



TRANSFORM

Energy Systems through Game-changing Technology

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A MORE SUSTAINABLE WAY TO TREAT MUNICIPAL SEWAGE

Wayne J. Parker, Martha Dagnew, Peter Seto

Anaerobic membrane reactors (AnMBRs) have become increasingly common in industrial wastewater treatment. A specialized membrane keeps microorganisms in close contact with the biological waste, allowing them to break down the dissolved solids more effectively. Now, University of Waterloo researcher Wayne J. Parker and his former PhD student Martha Dagnew hope to transfer the system's potential to the municipal level.

AnMBRs promise an attractive formula of low energy and chemical inputs, minimal residues to dispose of, plus a valuable byproduct - methane - that can be used to generate electricity. As a result, these reactors can create a positive energy balance. However, municipal system operators have typically avoided AnMBRs because the membranes become clogged when processing high-solid streams, leading to a drastic reduction in efficiency.

Dagnew and Parker believe they've found an answer. In a pilot study at Environment Canada's Wastewater Technology Centre in Burlington, Ontario, they contrasted the performance of AnMBR systems with conventional digesters. The researchers found that by varying factors such as solid and hydraulic residence times and incorporating a combination of mechanical and chemical cleaning techniques, AnMBRs could outperform their conventional counterparts.

By proving the technical feasibility of using AnMBRs in municipal treatment plants, the WISE researchers have opened the door for a more sustainable way to treat our sewage - one that can generate green energy and reduce greenhouse gases in the process.

Partners: GE Water and Process Technologies, Environment Canada