



Plastic, Packaging

Strategies to solve the problem of hardly recyclable Packaging Materials



Bio-Waste

Extracting valuable compounds from different Bio-waste streams



Water

Water Symbiosis Strategies in Industry, Agriculture, and Urban contexts

 **CIRCSYST** Circular Systemic Solutions
PLASTIC • PACKAGING • BIO-WASTE • WATER

Demonstrator 4

Integrated tools and methodologies for evaluating water circularity and symbiosis

VISBY, GOTLAND, SWEDEN



Circular
Cities & Regions
Initiative



UK Research
and Innovation



Funded by
the European Union



Start 2024



36 mo



€ 10.24 M



32 partners



9 pilots /
8 regions



About CircSyst

Resource extraction is responsible for nearly half of global greenhouse gas emissions and the vast majority of biodiversity loss. With 90% of world economy still linear, plastics, water and bio waste are treated as single use commodities rather than valuable resources. The CircSyst project addresses this challenge by developing Circular Systemic Solutions (CSS) that drive sustainable, circular economic models.

Over 36 months, 32 partners led by AIJU will run nine large-scale pilot systems spread across eight European regions, targeting three priority value chains from the EU Circular Economy Action Plan: water management, bio-waste valorisation, and plastics & packaging. The pilots exchange by-products and know-how so that, for example, a plastic fraction recovered in Greece can feed a recycling line in Spain. In this way, CircSyst forms an industrial-symbiosis network that supports the EU's Circular Cities and Regions Initiative (CCRI) and provides replicable and scalable solutions.

About DEMO 4: Integrated tools and methodologies for evaluating water circularity and symbiosis



By combining real-world experience from a water-stressed region with the flexibility of advanced modelling tools, Demonstrator 4 enables both practical testing and exploratory scenario analysis.

The demonstrator focuses on three key areas:

- **Water mapping and dynamics:** Detailed mapping of water sources, uses, quality and flow dynamics, down to sub-daily patterns, forms the basis for a model of the system. Such a model allows exploration of scenarios involving changing seasonal demand, future climate, and infrastructure constraints, enabling the design of robust water reuse strategies.
- **Microbiological risk assessment and storage guidelines:** Through laboratory trials using reclaimed water from local industries (e.g. dairy condensate, rainwater), the demonstrator evaluates microbial growth during storage under different conditions. The results allow development of guidelines for safe storage durations, preservation strategies, and cleaning procedures for reused water systems.
- **Decision support using dynamic marginal cost curves (MCCs):** A system dynamics model helps stakeholders compare water reuse options from multiple perspectives such as the impact on water stress costs to different users, and sustainability aspects. The tool supports scenario exploration and participatory decision-making through interactive dashboards and workshops.

By combining technical innovation with stakeholder engagement, Demonstrator 4 aims to deliver actionable insights and replicable solutions for circular water systems in water-scarce regions.

Who is involved?

RISE Research Institutes of Sweden leads the development and testing of the integrated tools and methodologies in Demonstrator 4. With expertise in water management, microbiological risk and system dynamics modelling, RISE conducts the main activities of the demonstrator.

The local municipal authority, **Region Gotland**, contributes through providing data and insights on local water management and its relationship to development in the region.

Local stakeholders **Arla Foods** and **Protos** (food industry) and **Gotlandshem** (housing) contributes to the project work.



**System dynamics models
for assessing water circularity
interventions**

**Guidelines for storage of
reused water**

**Guidelines for cleaning of
reused water systems**



PARTNERS



www.circsyst.eu

 CircSyst  @CircsystCSS

The CircSyst project is funded by the European Union in the framework of Horizon Europe Research and Innovation Programme under Grant Agreement N. 101135505



UK Research
and Innovation



Funded by
the European Union