NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE
Advanced Environmental Biotechnology Centre
Nanyang Environment and Water Research Institute

Electro-Enhanced Anaerobic Digestion Technology (EAD)

Objective

Merging electrochemistry with traditional anaerobic digestion (AD) technology for enhanced organic removal and biogas generation

Research members

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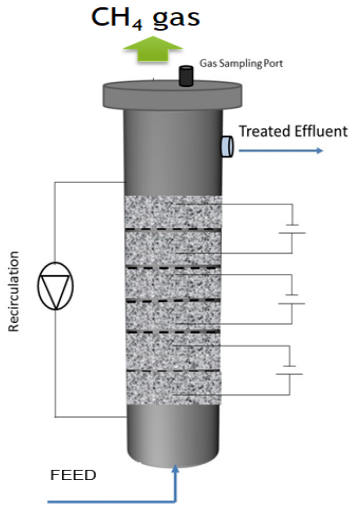
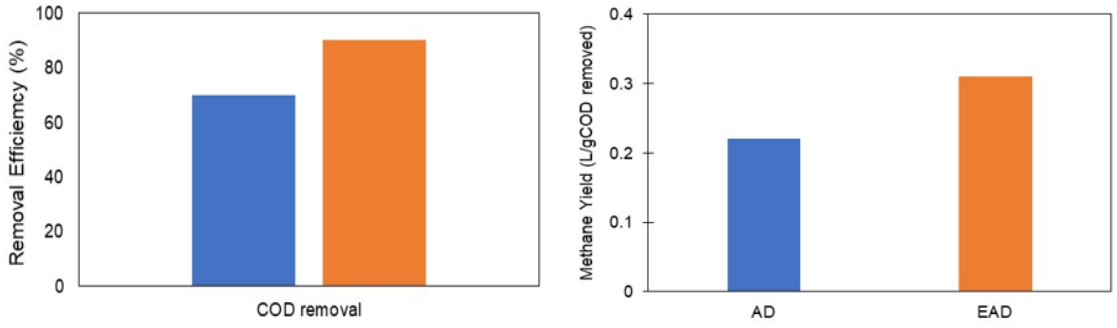
Graphic abstract



Electro-enhanced anaerobic digestion technology (EAD) merges traditional anaerobic digestion with electrochemistry. An imposed electrical field improves the microbial kinetics, and maintains the redox environment inside the digester, resulting in improved methane production, increased carbon removal efficiency and organic removal rates. A conventional anaerobic digester (AD) unit can be retrofitted to an EAD. The electrical input accounts for mere 10-20% of the additional energy recovered in the form of methane.

Results



COD removal efficiency and methane yields were 20-40% higher in a EAD system.

*AD represents a conventional anaerobic digester

Conclusions

Facilitating electrochemical reactions can improve treatment and energy recovery capability of an AD system