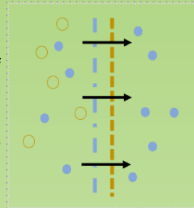


# Nutrient Recycling Community



## Membrane based systems

A broad and highly versatile **technology package** mainly applied as a **separation technology** for different liquid effluents. A wide variety of membrane systems available in the market are commonly included in biorefining processes and particularly in nutrient recovery: pressure driven processes, such as **micro-, ultra- or nano-filtration** and **reverse osmosis (RO)**; or membranes working under electric potential gradient such as **electrodialysis (ED)**.



### Potential products

- Bio-based fertilisers (nutrient concentrates, Selective separation of the compound of interest with ED)
- Green chemicals (acids)
- Clean water (Biosecurity of permeate experimentally quite demonstrate)

### Key challenges to be addressed:

- Energy consumption and economics
- Membrane fouling that might require aggressive cleans (depending on the membrane material)
- Legal restrictions and gaps on the re-use of the reclaimed water. Limited demonstration of virus removal, no information on prions removal so far
- Treatment of complex mixtures including charged particles and colloids and their interaction with the membrane
- Difficulties to find providers of membranes with specific characteristics

### Innovative applications raised by speakers:

- Use of ceramic membranes and membrane coatings to reduce membrane fouling and costs
- Selective separation of compounds (nutrients, organic acids) with ED process



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