



Cities of the Future

Changing How We Think About Food Scraps

Virginia Recycling Association

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public affairs + environmental business

- Founding Asst. Dir., NYC's Recycling Program
- Chaired NYC's Citywide Recycling Advisory Board
- Working group to update recycling law
- Senior Consultant, InSinkErator
- Recycling/solid waste/composting/wastewater/biogas/biosolids/greenbuilding

Overview

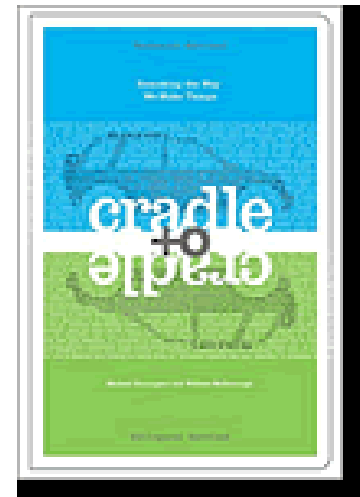
- Cities of the Future
- First Principles
- Two Memes
- Four Big Ideas
- What it means



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





Cities of the Future

- In U.S., over 50% live in cities/metro areas of 1M+
- Sustainability profile good
 - Transit
 - Energy
 - Housing
- Intense pressures on infrastructure
 - Waste management
 - Water/wastewater
 - Energy
- Green Codes
 - LEED
 - NGBS
 - ICC

Green/Sustainable Buildings



- Verdesian
- Battery Park City/NYC
- 40% more energy efficient than code
- Water consumption reduced 50%
- On-site blackwater treatment

Near-Zero Waste of Brooklyn HH of 4-6 adults/teens

- Paper: @ 60%
- Containers: @ 10%
- Other: @ 10% - goes to landfill
- Food waste: @ 20%
- *But zero food waste @ curb for 13 yrs*





MEME #1

What should I do with my banana peel?*

****If I'm concerned about global warming....***

NPR All Things Considered – June 2007

NBC's Today Show – November 2007

Should I:

- **Try to compost it in my backyard or worm bin?**
- **Put it in a garbage bag for collection in a truck headed to a landfill or waste-to-energy facility?**
- **Pulverize it in my food waste disposer and send it thru the sewer to a wastewater treatment plant for processing into clean water, fertilizer products and renewable energy?**



MEME #2: Food Fights!

Key drivers:

- Diversion from landfills/incinerators
 - www.stoptrashingthecolimate.org
- Municipal green-bin programs
 - www.beyondrecycling.org ; SWANA
- Composting industry
 - www.compostingcouncil.org
- Renewable energy potential
 - www.americanbiogascouncil.org
- WWTPs push to energy self-sufficiency
 - www.wef.org www.werf.org



What's the Big Deal?

- Organic waste 30% of MSW
 - Leaf/yard waste diversion significant
- Food waste 10% to 20%
 - Current recovery/composting dismal - <2%
- Disposal options not sustainable
 - Landfilling – methane generation
 - Incineration – no energy benefit
- Sustainability push – “zero waste”
 - Feed soils
 - Produce energy

What do we know about food scraps?

- Mostly water (@70%)
- Putrescible
- Higher C:N ratio than human waste
- Energy rich
- Methane potential (in anaerobic conditions)
- Collection challenging/expensive





Municipal Options

- Promote waste reduction
 - www.lovefoodhatewaste.org
 - www.leanpath.com
- Promote food recovery
- Create source-separated organics system
- Utilize existing infrastructure (e.g., wastewater treatment)

Big Idea #1: Feedstock Preparation @ Home

- Garbage disposer?
- Dispose-all?
- Food waste disposer?
- Garberator?
- *Feedstock preparation device*



Big Idea #1: FeedStock Preparation @ Food Service Establishment

Disposer (right)

AquaSaver water-
sensor (middle)

WastExpress – pulper
(left)



If you lived in Toronto...



What goes in the Green Bin?

greenbin

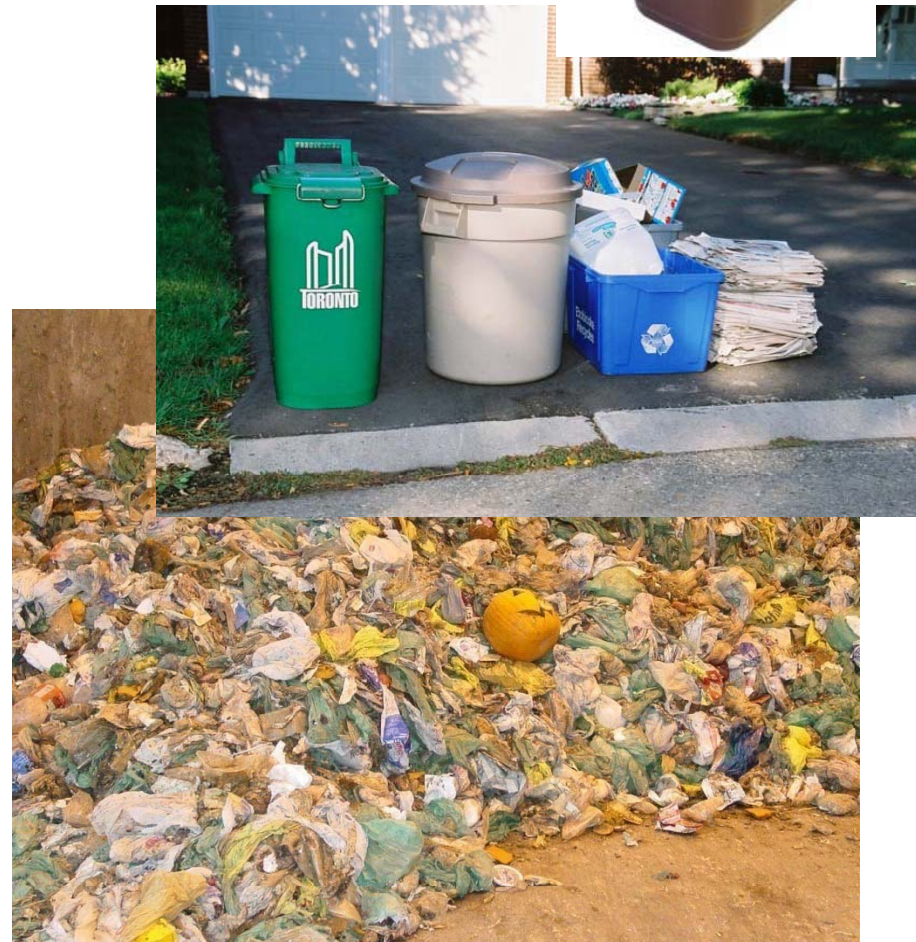
| YES | NO |
|---|----------------------------------|
| Fruit and vegetable scraps | Dryer lint NO |
| Meat and fish products (bones, skins, fat) | Dryer sheets NO |
| Pasta, bread and cereal | Feathers NO |
| Dairy products, egg shells | Hair/Pet fur NO |
| Coffee grinds and filters, tea bags | Fireplace or BBQ ashes NO |
| Soiled paper towels, tissues | Wood chips NO |
| Soiled food packaging - microwave popcorn bags, ice cream boxes | Vacuum bags NO |
| Candy, cookies, cake | |
| Diapers, sanitary products | |
| Household plants, including soil | |
| Animal waste, bedding and litter | |

QUESTIONS?
Call 416-338-2010
www.city.toronto.on.ca/greenbin

The Green Bin made easy...

1. Store your indoor container in a convenient location - it can be mounted inside a cupboard or placed on your counter or underneath your sink.
2. Line your indoor container with a plastic bag if you wish.
3. Collect all items accepted in the Green Bin program.
4. Empty the contents of your indoor container into your Green Bin.
5. Place Green Bin at the curb by 7 a.m. on your collection day.

Information card





Milwaukee's Answer

Metropolitan Milwaukee Sewerage District

(www.mmsd.com)

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.

We also use food scraps to help make a fertilizer called Milorganite that's sold around the country.





The Full Picture

Wastewater Treatment Plants Recycle Food Waste

- Wastewater treatment plants remove solids and send them to “digesters” to be broken down by microorganisms:
 - In the process, methane is generated.
 - Many plants turn methane into renewable power.
- “Biosolids” – what is left – can be processed into fertilizer for use on farm fields, golf courses, home gardens.

Sources: Water Environment Federation. Design of Municipal Wastewater Treatment Plants, 4th Ed. Diggelmann, Dr. Carol and Dr. Robert K. Ham. University of Wisconsin. National Biosolids Partnership, “Questions and Answers on Land Application of Biosolids.”



Biosolids?



- Heat-dried pellets
- Pathogen free
- Nutrient content: 5–4–3 (5% nitrogen, 4% phosphorus, 3% potassium)
- Land-applied – farms, road-sides, mine reclamation

Biogas as Fleet Fuel

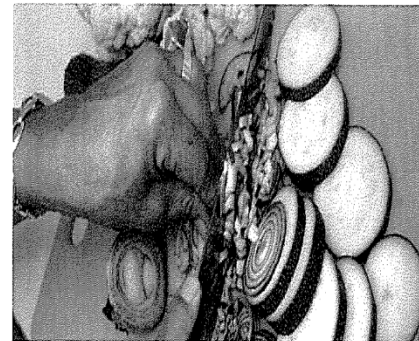
Sewage biogas fuels public transport buses in Oslo

- The city of Oslo, Norway, recognizes that biomethane produced from sewage treatment and kitchen waste is sufficient to run the city's entire bus fleet, while reducing carbon dioxide (CO) emissions more than 70o/o compared to diesel-fueled buses.

Check out animation at:

www.insinkerator.se

SvD



Slopad avgift för avfallskvarn

Publicerad: 1 september 2008, 14:39. Senast ändrad: 1 september 2008, 14:40

Avgiften för avfallskvarn slopas i Stockholm. Syftet är att uppmuntra fler Stockholmare att skaffa köksavfallskvarn och bidra till att öka biogasproduktionen.

Food = Fuel



- **Saving the World, One Sewage Plant At a Time**
- A new \$2.4 million biogas and energy efficiency project at a sewage treatment plant in Washington State will capture methane gas from the treatment process, saving more than \$228,000 yearly in utility costs. The biogas project will greatly reduce greenhouse gas emissions from the treatment plant and save about 2.8 million kilowatt hours yearly (enough to power about 210 homes), relieving pressure on the local grid and helping to obviate the need for new fossil fuel burning power plants in the region.



In Cities of the Future....

Food Waste Disposers

A good way to deal with your banana peel

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