

# Recovery and utilisation of nutrients for low impact fertiliser



## Circular economy to safeguard food production and water resources

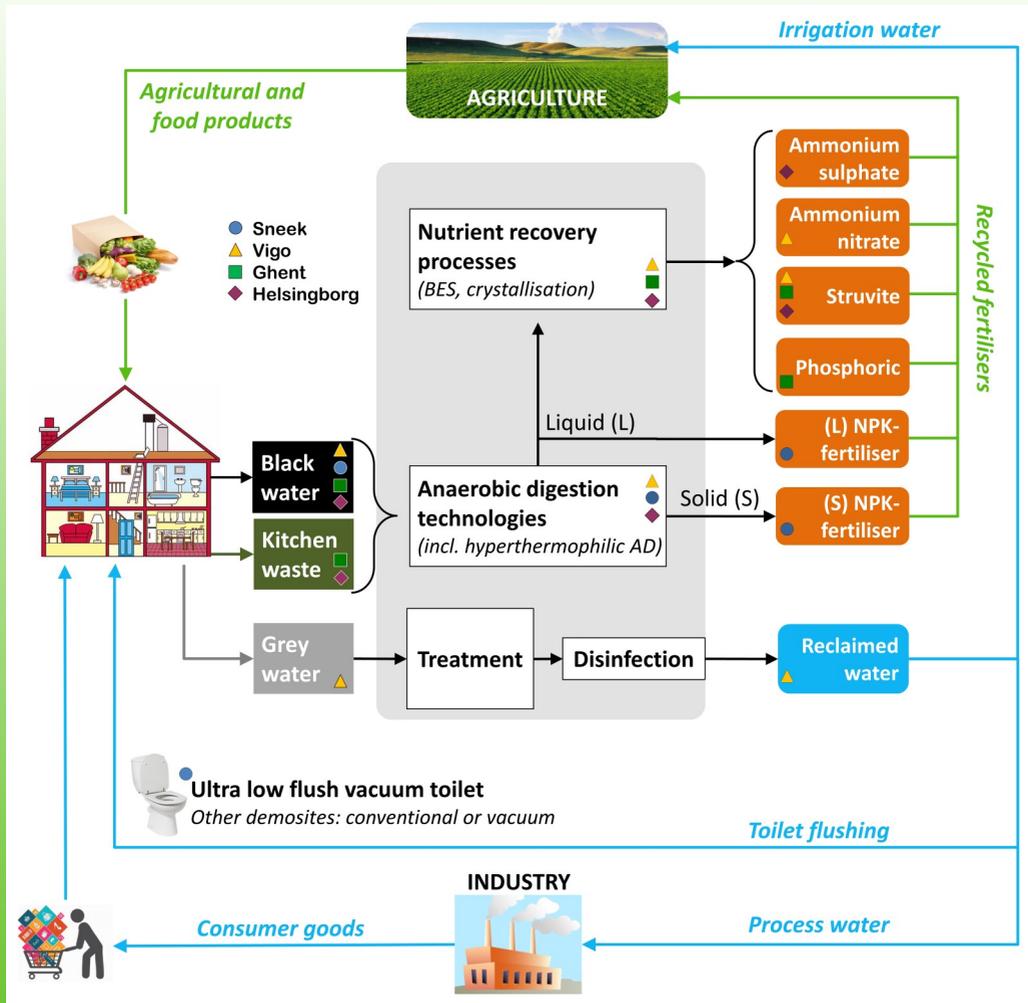
Run4Life proposes decentralised nutrient recovery from domestic wastewater at the source, for application in agriculture. This radical change opens a new paradigm in society. The world food supply is entirely dependent on the use of fertilisers. However, current fertiliser production practices are not sustainable. Domestic wastewater is an important carrier of resources, which are hardly recovered in the current centralised wastewater management systems.

Run4Life demonstrates an alternative strategy for improving nutrient recovery, based on a decentralised treatment of segregated domestic wastewater streams and organic kitchen waste at 4 sites in Europe. Different innovative technologies are combined to achieve this goal. In collaboration with key end-users included in the consortium and other stakeholders, the resulting products will be characterised and the possibilities for their agricultural application will be determined.

End users and other stakeholders along the value chain are fundamental in achieving institutional, legal and social acceptance as well as the market uptake of Run4Life technologies and products. This will be achieved through an engagement strategy that incorporates measures such as knowledge brokerage activities.



# Technologies and products in Run4Life



## Objectives

Improve innovative nutrient recovery technologies

Demonstrate large scale nutrient recycling from domestic wastewater

# Demonstrated at large scale at 4 sites in Europe

## ● Sneek, The Netherlands



- » Ultra low flush vacuum toilets for production of concentrated black water.
- » Hyper thermophilic anaerobic digestion at 70°C aimed at obtaining safe fertilisers in a one-step energy positive treatment.
- » Recovery of hygienised organic liquid and solid (NPK) fertilizer.
- » Optimisation of product recovery in cooperation with fertilizer company.

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## ▲ Vigo, Spain



- » Grey water recycling system (already present): effluent for toilet flushing.
- » Black water treated in anaerobic MBR (compared to aerobic MBR).
- » Anaerobic effluent processed in innovative nutrient recovery technologies e.g. bio-electrical systems, recovery of ammonium nitrate and struvite.
- » Integrated value chain with online monitoring tool.

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## ■ Ghent, Belgium



- » Segregated black water+ kitchen waste will be processed in an anaerobic system. Grey water will be treated in a system not included in Run4Life.
- » Recovery of struvite and phosphoric acid.

120



## ◆ Helsingborg, Sweden



- » Separate treatment of black water and kitchen waste
- » BW and KW will be treated in an anaerobic system for energy recovery
- » Ammonium sulphate and struvite will be recovered

320



Evaluate impacts on environment, society and economy

Promote full product acceptance and review legal framework

Implement a value chain for the products, including new business models

## A joint force of 15 well-matched partners

The Run4Life consortium represents the entire value chain, consisting of universities, research centres, technology providers, public utilities, end users, experts in social sciences and specialists in innovation and market uptake of new technologies. This optimal combination of partners increases the market success of the proposed solutions and enhances social acceptance.

