



Parallel Universe

Emerging Interest in Food Scraps From Wastewater Utilities – Updates and Perspectives

U.S. Composting Council
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public affairs + environmental business

- Founding Asst. Dir., NYC's Recycling Program (1989)
- Chaired NYC's Citywide Recycling Advisory Board (5+ yrs)
- Senior Consultant, InSinkErator
www.insinkerator.com/green
- Why?
 - Promote message about food scraps out of landfills and into resources
 - Re-position food waste disposers as "feedstock preparation device"

Overview

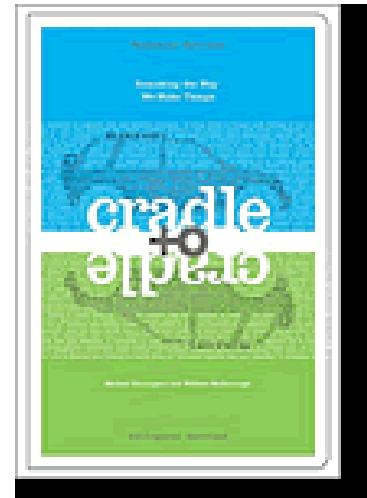
- First Principles
- One Meme
- Snapshot into Field of Wastewater
- Animation



First Principles

Waste = Food

- *Cradle-to-Cradle*
- “Design” is what we intend
- **Food for biological processes** (e.g., organics)
- **Food for technical processes** (e.g., metals, glass, plastics)
- William McDonough
Pioneering architect,
designer, visionary



What do we know about food scraps?

- Mostly water (@70%)
- Highly putrescible
- Nutrient rich - higher C:N ratio than human waste; phosphorous
- Energy rich
- Easily contaminated
- Wasted in landfills/WTE





MEME

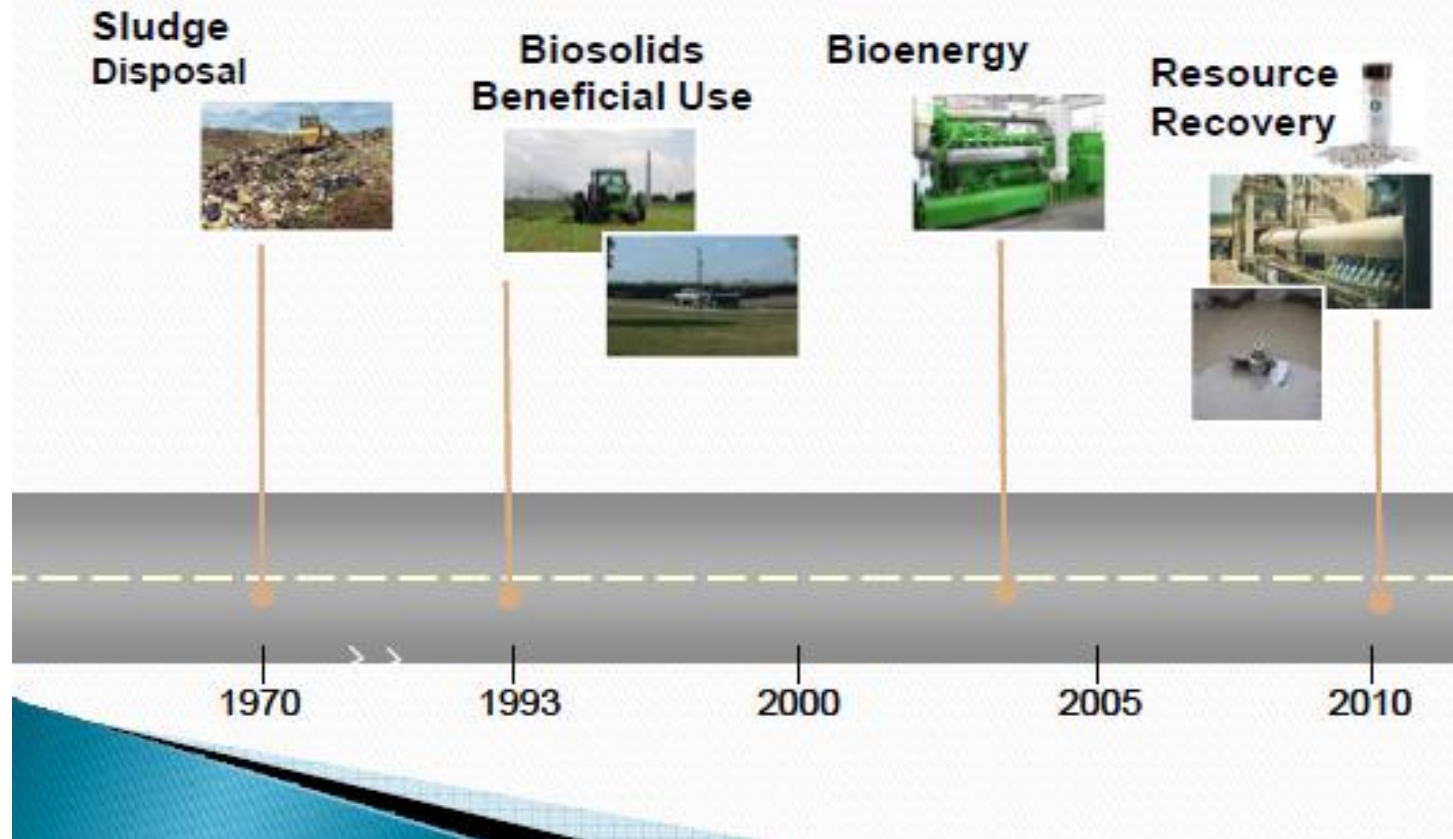
Food Fights!

- Key drivers:
 - renewable energy potential
 - nutrient recovery
- EU biogas companies invading NA
- Municipal SSO/green-bin programs
- Composting industry revitalized
- WWTPs push to energy self-sufficiency

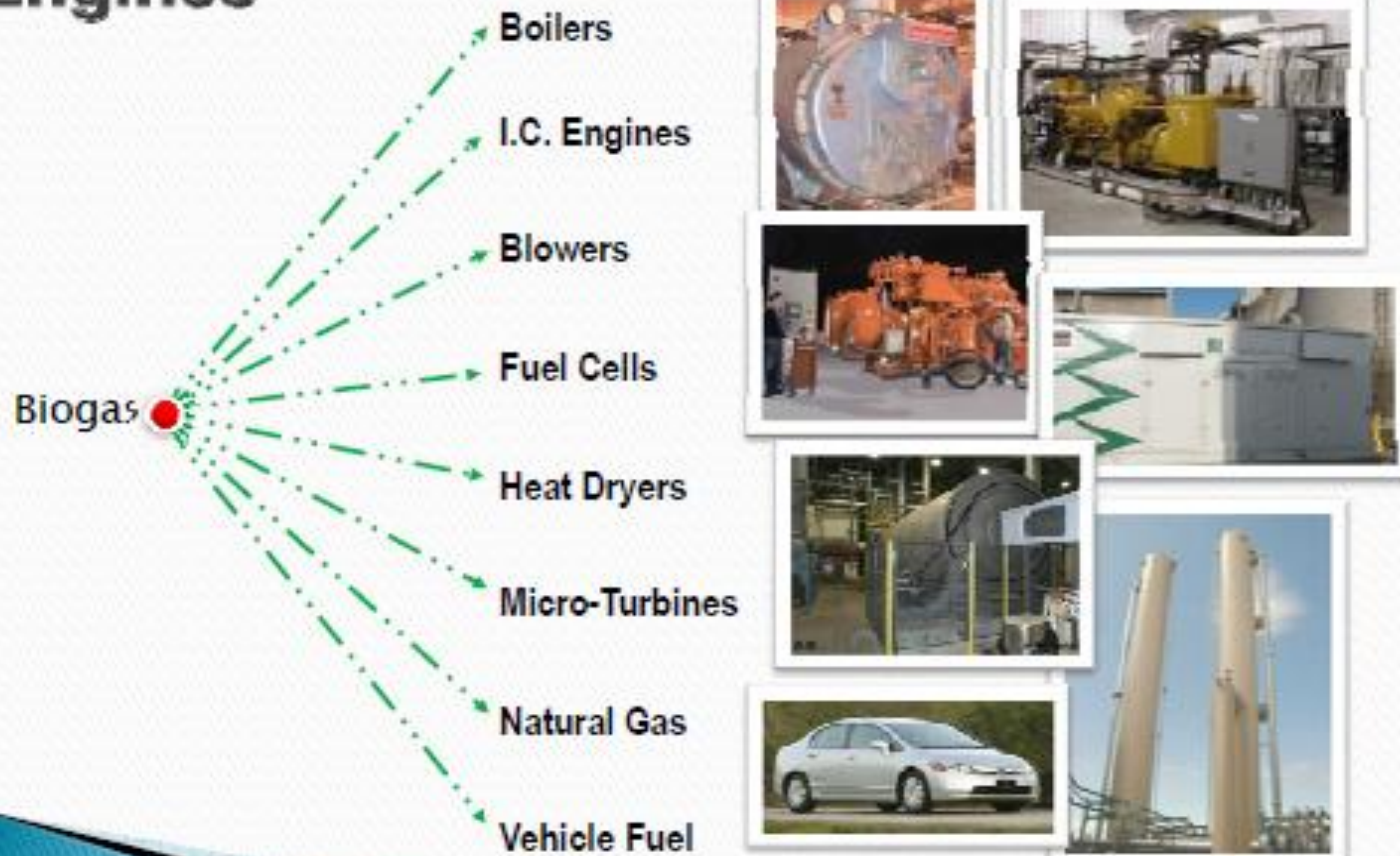
Food Fights – more evidence

- Keynote at UK Biosolids Conference
 - ***Wastewater Treatment Plants as Resource Centers***
- GreenBuild
 - ***Getting Waste Out of Water and Water Out of Waste: Tools for recovery of embedded renewable energy, water and nutrients from wastewater***
- NACWA – ***The Expanding Roles & Relationships of the Clean Water Utility: Turning Wastes into Resources...and Making a Profit Too?***
- WEF-Cities of the Future (March 2010)
 - ***Food Waste to Renewable Energy (via WWTPs)***
- Re-branding – from inputs to outputs, e.g., Clean Water Services

Our Changing View of Solids Management



Biogas: Looking Beyond Boilers and I.C. Engines



**Co-Digestion
with FOG (fats, oils,
grease) and other
organic wastes
results in additional
biogas production**



Co-Digestion of organic waste at the Des Moines Wastewater Treatment Plant, Des Moines, IA (One example of an increasing number of plants practicing co-digestion)



Bench, lab, pilot, and full-scale
co-digestion research

Solids Side Stream Treatment

Technologies to recover nutrients from solids processing

- ▶ Nitrogen and Phosphorous Recovery
- ▶ Turning a Struvite Problem into a Resource
- ▶ Reduce Side Stream Loading on Biological Nutrient Removal Process Stream



Photo Courtesy of Ostar

WEF/WERF Research Projects

[water environment federation/water environment research foundation]

- **Technology Roadmap for Sustainable Wastewater Treatment in a C-Constrained World**
 - WERF report identifies pathways to **build sustainable wastewater systems over the next few decades**, including various approaches which utilities could utilize with achievable milestones over the 20-30 year planning horizon.
 - In the context of sustainability and climate change, the **next generation of wastewater treatment processes should focus on resource recovery** (water reuse, energy/carbon recovery and nutrient recovery) as much as they currently do on treatment. The future goal is for wastewater treatment of domestic wastewater to have a minimal carbon footprint, and to be 100% self-sustainable with regards to energy, carbon, and nutrients, while achieving a discharge or reuse quality that preserves the quality of the receiving waters.

WEF/WERF - More

- **Barriers to Biogas Utilization for Renewable Energy**
 - Surveying wastewater treatment plants that could be utilizing AD
- **Co-digestion of Organic Waste Products with Wastewater Solids**
 - Examine the economic, environmental, social and operational considerations of food waste management as part of domestic wastewater treatment operations.
 - Expanded technical committee
- **Dutch Wastewater Program**
 - The Dutch wastewater utilities recently initiated a 10-year program to develop energy-positive wastewater treatment plants - the "Energy Factory."

Milwaukee's Approach

Metropolitan Milwaukee Sewerage District

(www.mmsd.com)



Don't be the cat
throwin' food scraps in the trash.
Use your disposal instead.

The average family of four generates 36 lbs. of food waste each week, or nearly 2,000 lbs. a year. Don't send your leftovers to a landfill. Grind them up and send them down the drain to MMSD to be recycled into energy and fertilizer – saving money for all of us.

What can and cannot be put into a disposal?

The standard disposal can handle basic food scraps. However, avoid large amounts at one time. Newer disposals can grind much more, like bones, cornhusks, artichokes and celery.

Standard Garbage Disposal

- Everyday food scraps
- Vegetable peels (ok in small amounts)

Disposer With Advanced Grind Features

- Everyday food scraps
- Vegetable peels
- Celery, corn husks, artichokes and other fibrous material
- Bones, fruit pits and other hard materials



NEVER put fats, oils or grease down the drain. They can lead to basement backups, sewer overflows and expensive plumbing repair bills. Instead, pour grease into a container and throw it in the trash.

How it pays to use your disposal:

Food waste fuels lower sewer bills. Food scraps produce methane gas that MMSD captures and turns into power to run our facilities. We also use food scraps to help make a fertilizer called Milorganite that's sold around the country.

- Food waste is mostly water, so it makes perfect sense to grind it up in a disposal and send it to our water reclamation facilities.
- Food disposals use less than 1% of a household's total water consumption and average less than 50¢ a year in electricity to operate. Commercial disposers use about 12¢ of electricity a day.

Did you know?



- Last year more than 13 million tons of food scraps were sent to landfills in the U.S.
- Modern disposals grind food to less than 1/4 inch in size, so it's safe for household, restaurant and municipal pipes.
- When using a disposal, run cold water down the drain for several seconds afterward to flush food waste through the plumbing system and keep debris from settling in the pipes.

FREQUENTLY ASKED QUESTIONS

How does a disposal help the environment?

Using a disposal allows food waste – which is 70% water – to be ground up and sent through pipes to Milwaukee Municipal Sewerage District – your local wastewater treatment facility. That keeps food scraps from being trucked to landfills where the waste decomposes and produces methane, a powerful greenhouse gas linked to global warming.

At MMSD, we can capture the methane generated from food waste and turn it into energy, saving our customers nearly \$2 million a year. We also use food waste to help feed microscopic organisms used in wastewater treatment that we later turn into Milorganite, a fertilizer trusted by the pros for more than 80 years.

Do I need a special disposal or are all disposals good for the environment?

All disposals are environmentally responsible at disposing of food scraps, and there is no need to purchase a certain type of disposal. Disposals basically serve the same function, to grind food waste and send it down the drain. However, there are different models on the market – with some basic, functional models you can't grind any and all kinds of food waste. However, the more technologically advanced models can grind virtually any food waste to extremely fine particles, so you never have to worry about what can or can't be put in your disposer.

Are disposals safe to use, especially with children in the household?

There is a common misconception that disposals have blades. Not true - when food waste enters the grind chamber, blunt lugs throw it against a rotating shredder plate - similar to a cheese grater - grinding it into fine particles that are flushed down the drain. But if reassurance is what you want, look for a "batch feed" unit - the disposer starts only when a special cover is in place.

09-010

MMSD's Tag-Lines:

**Don't be the cat throwin'
food scraps in the trash.
Use a disposal instead.**

We can turn your food waste
into energy.

For more information, go to

www.mmsd.com

How it Pays To Use Your Disposal

Food waste fuels lower sewer bills. Food scraps produce methane gas that MMSD captures and turns into power to run our facilities.

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Parallel Universe

- “Architecture” of food scrap recovery systems already exists
 - Food waste disposers to sewers to WWTPs
 - Functioning for decades
 - Expanding international interest
 - Connect the dots; tear down the silos; understand opportunities

Implications for Compost Industry

- On-Site vs. Centralized
 - Tensions between
 - Urbanization – Siting, Operations
- Feedstock Consolidation/Preparation
 - Grinding/pulverizing
 - Contaminant minimization
- Feedstock Transport
 - Slurry
 - Solid
- Use/Transport of Water
 - Use of pulpers/de-watering equipment
- Optimizing Energy
- Use of digestate, ash (from gasification)

Conclusion

- Prepare for competition
- Don't overlook existing assets
- Beneficial use of digestate, ash
- Expand options
- Public conversation
- Don't forget goal:
*maximum diversion
of food scraps
from disposal
into beneficial uses*



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