

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 the 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 reused, we contacted Morgan Commons personnel, the GPS: Feed the World, WPI Grounds Services director, Greek organizations on campus and nearby restaurants such as the Boynton and the Sole 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 (tackling 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.



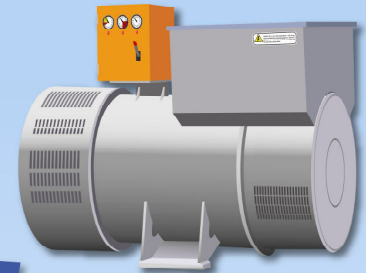
Objectives

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

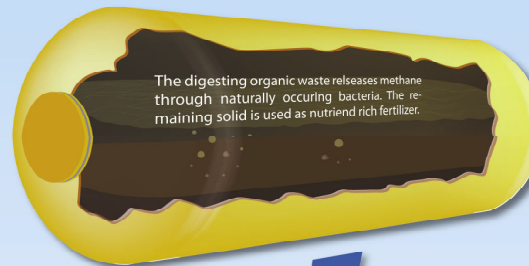
Conclusion & Recommendations

- Effectively implemented with the upfront cost returned in 3 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

20000 kWh/year



80000 m³ biogas



Food Waste

Methane

Fertilizer

Leaves are shredded and left to composte with water. They can then be used as mulch in WPI beds.

72000 ft²
garden bed coverage

