Master´s thesis proposal - autumn 2016

A system analysis of implementation of urine separation in Malmö

Background

The urban population is an important point source of recycled crop nutrients in a sustainable society. The wastewater systems in the developed urban areas are well-functioning regarding prevention of eutrophication, but not good at nutrient recycling. Source separation of urine in NoMix toilets and urinals allows for a potential recovery of 80% of the nitrogen, 60% of the phosphorus and potassium, respectively, from the wastewater. The economic value of the plant nutrients potentially recovered in urine is about three times higher than the plant nutrients that can be utilised from wastewater sludge from conventional WWTPs[1]. The potential decrease of greenhouse gas emissions in a urine separation systems is 50-60% compared to a conventional wastewater system[2]. Furthermore, urine contains very low concentrations of heavy metals[3].

VA SYD and the City of Malmö, in cooperation with Sweden Water Research, are currently working on implementing urine separation in a housing area of Malmö for research activities.

Aim

The aim of this Master's thesis is to make a system analysis comparing today´s wastewater system in the city of Malmö with a futuristic conventional system and a system with all new housing developments having installed urine separation systems. The parameters to be analysed are primary energy usage, nutrient recovery, greenhouse gas emissions and cadmium flows.

Method

The goal and the scope of the system analysis are first identified. Earlier systems analyses of similar systems are reviewed. The analysis will be performed in an Excel based tool.

When?

Autumn 2016

Interested?

Send an e-mail with a few words about you, your educational background and why you are interested in this Master´s thesis project to david.gustavsson@vasyd.se.

[1] Jönsson *et al*. (2011)
[2] Spångberg *et al*. (2014)
[3] Jönsson *et al*. (2005)