

# FIT4REUSE

Sustainable and accepted ways of water supply  
Pilot 1

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-  
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MEDWAYCAP



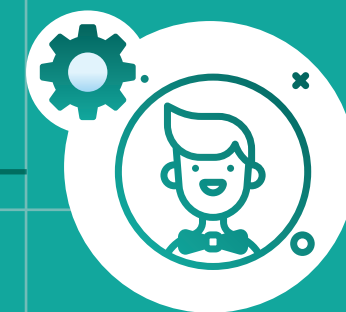
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more info



project



## HOW

Intensive systems are implemented through the development of biotechnology, membranes and ingenious nanotechnology, through which urban wastewater is treated so that it can be safely reused in agriculture.



## WHAT

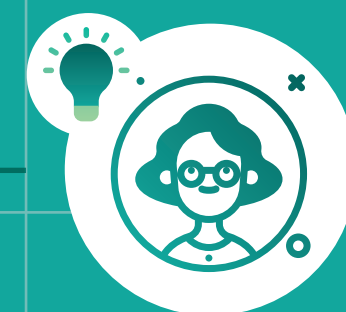
### Municipal wastewater treatment

Seven pilot sites were implemented for municipal wastewater treatment. Nature-based solutions (i.e. constructed wetlands) were implemented at three of them, while intensive technologies were adopted at the other four sites.

These practices aim to design and improve nature-based solutions centred on single-stage and hybrid wetland systems for the treatment of municipal wastewater and safe effluent reuse in agriculture.

These solutions are being optimised, energy efficiency is improved, important nutrients are recovered and, at the same time, pollutants in the effluent, pathogens and pharmaceuticals are removed.

**WETLANDS**  
**BIO-ELECTRIFIED WETLAND**  
**MICROFILTRATION**  
**ADSORPTION COLUMNS.**



## WHY

The specific objective is therefore to optimise different wastewater treatment technologies and to enable nutrient recovery in south and north Mediterranean areas; to enhance removal of pharmaceuticals and toxic compounds by membrane and nano-technologies and, finally, to assess and compare toxicity, eco-toxicity and phyto-toxicity of treated effluent.



▲ tested/installed ● partner location





## WHAT

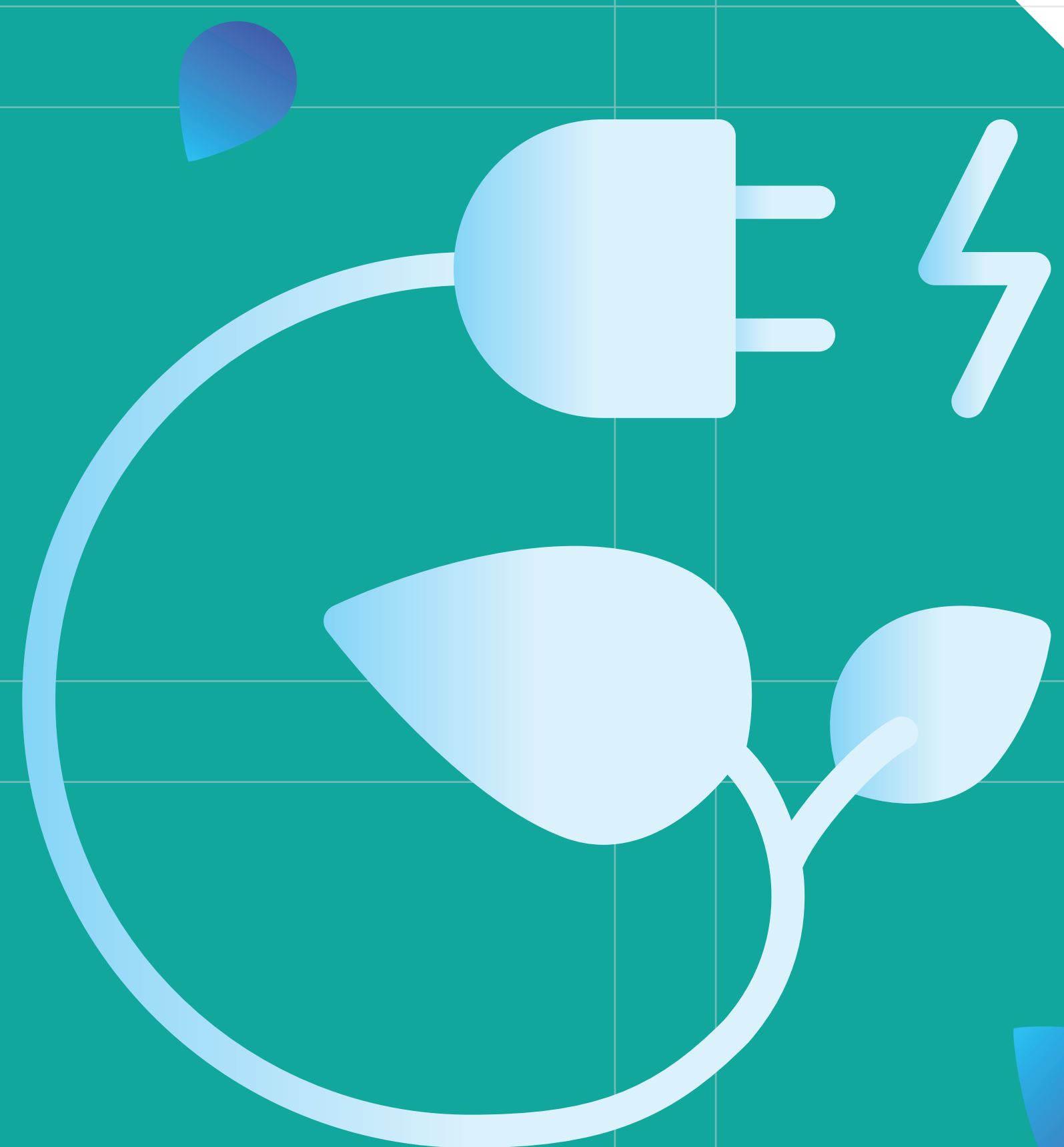
### Integrated treatment solutions

Integrated systems were implemented at **three pilot sites** where different combinations of intensive and/or wetland systems were tested.

The general objective is to study **removal efficiencies of pollutants, pathogens and pharmaceuticals**. At the same time, energy and cost saving performances of combinations of these technologies are being assessed.

Furthermore, thanks to these sites, the optimum combination of the developed technologies is investigated at different regions with **different reuse requirements**.

### MUNICIPAL WASTEWATER INTEGRATED SYSTEM WETLAND FILTRATION



## HOW

In addition to setting up three pilot sites, a **simulation platform** was also realised. Its objective is to simulate the FIT4REUSE solutions and predict their performance under conditions different from the experimental one, and therefore it can also serve as a **tool for decision making**.

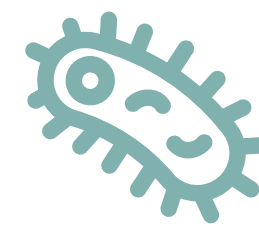
The platform is able to execute steady state and dynamic simulations for the individual units as well as for combinations of several process units with the result of system performance in terms of water quality, energy and carbon footprint. Each module includes significant **design and operational parameters** of each unit, inputs (e.g. wastewater characterization) and relevant conversion processes physico-chemical and biochemical) involved.



# FIT4REUSE

Sustainable and accepted ways of water supply  
Pilot 3

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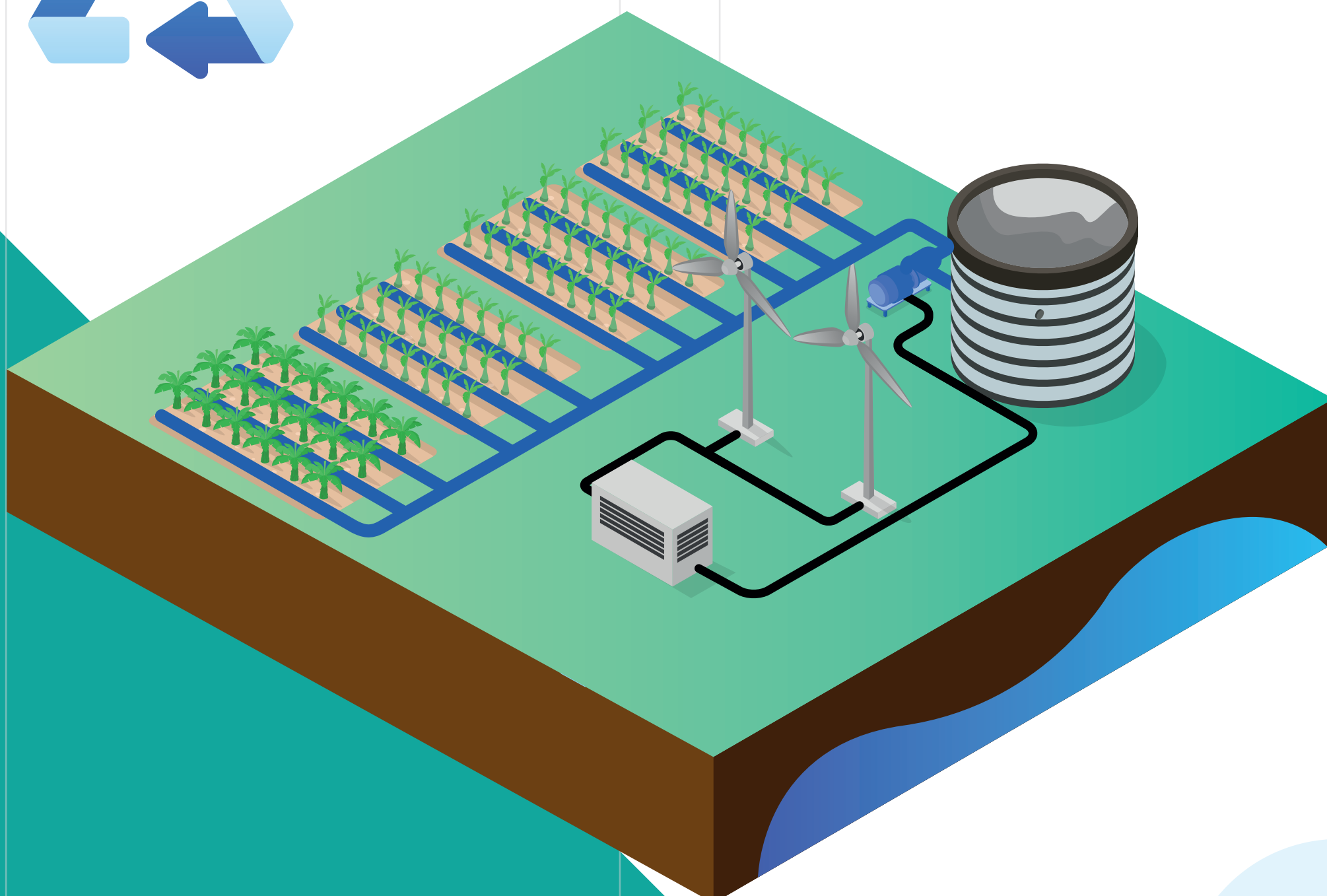
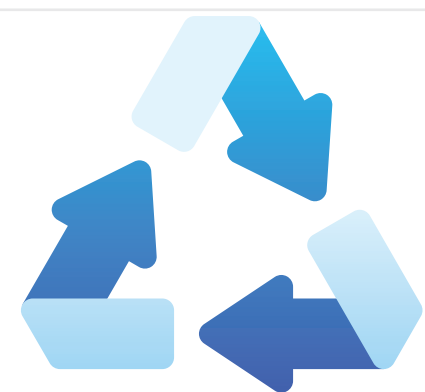
## WHAT

### Agricultural use of non-conventional water resources

The project studies the use of high-quality non-conventional water resources, treated with the FIT4REUSE technologies, in irrigation, fertigation and aquifer recharge, both as direct and indirect water reuse schemes.

In particular, effects of these water resources on soil, crops and drainage water are being tested and the optimisation of the Soil Aquifer Treatment (SAT) systems is being done in order to increase infiltration rate.

The project will also produce supporting guidelines for practitioners in the use of non-conventional water resources with the aim of good management of irrigation and recharge systems in a frame of water scarcity/bad water quality situation to meet market, safety and consumer demands.



## HOW

Two experimental sites have been set up to test the effects of treated wastewater on clogging of irrigation drippers, soil and crop health quality, and the effect of wastewater nutrients on crop growth. These tests also enable assessment of the benefits of water reuse in terms of fertilisation and overall yield. In addition, FIT4REUSE also evaluates the evolution of water quality in open storage since it is an important component when planning water reuse.



### AGRICULTURE

NON-CONVENTIONAL WATER  
WATER QUALITY  
IRRIGATION  
FERTILISATION

