

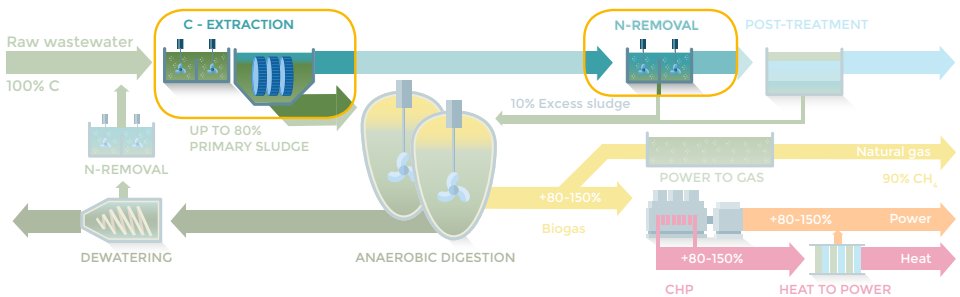


SJÖLUNDA

CARBON EXTRACTION AND NITROGEN REMOVAL

A high carbon extraction efficiency that increases the carbon available for biogas production is vital if wastewater treatment plants (WWTP) are to be converted into power production facilities. Simultaneously, there is a need to remove nitrogen from the wastewater without utilising the valuable carbon. At Sjölanda, microscreens are used as a primary treatment for enhanced carbon extraction, followed by a nitrification-anammox process for mainstream nitrogen removal.

WHAT IS THE INNOVATION?



At Sjölanda, enhanced carbon extraction in primary treatment is demonstrated through discfilters and optimised use of chemicals. Discfilters are compact gravity-driven units featuring a head loss of only 250mm and are capable of treating primary wastewater with less than 50 times the footprint required by a primary clarifier and equivalent or superior removal efficiencies. Mainstream nitrification-anammox for

nitrogen removal is demonstrated in two Moving Bed Biofilm Reactors (MBBR) using a recently developed carrier (Z-MBBR) which allows for biofilm control. Since anammox converts ammonium and nitrite directly into nitrogen gas without a need for carbon sources, large savings on aeration, compared to complete nitrification traditionally used in nitrogen removal, can be accomplished.

○ WHAT IS THE ADDED VALUE?

Enhanced carbon extraction with microscreens increases the carbon available for biogas production. Mainstream nitrogen removal with nitrification-anammox processes results in low energy demand for aeration, lower sludge production and no need for external carbon source. Hence, the integrated combination of the technologies contributes to the development of energy-positive wastewater treatment plants.

○ WHAT ARE THE TECHNOLOGIES AT STAKE?

Primary treatment for enhanced carbon extraction with microfiltration, followed by a two-stage MBBR nitrification – anammox process for mainstream nitrogen removal.

○ WHAT ARE THE EXPECTED OUTCOMES?

- ▣ High carbon extraction capacity through pre-filtration with discfilter, using a minimum of chemicals and lowest possible remaining chemical oxygen demand (COD).
- ▣ Maintain stable nitrogen removal in the mainstream nitrification-anammox process.
- ▣ Optimised nitrogen removal operation with an advanced control strategy using Superior Tuning and Reporting (STAR) control.

○ PARTNERS



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