Maximizing Bio-Renewable Energy from Wet Wastes (M-BREWW)

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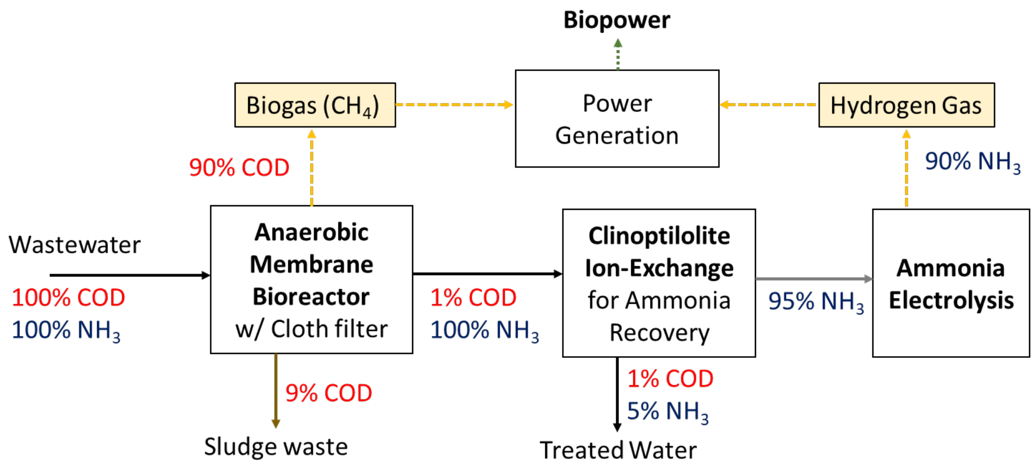

Simplified block-flow diagram of the proposed wastewater treatment scheme for enhanced biopower recovery

Project Goal:

Enhance waste-to-energy efficiency through combining low energy anaerobic membrane bioreactor and NH_3 electrolysis technology to achieve more than 10 folds increasing in bioenergy recovery from wastewater biosolids compared to conventional wastewater treatment

Project Summary

This project aims to enhance biopower recovery from municipal wastewater biosolids and reduce waste sludge. This will be achieved through development of a novel low-energy cloth-filter anaerobic membrane bioreactor (AnMBR) combined with clinoptilolite ion-exchange and ammonia electrolysis. Together, this three-parts system will convert wastewater biosolids and ammonia into two harvestable fuels for biopower production: methane & hydrogen gas. These fuels will be combined and combusted for electricity production. The proposed system can either replace current anaerobic digestion unit processes in conventional activated sludge (CAS) treatment schemes, or replace CAS completely, treating the whole wastewater flow. University of Illinois (UIUC) will lead a team comprised of sub-awardees from Ohio University, Colorado State University and Mainstream Engineering, Inc. to perform the research and development to achieve the objectives of the proposed project. In addition, there will be pilot equipment provided by Aqua-Aerobic Systems and Ambreon. The project will also incorporate advisory input from a research collaborator from the US Army Corp of Engineers, and managers of the local wastewater plant (UCSD), which is serving as a host site for field testing on this project. The proposed wastewater treatment system has the potential to increase energy recovery from wastewater biosolids by more than 10 fold, or 18 MWh/day, by utilizing cutting-edge AnMBR technology combined with an innovative ammonia ion-exchange and ammonia electrolysis process.