Organic Waste Management at WPI

Abstract

Waste is a growing environmental problem worldwide. A typical waste management process is not conscious of the different types of materials it receives—a mix of organic and inorganic waste. The objective of this research project is to create an efficient organic waste management plan at WPI which will reuse all organic waste thrown away to produce methane and mulch. Our plan proposes anaerobic digestion of food and yard waste to produce methane for power production and rich soil and mulch for campus beds. To get data on the waste that could potentially be recycled, we contacted Morgan Commons personnel, the GFS, Feed the World, WPI Grounds Services director, Greek organizations on campus and nearby restaurants such as the Boynton and the Salo Proprietor. For digester and reactor design, we carried out an intense literature survey. Our findings focused on developing a reactor that could be feasibly implemented at WPI (facilitating issues such as size, space and cost). In addition, we developed an effective mulch production system by recycling leaves. The proposed plan is easily implementable with a payback in 3-4 years. WPI’s sustainability initiative can be furthered by implementation of this proposal.

Objectives

- Recycle organic waste to produce: Electricity, Mulch, Fertilizer
- WPI to lead sustainable development in NE and U.S.
- Increase awareness on campus

Conclusion & Recommendations

- Effectively implemented with the upfront cost returned in 4 years.
- Savings in trash removal costs, energy consumption costs, mulch and topsoil costs
- 250 tons of organic waste recycled
- We suggest a more detailed study of organic waste produced
- Professional assistance in further reactor development
- Sewage as potential feedstock for it’s rich methane content