**Recovery of phosphate from anaerobic membrane bioreactor effluent using biowaste**

**Maria Poulizou1, Panagiota Photiou2, Ioannis Vyrides2\***

1 Department of Chemical Engineering, University of Patras, GR 26504, Rion, Patras, Greece

2Department of Chemical Engineering, Cyprus University of Technology, 30 Archbishop Kyprianou Str., 3036, Limassol, Cyprus,

*Email: \** [ioannis.vyrides@cut.ac.cy](mailto:ioannis.vyrides@cut.ac.cy)

**ABSTRACT** Anaerobic membrane bioreactors can revolutionize post-treatment as the effluent is already solids and bacteria-free; hence, attention needs to be focused on resource recovery from this effluent. Phosphates removal from wastewater using biowaste and recovery as fertilizers helps prevent environmental problems, contributes to the recycling of Phosphate as a non-renewable resource, and embraces the concept of a circular economy. This study examined effluent treatment from an anaerobic digester through a submerged anaerobic membrane bioreactor (SAnMBR). Then, the effluent from the SAnMBR (high in Phosphate) was treated through two columns a) the first consisted of calcined eggshells and the b) second thermally treated seagrass. High recovery of Phosphate was found in both columns. The solid product from the columns was then tested as a fertilizer.

**KEYWORDS:** Anaerobic membrane bioreactor, calcined eggshells, circular economy Phosphate recovery,