



DECENTRALISED SANITATION AND REUSE (DESAH)

DETAILS OF THE PROJECT

1. Decentralized treatment plant, based on source separation, for black (BW) and greywater (GW) of 350 people in Sneek (NL). Operational since 2011.
2. In total 35 m³/d of BW and GW is treated with a focus on energy reclamation (biogas and heat), phosphate recovery and very high removal efficiencies.
3. Since BW is highly concentrated (12g COD/L, 1.5g N/L, 0.2g P/L) treatment technologies like anaerobic digestion (UASB), annamox (OLAND) and struvite precipitation can be used.
4. Very high removal efficiencies of more than 90% are reached for COD, Nitrogen and Phosphorus.

COMPELLING VALUE PROPOSITION

The concept was introduced as alternative to:

1. Conventional centralized wastewater treatment, but much more flexible due to smaller scale, energy producing, no chemicals are used and less sludge is produced.
2. Existing decentralized treatment technologies like:
 - constructed wetlands, but with much less surface area required, better effluent quality and nutrient recovery
 - membrane bioreactors, but much less energy required, lower operational costs and nutrient recovery

THE EXPERIENCE

Extensive evaluation of the project has shown that compared to conventional centralized wastewater treatment at a scale of 100,000 P.E. the DeSaH concept:

1. will have similar OPEX (including depreciation) at a scale of 3,000 people;
2. will produce 200% more energy than an energy optimized centralized wwtp;
3. will recover 250% more phosphorus than the current state of the art;
4. will produce 2x times less surplus sludge, with much higher quality due to lower heavy metal concentrations;
5. will save 30% of potable water;

OBJECTIVE

The concept addresses multiple issues, like:

1. Water saving
2. Energy production
3. High removal efficiencies for COD, N and P
4. Nutrient recovery

The concept demonstrates the combination of a net energy positive WWTP that recovers nutrients but also has the ability to produce reusable effluent.

FUTURE PROSPECT

The following reference projects are built / under construction:

1. Run4Life: European project with 15 partners and 4 demo sites that at multiple locations demonstrate the DeSaH concept. H2020, GA730285
2. Rijnstraat 8, office building in The Hague for 3,500 employees
3. H+, housing estate for 2,200 people in Helsingborg, Sweden
4. Waterwerkkx, housing estate with 500 houses in Edmonton, Canada
5. Villa Flora, office building in Venlo, NL
6. NIOO, office building in Wageningen, NL



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