

## Partners



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## Project details

**Grant Agreement Number:** 101091980

**Project Full Title:** Single photon source and detector based on novel materials for the detection of endocrine disruptors

**Project Acronym:** GREENER

**Topic:** HORIZON-CL4-2022-RESILIENCE-01-10

**Type of action:** HORIZON-RIA

**Granting authority:** HADEA

**Start date:** 01 January 2023

**Duration:** 36 months

**EU Contribution:** 3.759.104,00 Euro

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# GREENER

Single photon source and detector based  
on novel materials for the detection of  
endocrine disruptors



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## Project

GREENER aims to help water monitoring with new compact spectrometer technology that can measure extremely low concentrations of **contaminants in water**, including hormones that remains a major problem worldwide, posing a significant **health risk to humans and animals**.

This marks the **first time that an electrically pumped, quantum dot based single photon source, which operates at room temperature, has been applied to spectral sensing**, taking advantage of the significant noise reduction provided by the spectrometer system including intelligent data processing and AI algorithms, thus enabling a low-noise detection method.



## Objectives



Development of new, environmentally friendly quantum dots (QDs) capable of emission at wavelengths up to 2  $\mu\text{m}$



Optimization of DNA origami based heterogeneous integration technology on wafer level for singulation of QDs



Development of electrically driven QD based single photon source and detector for noise-reduced absorption measurement



Development of a suitable AI-assisted data processing



Validation of the optical device for the absorption measurement of relevant hormone concentrations in water

## Impacts

The resulting biosensor will be evaluated for the **detection of critical (endocrine disrupting) contaminants in water in fisheries and aquaponics**.

The GREENER project's innovative technology will revolutionize the **water monitoring industry**, providing an **environmentally friendly and cost-effective solution** that can be used by anyone to monitor water safety and quality.

The innovative use of quantum technology in spectral sensing marks a significant step forward in the field of water monitoring and significantly to protecting our **natural resources** and improving public health.

A New Compact spectrometer technology