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**2023 SWANA Design  
Competition  
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# HOW SHOULD ORGANIC WASTE BE DISPOSED OF?

## Source-Separate Organics for Use in Composting



## Landfill Organics, Recycle its Gas Output as Renewable Gas

• This method involves the capture and refining of landfill gas (LFG) into renewable natural gas (RNG) as a replacement for conventional fossil fuels.

**Key Benefit #1**  
Selling Renewable Gas allows an enormous amount of non-renewable gas to not be used, saving upwards of 2 million gallons of gasoline every year.

**Key Benefit #2**  
After ten years of implementation selling Landfill Gas would potentially be VERY profitable, much moreso than the other Organics Disposal Option.

**Notable Drawback**  
By continuing to put organics in landfills, landfills will be filling up at a drastically higher rate than by means of source separation.



Landfill Lifetime would Increase by 900% under a LFG System of Organics Disposal as opposed to SSO

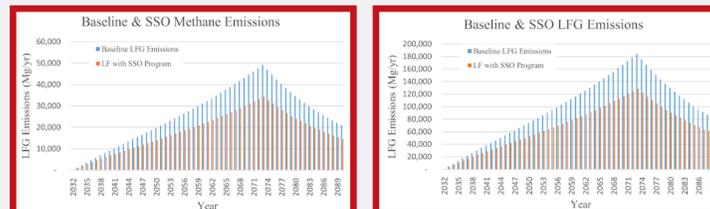
Criteria	Score	
Economic Comparison	C&O Costs	1
	Investment Projection	2
	Employment Generated	2
Social and Environmental Comparison	Social Support	3
	Emission Reduction	1
	Energy Savings	3
	Landfill Lifetime	0
<b>Total Weighed Score</b>		<b>36</b>

## Objective and Scope

The Innovative Waste Solutions student design team from Florida Atlantic University (FAU) has been tasked with evaluating the most sustainable option for organic waste management for a county located in the upper-midwest of the United States.

- We put our SSO projections to be enacted at the beginning of 2025, and our LFG into RNG projections to be enacted in 2032.
- We utilized a *cost-benefit analysis points-system* to determine which method of organics methods disposal is the best option given our criteria.

### Methane and Landfill Gas Emissions of Both Options Compared

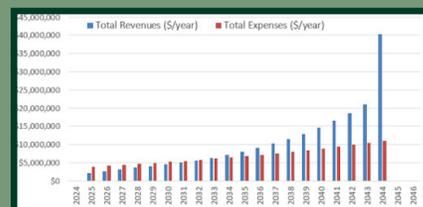


The above graphs help us answer the key question about which mode of organics disposal is more sustainable. From the graphs it is very clear that a Landfill with a Source-Separated Organics Program emits far less methane and landfill gases.

## We found that Source-Separating Organics for use in Anaerobic Digestion is the BEST method of organic waste management!

A "SSO to Compost" method of organic waste management would be far more beneficial to utilize in almost every single criteria that we analyzed. The "SSO to Compost" method is most clearly preferable as opposed to the alternative for its far better reductions to emissions and its favorable symbiotic benefit to landfill lifetime.

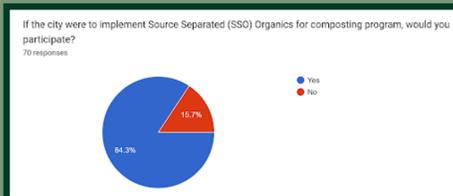
SSO Program Revenues vs.



### Key Benefit #1

We have projected that a Source-Separated System would be able to make profit margins after its 10th year of implementation. After its 20th year of implementation, the SSO program would have very high profit margins.

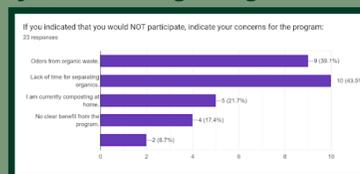
Survey Question Regarding Par-



### Key Benefit #2

After surveying a large amount of individuals, we also have strong evidence of potential universal public participation to a Source Separated Organics program.

Survey Question Regarding SSO Program



### Notable Drawback

After surveying a large amount of individuals, some in the survey have objected to a SSO program on grounds of their lack of time to manually separate organics.

Final Cost-Benefit Analysis Score for the SSO Option

Criteria	Score	
Economic Comparison	C&O Costs	2
	Investment Projection	1
	Employment Generated	3
Social and Environmental Comparison	Social Support	2
	Emission Reduction	3
	Energy Savings	0
	Landfill Lifetime	3
<b>Total Weighed Score</b>		<b>39</b>