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in Social Economy

MAR MENOR: A THREATENED ECOSYSTEM AND THE KEY ROLE OF SOIL IN ITS RECOVERY

DATE: 24th September 2025

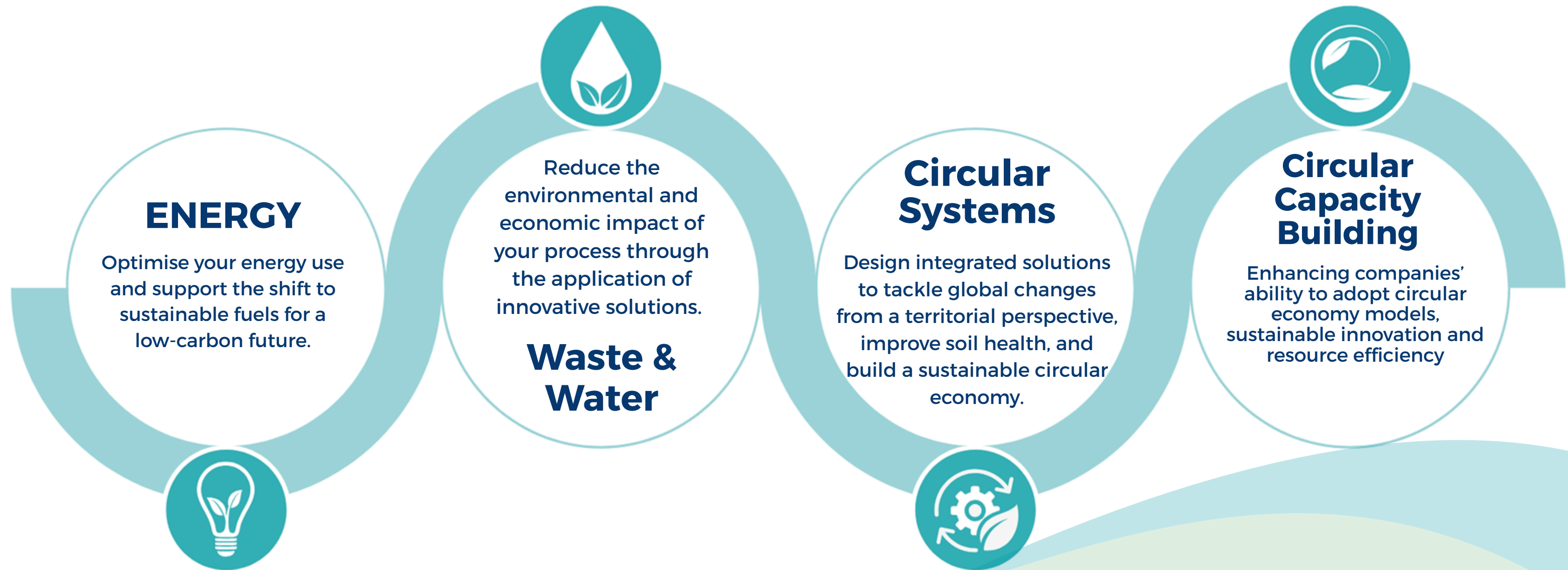
SPEAKER: Almudena Sánchez | almudena.sanchez@cetenma.es

ROLE: Innovation Strategist | EU Funding & Partnerships



The Technology Centre for Energy and the Environment, CETENMA, is a **private, non-profit Business Association**, which was set up to **support companies with technological research, development and innovation**, assisting them in becoming more competitive

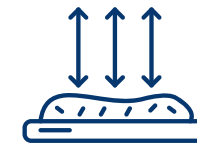
OUR R&D



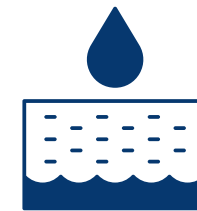
REGION CONTEXT



Europe's driest corner | 150-300 mm/y



Poor and degraded soils



Irrigated agriculture using water from an aquifer **(Almeria; now desalinisation) and transfer from Tagus river (Murcia)**



Very strong, sophisticated and innovative agriculture sector



ENVIRONMENTAL IMPACTS

If Almería is one of the driest places in Europe, how can it have so many greenhouses?

Because in the 1960s people started taking water from a big underground reservoir. At first it worked, **but over the years the water level dropped, salty sea water entered, and the soil and water became saltier.**

Now they use desalination plants and grow crops that can live with salty water to keep farming going



In 40 years, an area of around **20,000 hectares** has been transformed into a **giant greenhouse**, producing millions of tons of vegetables for export to both Europe and the rest of the world. The number and volume of greenhouses are so high that they are clearly visible from space, giving the area its nickname: "the sea of greenhouses." Copernicus

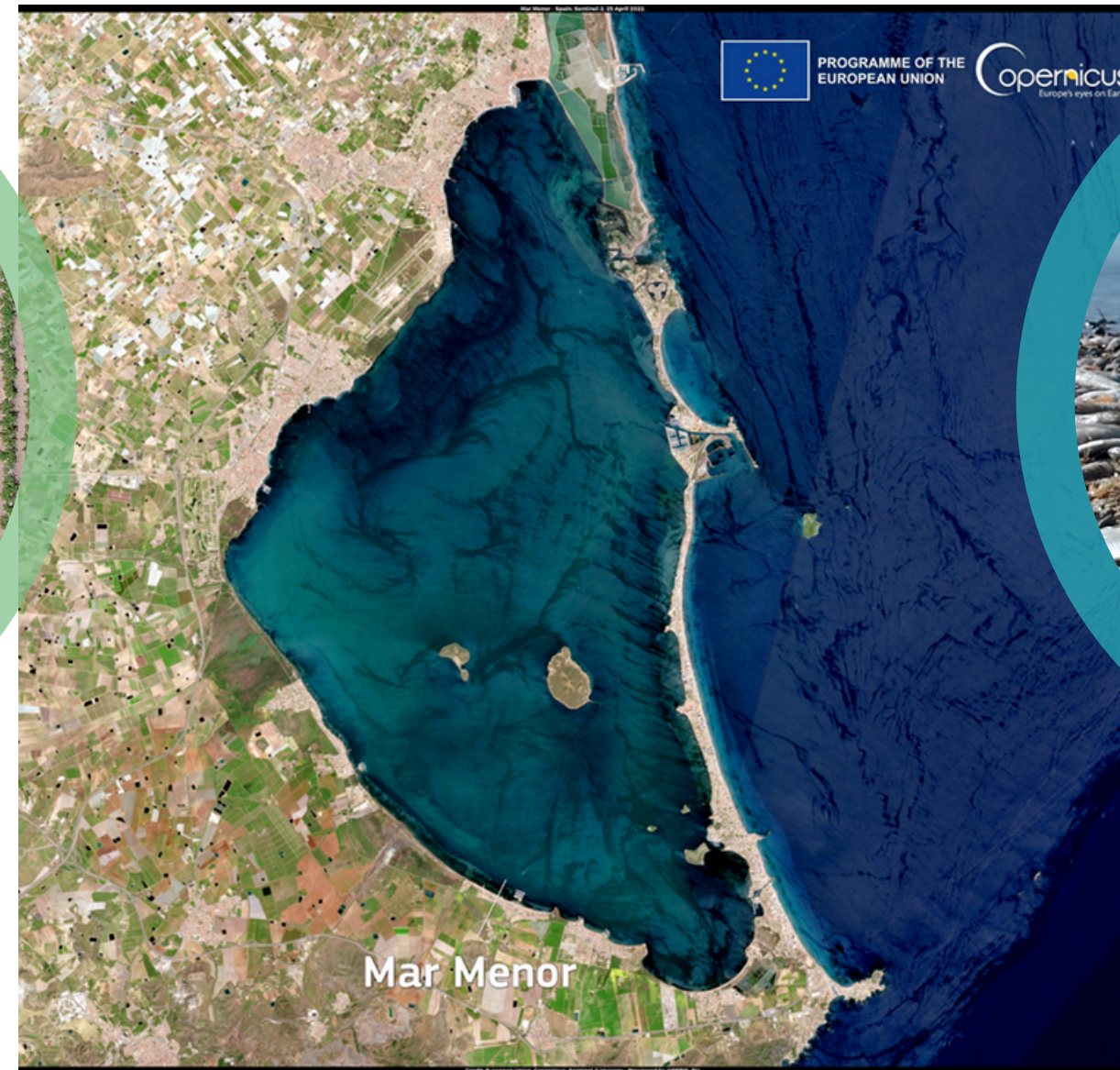
Why is the Mar Menor, Europe's largest salt lagoon, now so polluted?

SOIL IMPACTS



- **Tajo water transfer** → irrigation farming replaces traditional dryland crops.
- **Nutrient depletion** → soil loses organic matter and key nutrients, rarely restored.
- **Heavy machinery** → compacts soil, reducing natural structure.
- **Salinisation & contamination** → salts and chemicals build up in soil and water.
- **Biodiversity loss** → habitats and species decline.
- **Soil as contaminant** → intensive use of pesticides, herbicides and fertilisers adds persistent organic compounds and nutrients that leach into the lagoon.

REGION OF MURCIA



SEA IMPACTS



EUTROPHICATION

- **Too much fertiliser** → extra nitrogen and phosphorus stay in soil or run off with rain.
- **Nutrients reach the lagoon** → algae grow fast.
- **Algae die** → dead matter feeds bacteria.
- **Bacteria use oxygen** → oxygen drops, fish and other life suffocate.

OUR RELATED BACKGROUND

CO-CREATING INNOVATIVE SOLUTIONS TO RESTORE SOIL HEALTH ACROSS EUROPE



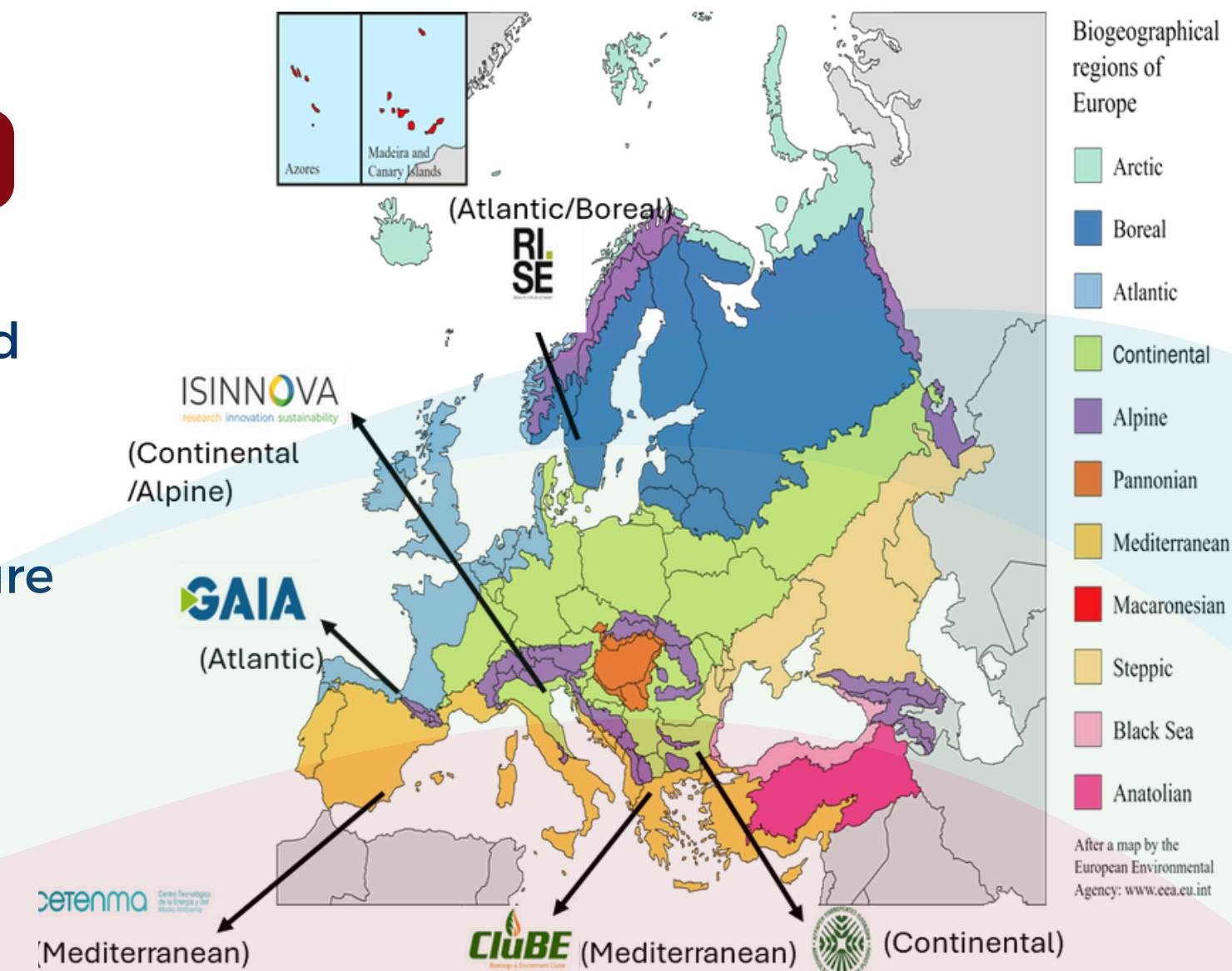
- HORIZON-MISS-2023-SOIL-01-08
- RIA, 12M€ - START: 1 SEPT 2024; 48M | 37 Partners + 4 associates
- Coordinator: RI.SE (Research institute of Sweden)

FSTP: LLs OPEN CALL - Cascade Funding, 2 open calls | 900.000€

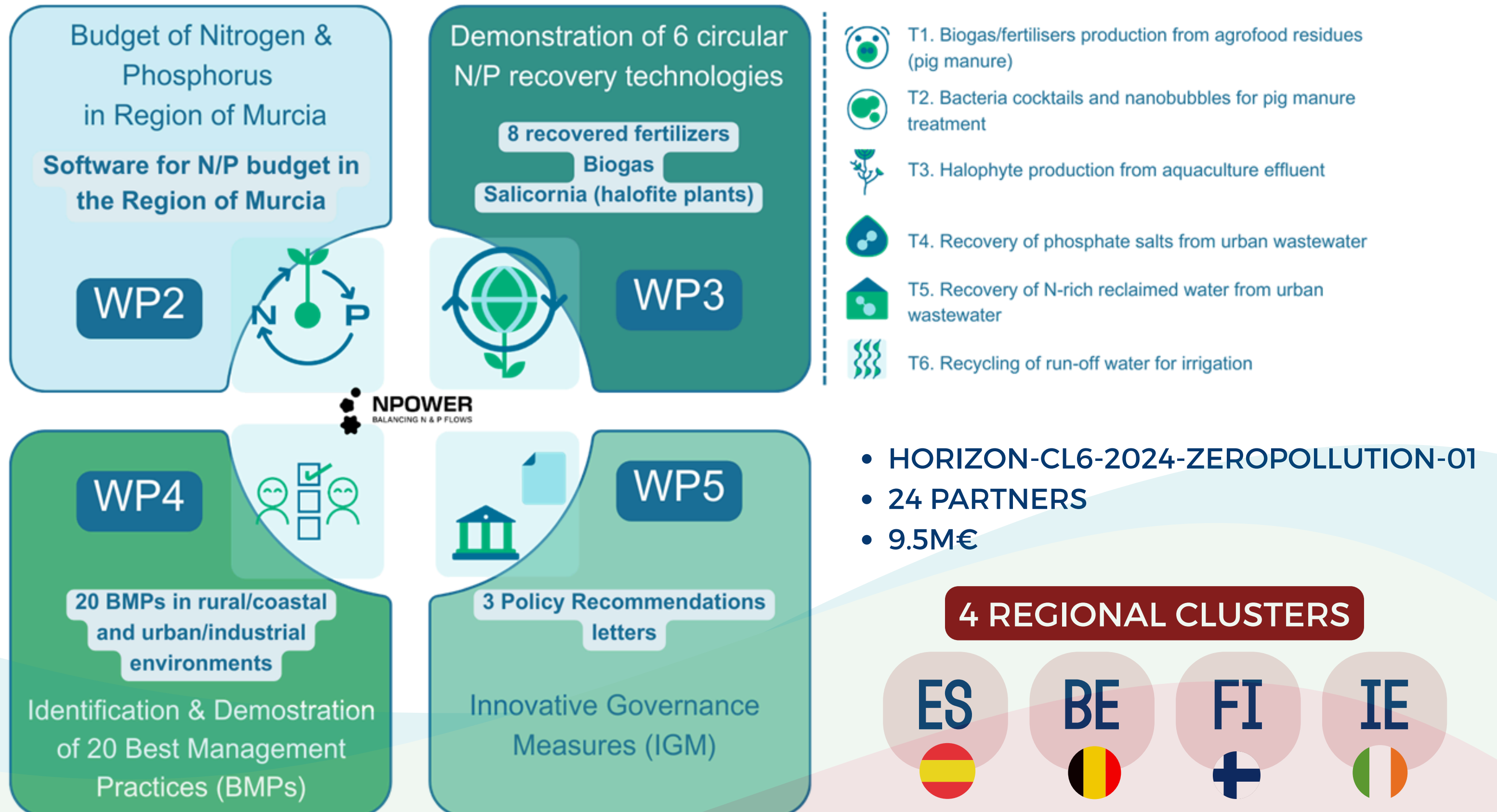
+12 NEW LIVING LABS

CETENMA ROLE: soil health monitoring and evaluation framework

- Catalogue of HEALTH soil indicators
- Web application and dataset architecture



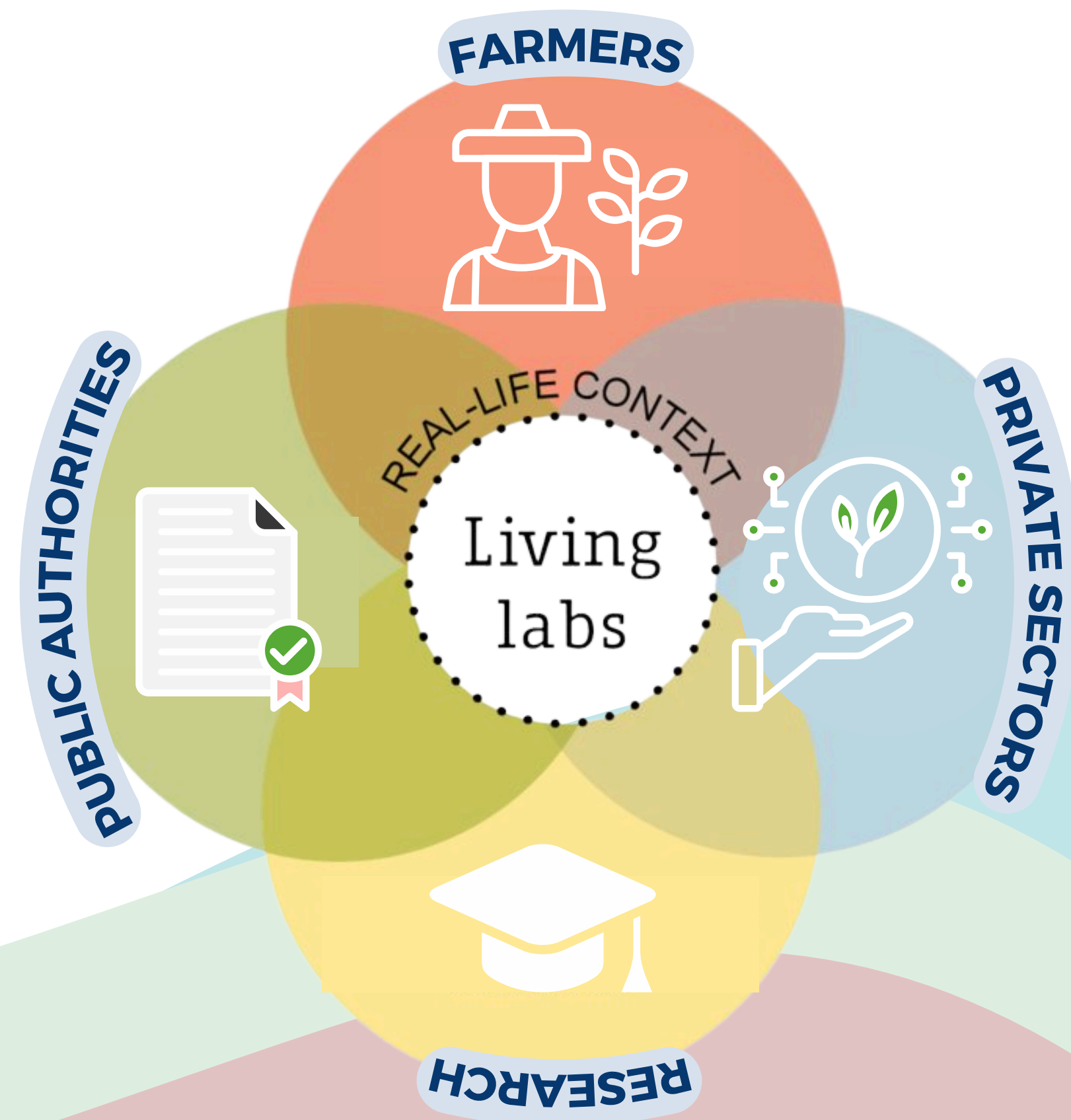
BALANCING NITROGEN AND PHOSPHORUS FLOWS BY BUDGETING AT REGIONAL SCALE



TO PUT TOGETHER THOSE INITIATIVES AND MUCH MORE... WE HAVE CREATED A SOIL LIVING LAB

What a LIVING LAB (LL) is?

- The European Commission defines a **Soil Living Lab** as an **open space for innovation** carried out in **real conditions**.
- It brings together **farmers, researchers, companies, citizens and public authorities** to co-create and test new solutions for soil health.
- Unlike a normal research plot, a living lab **works with real farms and real communities**, so results are practical and easy to adopt.
- Each lab also **measures and shares data**, so the knowledge can help other regions across Europe.



CO-CREATION SPACE FOR IN SITU TESTING OF GREEN INNOVATIVE SOLUTIONS UNDER MEDITERRANEAN ENVIRONMENTS

What we offer through the Living Lab?

Region of Murcia & Almeria

- LAB and DEMO experimentation facilities
- Access to key stakeholders and sources of funding
- Field sites to test under Mediterranean environments
- Support to define the solutions to be tested
- Tools to evaluate the impact of solutions
- Organisation of co-creation activities



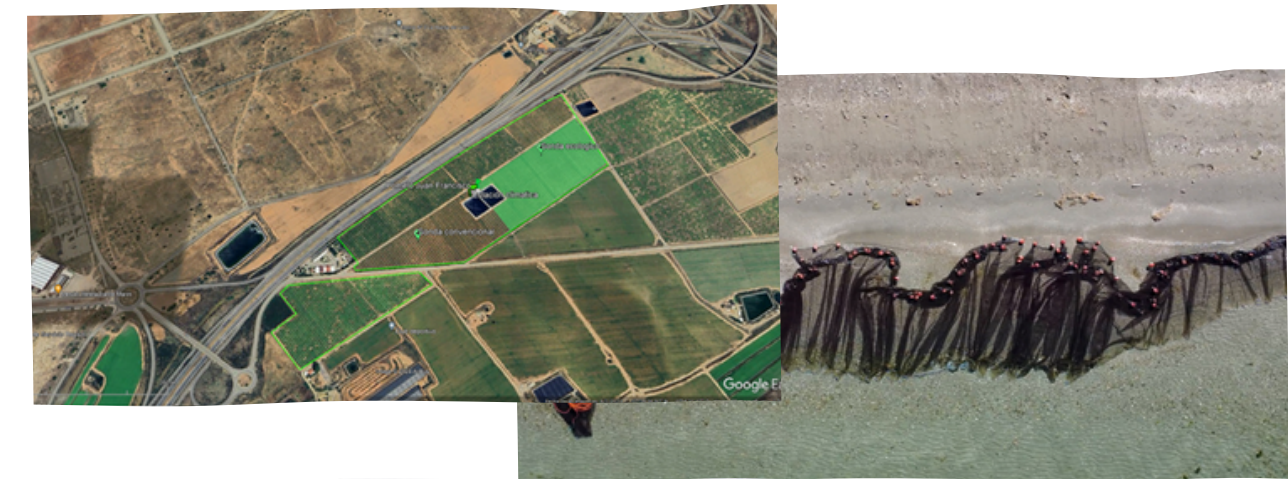
GOOD PRACTICES IN ACTION | EXAMPLES

TESTING SMART PRECISION-TECH TO CUT NUTRIENT WASTE



We're piloting **real-time soil-sensor technology** that maps the exact nutrient budget of each plot.

This lets farmers deliver **only the fertiliser the soil truly needs**, reducing costs, avoiding runoff and protecting the Mar Menor from eutrophication.



PEST CONTROL | NEMATODE MANAGEMENT



We're **testing crop rotation combined with biosolarisation**, a natural soil-disinfection method that uses sunlight and organic matter.

This approach breaks pest cycles, controls nematodes without chemicals, and keeps soils healthy while cutting pesticide use - protecting the MAR MENOR.



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THANK YOU FOR LISTENING!



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