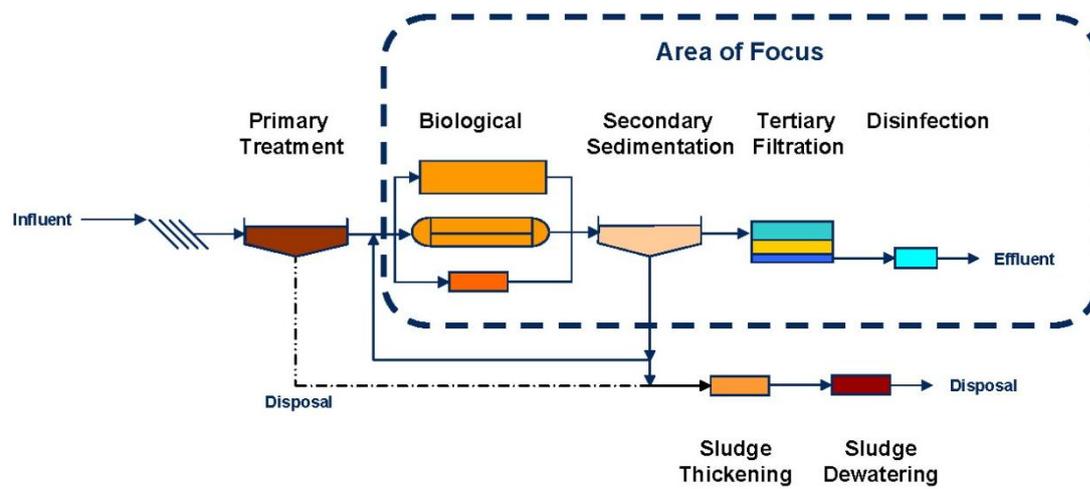


# Reuse of treated wastewater for non-potable use

Utveckling och optimering av vattenreningsprocesser och -system för en uthållig återanvändning av renat avloppsvatten i samhället



## Collaboration partners

Xylem, Hammarby Sjöstadsvverk

## Summary

The project aims at developing and optimizing water treatment processes and systems for sustainable reuse of treated wastewater in the community. The starting point is to combine the sequential batch treatment (SBR, sequencing batch reactors) with different conventional and emerging secondary and tertiary treatment techniques in various combinations that are optimized from an overall sustainability perspective. Evaluation and optimization is done using life cycle assessment.

## Description

Discharge of large quantities of pollutants to surface waters is a contributing factor to lack of water suitable for drinking water. In addition, supply and demand of fresh water is skewed in the world, which increases water stress in many regions, with some serious conflicts as a result. While there is a

severe shortage of fresh water, many applications for used water that do not require water of such high quality.

This project seeks to optimize existing treatment steps and systems to allow for purification of municipal wastewater for various water reuse applications in various sectors such as agriculture, industry, but also to increase the availability of natural water by infiltration of treated wastewater into groundwater.

The project consists of several components, which are all linked to the central optimization of wastewater treatment by using Life Cycle Assessment (LCA). The starting point of this LCA is to first assess the existing water treatment system. Based on this inventory, optimization proposals are developed that will lead to a substantial improvement of the various treatment processes and systems, and create a comprehensive basis in order to apply these different treatment systems in different parts of the world with different abilities and needs.

The project is implemented at IVL with data collection and optimization at a pilot facility that is placed at the R&D-facility Hammarby Sjöstadsverk.

In order to implement this project a global screening of different standards for the reuse of water for different purposes was conducted. Before the project, a number of treatment steps were identified for inclusion in this project. These purification steps (as shown in the figure above) consist of best available and emerging technologies.

## Goal

The overall aim of this project is to:

- ✓ Optimize treatment processes and systems for non-potable water reuse applications worldwide.
- ✓ Assess treatment processes in terms of sustainability to achieve the lowest life cycle costs now and in the future.
- ✓ Achieve the best possible micropollutants reduction.
- ✓ Create treatment systems that can be adapted to local and regional requirements and conditions.

## Expected benefit

The project will develop sustainable solutions to reclaim treated wastewater for urban, agriculture, recreation, industry, and groundwater recharge uses.

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