

# Legal and Regulatory framework Workshop


2<sup>nd</sup> December 2019




## Run4Life project introduction

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*Run4Life GA M30  
Gent, 2<sup>nd</sup> December 2019*

The Run4Life project receives funding from the EU Horizon 2020  
Research and Innovation programme, under G.A. No 730285.

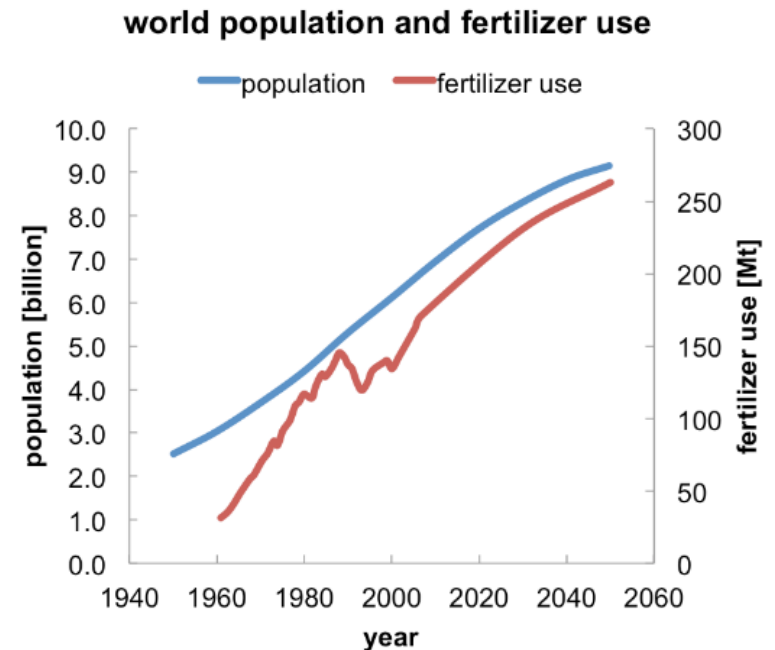
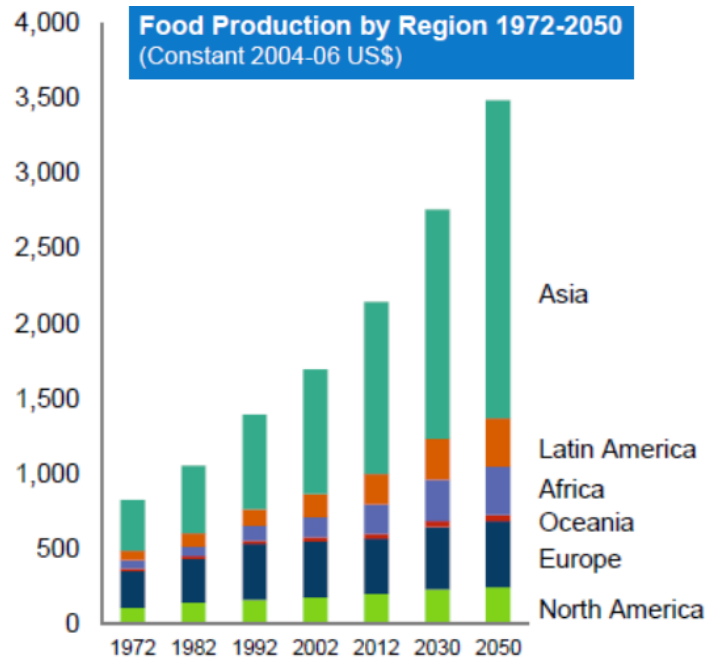


## SUSTAINABLE DEVELOPMENT GOALS



- Related to natural resources

- Growth and urbanisation of population ↑
- Global demand for food ↑
- Demand for fertilisers ↑

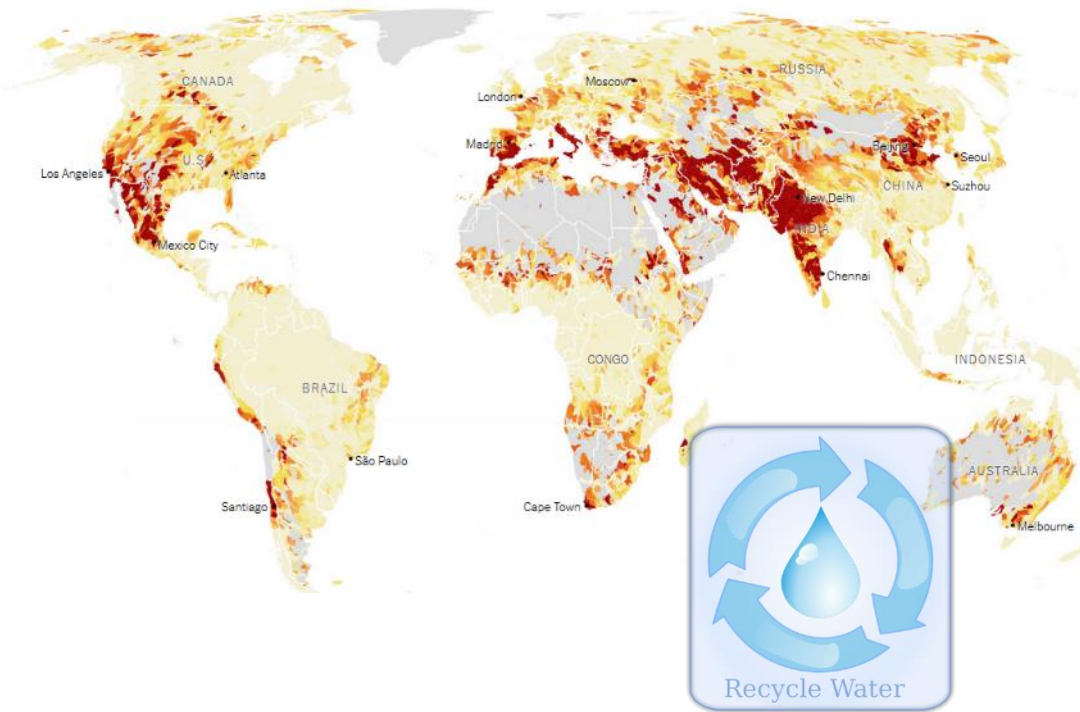


The New York Times

## A Quarter of Humanity Faces Looming Water Crises

By Somini Sengupta and Weiyi Cai Aug. 6, 2019

Water stress level Low Low to medium Medium to high High Extremely high No data



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### The 11 cities most likely to run out of drinking water - like Cape Town

© 11 February 2018

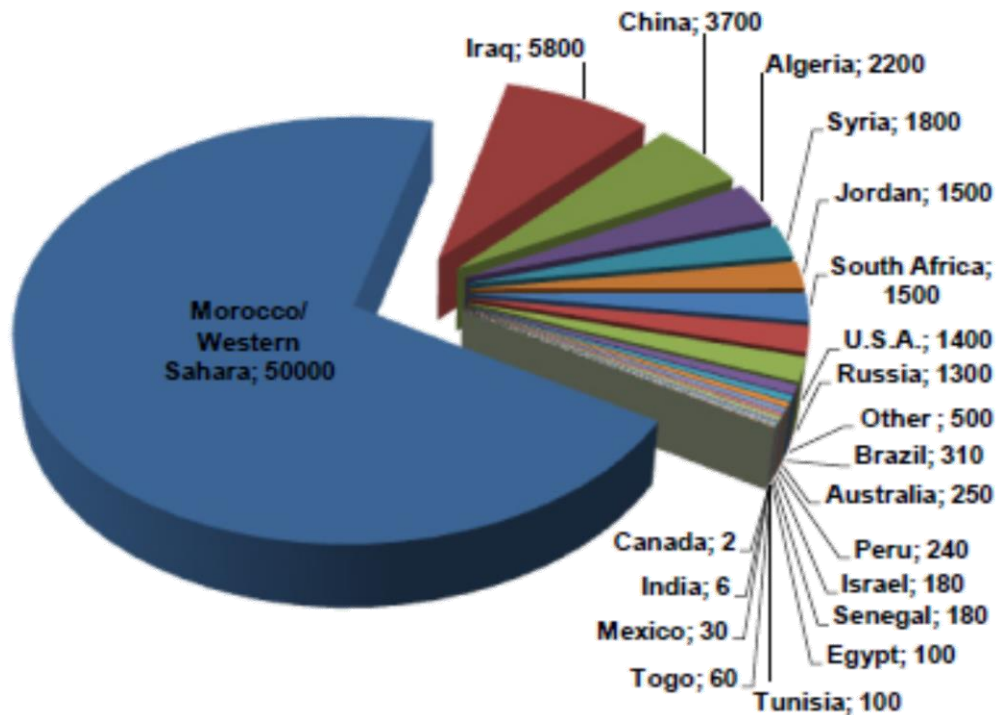
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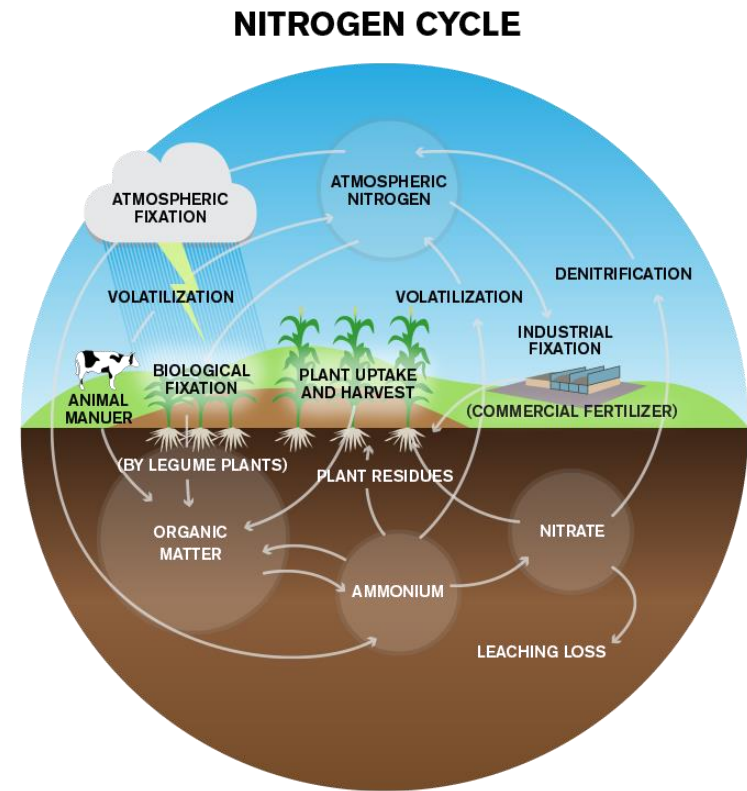
A quarter of the world's major cities face a situation of water stress



- Phosphorus. No renewable. Localised reserves.
- Nitrogen: “Fertilizer from air” but highly energy demanding

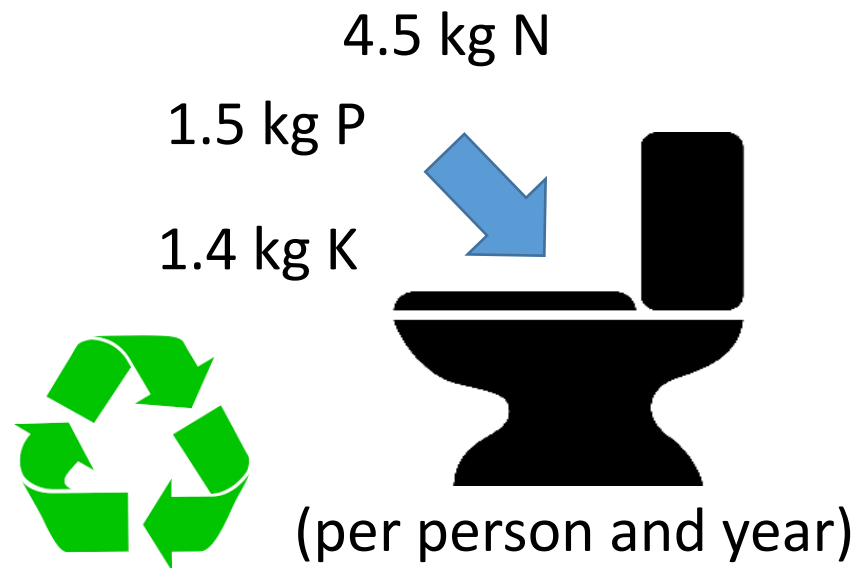


Worldwide P reserves in millions of tonnes.  
Data from: U.S. Geological Survey (2012).





- Annual costs of pollution by N from agriculture: \$210 billion (US) and €320 billion (EU)
- Environmental costs related to nutrients in wastewaters and agriculture runoff



- Conventional, centralised and linear approach: old concept of *Cloaca Maxima*

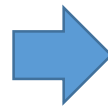


Only recover a small fraction of diluted nutrients



[Cloaca Maxima From: Wikipédia](#)

- Municipal WWTP removes 80-90% of the P and >70% of N to fulfil discharge limits



At considerable expense (5 kWh/kg N)



From Wikimedia Commons. US [Department of Agriculture](#)

- Highly diluted municipal WW



Nutrient recovery very limited

- To apply nutrient recovery **at the source**, increasing **recuperation** rates by treating **concentrated streams**.

Attractive alternative where:

- centralised system do not exist (e.g. rural/isolated areas, new buildings and developments and new cities in developing countries)
- existing sewerage is old/leaky and its replacement/upgrade is too costly
- existing WWTPs are overloaded



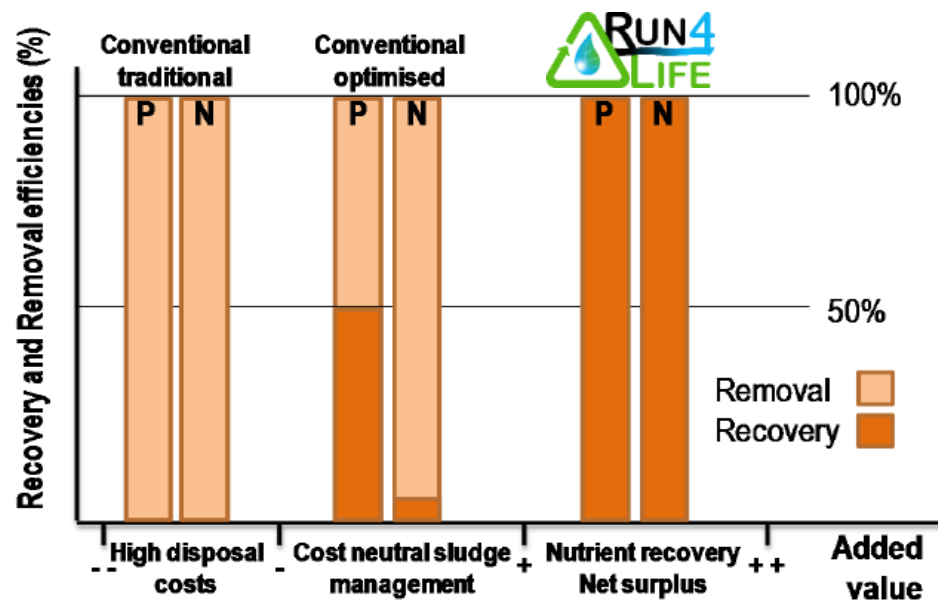


Three strategies:

1. Separation of streams at source for process optimization
2. Technological innovations applied at various points of the process
3. Business Model innovation

... to achieve:

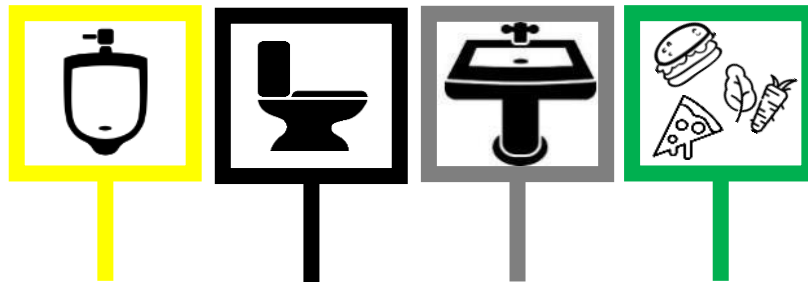
- 2 fold P recovery
- 15 fold N recovery



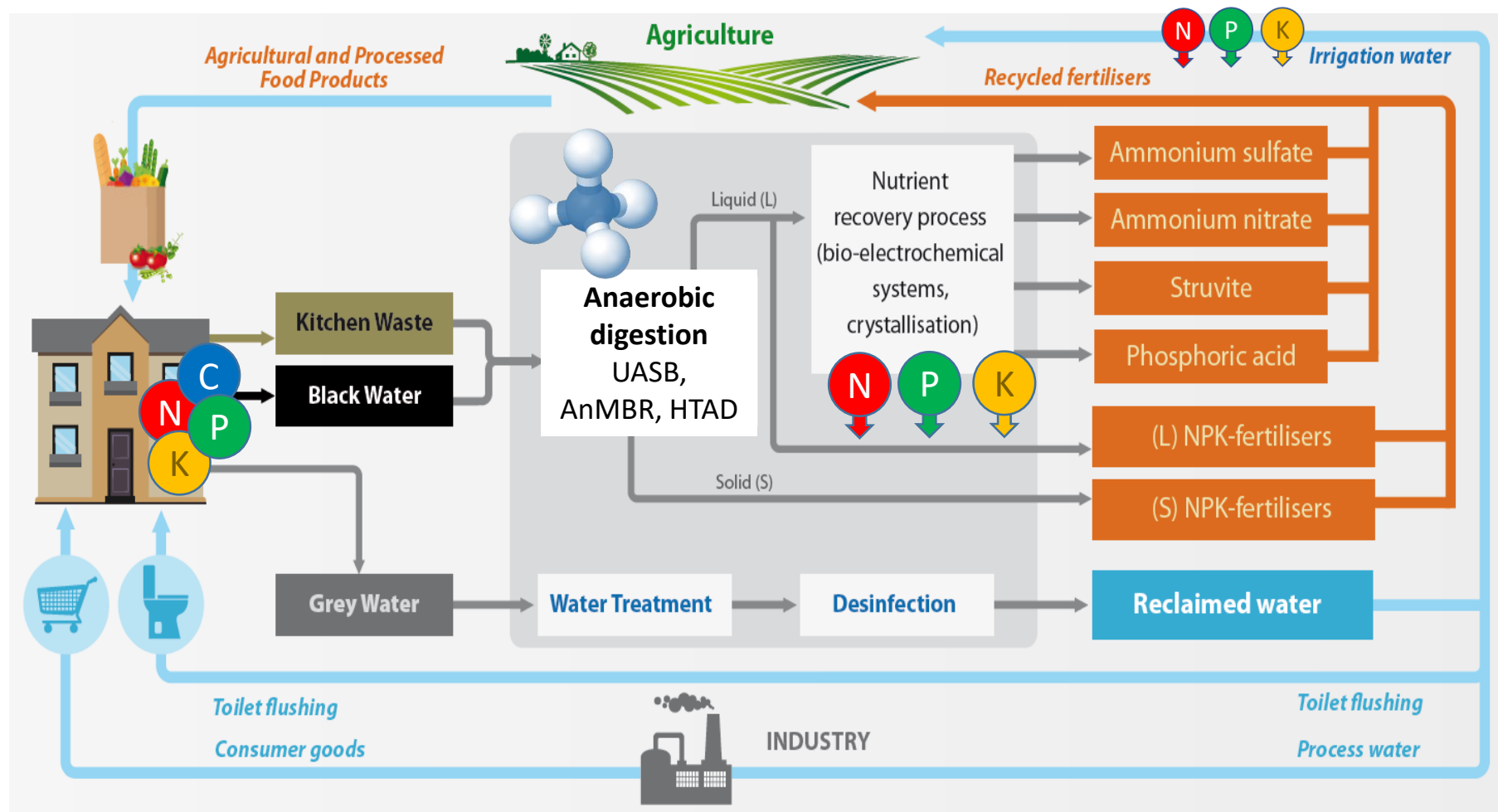


**Black water (BW)** comes from toilets, mainly containing faeces and urine. It presents the majority of the P and N in household WW, which can be recovered as highly valuable fertiliser products.

**Grey water (GW)** comes mainly from shower and laundry activities. Its low nutrient concentration makes more suitable for reuse and obtaining reclaimed water.



**Kitchen waste (KW)** contains a high percentage of the domestic-generated P and N, as well as most of the organic material in a relatively small volume.



**Potentially recycling up to 100% of the nutrients present in household  
WW and organic KW (N, P, K and micronutrients)  
Recovering >90% of GW as reclaimed water  
Energy Positive and Carbon Neutral**

Nutrient recovery processes can be tailored to specific local priorities and will be slightly varied to adapt Run4Life to local conditions and requirements

**Break barriers to implementation: market uptake of products and  
social acceptance,**

**Necessity of further developments in technological, legal and  
end-user aspects.**



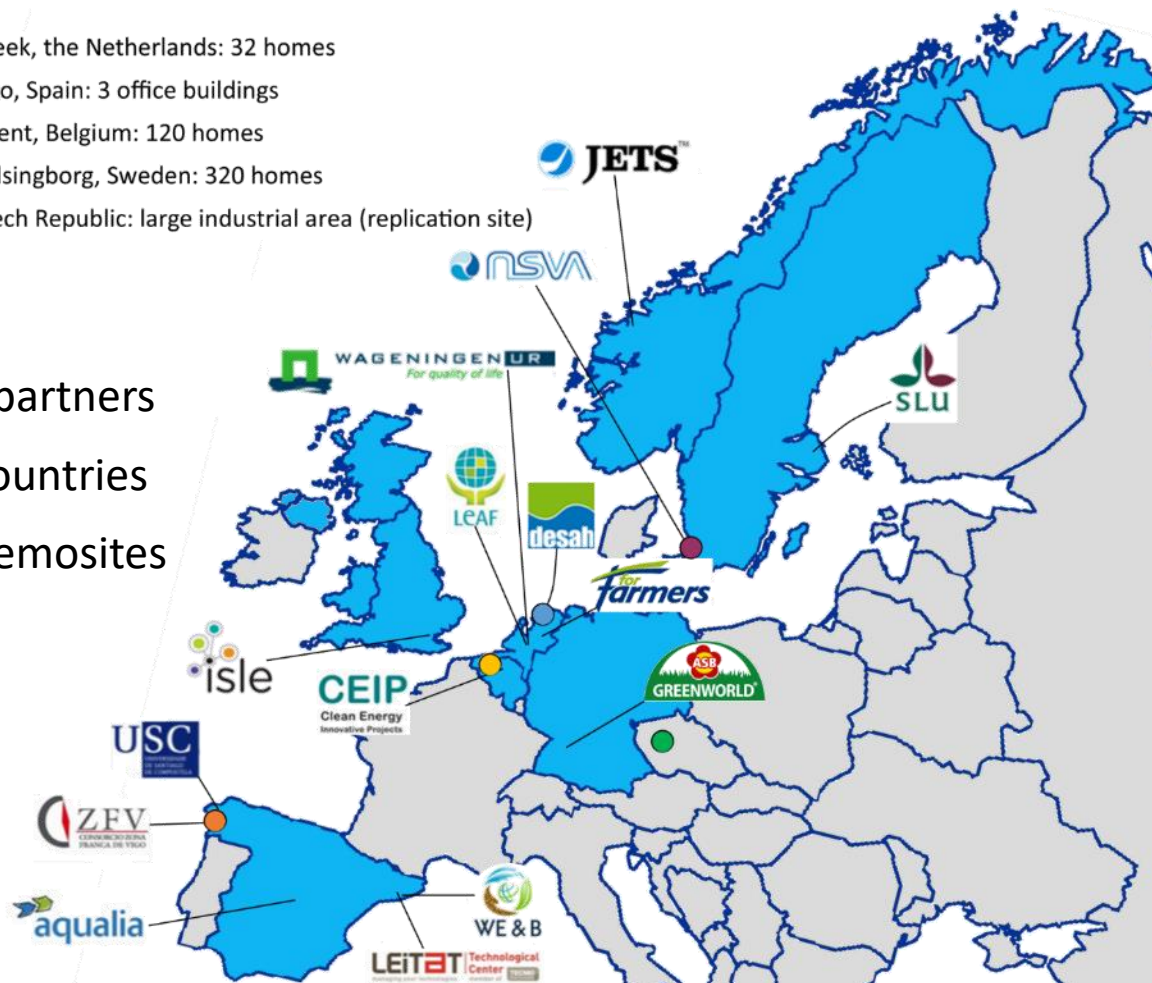
- 15 partners
- 7 countries
- 4 demosites



June 2017

May 2021

- Sneek, the Netherlands: 32 homes
- Vigo, Spain: 3 office buildings
- Ghent, Belgium: 120 homes
- Helsingborg, Sweden: 320 homes
- Czech Republic: large industrial area (replication site)





## Sneek, The Netherlands

- Ultra low flush vacuum toilets for production of concentrated black water
- Hyperthermophilic anaerobic digestion at 70°C aimed at obtaining safe fertilizers 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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## Helsingborg, Sweden

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

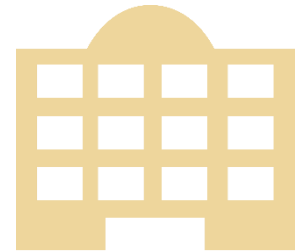
320



## Vigo, Spain

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

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## Ghent, Belgium

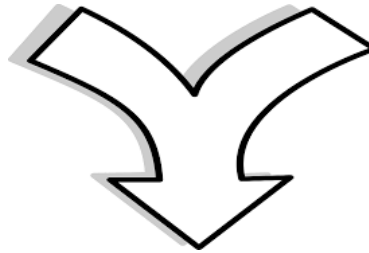
- Segregated black water (conventional vacuum toilet) + kitchen waste processed in an anaerobic system.
- Grey water treated (in a system not included in Run4Life).
- Recovery of struvite and phosphoric acid
- Heat recovery from WW
- Water recovery for industry

420

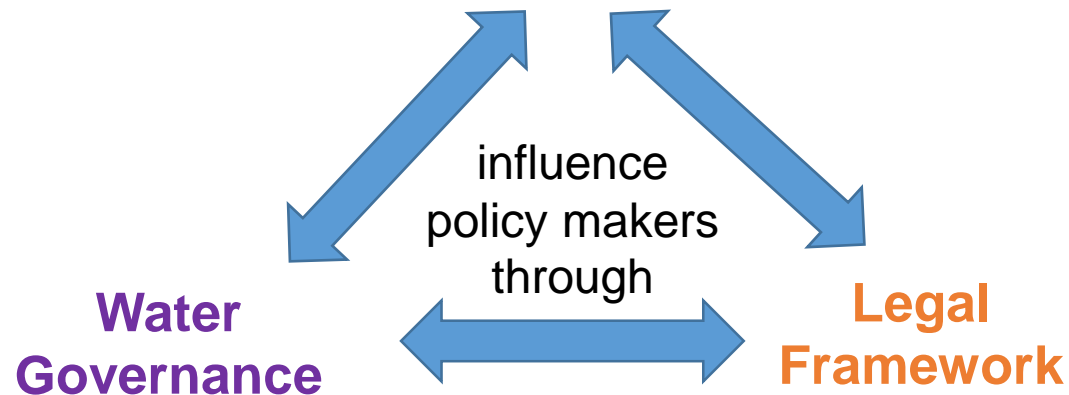


Environmental, Technical  
and Health Assessment

End-users'  
perspective



**Social Acceptance**



## Kitchen waste grinder

The New York Times

### *Only in New York: Garbage Disposers, Banned, Stir Debate*

By Michael Specter

June 22, 1992

## THE IRISH TIMES

Sat, Nov 30, 2019

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### Houseworks: Is it okay to have a food waste disposer?

These under-sink units don't take up much space – and they eat up food waste

© Sat, Jan 26, 2019, 00:00

Liz Dwyer



Personalizar el tiempo

30 de Noviembre de 2019

## DIARIO DE NAVARRA

Buscar en DN.es



Navarra > Pamplona y Comarca > Pamplona

### Las trituradoras domésticas están prohibidas

Mancomunidad detecta en redes y fosas sépticas desechos procedentes de estos aparatos que causan problemas

(Domestic waste disposers are prohibited)

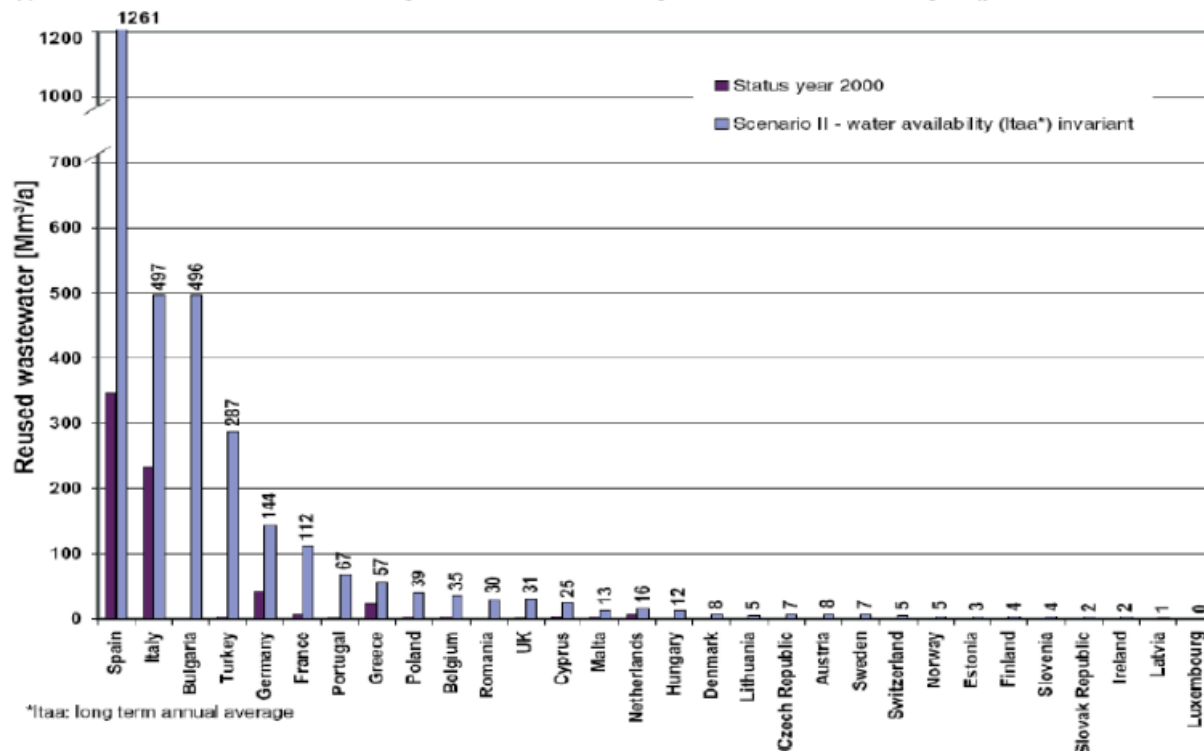


## Decentralized treatment: Waste water taxes Water reclamation and reuse

In 2018 only six Member States had standards that defined minimum requirements for the reclaimed water before it can be reused for e.g. irrigation in agriculture, urban or recreational uses

( )

Figure 1: Wastewater reuse potential in European countries on projection horizon 2025



Source: Scenario II of AQUAREC project cited in BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I, p. 32.



## Decentralized treatment: Waste water taxes Water reclamation and reuse



Brussels, 17 June 2019  
(OR. en)

10278/19

Interinstitutional File:  
2018/0169(COD)

ENV 575  
SAN 301  
CONSOM 185  
AGRI 300  
CODEC 1218

### NOTE

From:	General Secretariat of the Council
To:	Council
No. prev. doc.:	9909/19
No. Cion doc.:	9498/18 + ADD 1 - COM(2018) 337 final - Annex
Subject:	Proposal for a Regulation of the European Parliament and of the Council on minimum requirements for water reuse
	- General approach

## How to promote Greywater and Blackwater segregation?

## Water reuse and Fertirrigation?

## Fertilizers from wastewater?

### End-of-waste criteria

The drawing up of end-of-waste criteria consists of thorough techno-economic-environmental assessments that verify when the recyclable waste material is safe for the environment and is of a high enough quality to no longer have to be classified as waste.

### 2019: EU Fertilising Products

Regulation (Official Journal of the European Union, L 170, 25 June 2019)

European Sustainable Phosphorus Platform

NSSR Paris 7/10/2016 - 8

[www.phosphorusplatform.eu](http://www.phosphorusplatform.eu)

### Regulatory status of struvite as fertiliser

		Documents ?
Germany	Authorised ?	Sold as 'partially solubilised rock phosphate'?
NL	Authorised by Law 29/3/16	Online*
Flanders	Authorised by Ministry letter	Online*
Denmark	Authorised by Ministry letter	Online*
UK	Authorised	No documents to date
France	NOT authorised	
Spain	NOT authorised	
USA	Federal? States?	No documents to date
Canada	Federal? States?	No documents to date

\* See [www.phosphorusplatform.eu/regulatory](http://www.phosphorusplatform.eu/regulatory)

European Sustainable Phosphorus Platform

### EU Fertilisers Regulation:

To the best of our understanding, as expected at 15/12/18

in? or out?	Sewage	Manure + Cat 2 & 3 ABPs	Cat1 ABPs	Plant materials	Food waste / biowaste	Food industry
CMC2: plant materials	X	X	X	✓	X	X
CMC3: compost	X	✓	X	✓	✓	?
CMC4: "energy crop" digestate	X	X	X	(✓)	X	X
CMC5: other digestate	X	✓	X	✓	✓	?
CMC6: food-industry by-products	X	X	X	✓ (added)	X	X (only lime, molasses, vinasse, distillers grains)
CMC11: animal by-products	Undefined empty box ..... (but already included in CMC3, CMC5, STRUBIAS ...)					
STRUBIAS P-salts	✓	✓ (sterilised ?)	X	✓	✓	✓
STRUBIAS ashes (inc. used as fertiliser process ingredient)	✓	✓	X	✓	✓	✓
STRUBIAS biochars etc	X	✓	X	✓	✓	?

- n°1



