Removing contaminants of emerging concern from water streams

Innovative and versatile integrated solution to remove emerging pollutants in water treatment systems

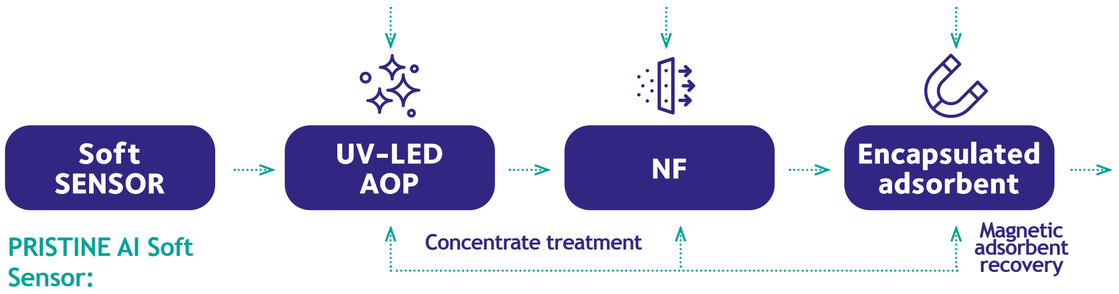
LIFE PRISTINE is postulated as a sustainable alternative to guarantee the elimination of contaminants of emerging concern (CECs) from the integral water cycle. To do so, LIFE PRISTINE integrates water treatment processes and digital tools based on artificial intelligence in a unique solution designed for the elimination CECs in drinking water and wastewater.

The integrated and versatile PRISTINE solution will be demonstrated in two operational environments, representing real water treatment plants, in order to facilitate subsequent full-scale implementation.

1. Encapsulated adsorbents
2. Hollow-fibre nanofiltration membranes
3. Advanced Oxidation UV-LED reactor
4. Artificial intelligence based soft sensors

PRISTINE Solution

The PRISTINE solution aims to remove CECs in a more sustainable and cost-effective way. Thereby CECs in the water environment shall not only be relocated into other media and waste streams, but the release of CECs to the water cycle shall be permanently reduced.



PRISTINE AI Soft Sensor:

- Based on AI techniques
- To estimate CECs concentration levels (15-20% of deviation) based on available (online/offline) measurements

PRISTINE AOP technologies:

- UV-LED:
  - Low energy
  - Flexible smart design
  - Instantaneous activation (<1 sec) > treatment train can be selected based on real-time influent data
- H_2O_2/O_3 residue-free empowering reagents
- CECs destruction in feed water & NF concentrate

PRISTINE hollow-fibre nanofiltration:

- Low energy (<0.3 kWh/m^3) requierements
- Low fouling, footprint and maintenance requirements
- Chemical-free process
- Concentrate to be treated by AOP or adsorption

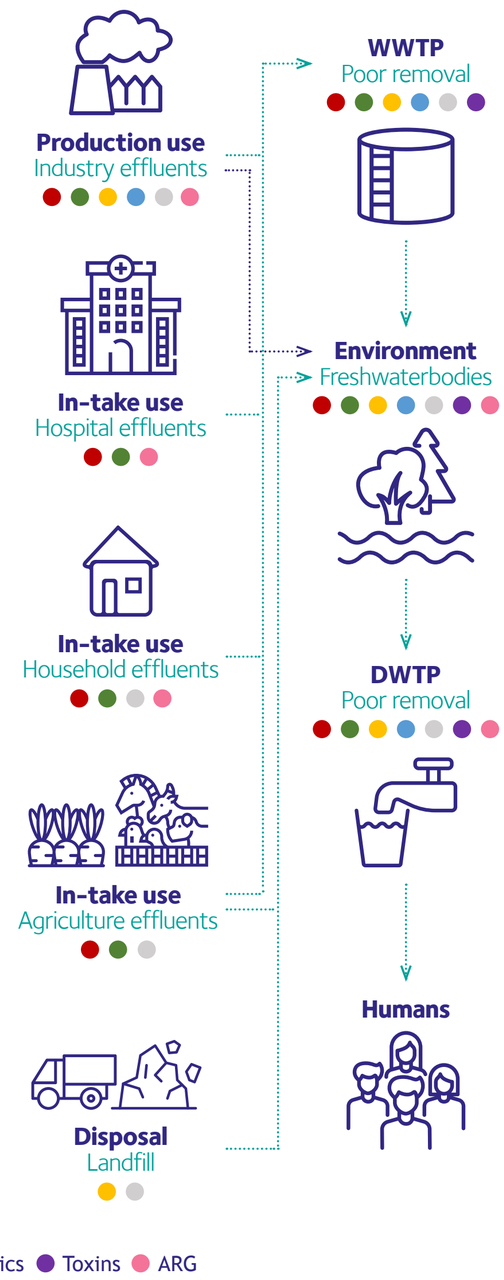
PRISTINE encapsulated adsorbent:

- Customised for wide-range CECs adsorption
- Resistance to abrasion
- Material losses <2% because of magnetic recovery

What are Contaminants of Emerging Concern (CECs)?

Contaminants of emerging concern (CECs) are compounds of different origin and chemical nature that are disseminated in the environment, in concentrations so low that they make their detection difficult. Relatively little is known in terms of their presence, impact and elimination.

LIFE PRISTINE will focus on perfluoroalkyl and polyfluoroalkyl substances (PFAS), pesticides, pharmaceuticals and personal care products, toxins, antibiotic resistance genes and microplastics as the main families of emerging contaminants.



LIFE PRISTINE main goal is to eliminate emerging pollutants from the integral water cycle, one of the essential measures to promote high-quality water resources in the face of water scarcity, a problem that affects to more than 2.8 billion people around the world.

eurecat.org/en/portfolio-items/life-pristine

@PRISTINE_eu

LIFE PRISTINE

lifepristineproject@gmail.com

Co-funded by the European Union