



Waste-to-energy: Fuelling sustainable wastewater treatment with food waste

The challenge

Anaerobic digestion is the process of converting organic material (such as animal or food waste) into renewable energy and organic fertiliser. This occurs through microorganisms breaking down the organic material in the absence of oxygen. Anaerobic digesters can be built at any scale, from small digesters supplying heat to a single cooker in a kitchen, to large full-scale digesters producing enough biogas to constantly power thousands of average Australian households.

Currently, there are anaerobic digesters within Australia operating with spare processing capacity that can be used for co-digestion. Anaerobic co-digestion is when combinations of organic materials from different sources (such as agricultural, municipal, industrial, food and/or farming waste) are combined to improve the generation of biogas from the available infrastructure.

Enhanced understanding of co-digestion will maximise environmental and economic outcomes and ensure that less of Australia's food waste ends up in landfill.

There is significant scope for improved practical knowledge around the risks, rewards and opportunities for anaerobic co-digestion, including the chance for sewage treatment plants to adopt and optimise this technology.

Our plan

Urban Utilities has an existing network of commercial customers generating food waste including multiple sources of dairy processing, beverage industry, grease trap, meat processing, supermarket and food court waste. All of this food waste could be used in an anaerobic co-digestion process utilising the existing capacity in Urban Utilities digesters.

Co-digestion requires an understanding of the different operational limits, various process risks and different cost-benefits factors that come from combining different waste streams. If not done well, it can result in both operational problems, reduced biogas generation and significant cost burdens to the utilities.



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Therefore, for this project to be a success, it must focus on scaling up, process integration, and the optimisation of retrofitted anaerobic co-digestion processes within the constraints of existing infrastructure. In addition, when large volumes of food waste are considered for co-digestion, feeding optimisation is needed to maximise energy recovery and minimise co-digestion downstream impacts.

The Urban Utilities strategy is to become a key player in the circular economy value chain through anaerobic codigestion. This highly beneficial circular economy process can help the industry to reduce its reliance on fossil fuels and the costs of sending food waste to landfill.

Through environmentally sustainable use of co-digestion, Urban Utilities will promote cooperation between industries to re-direct food and organic waste away from landfill and towards beneficial re-use other than composting.

Diverting this organic waste from landfill to anaerobic digestion will potentially reduce the quantity and range of greenhouses gases released to the atmosphere from the waste and increase the generation of renewable energy at the sewage treatment plant. In addition to energy, this project also has the potential to generate beneficial reuse products from the recovered nutrients and solid stream, thus contributing to the circular economy value chain.

Timeline

January 2020 - December 2022

Project leader

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Participants

