



**Desah BV**



# Technologies for Sustainable Decentralised Treatment



**Paraschos Chatzopoulos**  
R&D Process Engineer

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# DeSaH B.V.



- Sustainable and innovative (C2C) Sanitation
- Track record with New Sanitation projects
- Close cooperation with knowledge institutes (Wetsus, WUR, UGENT)
- Partner in multiple innovation projects (regional, national, EU)

## ➤ Closing loops

➤ Energy loop



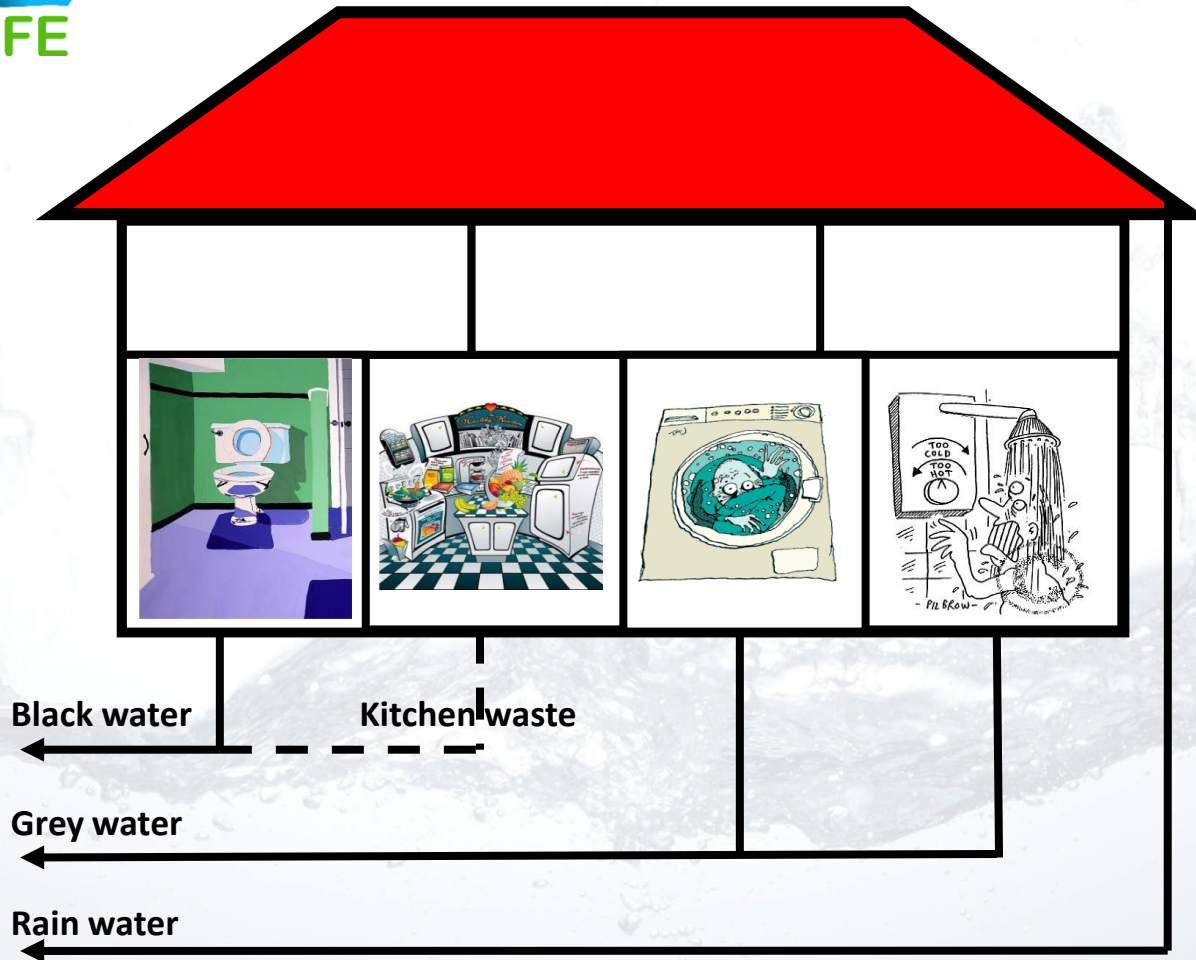
➤ Nutrient loop



➤ Water loop



Easier in a local  
(decentralised) level



Vacuum toilets flush with 1-1.5L of water and 100L of air (Conventional toilets -> 5-7 L).



## **Black water (toilet water):**

High in organics -> enables digestion

High in nutrients -> facilitates recovery

Hormones and medicins

## **Grey water**

Low in organics-> less energy for treatment

High temperature -> recover energy

Low heavy metal and salt concentration (good for irrigation)



# Where?

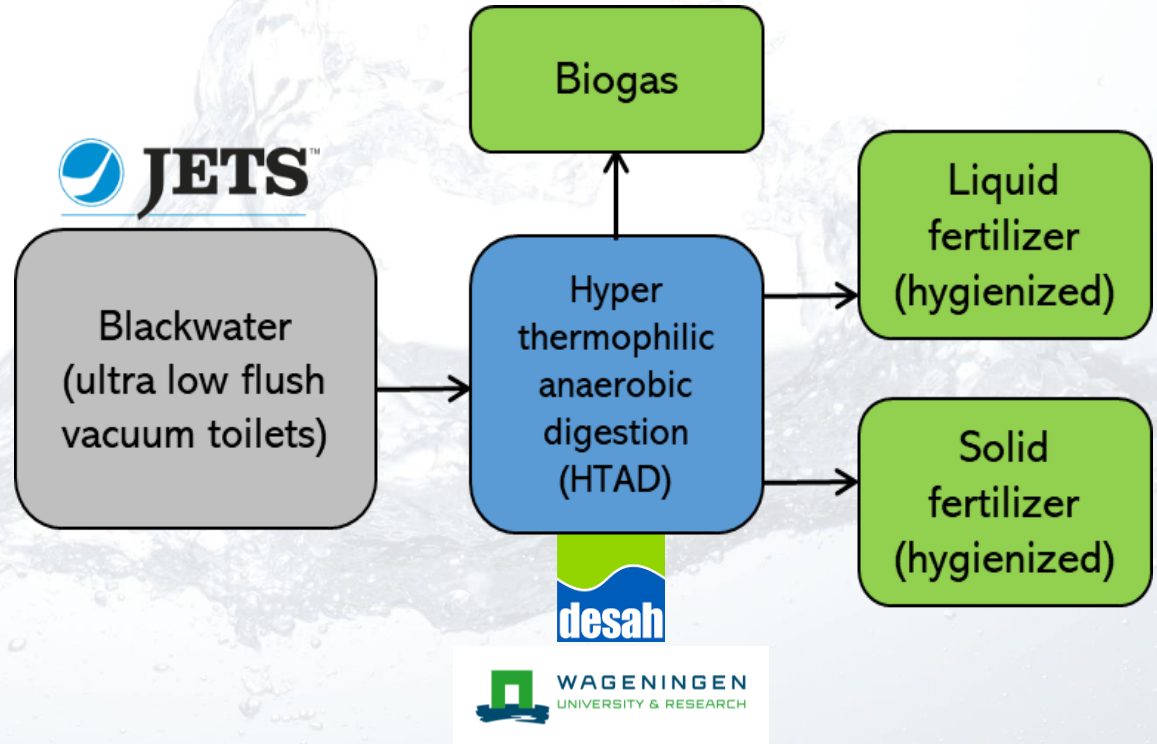


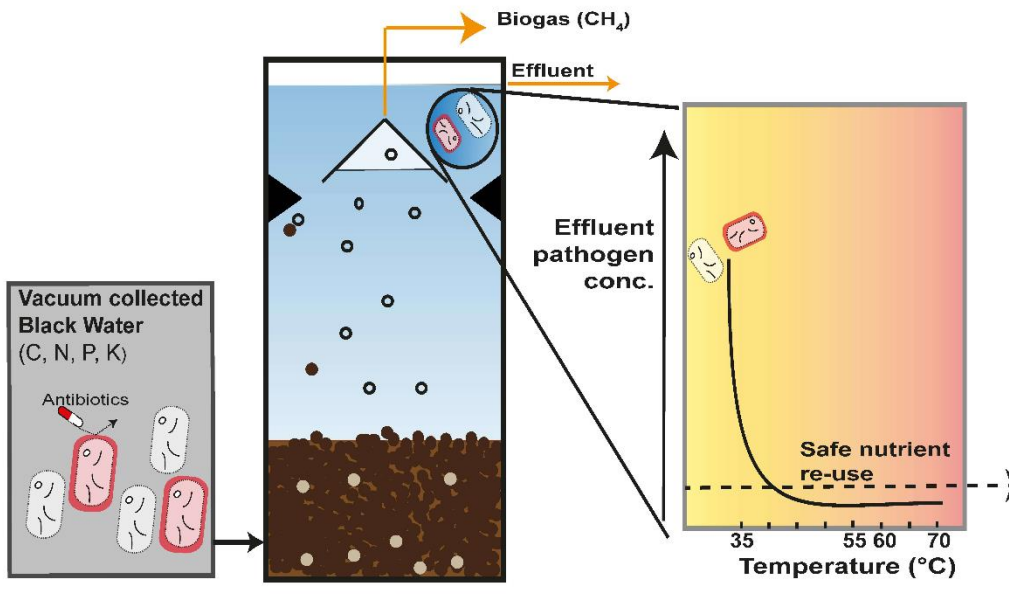
- Sustainable buildings (e.g. houses, hotels, resorts, offices)
- Rural areas and remote locations
- Newly build districts and districts converted from low to high-rise buildings
- Any area that sewer/WWTP can't handle increased load

“Lemmerweg”  
neighborhood,  
Sneek, The Netherlands

32 houses (100 p.e.)  
64 vacuum toilets

Already 15 years of  
source separation





Co-developed by Desah and WUR

High operating T (55°C):

Production of safe liquid fertiliser (effluent)

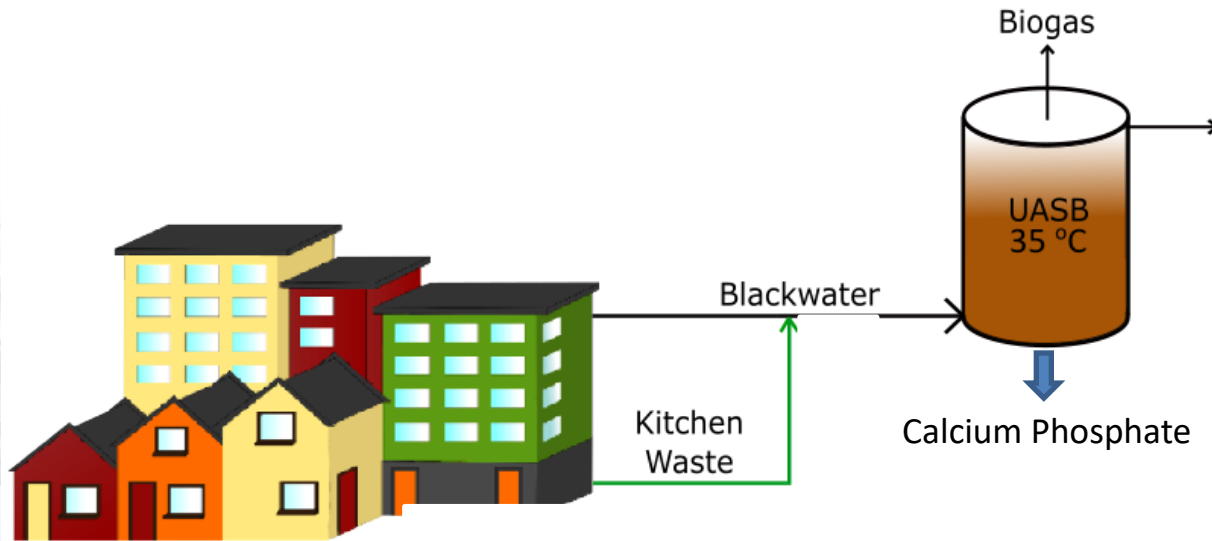
Production of safe solid fertiliser (Sludge)

**Increased (Antibiotic-Resistant) Pathogen Indicator Organism Removal during (Hyper-)Thermophilic Anaerobic Digestion of Concentrated Black Water for Safe Nutrient Recovery**

by <sup>1</sup>, <sup>2</sup>, <sup>3</sup>, <sup>3</sup>, <sup>1,\*</sup>, <sup>4</sup> and <sup>1</sup>

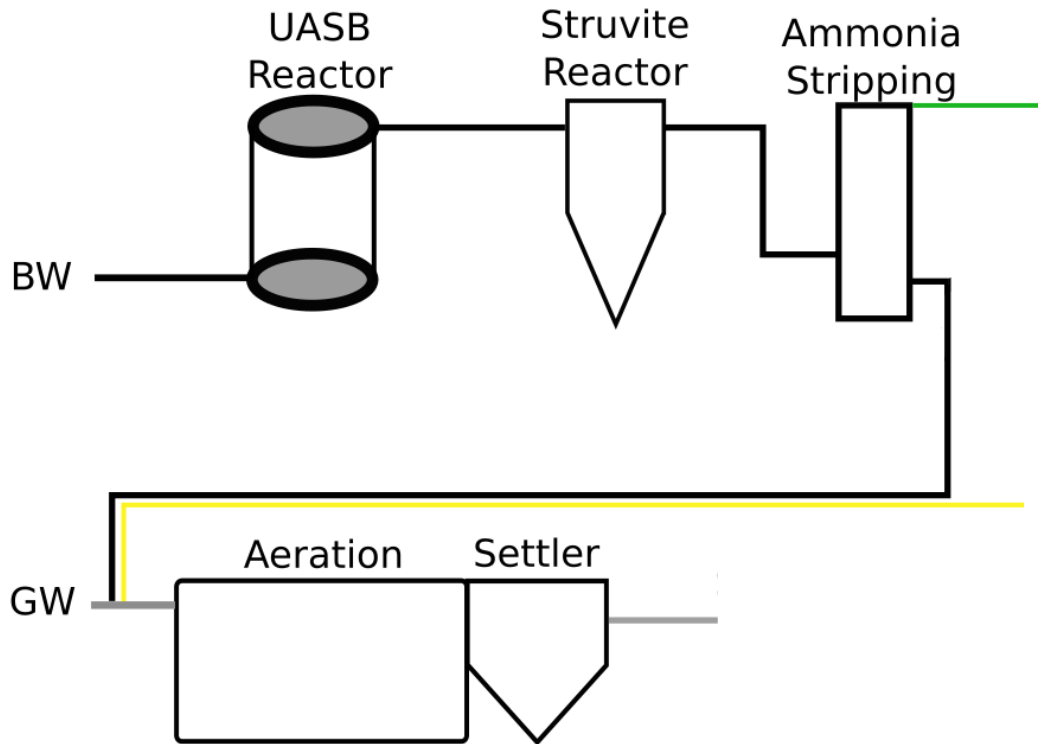


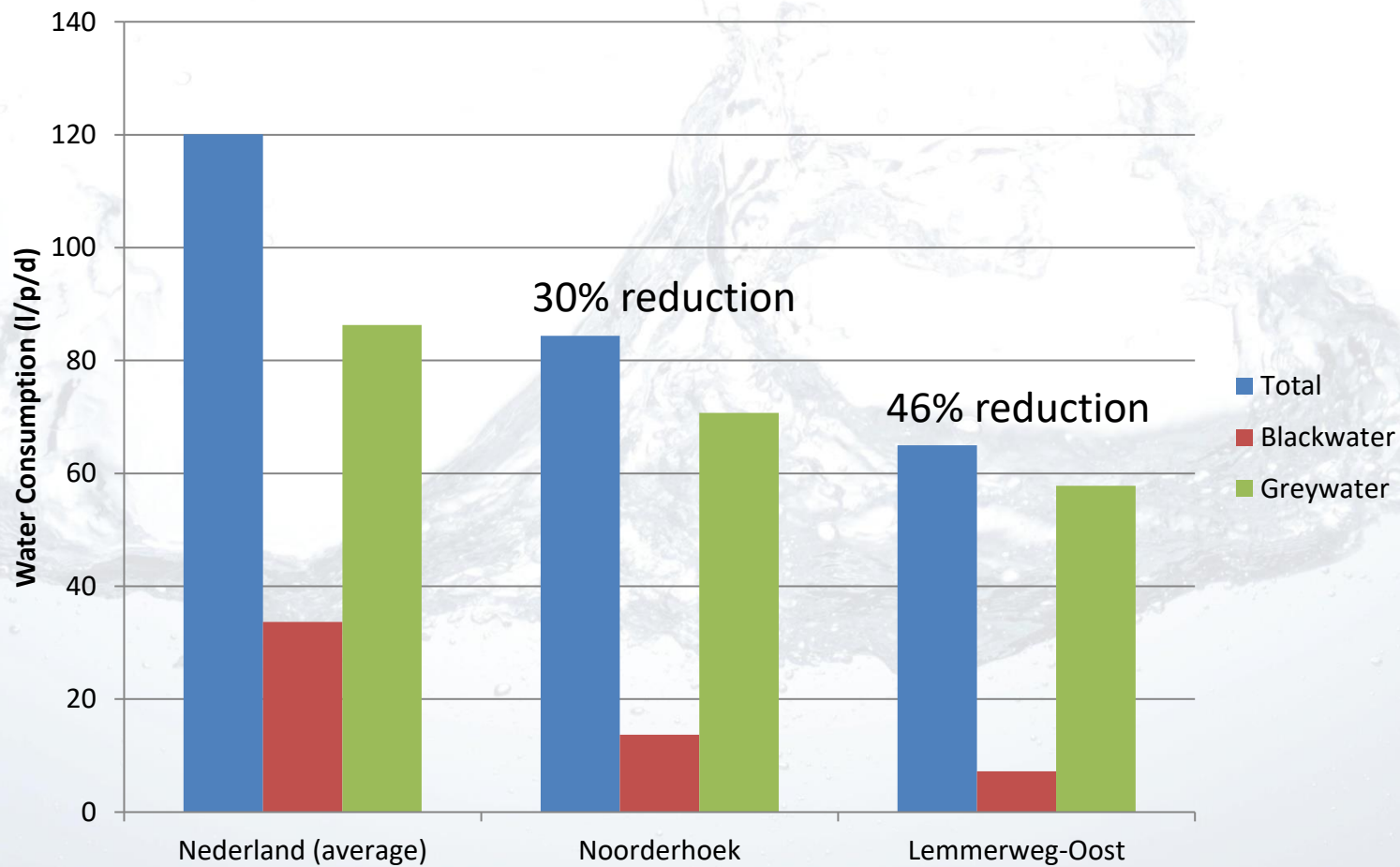
# Treatment scheme





# Water Reuse (Sweden)







# Decentralized vs Centralized



Compared with a centralized WWTP (100.000 p.e.) the DeSaH concept:

- Similar OPEX (incl. depreciation) @2000 p.e.
- 2x higher energy production than an energy optimized plant, ~25% of total household heating demands
- Recovers 2.5x higher P than the current state of the art
- Produces 2x times less surplus sludge
- Footprint is ~0.2% of the total footprint of the connected houses





# Additional Advantages



- Water savings of at least 25%
- Treatment of WW and organic solid waste
- No harmful by-products
- Modular design with options for:
  - Energy recovery (biogas, heat)
  - Nutrient recovery (sludge, struvite, CaP, ammonium sulphate)
  - Water recovery (fertigation water, process water, drinking water)

Thank you!

[p.chatzopoulos@desah.nl](mailto:p.chatzopoulos@desah.nl)

## How to participate?



**WEB**

- 1 Connect to [www.wooclap.com/GKSSKR](http://www.wooclap.com/GKSSKR)
- 2 You can participate