



*Status of Managing
the Organic Waste in the U.S.:
The 2013 Columbia Survey and Beyond*

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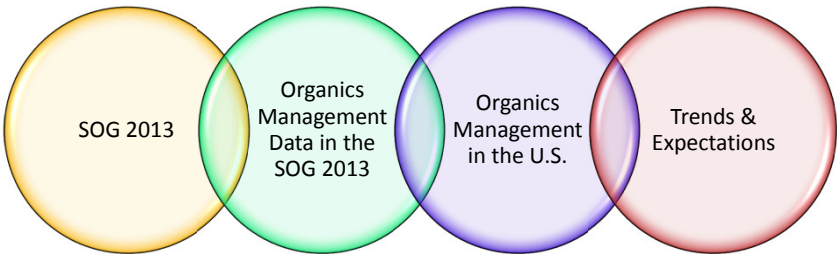
Presented at the WTERT Bi-Annual Meeting
October 9, 2014



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Outline




SOG 2013

Organics
Management
Data in the
SOG 2013


Organics
Management
in the U.S.

Trends &
Expectations




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"STATE OF GARBAGE IN AMERICA" 2013 SURVEY



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"State of Garbage in America"



Initiated in 1989 and Earth Engineering Center (EEC) joined in 2004



17th NATIONWIDE SURVEY OF MSW MANAGEMENT IN THE U.S.

THE STATE OF GARBAGE IN AMERICA

A joint study by BioCycle and the Earth Engineering Center of Columbia University

BIOCYCLE, in collaboration with the Earth Engineering Center (EEC) of Columbia University, conducts the biennial State of Garbage in America survey on the generation and management of municipal solid waste (MSW) in the United States. The State of Garbage in America Report, launched by BioCycle in 1998, is unique in that actual garbage data is collected from each individual state, with waste characterization studies solely used for validation of the numbers. This is the 17th nationwide survey, reporting data from calendar year 2009.

The data was gathered during the spring of 2010, using an Excel form that was e-mailed to the solid waste management departments in all 50 states and the District of Columbia. All entries were checked and validated using results of former State of Garbage in America reports, EPA waste characterization studies, and also a survey of Materials Recovery Facilities (MRF) carried out by Ebers Research of Government Advisory Associates (GAA). We greatly appreciate the time spent and the contributions made by the solid waste and recycling officials listed at the end of this report. Thanks to their help and expertise, we can present the 2010 edition of "The State of Garbage in America." All numbers are reported in U.S. tons (1 U.S. ton = 1 metric ton).

SURVEY METHODOLOGY

In 2009, the EEC was invited by BioCycle to collaborate on a nationwide waste survey requirement and another 12 states did not respond to this question. Only five states did not complete the 2010 State of Garbage survey. For states where comparison and local agencies are not required to report in the state, reported data was used. In most cases, we still collected from waste management facilities. This is especially true for landfills and waste-to-energy

Figure 1. Regional Breakdown

Landfilling, recycling, composting, and WTE, tons by region, 2009

Region	Landfilling	Recycling	Composting	WTE
Midwest	9%	10%	1%	1%
West	15%	12%	1%	1%
Risky Mountain	10%	10%	1%	1%



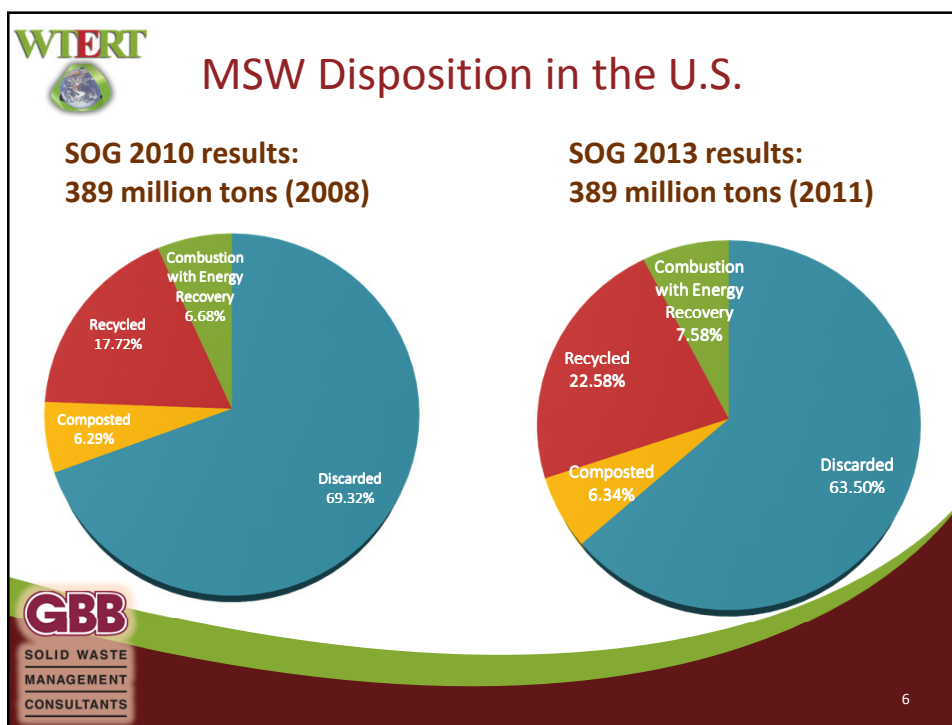
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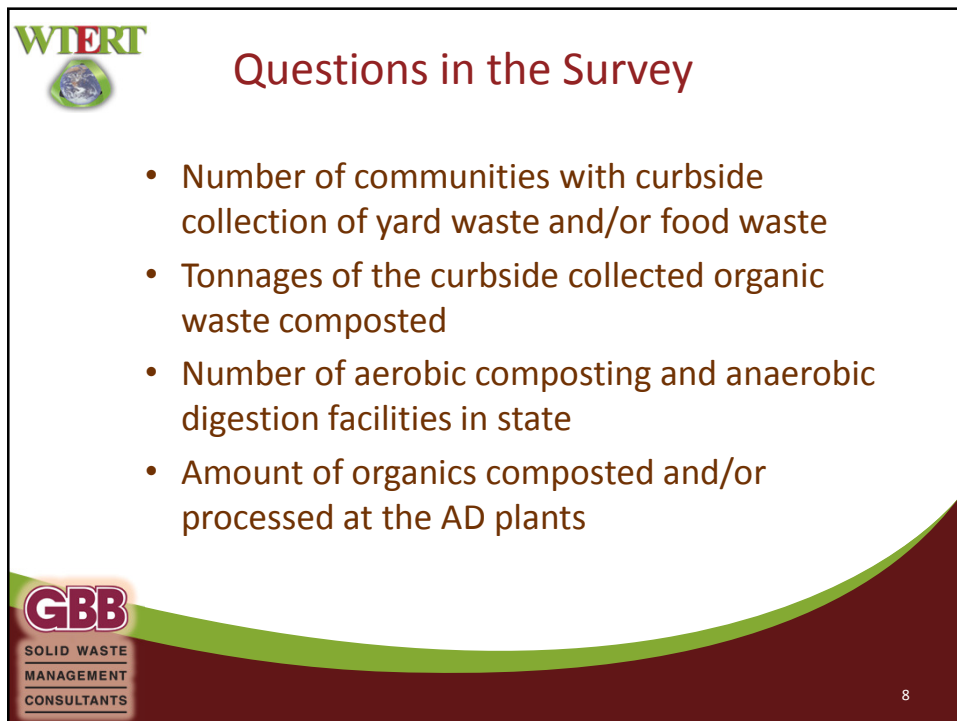


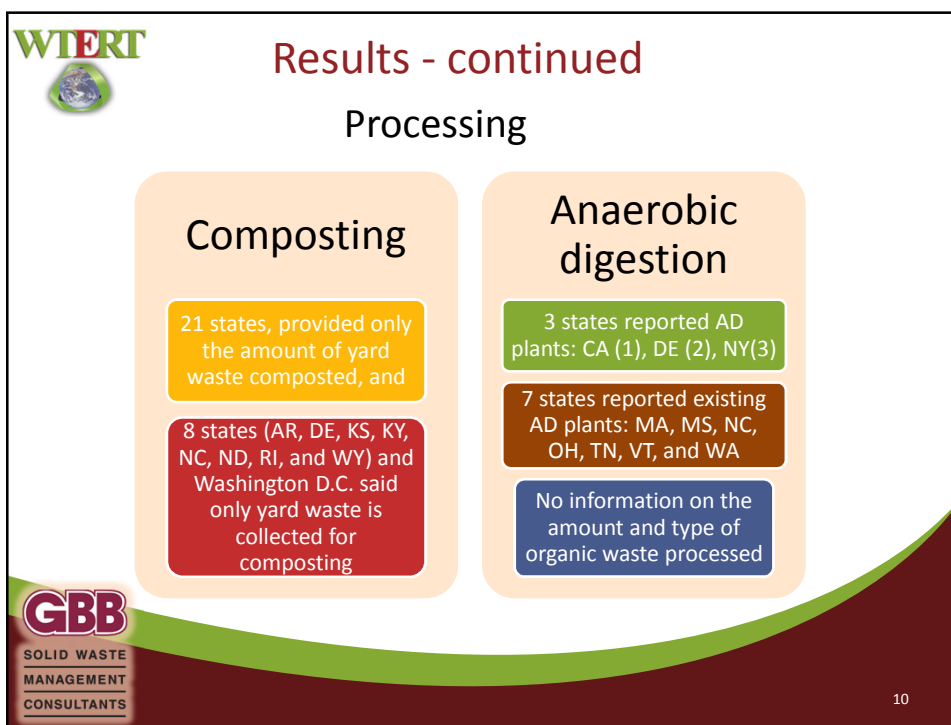
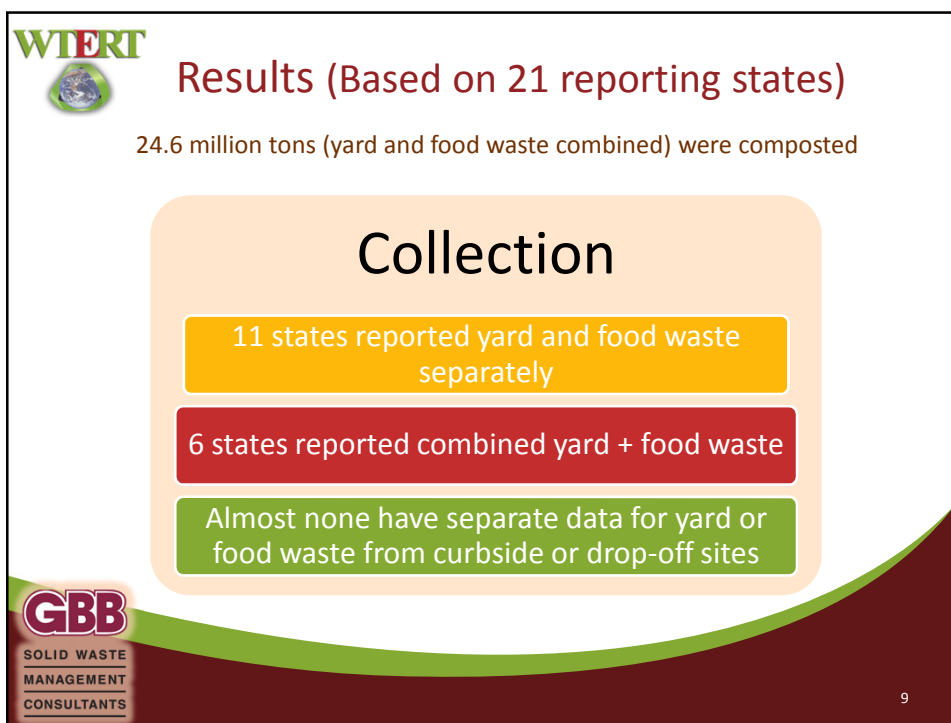
- Conducted solely by EEC- Dolly Shin, MS in Earth Resource Engineering
- Guidance provided by US-EPA Office of Resource Conservation and Recovery
- Collected 2011 data from state waste management agencies in Fall 2012 and Spring 2013
- “Thanks!” to the American Chemistry Council and National Science Foundation for supporting the research

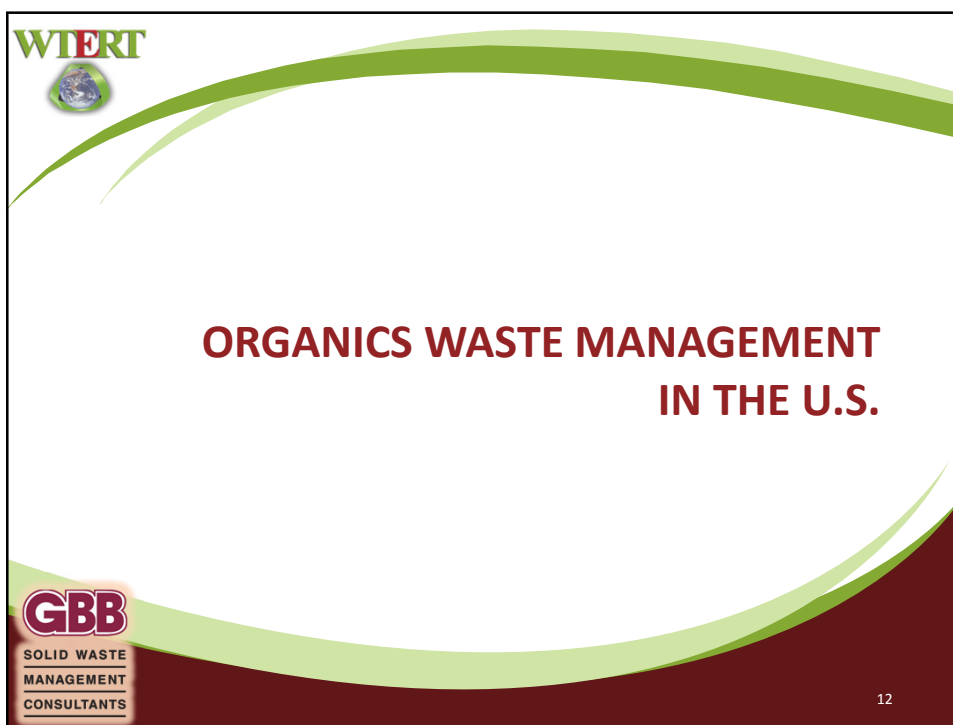
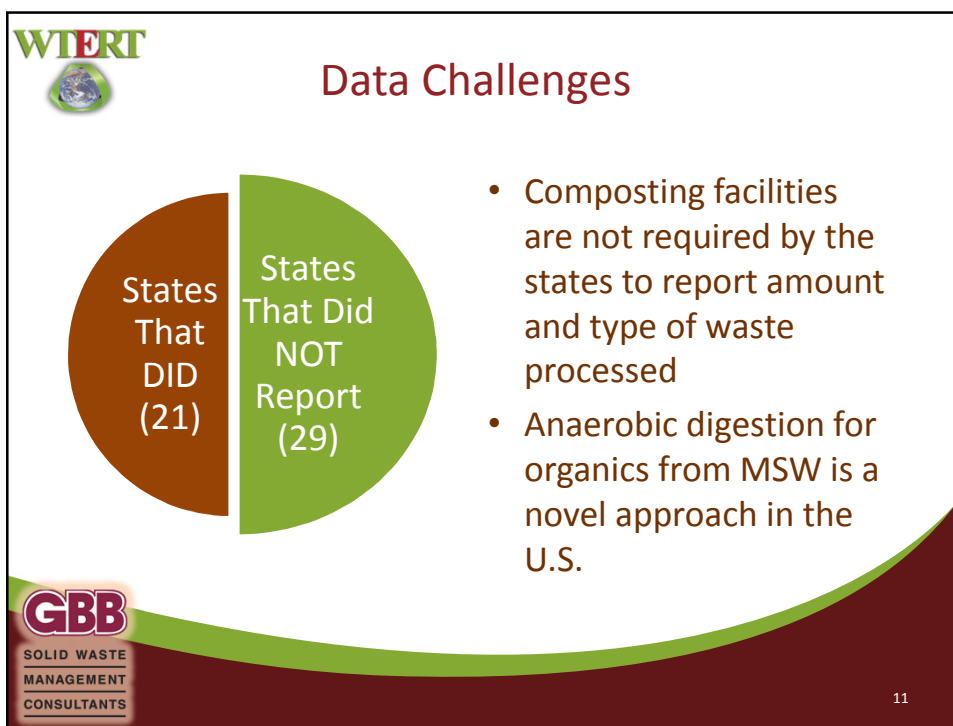


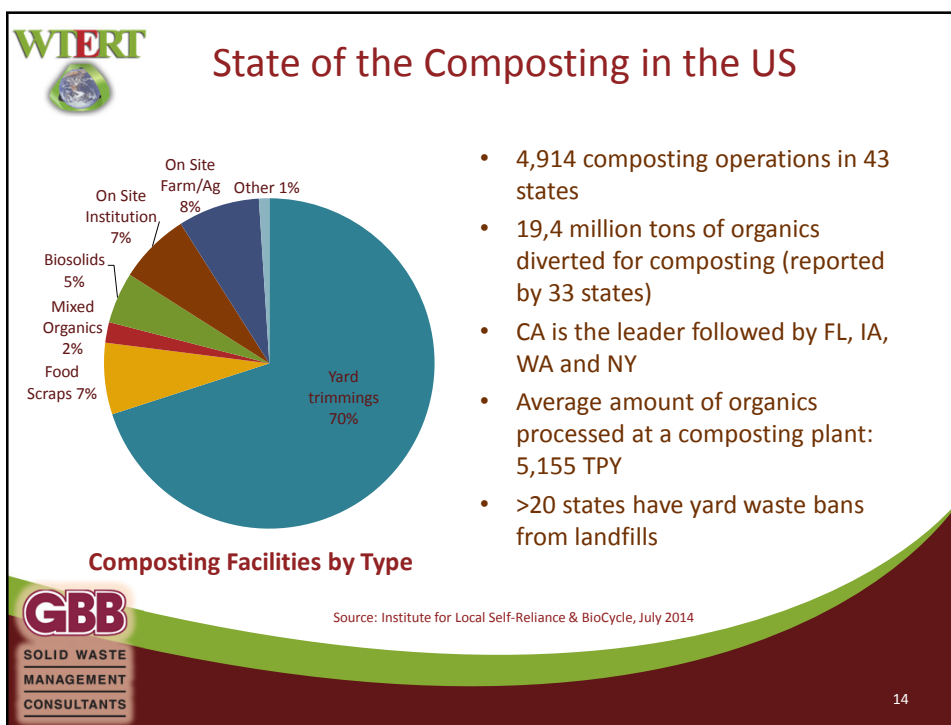
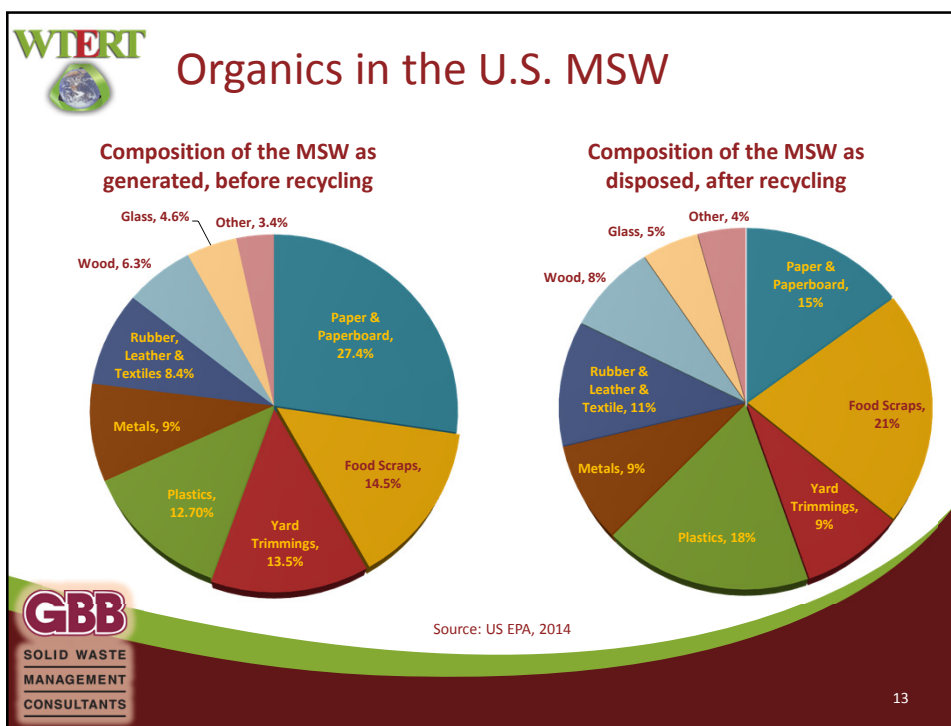
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Anaerobic Digestion

Biological degradation of organic material in absence of oxygen



CR&R Eiseemann – Perris, CA (under construction)

- Biogas fuel for electricity and/or heat production; can be conditioned to pipeline quality
- Digestate for soil amendment, animal bedding, or rolled into a composting process
- ~ 20 plants operating in the U.S. (Source: GBB, 2014)

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WTERT  Companies in U.S. at Work with AD

EISENMANN  **BEKON**
Recovery and Energy with Zero Waste Energy Technologies GmbH & Co. KG

 **CR&R**

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- US company founded in 2008 in Waltham, MA
- Licensed European AD technologies
- More than 10 composting plants
- Three commercial AD plants
 - Richmond Energy Garden, Canada- 40,000 TPY of food and yard waste
 - London Ontario Energy Garden, Canada- 65,000 TPY of mixed organic waste
 - Energy Garden in Bay Lake, FL (Disney World) - 100,000 TPY of Mixed organic waste


Richmond Energy Garden


London Energy Garden

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Cleveland, Ohio- 42,600 TPY of Biosolids, FOG and food waste

- US company established in 2006 in Cleveland, OH
- Initially European technology, now more than 98% of the components are purchased in the U.S. and more than 76% of those are from Ohio-based companies
- Integrated Anaerobic Digestion System (iADs) is patent pending technology developed at Ohio State University
- Projects:
 - 8 operating commercial AD projects in the US
 - 3 commercial projects under construction



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Wooster, OH- 20,000 TPY, Pumpable and high solids organic biomass

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ZeroWaste™
ENERGY, LLC.
Recovery and Energy with Zero Waste



Monterey, CA

- US company based in Lafayette, CA
- Dry Anaerobic Digestion licensee for:
 - KompoFERM
 - SmartFERM
- Plants:
 - Monterey Regional Waste Management District- 5,000 TPY of food and green waste
 - City of San Jose (start-up November 2013)- 90,000 TPY of commercial food waste
 - Operator for Infinitus in Montgomery, AL
 - 3 plants under construction and development

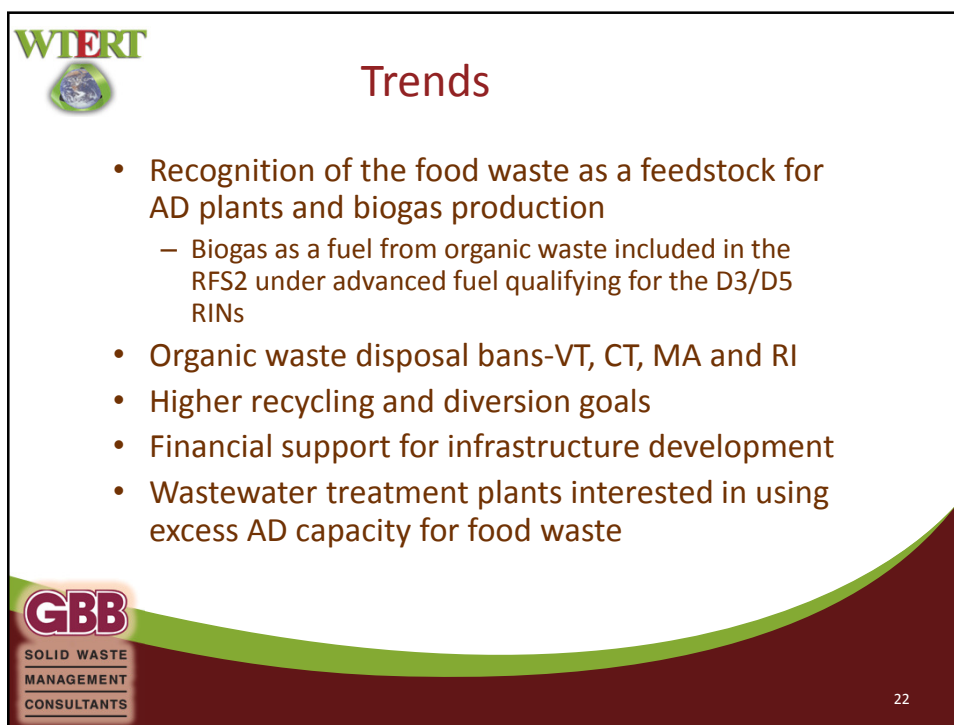


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San Jose, CA

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Biogas Opportunities Roadmap


- USDA, US-EPA, USDE- August 2014
- Part of the White House Climate Action Plan- Strategy to Reduce Methane Emissions
- Voluntary actions to reduce methane emissions and increase energy independence
- Estimations
 - >11,000 additional biogas systems (including farms, agriculture and WWTP) could be deployed in the US
 - Energy to power 3 million homes






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Expectations

- AD plants currently under development:



City of Portland, OR - Columbia Biogas

Perris, CA - CR&R/Eisenmann

County of Santa Barbara, CA - Mustang Renewable

Monticello, IN- Waste No Energy LLC

Town of Brunswick, ME


Town of Bourne, MA - Harvest Power

Johnson, Rhode Island- Blue Sphere

Prince William County, VA – TBD


City of Charlotte, NC - Blue Sphere

City of Columbia, SC - W2E




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Renewable Energy from Waste



NOVEMBER 17-20, 2014 » **SAN JOSE, CALIFORNIA**








Food Waste or Fuel Source?
DEPARTMENTS - CRITICAL THINKING


Harvey Gershtman
OCTOBER 16, 2013

Hahvee...take out the garbage...it stinks! my mom used to remind me of my household chore growing up in Pawtucket, R.I. in the '60s. We had a 30-gallon can for food waste in the back corner of our lot waiting to be collected by the city and delivered to pig farmers for feed. Neighboring Providence did it a little differently. It had to be bundled in newspapers and set out for collection, eventually to find its way to pig farmers.

Fast-forward to the new millennium. We are serious about increasing recycling even more by going after organics. The U.S. Environmental Protection Agency reports that food waste accounts for approximately 21 percent of landfilled municipal solid waste (MSW), or around 35 million tons per year (TPY). This waste is a resource that can be used to produce bioogas, for power production or



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Questions and comments?

Thank you!

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