Talking... TRASH

The Newsletter of the SWANA Florida Sunshine Chapter Summer 2013

Inside:
Technical Articles
Committee Updates
Member News

Hillsborough County

Food Scraps Recycling - An Emerging Trend

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The organic fraction of the municipal waste stream, which includes food scraps, yard waste, wood waste, and mixed paper, is about 30 to 40 percent by weight. As such, many communities in Florida have been evaluating options to handle organics beyond the traditional approach of just supplying information about the benefits of backyard composting.

According to a 2013 BioCycle survey in the United States, there are more than 214 source-separated organics collection programs in operation, up from only 20 programs in 2005. Recently, two northeastern states, Connecticut and Vermont, enacted legislation requiring large generators of food waste to transport their materials to a processing facility if one is located within 20 miles. We expect this regulatory trend to become the norm, in time, rather than the exception.

Investigations, demonstrations, and pilot organics processing programs for organics have literally exploded across North America in just a few short years as communities or agencies attempt to respond to ever-increasing higher recycling goals imposed by state or provincial agencies. The solid waste trade press appear to contain news reports literally everyday announcing the development of a new composting project. Yet, the facts of the matter are that a coordinated organics infrastructure is almost nonexistent in the United States at the current time. There is also a deficit of cost information to enable communities to evaluate whether or not certain organics processing technologies make economic sense. Development of successful operating facilities will take a lot of hard work, a tremendous amount of due diligence on part of local solid waste professionals, and, of course, public and private investment capital and partnerships.

Can Organics Recycling Make Sense for a Small Community?

While much has been written about organics initiatives being implemented for large municipalities like San Francisco or Toronto, small communities are oftentimes left out of this discussion. A recent organics feasibility study undertaken for the community of less than 1,000 illustrates the types of problems most small communities face when evaluating the issue of what to do with organics in their waste stream.

Over the past year, a Citizens Recycling Committee appointed by one of our clients conducted a solid waste and recycling study to evaluate both short and long-term options to expand recycling and composting options and help reduce the operations of its municipal incinerator. In April, they adopted a "zero waste" plan, mandating the development of recycling facilities and waste reduction goals, including the development of enhanced municipal ordinances to require the use of compostable materials for its vibrant restaurants, entertainment, and hotel trade.

While further feasibility work needs to be conducted before they move forward, it is anticipated in its Plan that it will establish a pilot program to include restaurants and possibly some residences. For example, plastic covered bins, specifically made for holding food wastes, will be provided to the pilot program customers. Customers will be expected to sort out any non-food waste items before putting the food waste in the bin. The bin would be typically left inside the store near the rear delivery door. Food bins will be picked up at restaurants by a collection truck on a daily basis. Residential pilot customers will be collected from the curb once per week. The food containers will be put on pallets in the collection truck and delivered to the wastewater treatment plant building.

The expectation is that the community will implement an in-vessel composting unit that can process food waste, dewatered biosolids and green waste. The unit would consist of a horizontal, frame mounted cylinder, which slowly rotates. Ground up wastes would be fed automatically into the front-end of the unit along with continuous air from a small blower fan. The mixture is turned in the drum for several hours each day, decomposing rapidly into rough texture compost in about 4 days. Inside the drum the wastes reach a temperature of at least 131 degrees Fahrenheit over the 4 days, adequate for sterilizing the compost and meeting U.S. EPA rules for public distribution and contact. The mixture would be discharged from the drum and onto a small stacking conveyor where it is piled up for final curing.

Can Anaerobic Digestion Make Economic Sense?

While there is a great deal of interest in considering the use of anaerobic digester technology, the basic question is whether or not these European technologies will prove economically feasible for many U.S. conditions. Further, there is limited operating and financial information to enable most communities to make a final decision to implement such a project.

With those thoughts in mind, one community has engaged SCS Engineers to develop comprehensive pro forma cost analysis to model capital and ongoing operating costs associated with implementing an anaerobic digester plant to process and treat a source-separated organics waste stream at its landfill. The desired use of the model is as a preliminary strategic planning tool for purposes of evaluating the financial efficacy of this project.

Costing and revenue variables to be evaluated as part of the pro forma model include:

(*Food Scaps Continued*)

- Initial project planning, design, and permitting;
- Site engineering and construction, including digester plant components, site development work, license, and installation;
- Operations, including training, maintenance, equipment, staffing, waste stream tonnage, waste stream composition, production rates, and design life; and
- Financial considerations, including production values, tipping fees, cost of living and inflationary adjustments, and debt structuring.

SCS Engineers' analysis will also evaluate marketability of various end-use products (including electricity from biogas combustion, combined heat and power, clean-up of biogas to compressed natural gas quality, and high quality compost). Model outputs will include cash flow, revenue, and profit/loss projections, as well as requisite tipping fees to achieve desired financial outcomes. Further, an evaluation will be made of anticipated market opportunities, and operational/functional challenges associated with implementing this technology.

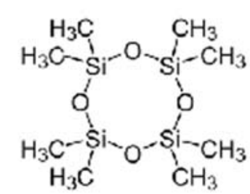
Siloxanes in MSW: Quantities in Waste Components, Release Mechanisms during Waste Decomposition and Fate in the Environment

Written by Berrin Tansel, Ph.D., P.E. and Sharon Surita, Civil and Environmental Engineering Department, Florida International University

Use of siloxanes in consumer products (i.e., fabrics, paper, concrete, wood, adhesive surfaces) have significantly increased in recent years due to their excellent water repelling and antimicrobial characteristics. Siloxanes can be in linear configuration, cyclic form, or tetrahedral formation with organic groups. Some widely used cyclosiloxanes are hexamethylcyclotrisiloxane (D3), octamethylcyclotetrasiloxane (D4), decamethylcyclo-pentasiloxane (D5), and dodecamethylcyclohexasiloxane (D6). Cyclosiloxanes are typically formed during depolymerization or reversion reactions.

Air samples collected near landfills and wastewater facilities show that siloxanes are released to the environment and transported with wind currents. Siloxanes contain silicon atoms attached to an organic backbone; hence, they are converted to silicates (SiO2 or SiO3) during combustion. Some waste to energy (WTE) facilities have installed gas treatment processes (e.g., carbon adsorption, silica gel adsorption) for removing siloxanes to reduce deposit formation in engine parts during combustion. However, the addition of gas treatment systems increases the energy recovery costs from LFG. Research sponsored by Hinkley Center showed that in multimedia environments, cyclic volatile methyl-siloxanes readily partition to the atmosphere due to low water solubility and high vapor pressures.

D4



D5