

Water Reuse and Circular Economy

Environmental and Socioeconomic Implications

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Changing Regulatory Frameworks

Recast of UWWTD as a Driver for Change

- Article 7: Tertiary Treatment
- Article 8: Quaternary Treatment
- Article 15: Water Reuse and Discharge of Urban Wastewaters

Derogation on Tertiary Treatment for Agricultural Irrigation

EU Circular Economy Action Plan

- Encouraging water reuse beyond agricultural irrigation

CIS Process – WG Reuse

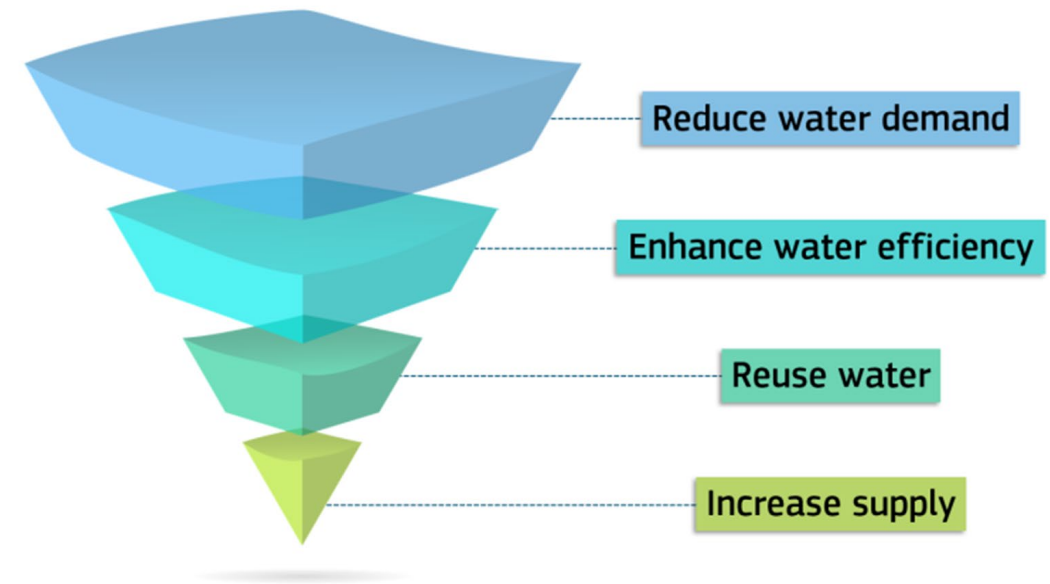
..... promoting reuse in other sectors and hence support implementation of the Circular Economy Action Plan



Context – Water Reuse

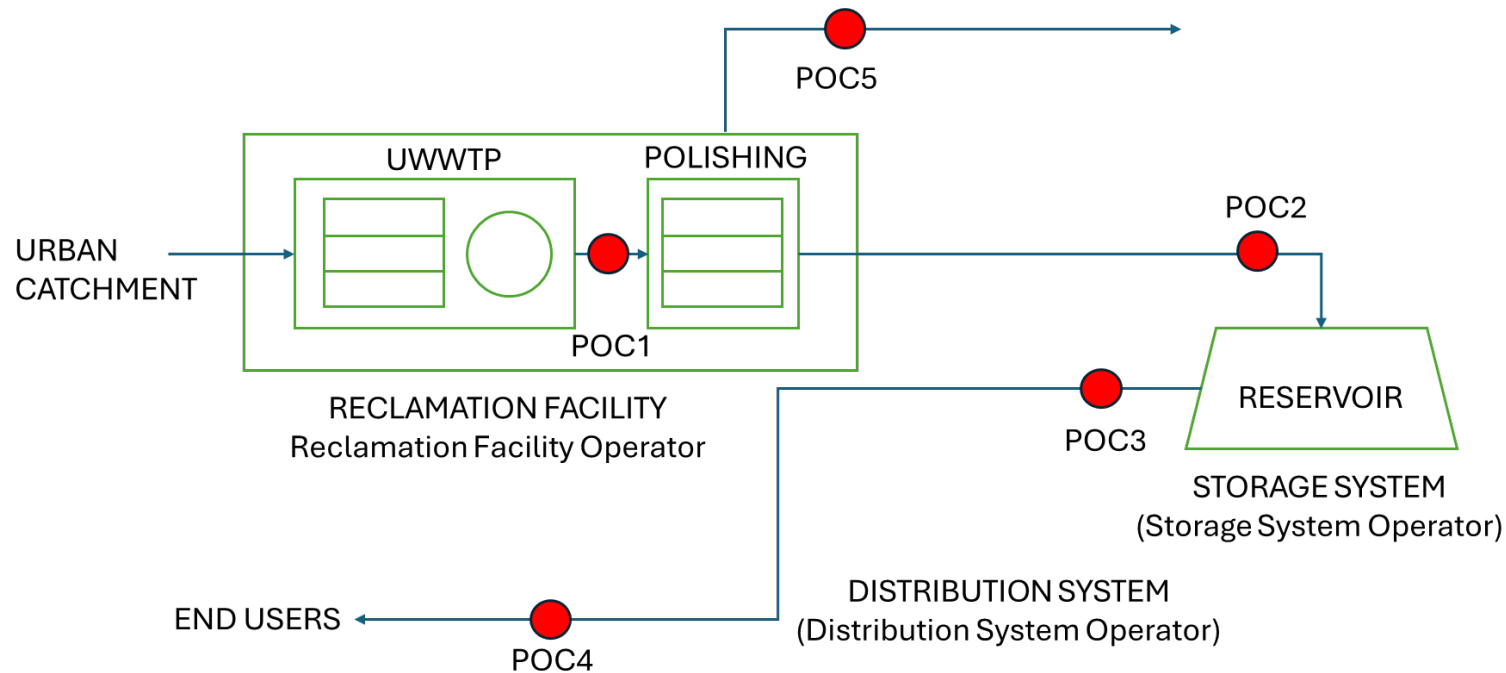
Integration of Water Reuse in RBMPs – due consideration to both quantitative and qualitative aspects of reuse:

- Reuse presents the opportunity of reducing pressures on scarce natural water resources – but integrated approach to ensure environmental (ecological) functions;
- Energy – reuse applications require less energy than alternative non-conventional water resources (ex. sea-water desalination);
- Food – management of nutrients, when integrated within Nitrates Action Programmes under the Nitrates Directive (and derogation under the UWWTD).



Source: EU Water Resilience Strategy

Centralised Water Reuse



Regulatory process outlined under EU Regulation 2020/741 (Minimum Requirements for Water Reuse).

Focused on a Risk Assessment Process.

Concept can be extended to other end-users, including industry, municipal, landscaping and ecological functions – broadening the context of reuse.

Progressively increased alignment with the WEF Nexus.

Centralised Water Reuse

Increased integration of water reuse in River Basin Management Plans.

Key Challenges:

- Balancing water-use efficiency, wastewater flows and wastewater quality.
- Additional challenges in islands: Salinity of Wastewater arising from the infiltration of sea-water in sewer networks (and possibly discharges of saline waters in sewers).

Recommended Measures:

- Regulation of discharges to sewers.
- Repair of sewer network to avoid seawater infiltration.

Increased focus on protecting the quality and resource value of wastewater



Circularity Principles

- Recovery of Water (traditional function of water reuse)
- Energy Recovery (and Energy Efficiency) in the wastewater management process
- Recovery of Resources (N and P) through the treatment process

With the application of the new UWWTD (Dir EU 2024/3019), upgrade of existing UWWTPs will be required.

What are the challenges? Which technologies will become available?

Decentralised Water Reuse

Wastewater Treatment and Reuse at the point of use.

Guidance:

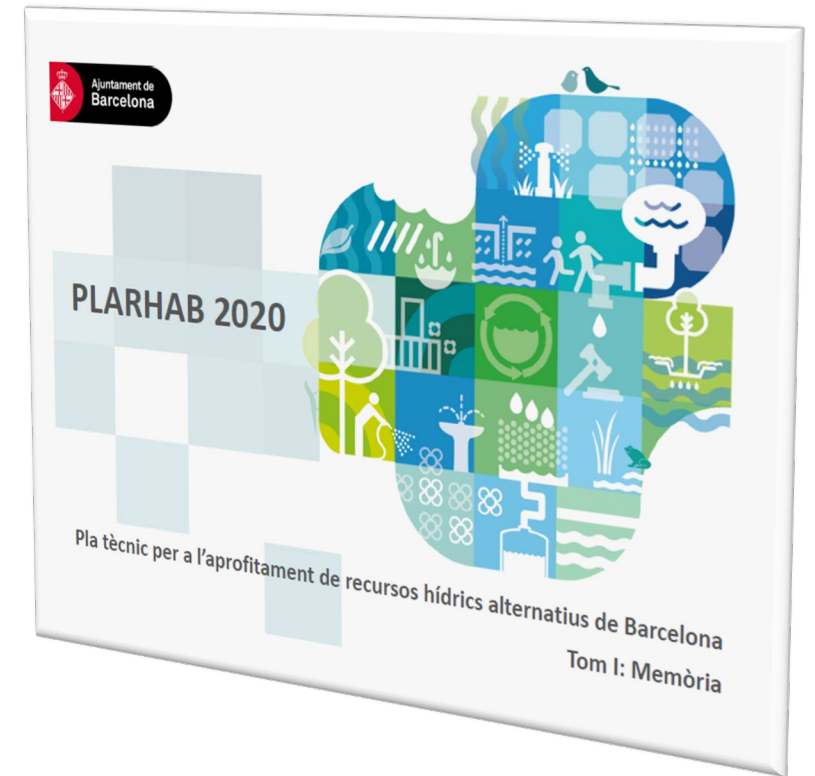
EN12566-3:2016

Small wastewater treatment systems for up to 50PT - Part 3. Packaged and/or site assembled domestic wastewater treatment plants.

EN16941-2:2021

On-site non potable water systems – Part 2: Systems for the use of treated greywater.

Key example in the Mediterranean: Barcelona Alternative Water Resources Plan.



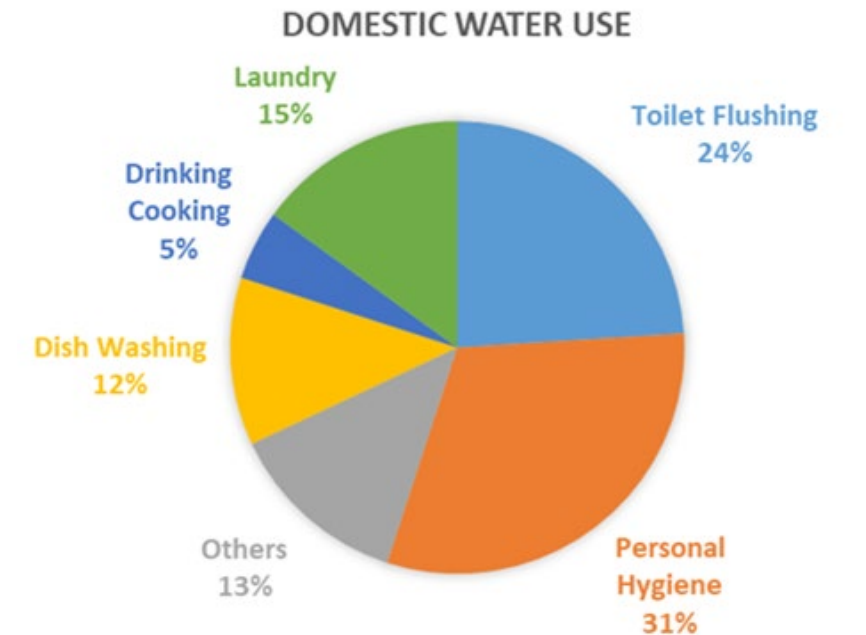
Greywater Reuse

High Potential:

Shower to Flushing Applications can reduce domestic water demand by around 25%.

But:

Importance of balancing water-use efficiency, wastewater flows and wastewater quality.
High uptake can impact wastewater networks, wastewater quality and consequently treatment efficiency.



Source: Energy and Water Agency, Malta

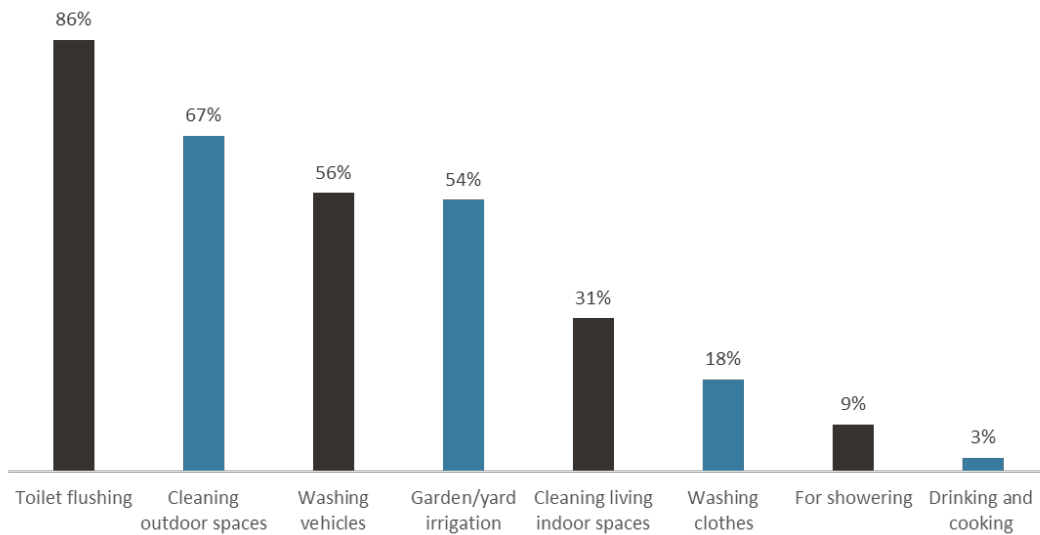
Barriers for Implementation

Outcome of regional stakeholder consultation process on the applicability of NCWR undertaken under the NAWAMED Project:

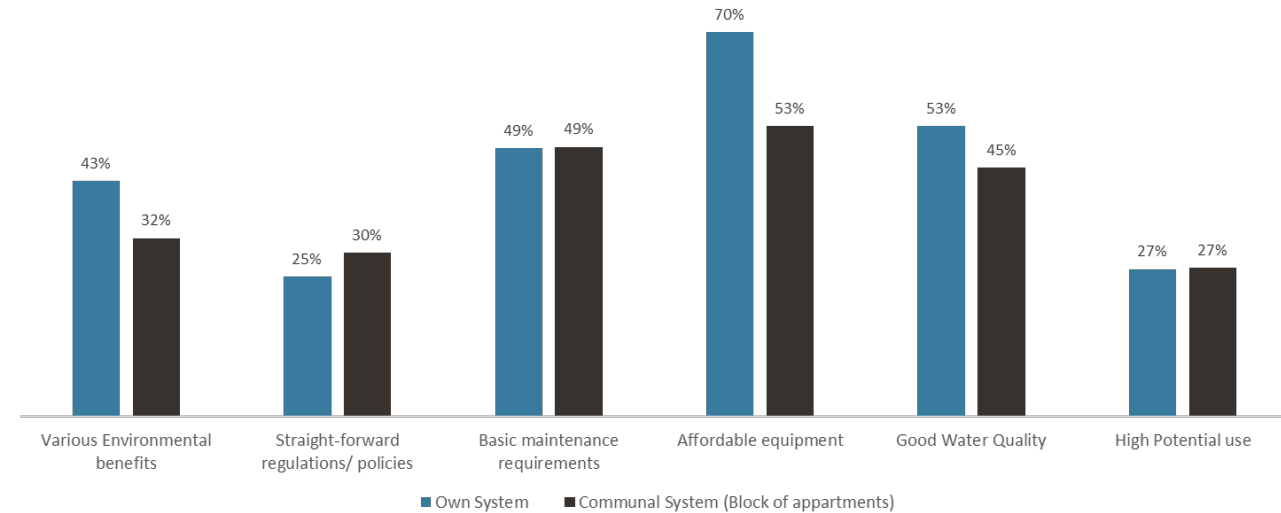
- Availability of Affordable Technologies,
- Building Type and Space Availability,
- Perception of Users,
- Lack of Regulations,
- Separate Plumbing Systems (and Plumbing Codes),
- Cost-Effectivity (Pay-Back Periods),
- Lack of Financial Support Schemes, and
- Lack of (Technical) Knowledge on Treatment Systems.



Public Perception



What activities in your household do you think you could use treated greywater for?

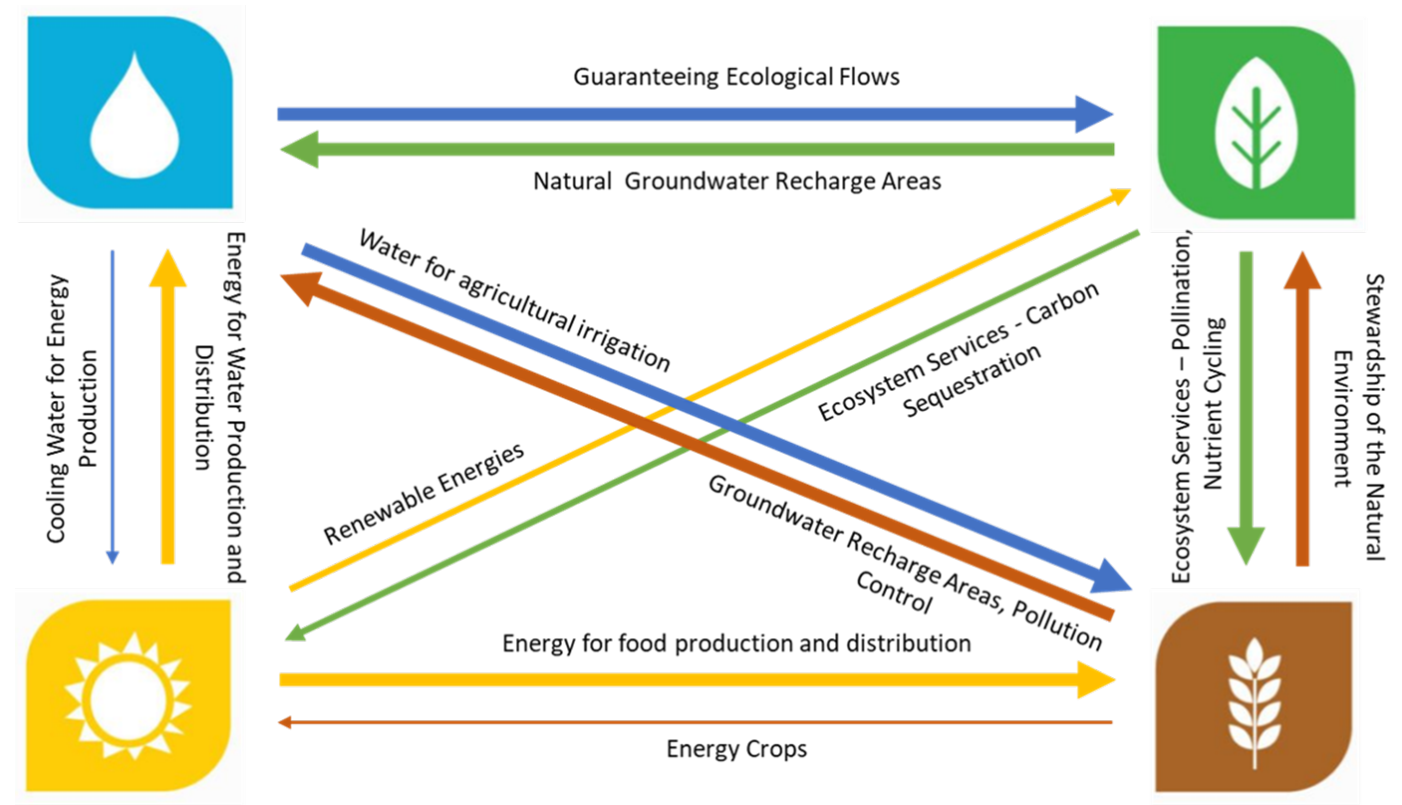


What factors would influence your decision to install your own or accept the installation of a communal greywater treatment system?

Way Forward

Integration of Water Reuse in Water Management Planning – particularly through River Basin Management Plans.

Increased alignment of water reuse with WEF E Nexus Principles – increasing circularity through increased consideration to all NEXUS pillars.



Thank-you for your attention

Further Questions:

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