Editorial

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Water and wastewater collection and treatment systems are energy intensive and costly. A shift from conventional water services to alternative strategies that focus on energy/nutrient/water (resource) recovery, with the flexibility to effectively manage emerging contaminants, could provide socially preferred water services that maximise pollutant removal and are more economic and environmentally safer than existing models. Such an approach will ultimately contribute to efficient water and resource management in urban areas.

Firstly, Vaneekhaute *et al.* (2019) describe a newly developed nutrient-recovery model library to establish operational settings for sustainable and cost-effective wastewater treatment with maximised resource (nutrients and biogas) recovery and minimal energy and chemical requirements. An economic analysis was programmed in the model library and the operational settings were optimised in a case study. As the world has a limited supply of phosphorus resources, phosphorus recovery is important. Zeng *et al.* (2019) evaluated and optimised phosphorus recovery from pharmaceutical surplus activated sludge. Models were applied to describe phosphorus and organic matter release.

New treatment options based on resource recovery offer an important element in enhancing community resilience. For instance, rather than replacing old sewers or building greenfield developments with traditional sewers, an alternative option is to develop a blackwater-only sewer (toilet water and kitchen food streams) separate from household greywater. Gao *et al.* (2019) evaluated the biological methane potential (BMP) of source-diverted blackwater collected from various types of toilets and conventionally collected sewage at 20°C and 35°C. At 35°C, blackwater collected from a vacuum toilet had a low BMP due to potential free ammonia inhibition, while low hydrolysis rates were observed when blackwater was treated under 20°C. Zhang *et al.* (2019) evaluated pretreatment options to accelerate the hydrolysis of blackwater solids and reported that ultrasonication pretreatment enhanced the BMP.

Microbial electrochemical (MEC) technologies are being studied as a promising platform for bioenergy production, value-added

chemical production, desalination and wastewater treatment. Barua *et al.* (2019) investigated the effect of various total ammonia nitrogen concentrations on the anodic performance of dual-chamber MEC technologies.

Lastly, the proliferation of predator organisms that consume ammonia-oxidising microorganisms in biological wastewater-treatment systems is continuously reported in the literature. In particular, the growth of redworms that can feed on ammonia-oxidising microorganism and has been found to be difficult to control. Xu *et al.* (2019) presented strategies to eliminate redworms from an integrated fixed-film activated sludge reactor treating municipal wastewater.

I hope you find these papers stimulating and informative. I would be pleased to receive comments on this issue.

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