

Master thesis on sustainable management of sludge from sewage treatment plants.

Sludge from sewage treatment plants is a significant resource that, properly managed, provides the opportunity for circular flows of nutrients. Today, only about 35% of the sewage sludges resources are reused on arable land and this is not sustainable. The water and sewerage industry want to make a real difference and take large steps forward in nutrient recycling. Different combustion techniques and new technical solutions are needed to extract phosphorus and other resources from the ash or sludge. There are several exciting Swedish companies that are in the starting blocks and ready to meet this challenge (1). Which techniques are available and how these can be compared in a systematic way needs to be studied.

This thesis is aimed at evaluating the sustainability of methods for nutrient recycling in sludge that is separated at treatment plants that have biological phosphorus removal. Biological phosphorus removal does not use chemicals in the same way as chemical precipitation does, and therefore has a smaller environmental impact.

You will look at systematic methods for sustainability evaluations and assess which methods may be appropriate. The Selected methods will then be evaluated in a case study, in the municipality of Kungsbacka, for techniques that are suitable for a sludge from a biological treatment process.

Market research of possible technologies must be included, furthermore technologies for sludge dewatering. In the municipality there is a lot of support and knowledge to be found, for example data is available for the baseline option (what the plant uses today), and for pyrolysis that has been tested on a smaller scale

There is a great potential in sustainably managing sludge from sewage treatment plants. In Sweden alone, just over 200,000 tons of sludge are separated annually as dry matter (DS). Digested sludge contains about 0.65 kg of phosphorus and just under 1 kg of nitrogen per connected person and year. The content of organic matter (soil-forming substances) is just over 10 kg per person and year. The energy content of the sludge that is separated at treatment plants is approximately 135 kWh per connected person and year

This thesis is suitable for two students, probably with a bachelor in civil or chemical engineering and studying a masters program in industrial ecology and who preferably have experience in some form of systematic sustainability assessment, from one of the following courses: Environmental systems analysis (VMI010), Assessing sustainability - Assignments (ENM035), Life cycle assessment (VTM081) or Environmental risk assessment (TEK675).

You will be provided with both a scientific challenge and an insight into a business, with the opportunity to contribute to circularity and sustainability.

Interested? Contact:

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