

# Towards Energy and Carbon Neutral Municipal Wastewater Reclamation



**Professor Liu Yu**

Dr Liu Yu is a professor of Environmental Engineering in School of Civil and Environmental Engineering, Nanyang Technological University (NTU), Singapore. Prof Liu's research primarily focuses on novel and innovative technologies for municipal wastewater reclamation with specific interests in energy/resource recovery, energy and carbon neutrality. Prof Liu has published more than 320 SCI journal papers, most of which appear in the mainstream environmental biotechnology and engineering journals, with the Google Scholar citations of 27501 and the h-index of 81. He has also authored 8 books published by Elsevier, Wiley, CRC Press, IWA Publishing etc. Many of his research works have been translated into the pilot demonstration. In recognition of his contributions to R&D, Prof Liu was awarded the prestigious Singapore National Science and Technology Award (2003), Singapore Ministry of National Development's Research and Development Merit Award (2013) and Singapore Public Administration Medal (Bronze) (2014) etc.



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## Abstract

The design and operation of current municipal wastewater reclamation plant is primarily based on a biological oxidation-reduction principle with the input of substantial amount of energy and generation of waste sludge/greenhouse gases, making them a significant carbon emitter. With the fast-evolving global climate change, the carbon neutral municipal wastewater treatment technologies have been put on the agenda of more and more countries. Thus, this talk aims to provide a holistic view with in-depth discussion on the critical issues towards the carbon neutral municipal wastewater reclamation. It appears that the energy neutrality would not naturally lead to the carbon neutrality as direct carbon emissions are much more pronounced than indirect carbon emissions in municipal wastewater reclamation plants. To address such a challenging situation, the NTU team has developed several integrated anaerobic MBR-RO processes for realizing the carbon neutral municipal wastewater reclamation.