

Food Waste Anaerobic Digestion Demonstration Program at the Joint Water Pollution Control Plant

Presented to:

Alternative Technology Advisory Subcommittee
Los Angeles County Solid Waste Management Committee
Integrated Waste Management Task Force

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Project Overview



- Background.
- Objectives.
- Summary of the demonstration program.
- Policies that are driving food waste anaerobic digestion (AD) in California.
- Project details...
 - Food waste (FW) processing at Waste Management
 - Processed FW delivery and receiving at JWPCP
 - Testing and anticipated results



Background

- Districts performed 2011-12 feasibility study on FW/biosolids co-digestion at Districts WWTPs.
- Conclusion: A project at JWPCP...
 - Is technically feasible (economics still a question)
 - Is allowed under current regulations
 - Could assist L.A. County cities/haulers with diversion efforts
- Bench scale testing of co-digesting WM FW slurry and Districts biosolids...
 - Characterized FW slurry (developed FW slurry specifications)
 - Quantified biogas production potential
 - Determined no negative impacts on digester operations



Districts Objectives

- Assist Districts member cities and haulers in diversion efforts.
- Determine the impacts of full-scale food waste co-digestion on WWTP operations.
- Evaluate the performance and cost-effectiveness of food waste co-digestion at a WWTP.
- Use project results to determine feasibility of a larger food waste digestion program at Districts wastewater treatment facilities.





WM's Strategy

- Develop the Centralized Organic Recycle and Energy (CORE) program
- Provide an innovative solution to support Southern California's jurisdictional organics recycling goals
- Minimize collection and conversion carbon footprint
 - Collect and process materials without leaving urban areas
 - Anaerobic digester captures >99% of methane emissions from organic waste conversion
 - Uses existing digesters – no need for additional infrastructure



Digesting Organic Waste Streams at WWTPs

- Advantages:
 - Digester already exists
 - Energy recovery equipment may already exist
- Concerns and challenges:
 - Limited capacity statewide – a niche, not a solution
 - Can accept only relatively clean feedstock
 - Impact of additional residuals on biosolids
 - WWTPs have an important public health mission



Project Summary

- The Districts and Waste Management entered into a 2-year demonstration program agreement.
- WM will process 84 tons per day of food waste slurry at an off-site location and deliver to JWPCP.
- AT JWPCP, the slurry will be injected into one digester for co-digestion at 9% food waste/91% plant solids.
- WM and JWPCP's Research team will monitor the program to evaluate the impacts and performance of food waste digestion when co-digested at a WWTP.
- Results will be used to determine the feasibility of a full-scale food waste AD program at Districts WWTPs.





Policy Drivers



- AB 341 establishes a statewide solid waste recycling goal of 75% in 2020.
- Diversion of organic material from landfills will be target of new regulations.
- Where can the organic materials go?
 - Anaerobic digestion
 - Composting
 - Other conversion technologies



WM's CORE Program

- WM collects food waste from sources such as restaurants, food processing plants, and grocery stores.
- Food waste is screened through WM's CORE facility to remove contamination (such as utensils, packaging, bones) and blended into *Bioslurry*, a proprietary slurry similar in thickness to cooked oatmeal.
- Bioslurry will be loaded into tanker trucks at WM's facility for delivery to JWPCP.





Food Waste Receiving at JWPCP

- Food waste will be pumped from WM tanker trucks into closed, sealed storage tanks, controlling odors.
- As new food waste slurry enters the sealed storage tanks, the displaced air is scrubbed through an odor control filter.
- Food waste slurry will be pumped from the storage tanks into the test digester.
- Test Digester #16; Control Digester #15 for baseline data.





Joint Water Pollution Control Plant

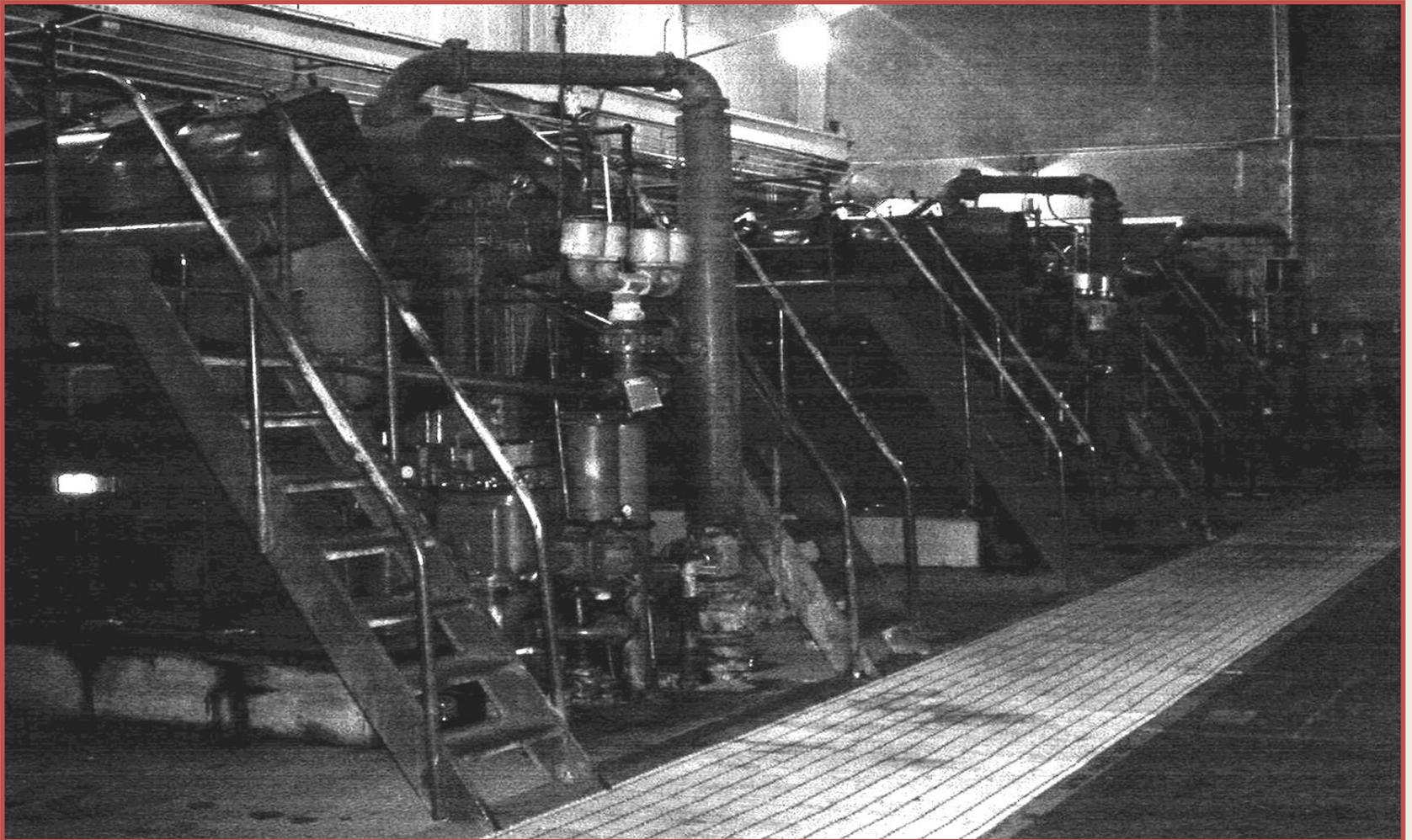
- 24 active digesters each with a capacity of 3.7 million gallons.
- 4.4 million gallons of biosolids are added to digesters each day.
- Biosolids breakdown (digest) for 18-19 days before exiting digester.
- 5,500 scfm (or ~ 22 MW) of biogas is created.
- Non-digestible solids are dewatered and trucked off for use in composting and land application.





Reciprocating Engine-Generators

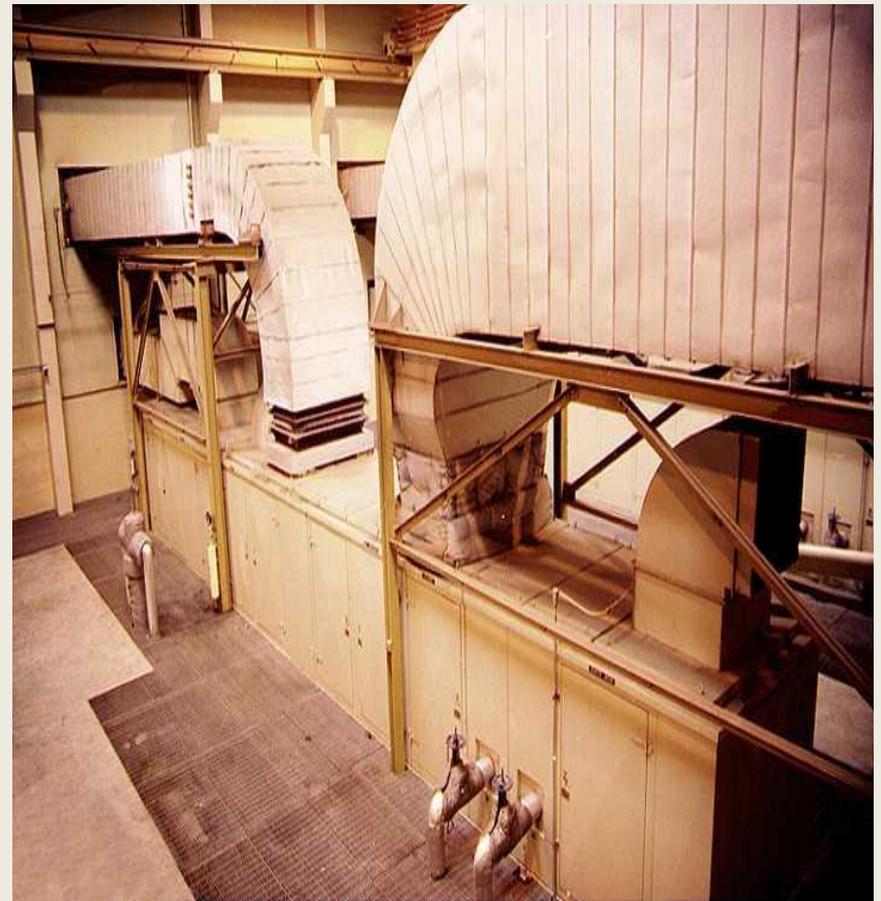
JWPCP has been using digester gas for energy since 1938.





JWPCP Total Energy Facility

- Combined Cycle Cogeneration Power Plant
 - (3) 9 MW Solar Mars T-13000 gas turbine generators
 - (1) 3 MW DeLaval HJT steam turbine generator
 - 22 MW used to meet on-site load





Testing and Results

- The testing program is scheduled for 2 years and is expected to start up in early 2014.
- FW slurry will be injected into one digester so that biogas production can be measured and the digestion process can be monitored.
- The result... Renewable energy created from digestion of 84 tons FW slurry could be used for:



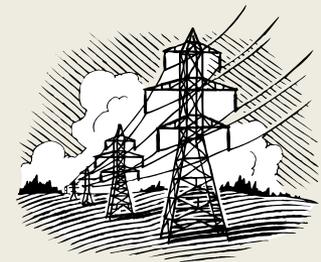
digester heating
~200 scfm

or



vehicle fuel
~1,500 GGE

or



electricity generation
~800 kW



Thank you. Questions?

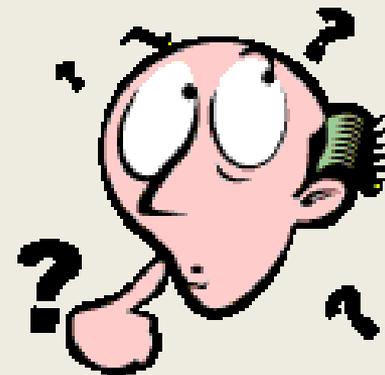
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