-purpose **demand/supply matchmaking** (W-E-P balance)
 - + health & environmental **risk assessment of water reuse**
 - + reclaimed water quality model in the distribution for **risk management**
- + protocol for **direct potable reuse by craft beer industry** based on a **pilot demo** of advanced treatment technol (UF, O3, BAC, RO)
- + **urban water cycle observatory** (data repository, stakeholders & society)
- + **climate-readiness certificate** for households & buildings

Innovations deployed



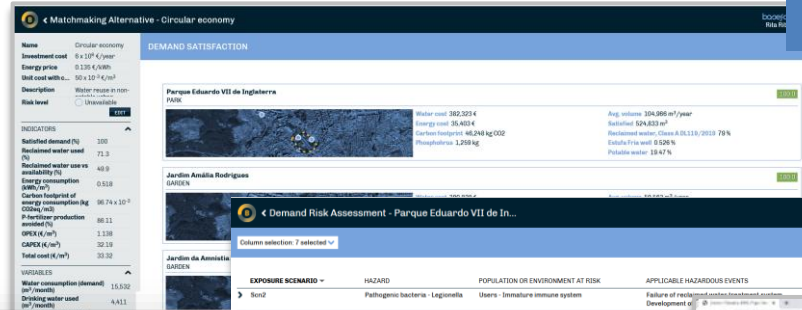
Lisbon WOLL solutions



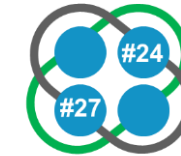
#1



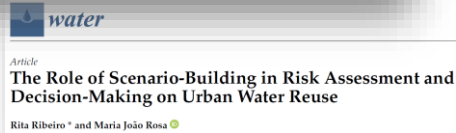
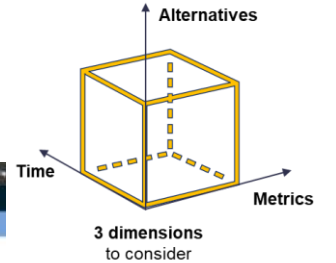
#25



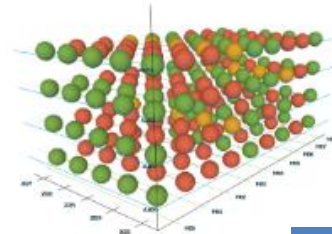
Smart water allocation



Safe water reuse



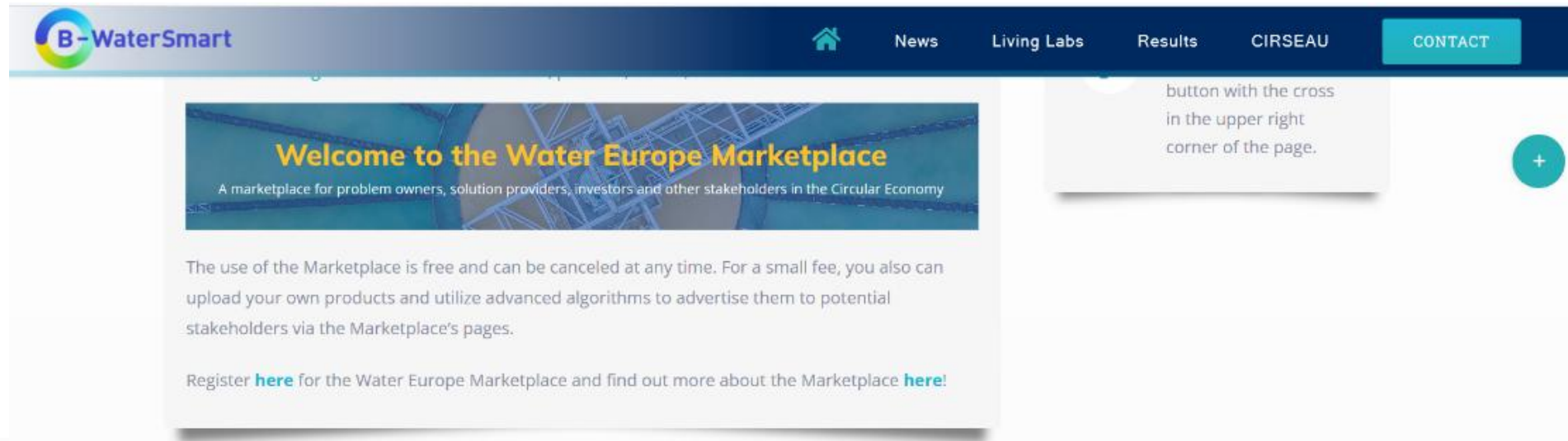
#24



#17



Lisbon WOLL solutions



The screenshot shows the B-WaterSmart website. The header includes the B-WaterSmart logo, a home icon, and navigation links for News, Living Labs, Results, CIRSEAU, and a CONTACT button. A large banner for the 'Welcome to the Water Europe Marketplace' is displayed, with a sub-header 'A marketplace for problem owners, solution providers, investors and other stakeholders in the Circular Economy'. Below the banner, text explains that the marketplace is free to use and can be canceled at any time, and that users can upload products and utilize advanced algorithms to advertise them. A call to action asks users to register 'here' for the marketplace and find out more 'here!'. A callout box points to a button with a cross in the upper right corner of the page.

B-WaterSmart products and tools at the Water Europe Marketplace	More information	Training material
Urban Water Cycle Observatory: Data visualization instrument to monitor performance & support urban planning & decision making	Link to product	Link to training
Climate ready certificates: Simulator & app toolkit to analyse the water-energy nexus for households, buildings & neighbourhoods	Link to product	Link to training
Reclaimed water distribution network water quality model is a simulation model for pressure flow networks	Link to product	Link to training
Water-energy-phosphorous balance planning module is a matchmaking environment combining sources and demand points	Link to product	Link to training
Risk Assessment module for urban water reuse is a human and environmental risk framework	Link to product	Link to training
Environment for decision support and alternative course selection is a multi-criteria decision framework	Link to product	Link to training

Lisbon WOLL legacy

- + **Tools & instruments** implemented within B-WaterSmart
- + **2 urban parks** (68 ha) irrigated with reclaimed water (licensed)
- + **Lisbon's strategic agenda for water-smartness**
co-produced with the **Community of Practice**
- + **Lisbon's Municipality Strategic Plan 2050 on Water Smartness**
(objective-oriented, data-based; BWS-Assessment Framework)
- + **Lisbon WOLL = accelerator for sustainability & climate neutrality**
 - + Link stakeholders in an innovation & co-creation environment (end users vs. practitioners)
 - + Boost systemic transformations and foster the matchmaking between problems and solution providers
 - + Develop data-driven policies
 - + Transform innovation programs in long-term investments, enabling **water security** and **job creation**

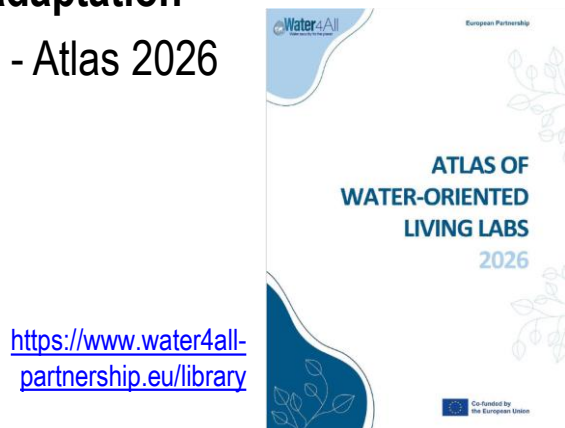


2020

- Collaborative platform to test and scale **B-WaterSmart** innovative solutions
- Focus on urban water management • reuse
- A pioneer WOLL of Water4All - Atlas 2024

2025

- Evolved to **Água-Mãe Living Lab**, a stronger driver of systemic transformation in the water sector
- 3 founding members
- Broader territorial scope and impact
- Expanded from city-level to regional ecosystem
- Focus on urban water management • reuse + WWT + WRR
- **Climate adaptation**
- Water4All - Atlas 2026



<https://www.water4all-partnership.eu/library>



Why climate adaptation needs WOLLs?

- WOLLs generate **practical evidence** on what climate adaptation works, where, and why
- WOLLs **inform decisions** by testing adaptation options under real local conditions
- WOLLs strengthen **policy uptake** by linking pilots to planning and regulation
- WOLLs enable **scaling** by proving which solutions can be **replicated/transferred** across territories
- WOLLs improve access to **finance** by **reducing uncertainty** for adaptation investment
- WOLLs support institutionalisation through **long-term governance and resilience strategies**
- WOLLs build **shared ownership** by engaging **communities** in adaptation pathways
- WOLLs create **transferable learning** for climate adaptation across regions and sectors



Key challenges being overcome by

- Weak links to formal adaptation planning
 - Short-term pilots with limited policy uptake
 - Unclear pathways from testing to adoption
- Fragmented governance across sectors and levels
- Insufficient long-term funding and institutional anchoring
- Limited evidence, metrics, and monitoring for decision-makers
- Weak stakeholder ownership and uneven community engagement
- Weak data sharing and cross-sector coordination

- New task in Pillar D (2026-2029) for clustering the projects funded by Pillar B (e.g. ReWAdd) • WOLL-facilitated TRL upgrade

- Application for new WOLLs is always open

- Capacity development programs on WOLL maturity and impact (2027, 2028)



Results

21 WOLLs in ATLAS 2024

20+ potential WOLLs

1. City of Mechelen, Belgium
2. (Waterland) Herk & MombEEK, Belgium
3. Port of Antwerp-Bruges, Belgium
4. Water Climate Hub, Belgium
5. Water Valley Denmark, Denmark

Country	N. Of WOLLs (21)
Belgium	4
Denmark	1

New WOLLs from scouting of partners, self candidate, maturity from project CSs



Results

29 WOLLs in ATLAS 2026

1. Attica Water Lab, Greece, from ULTIMATE project
2. VesperX WOLL, Greece, from ToDrinQ project
3. Lesvos WOLL, Greece, scouted by WE
4. Tagliamento Living Lab, Italy, scouted by ISPRA
5. AG-WaMED Val d'Orcia Living Lab, Italy, scouted by ISPRA
6. VeniVE WOLL, Italy, from B-WaterSmart project
7. Axarquia Living Lab, Spain, from direct application
8. The Krycklan Catchment Study, Sweden, scouted by FORMAS

Country	N. Of WOLLs (29)
Belgium	4
Denmark	1
Finland	4
France	1
Italy	5 (+3 vs 2024)
Greece	3 (+3 vs 2024)
Malta	1
Portugal	1
South Africa	1
Spain	5 (+1 vs 2024)
Sweden	1 (+1 vs 2024)
Switzerland	1
The Netherlands	1

Note:

Lisbon LL replaced by Agua Mae LL



Water Europe Sept. 2026

Acknowledgments



Rita Lourinho (AdTA)

Pedro Teixeira (CML)

Helena Alegre



Thank you for your attention!

mjrosa@lnec.pt