

Additional

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Yes or No

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Presentation Title: An innovative bioelectrochemical system for the recovery of phosphorus, ammonia and electricity from urine

Please provide an abstract in less than 250 words describing the presentation.

Ammonium and phosphate fertilizers are needed in agriculture to ensure a sufficient food production. The recovery of valuable nutrients (ammonium and phosphate) from waste(water) streams will help to overcome future shortages and reduce the need for phosphorous ore imports and energy intensive ammonia production.

One person produces on average 1.5 L of urine per day, which contains about 9.1 g N /L and 1 g P /L. Urine contributes about 80% of the N load and 50% of the P load in conventional domestic wastewaters. These high nutrient concentrations in urine make it possible to develop more effective and energy efficient recovery technologies.

In the ValueFromUrine project the phosphorus recovery will be performed by struvite precipitation from hydrolyzed urine and the resulting effluent will be used for ammonium recovery and simultaneously electricity generation in Bioelectrochemical systems. Bioelectrochemical systems (ie Microbial Fuel Cells) are engineered systems in which bacteria catalyze the oxidation of organic substrates and transfer electrons to anode and at the cathode oxygen is reduced.

The aim of our project is to develop, demonstrate and evaluate an effective energy-efficient system for the recovery of nutrients from urine. Our treatment system will be able to recover >95% of the phosphorous (as struvite) and nitrogen (as struvite and ammonia / ammonium sulphate) while producing energy. These products can substitute salts used by the chemical industry, the artificial fertilizer industry and the agricultural sector which are currently obtained in a non-renewable and unsustainable way.