POWERSTEP

YOUR FLUSH, OUR ENERGY

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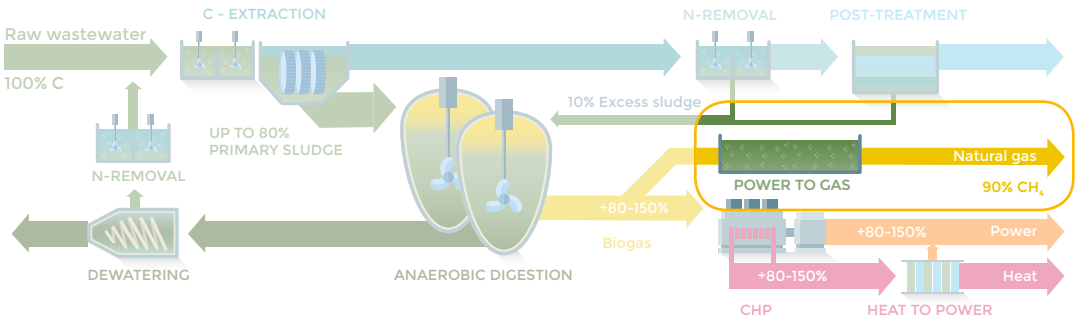
BIOFOS AVEDØRE

FROM BIOGAS TO A MORE USABLE FORM OF ENERGY

The conversion of the energy potential of biogas into storable forms of energy is a decisive process for the energy recovery of wastewater treatment plants (WWTPs). Methanation of the biogenic carbon dioxide from biogas provides an additional source of storable energy and a means of carbon mitigation. At Avedøre, POWERSTEP focusses on the integration of biological methanation to the WWTP, as a «power-to-gas» concept.

WHAT IS THE INNOVATION?



Biological methanation reactors are able to use raw biogas as a source of CO_2, which increases the methane production of existing biogas plants. Electrochaea built a 1 MW biological methanation plant at the Avedöre municipal WWTP that upgrades biogas to biomethane.

Beyond upgrading the methane fraction it also combines CO_2 from current raw biogas production, a unique biocatalyst, and hydrogen produced with excess solar and wind power. The goal is to produce biomethane suited for direct injection into the Danish National Gas Grid.

WHAT IS THE ADDED VALUE?

By 2020, 80% of Denmark's energy supply will come from green sources (i.e. wind, biomass). Unlike these fluctuating sources of energy, Avedøre provides a smart-grid solution. In a short-time, it converts electrical energy to chemical energy by converting the biogas CO_2 component into biomethane. The biomethane is injected into the Danish National Gas Grid, where it is stored until needed.

WHAT IS THE TECHNOLOGY AT STAKE?

Electrochaea's proprietary biological methanation technology converts stranded electricity and stocks CO_2 into pipeline-grade methane for direct injection into the natural gas grid. With this technology, Electrochaea provides a low-operation and cost-saving solution.

WHAT ARE THE EXPECTED OUTCOMES?

- Full-scale demonstration of biological methanation process integrated into a municipal WWTP.
- Development and full-scale test of advanced control strategies.
- Optimisation of the operating and capital costs and value creation for production, and storage of energy based on market pricing of electricity and biomethane.

PARTNERS

Electrochaea BIOFOS NEAS ENERGY

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