Interreg
Baltic Sea Region

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SUSTAINABLE WATERS
ReNutriWater

# ReNutriWater

## Closing local water circuits by recirculating nutrients and water and using them in nature.

Borlnholm | 8 November

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interreg-baltic.eu/project/renutriwater

# ReNutriWater

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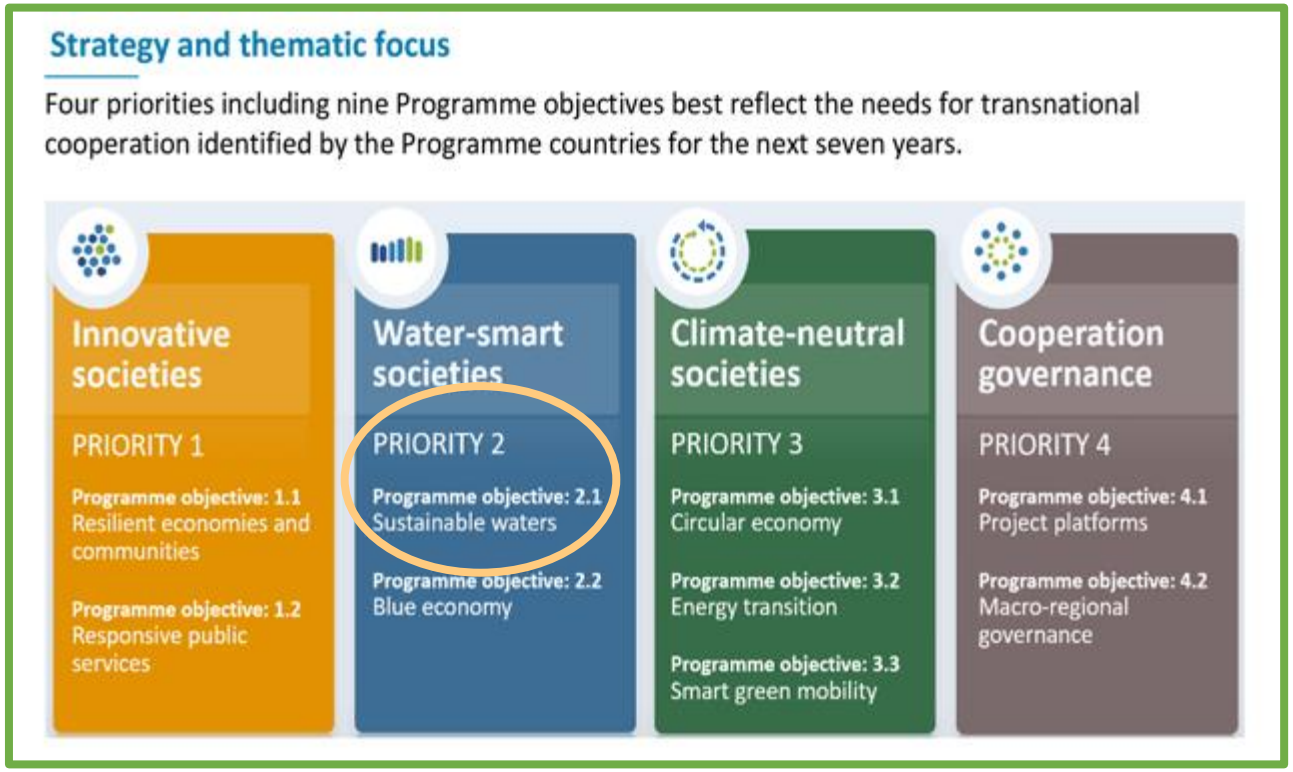
**ReNutriWater project answers to the challenges specified in the Programme objective Water-smart societies, priority 2.1. Sustainable waters.**

The Programme supports actions that improve the state of water in the region and make its management more sustainable.
These waters include the Baltic Sea, coastal waters and inland waters like rivers, lakes and groundwater.



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# Project Challenge

**Closing local water circuits by recirculating nutrients & water, and using them in nature.**

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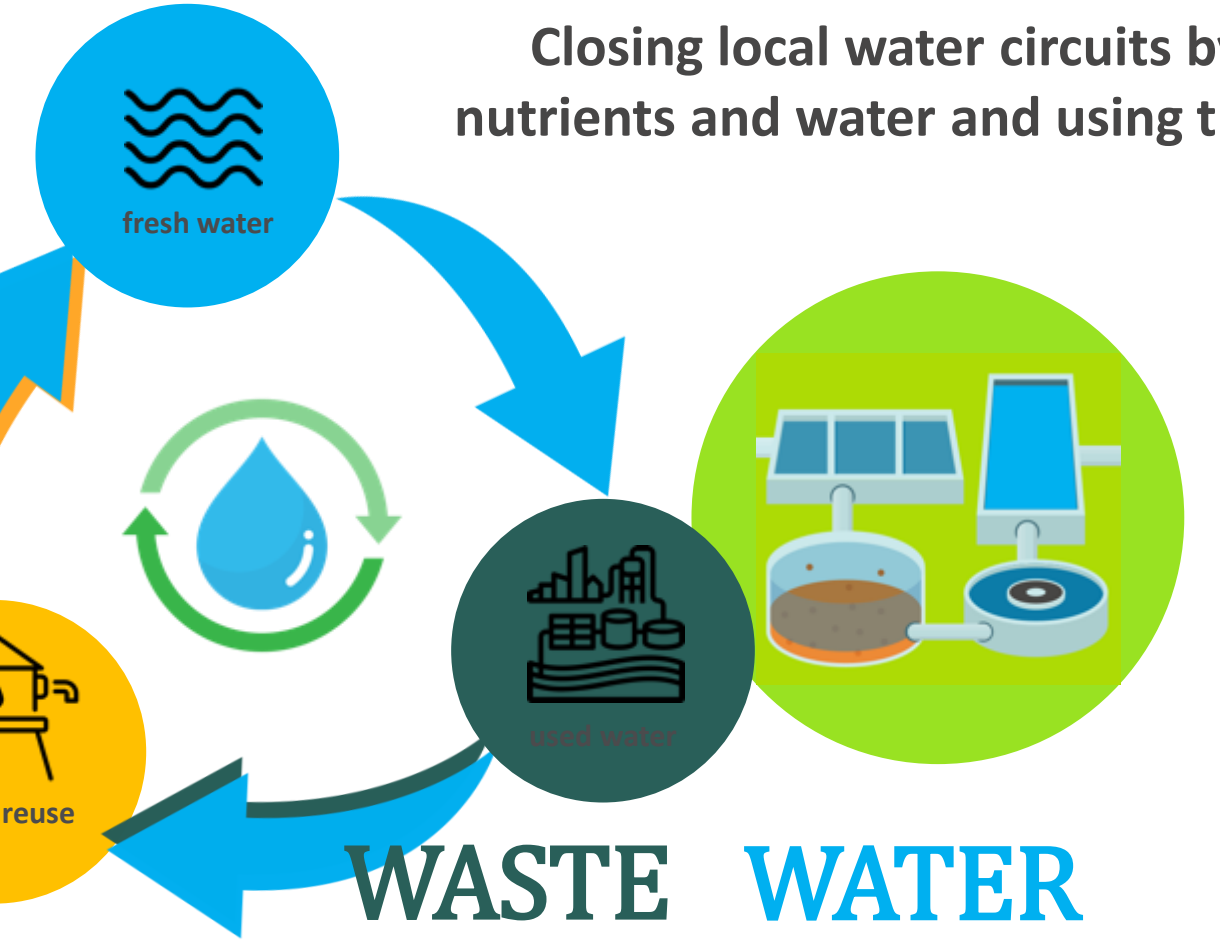
# Closing local water circuits by recirculating nutrients and water and using them in nature






## WASTE 0,1%

nutrients (N, P)
micropollutants
solid waste
microplastic

viruses
bacteria
parasites

Disinfection UV

## WATER 99,9%

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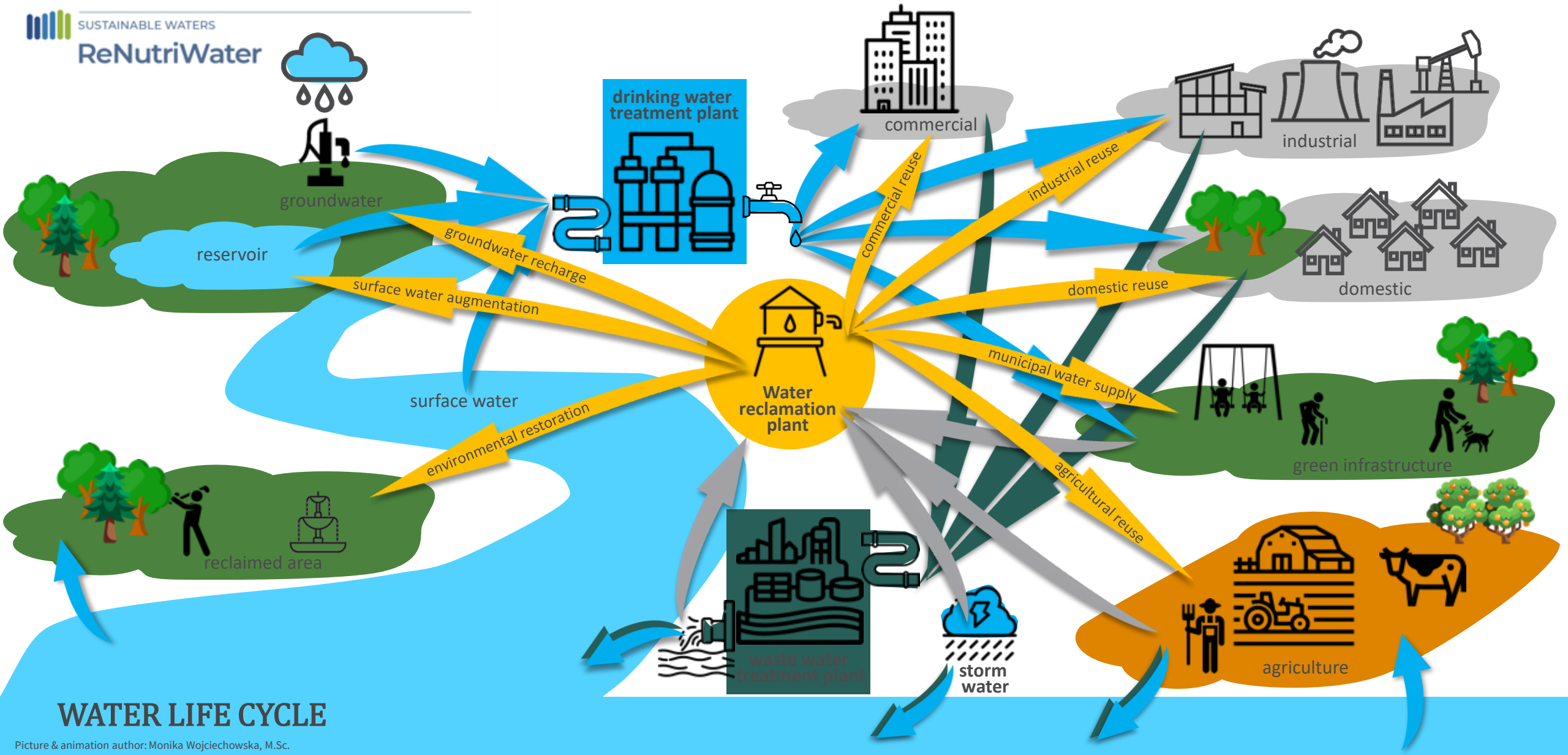
# fit-for-purpose water reclamation and reuse




WATER LIFE CYCLE

Picture & animation author: Monika Wojciechowska, M.Sc.

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## Target groups

- National/ Regional/ Local public authorities
- Infrastructure & public service providers
- Interest groups
- SME’s

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## Partnership

14 Project Partners representing  5 countries

22 Associated Organisations representing 8 countries


## Project leader

Izba Gospodarcza WODOCIĄGI POLSKIE

**Chamber of Economy Polish Waterworks**

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| No. | Country | City | Organisation EN | Organisation Original | | Type of Partner |
|---|---|---|---|---|---|---|
| Lead PP1 | Poland | Bydgoszcz | Chamber of Economy Polish Waterworks | Izba Gospodarcza Wodociągi Polskie | Izba Gospodarcza WODOCIĄGI POLSKIE | Interest group |
| PP 2 | Finland | Turku | Centrum Balticum Foundation | Centrum Balticum Foundation | CENTRUM BALTICUM | Interest group |
| PP 3 | Withdrawn | | | | | |
| PP 4 | Latvia | Rīga | University of Latvia | Latvijas Universitāte | LATVIJAS UNIVERSITĀTE | Higher education and research institution |
| PP 5 | Poland | Kraków | Mineral and Energy Economy Research Institute of the Polish Academy of Sciences | Instytut Gospodarki Surowcami Mineralnymi i Energią Polskiej Akademii Nauk | Instytut Gospodarki Surowcami Mineralnymi i Energią Polskiej Akademii Nauk | Higher education and research institution |
| PP 6 | Finland | Kuopio | Savonia University of Applied Sciences Ltd. | Savonia ammattikorkeakoulu oy | SAVONIA University of Applied Sciences | Higher education and research institution |
| PP 7 | Poland | Warszawa | Warsaw University of Technology | Politechnika Warszawska | | Higher education and research institution |
| PP 8 | Denmark | Samsø | Samsø Municipality | Samsø Kommune | SAMSØ KOMMUNE | Local public authority |

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| No. | Country | City | Organisation EN | Organisation Original | | Type of Partner |
|---|---|---|---|---|---|---|
| PP 9 | Poland | Stadła | Schwander | Schwander Polska sp. z o.o. spółka komandytowa | SCHWANDER POLSKA | Small and medium enterprise |
| PP 10 | Poland | Warszawa | Municipal Water and Sewerage Company in Warsaw | Miejskie Przedsiębiorstwo Wodociągów i Kanalizacji w m.st. Warszawie | wodociągi warszawskie | Infrastructure and public service provider |
| PP 11 | Denmark | Samsø | Samsø Wastewater Utility | Samsø Spildevand A/S | SAMSØ Spildevand | Infrastructure and public service provider |
| PP 12 | Latvia | Jūrmala | Jurmala Water Utility (Jurmalas udens Ltd.) | sabiedrība ar ierobežotu atbildību "Jūrmalas ūdens" | Jūrmalas ūdens | Infrastructure and public service provider |
| PP 13 | Lithuania | Šiauliai | Siauliai Chamber of Commerce, Industry and Crafts | Šiaulių prekybos, pramonės ir amatų rūmai | ŠIAULIŲ PREKYBOS, PRAMONĖS IR AMATŲ RŪMAI | Business support organisation |
| PP 14 | Latvia | Ventspils | VNK serviss, Ltd | SIA "VNK serviss" | VNK SERVISS | Infrastructure and public service provider |
| PP 15 | Lithuania | Vilnius | National Regions' Development Agency (NRDA) | Viešoji įstaiga Nacionalinė regionų plėtros agentūra | | Private and public sector service provider |

# ReNutriWater

## Associated Organisations

| | | | |
|---|---|---|---|
| 1. | WWF Poland, PL | 12. | Tahko Village Association, FI |
| 2. | Estonian Water Works Association | 13. | Tahko Development Oy, FI |
| 3. | Regional Council of Pohjois-Savo, FI | 14. | Ecoloop AB, SE |
| 4. | Klaipeda Water, LT | 15. | Water and sewerage company in Minsk Mazowiecki, PL |
| 5. | Administration of Jurmala local government, LV | 16. | Municipal and housing enterprise in Dzialdowo, PL |
| 6. | Kursenu vandenys, LT | 17. | Urban Waterworks and Sewerage in Bydgoszcz, PL |
| 7. | Latvia Centre for Environment, Geology and Meteorology | 18. | Hydrosphere Józefów, PL |
| 8. | Samsø Farmers Association, DK | 19. | Council of Oulu Region / EUSBSR PAC Tourism, FI |
| 9. | EurEau, BE | 20. | Tukums Municipality, LV |
| 10. | VIA University College, DK | 21. | The Pomeranian Regional Tourist Organization / PAC Tourism, PL |
| 11. | Ministry of infrastructure, PL | 22. | BANIA Limited liability company Limited partnership, Hotel Bania Thermal&Ski, PL |

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## Project budget

| | |
|---|---|
| Programme co-financing | 3,077,787 € |
| PPs Own funding | 769,447 € |

## Project time frame

Project implementation **1.1.2023 – 31.12.2025**

Project closure ends 31.3.2026

## Total budget

**3,847,234 €**

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| GROUP OF ACTIVITIES (1-5) | Work Package 1: Preparing solutions | |
|---|---|---|
| | WP1 | Prepare |
| | Title of preparatory activities | Deliverables<br>Components of the solution prepared |
| 1 | Determining preconditions for pilots | D: System boundaries defined (report) |
| 2 | Establishing the local target group networks | D: 5 local target group networks created |
| 3 | Validating final conditions for pilots | D: Final conditions for pilots defined – set of water & nutrients reuse techniques (report) |
| 4 | Determining a scope of the risk assessment for pilots | D: Validated scope of the risk analysis for pilots and other BSR regions (report) |
| 5 | Identifying business opportunities and defining scope of functionality of WaterSafe-tool | D: Sustainable and circular business models & determined functionality of WaterSafe-tool |

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| GROUP OF ACTIVITIES (1-5) | Work Package 2: Piloting and evaluating solutions | |
|---|---|---|
| | WP2 | Tests |
| | Title of pilot activities | Output<br>Solutions piloted, evaluated, adjusted |
| 1 | Pilot 1 (P1):<br>Disinfection efficiency of reclaimed water | O: Efficient methods of disinfection of reclaimed water |
| 2 | Pilot 2 (P2):<br>Composition adjustment of reclaimed water | O: Methods of selecting the composition of reclaimed water tailored to the needs |
| 3 | Pilot 3 (P3):<br>Breaking barriers for reclaimed water use | O: Methods to ensure the safe use of reclaimed water |
| 4 | Implementing and testing WaterSafe IT Tool | O: WaterSafe IT Tool |
| 5 | Developing a Handbook on water reuse | D: Handbook on safe water reuse |

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| GROUP OF ACTIVITIES (1-3) | Work Package 3: Transferring solutions | |
|---|---|---|
| | WP3 | Transfer solutions |
| | Title of transfer activities | Deliverables<br>Solutions transferred to target groups |
| 1 | Transferring solutions - communication, activities and tools | D: Transferred solutions - final report |
| 2 | Conducting survey analysis to measure and expand awareness | D: Awareness survey – report |
| 3 | Developing and implementing a mentoring programme "Safe Water" | D: Mentoring programme ”Safe Water” for target groups |

# Location of the pilots


**PILOT 1** — Disinfection

1. PP6 | Savonia's WaterLAB, Kuopio, Finland
2. PP10, WWTP Czajka / Pruszków / Południe, Warsaw, Poland
   with PP7 | Warsaw University of Technology, Warsaw, Poland

**PILOT 2** — Nutrients adjusting

1. PP6 | Savonia's WaterLAB with cooperation of WWTP Tahko, Finland
2. PP9 | Schwander with WWTP for Hotel Bania Thermal & Ski, Wołkowyja, Poland
3. PP12 | Jurmala Water Utility, Jurmala, Latvia
   with PP4 | University of Latvia, Riga, Latvia

**PILOT 3** — Green house

1. PP6 | Green house in Kuopio, Savonia's SuperDMA, Savilahti District, Finland
2. PP11 | Green house in Samsø Wastewater Utility Samsoe Island, Samsø, Denmark
3. PP14 | Greenhouse in Ugāle, Ugāle parish, Ventspils county, Latvia
   with PP4 | University of Latvia, Riga, Latvia

WP2 Leaders: PP 6 FINLAND SAVONIA University of Applied Sciences | PP 10 POLAND wodociągi warszawskie

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# WP2 – piloting

## PILOT 1

Disinfection efficiency of reclaimed water

**Reclaimed water**

end of pipe / before disinfection

On-site access

delivered from WWTP

**Disinfection** (UV, H2O2, O3)

AOP – Advanced Oxidation Processes

'ODM' – Other Disinfection Methods

Ozon | UV | Fenton | Chlorination | Filtration | Coagulation Floatation

lab-scale unit | pilot unit

existing | will be modified | will be built

**Measurements**

own LAB | external lab services

due to regulation (EU) 2020/741 and other regulations

required | optional

microbiological indicators | physico-chemical characteristic | toxicity tests

viruses | bacteria | protozoa | extended by micropollutants

## PILOT 2

Composition adjustment of reclaimed water

**Reclaimed water**

end of pipe / before/after microbiological treatment

On-site access

delivered from WWTP

**Nutrients composition**

nutrients augmentation | without nutrients augmentation

Carbon (C) | Nitrogen (N) | Phosphorus (P) | Potassium (K)

full-scale unit | lab-scale unit | pilot unit

existing | will be modified | will be built

**Measurements**

own LAB | external lab services

due to regulation (EU) 2020/741 and other regulations

required | optional

microbiological indicators | physico-chemical characteristic | toxicity tests

viruses | bacteria | protozoa | extended by micropollutants

**Watering greenery areas**

disinfection needed if watering

Pilot 2 could be connected with Pilot 1

Pilot 3 could be connected with Pilot 1

## PILOT 3

Breaking barriers for reclaimed water use

**Reclaimed water**

end of pipe after disinfection

On-site access

delivered from WWTP

**Green house**

pilot unit

existing | will be modified | will be built

1. soil choosing
2. greenhouse construction
3. Setting up of the experiment
4. plant choosing
5. Watering
6. Observation of plant development phases
7. Harvesting of plants

disinfection needed if watering

**Measurements**

own LAB | external lab services

due to regulation (EU) 2020/741 and other regulations

required | optional

microbiological indicators | physico-chemical characteristic | toxicity tests

viruses | bacteria | protozoa | extended by micropollutants

Water | Soil | Plants

# Possible synergies with Waterman

| Determining a scope of the risk assessment for pilots |
| --- |
| Identifying business opportunities and defining scope of functionality of WaterSafe-tool |

| O: WaterSafe IT Tool |
| --- |
| D: Handbook on safe water reuse |

- ❖ Kalmar case study
- Berlin case study

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**Project website available at**

**www.interreg-baltic.eu/project/renutriwater/**

We support smart ideas that shape the Baltic Sea region with EU funding.