

**What's Ahead for
Solid Waste Management
in the U.S. and Ohio?**

**Presented at the
SWANA BuckEye Annual Meeting**

September 14, 2009

**By
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Gershman, Brickner & Bratton, Inc.
Fairfax, VA**



GBB Overview



- Headquartered in Fairfax, VA
- Established in 1980 as an objective adviser to governments, institutions, and businesses
- 28 years implementing innovative solutions for waste and recycling industry
- Dedicated exclusively to solid waste management; more focused than broad-based firms
- “Change Agents” to produce better services and facilities






Agenda

- ❖ Looking back
- ❖ Solid Waste Management Now
- ❖ WTE and Conversion Technologies
- ❖ Federal Legislation
- ❖ Ohio
- ❖ Summary Points




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Looking Back Personally....

- The backyard burn barrel
- The in-ground garbage can
- Deposits on soda bottles
- Polluted Blackstone River
- Grandpa's ball of string
- Grandpa's oak leaves brushes
- Annual trips to the scrap yard with Dad
- Fly ash from the City incinerator




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Earth Day Origin – April 22, 1970

So, why is Earth Day different from any other day?

- Federal legislation in 1970s led to changing the U.S. environment
 - Clean Air Act
 - Clean Water Act
 - Resource Conservation and Recovery Act



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Earth Day Origin – April 22, 1970

- Solid waste hierarchy
 - Reduce
 - Reuse
 - Recycle
 - Recover
- *How did this affect me?*
 - *In 1970, a Senior Mechanical Engineering student*
 - *“Reclamation for a Town of 20,000” design team project*





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Alternative Technologies in the 1970s and early 1980s

- Ando Torrax Gasifier in Niagara, NY
- Black Clawson Hydropulper in Franklin, OH
- CEA Eco-Fuel in Bridgeport, CT
- Columbus, Ohio Trash Burning Power Plant
- GarbOil in San Diego, CA
- Monsanto Pyrolysis in Baltimore, MD
- Recovery 1 in New Orleans, LA
- Union Carbide oxygen pyrolysis in Charleston, WVA
- RDF for Utility Boilers in St. Louis, MO; Milwaukee, WI; Rochester, NY; and Chicago, IL

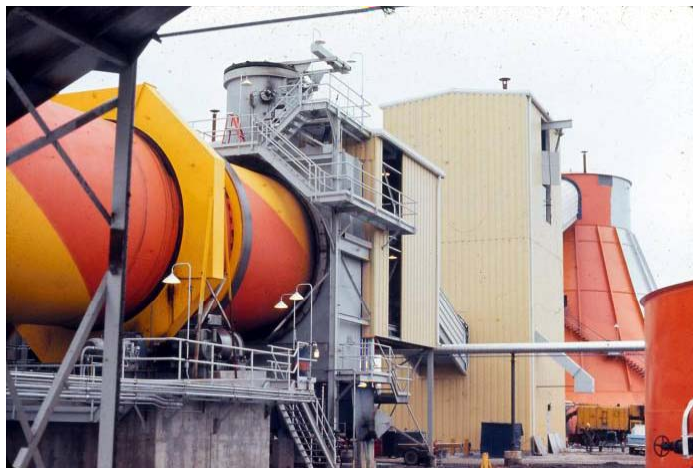
Why did these projects fail or stop operating?




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Monsanto Baltimore Pyrolysis Kiln




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Charleston, WV Union Carbide Purox System




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NCCR Recovery I Facility New Orleans, LA




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RDF Burning in Coal-Fired Utility Boilers

<p>Union Electric Co. St. Louis, MO</p> 	<p>Americology – WEPCO Milwaukee, WI</p> 
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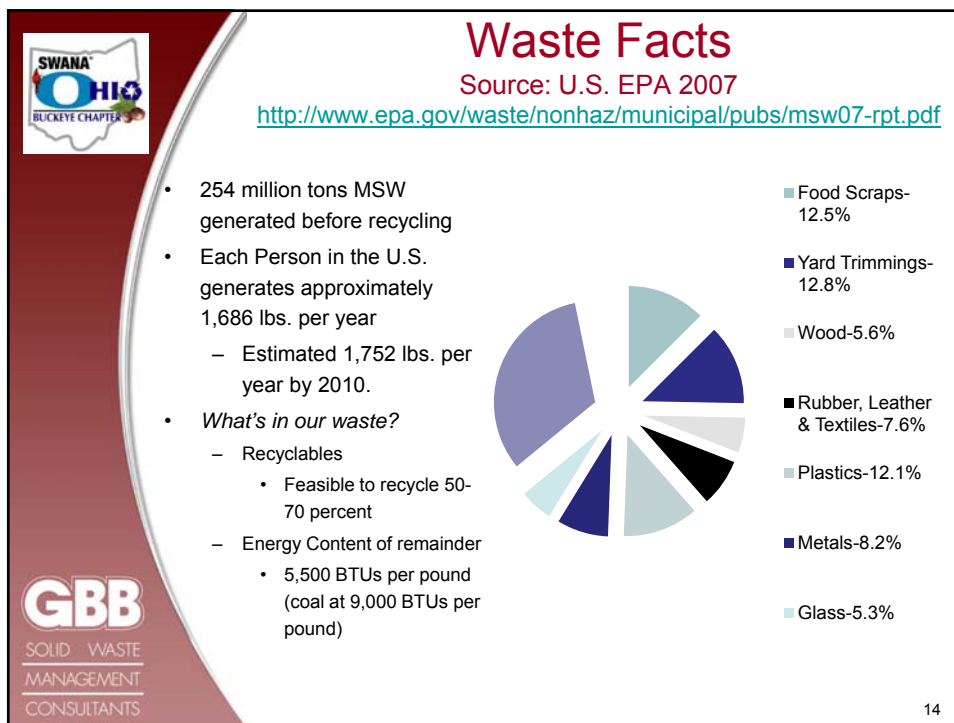
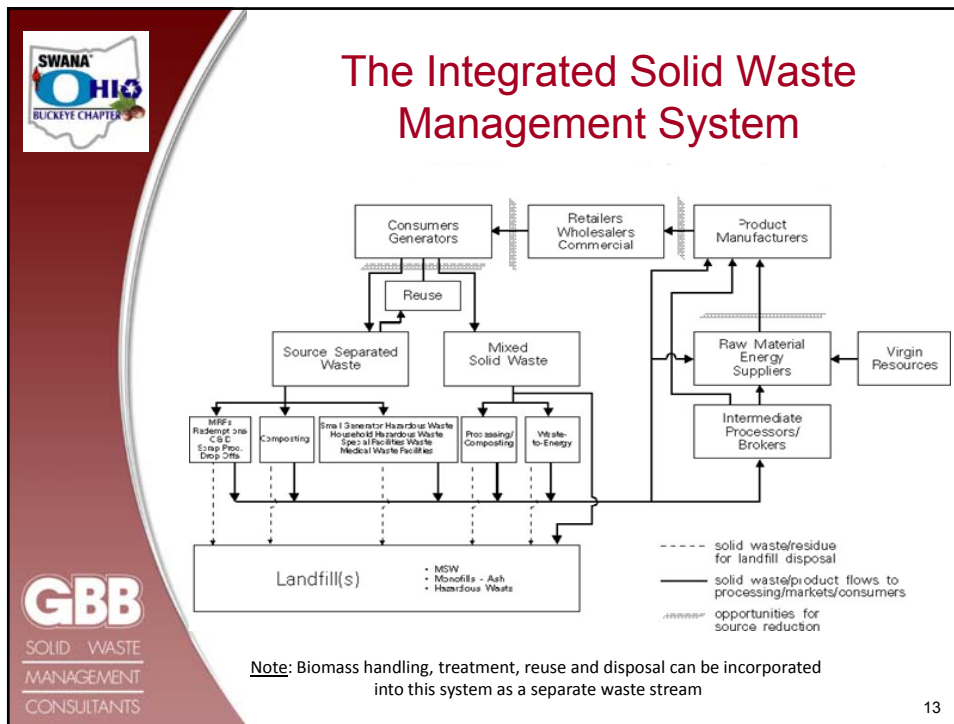
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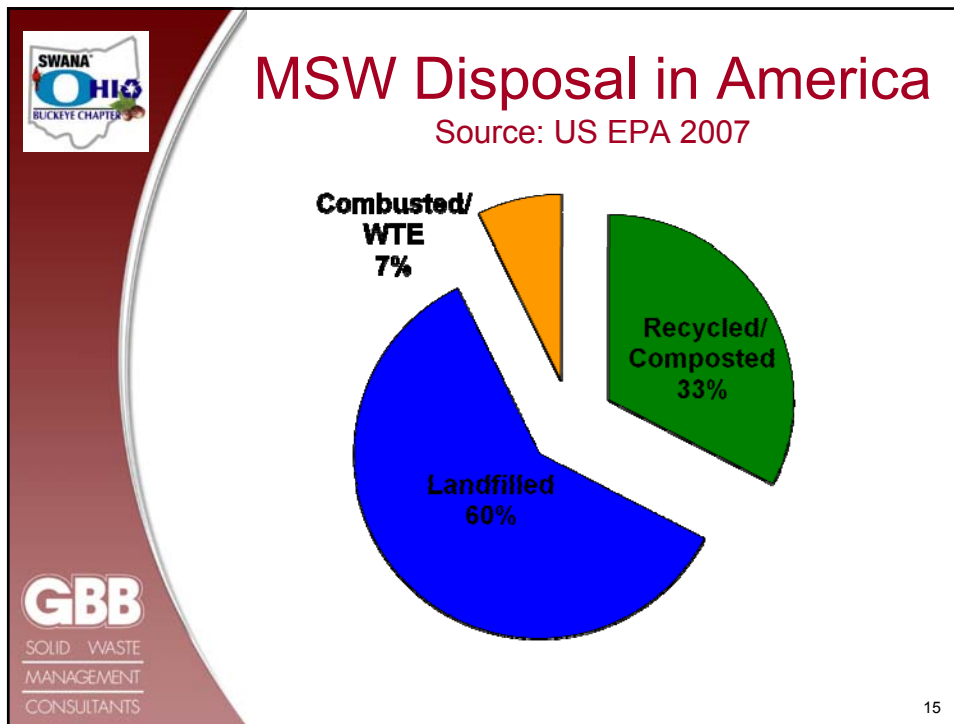


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U.S. Solid Waste Management Programs/Facilities*

Program/Facilities	2000	2002	2004	2008
Curbside Program	9,709	8,875	7,689	**
Yard Trim Facilities	3,846	3,227	3,474	**
Landfills (MSW)	2,142	1,767	1,654	**
Incineration	132	107	109	**
Landfills (C&D)	1,825	1,931	1,574	**
Transfer Station	3,970	3,895	3,744	**

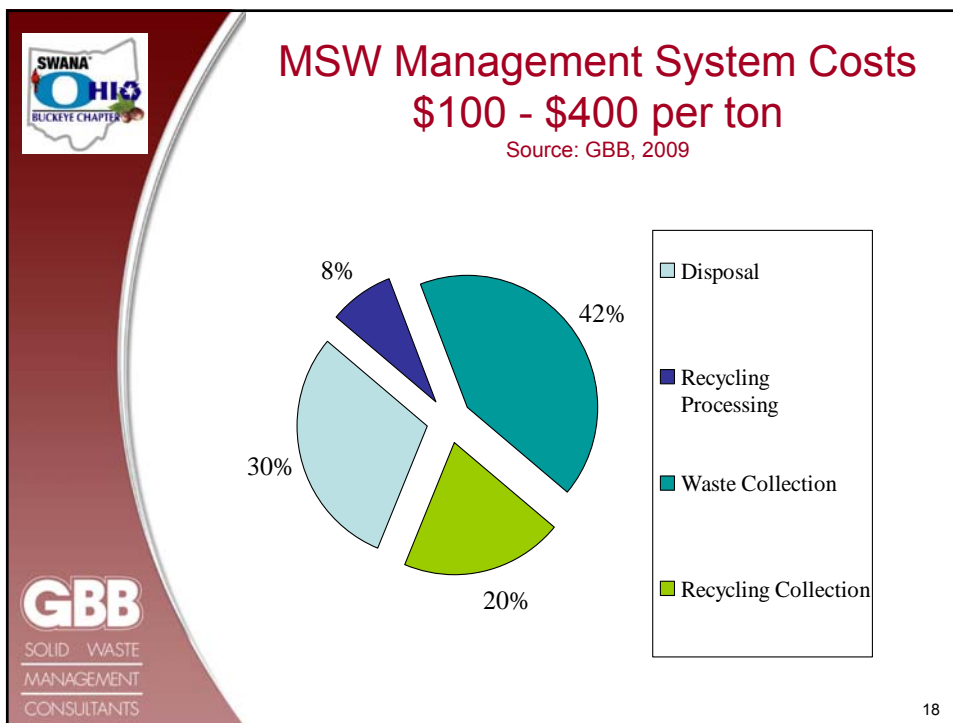
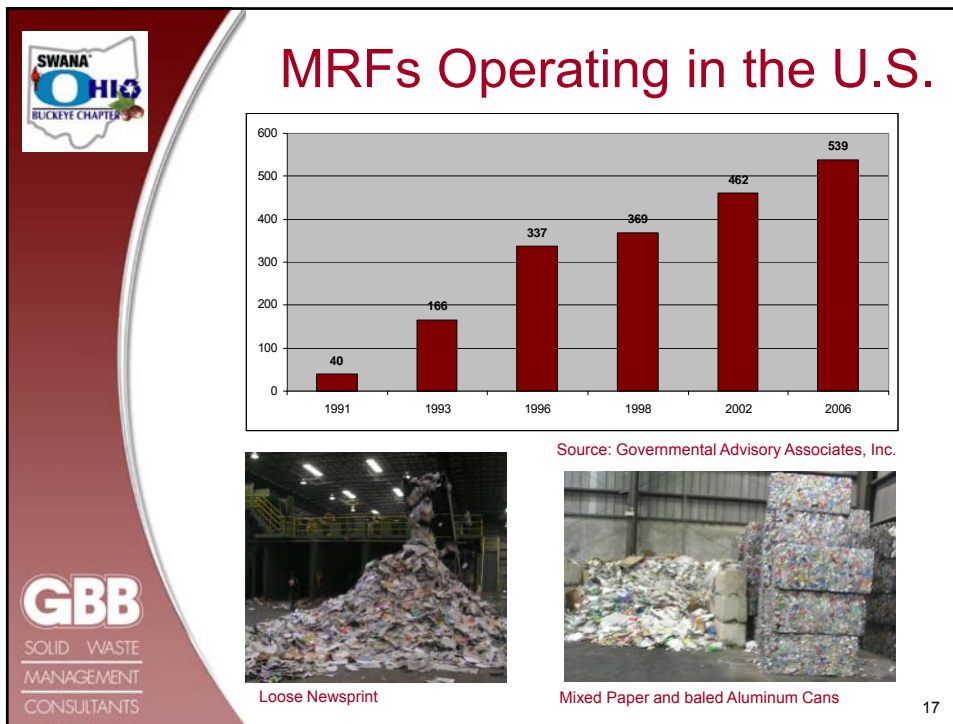
*Source: BioCycle, State of Garbage; various years


** Watch for publication in near future

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Waste-to-Energy:


\$14 Billion of Productive Assets Servicing the U.S.




North Broward County, FL



Alexandria/Arlington, VA




Springfield, MA



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U.S. WTE Plants by Technology

Technology	Operating Plants	Daily Design Capacity (TPD)	Annual Capacity ⁽¹⁾ (Million Tons)
Mass Burn	64	71,354	22.1
Modular	7	1,342	0.4
RDF - Processing & Combustion	12	15,428	4.8
RDF - Processing Only	2	6,075	1.9
RDF - Coal Combustion	2	4,592	1.4
Total U.S. Plants ⁽²⁾	87	98,791	30.6
WTE Facilities	83	92,716	28.7


⁽¹⁾ Annual Capacity equals daily tons per day (TPD) of design capacity multiplied by 365 (days/year) multiplied by 85 percent. Eighty-five percent of the design capacity is a typical system guarantee of annual facility throughput.
⁽²⁾ Total Plants includes RDF Processing facilities that do not generate power on site.



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Source: IWSA (now Energy Recovery Council), 2007 Directory


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Air Emissions of Top Three WTE Contenders for WTERT Award in 2006

Emission	WTE-A (mg/Nm ³)	WTE-B (mg/Nm ³)	WTE-C (mg/Nm ³)	Average of 10 Finalists (mg/Nm ³)	EU Standard (mg/Nm ³)	US EPA Standard (mg/Nm ³)
Particulate matter (PM)	0.4	1.8	1	3.1	10	11
Sulphur Dioxide (SO ₂)	6.5	7.5	3	2.96	50	63
Nitrogen oxides (NO _x)	80	11	58	112	200	264
Hydrogen chloride (HCl)	3.5	0.5	0.7	8.5	10	29
Carbon Monoxide (CO)	15	7	15	24	50	45
Mercury (Hg)	0.002	0.005	0.002	0.01	0.05	0.06
Total Organic carbon (TOC)	0.5	NA	0.9	1.02	10	n/a
Dioxins (TEQ), ng/m ³	0.002	0.002	0.015	0.02	0.10	0.14

Source: Themelis, N.J. Thermal Treatment Review. Waste Management World, July-August 2007.




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WTE Technology & Companies

Company	Technology		
	Mass Burn	RDF	Modular
Babcock & Wilcox	X	X	
Casella		X	
Covanta*	X	X	X
Energy Answers	X	X	X
Foster Wheeler	X		
Veolia*	X	X	
Wheelabrator (WMI)	X		
Xcel Energy		X	

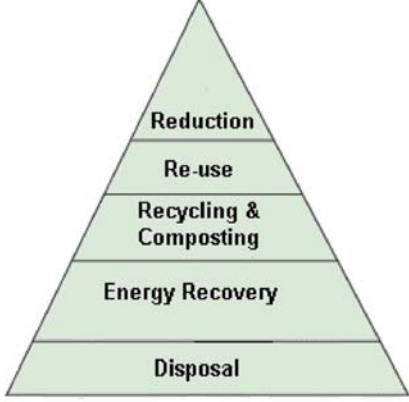
* Covanta purchased Energy Answer's plants in 2008 and announced purchase of Veolia's plants in 2009.




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Waste Management Hierarchy



In 2005, EPA designated WTE energy as renewable energy!




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EPA Warm Model Comparison Between Recycling Rates with Composting or Waste to Energy

Baseline Description	Alternative	Total GHG Emissions (MTCO2E/day) from:			
		Baseline MSW Generation and Management	Alternative MSW Generation and Management	GHG Emission or Reduction Difference	Barrels of Oil Saved (bbls/day)
Waste landfilled	20% Recycling	110	(310)*	(420)	523
Waste landfilled	50% Recycling	110	(543)	(653)	907
Waste landfilled	50% Recycling and Rest to Composting	110	(597)	(707)	904
Waste landfilled	50% Recycling and Rest to Waste To Energy	110	(661)	(771)	1,047

*Note: numbers in parenthesis are negative showing reductions in CO2 emissions.




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Alternative Conversion Technologies

- Biological
 - Aerobic Composting
 - Anaerobic Digestion/Codigestion
 - Biodiesel
 - Bioethanol
 - Biological Pretreatment
 - Vermicomposting
- Thermal/Chemical
 - Acid Catalysis & Distillation
 - Direct Combustion
 - Gasification/Pyrolysis
 - Microwave Processes
 - Plasma-Arc
 - Thermal Decomposition
- Processing
 - Fiberboard and Construction Composites
 - Refuse Derived Fuels



Source: Gershman, Brickner & Bratton, Inc., September 2008.

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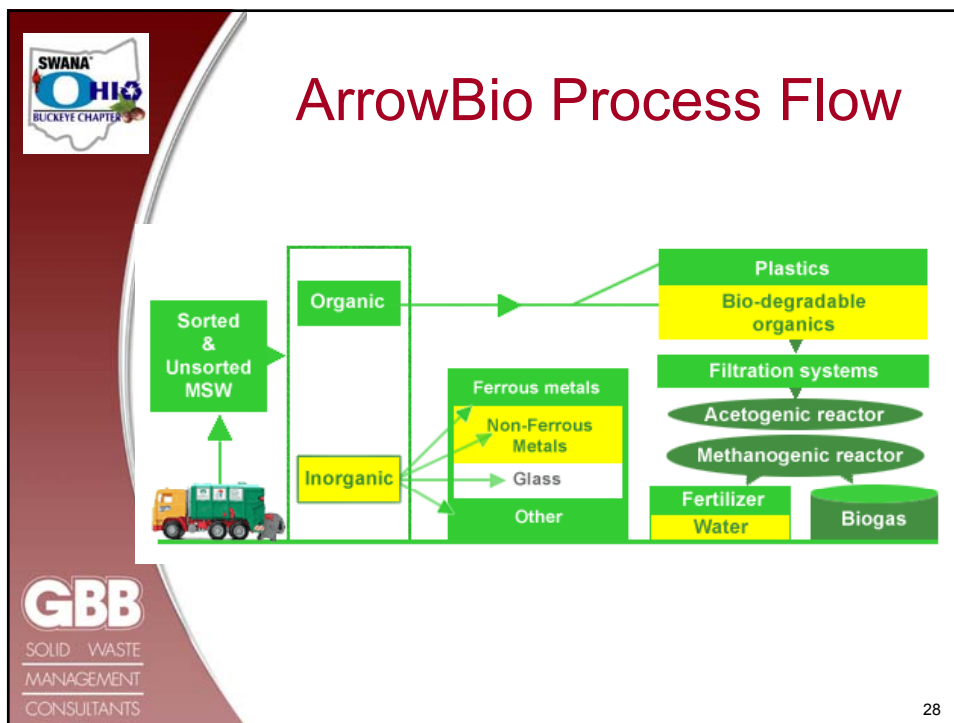
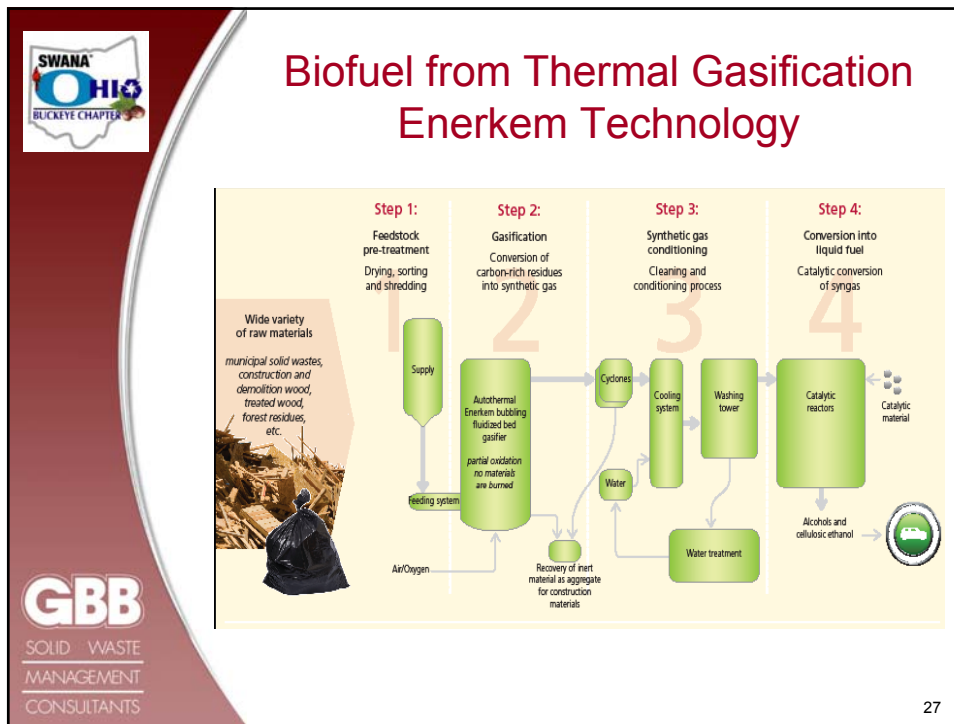


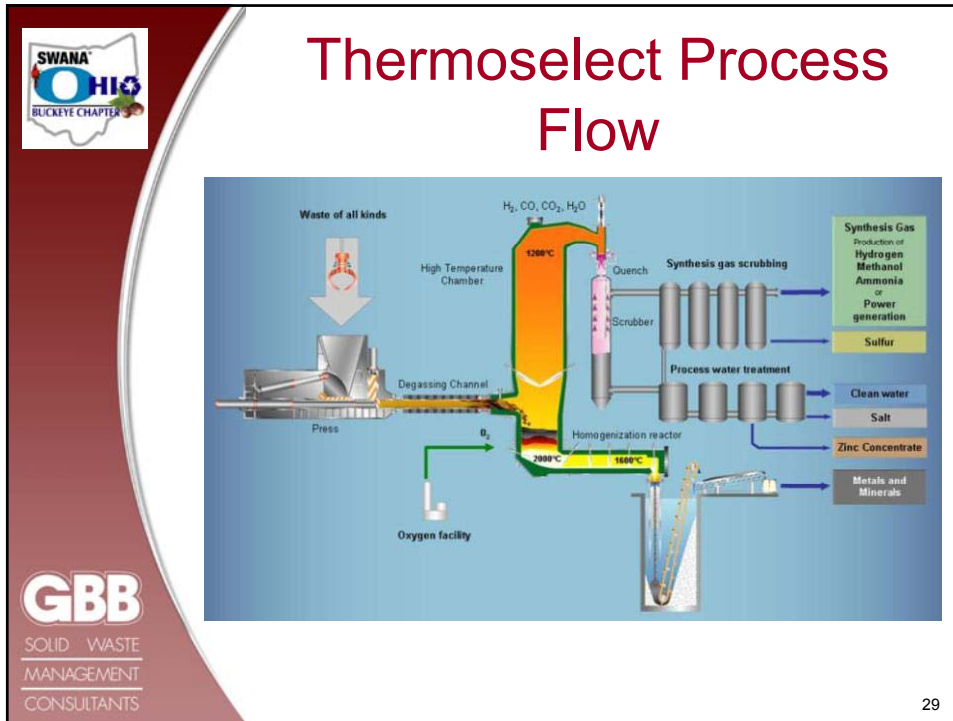
Waste-to-Energy and Conversion Technology Companies

Advanced Processes, Inc. Advanced Technology Concepts, LLC AgrestBiofuels Alco, Inc. Alstom Power Alter NRG American Ref-Fuel Company Anlow Ecology, Ltd. Balfour Projects, Inc. BC Energy Systems of Hawaii, Inc. Bofine, Inc./BioMetals, Inc. Biogate Fuels Corporation BlueFire Ethanol/Alkenol Fuels, Inc. BRI Energy Brian Brady & Associates, Inc. BTA (Bioscience Adaptive Engineering) BTG Biomass Technology Group & V. Canada Composting, Inc. CCI US Corporation Changing World Technologies (CWT) Chiptec CleanTech Biofuels, Inc. Community Power Corp. Comprehensive Resources, Recovery and Reuse Corplogic Coronal Industries Corasdech Systems, LLC Coronal, LLC Coskata, Inc. Coslich Company Covanta Energy - Martin GmbH CPM/Rockamp Champion Down Stream Recovery Service Dynamec Energy Systems Corporation Dynatech, Inc. Ebas Corporation Eco-Waste Solutions, Inc. EcoCorp Ecosystem Projects, LLC	ENERCON Energy Answers Corp. Enerkem Eneaste (EWI) Enech Enerpac Technologies Corporation EPI Edtech USA, LLC Europlasma FECCO International FERCO Enterprises, Inc. ForeverGreen Enterprises Inc. Fulcrum BioEnergy, Inc. Future Energy Resources Corporation GEM America, Inc. Genahol, LLC GenSight International Geosystems LLC GGT Waste (Green Growth Technology) Global Energy Solutions, Inc. Global Environmental Technologies, Inc. Global Green Energy, LLC Globale Renewables Grasseron Energy Management Green Power Inc. Green Power Systems Gryphon Technologies, Inc. Gulf Coast Energy Hitachi Metals, Inc. Home Farm Technologies USA, Inc. ICM, Inc. Improved Converters, Inc. Indiana Ethanol Power LLC InEriTec Inland Energy, Inc. Innovative Logistics Solutions International Power Group Ltd Interstate Waste Technologies, Inc. Iogen Jov Theodore Somestefaan	Kvaerner EnviroPower Inc. Linde-KCA-Dresden Masada Resource Group Mascoma Mayfran International MCX Environmental Energy Corporation Mology Corporation Systems, Inc. Moring Organics Management Mitsui Babcock Molecular Waste Technologies, Inc. MPM Technologies, Inc. New Bio North American Power Company Omnifuels Technology Inc. Onsite Power Systems Organic Recycling Technologies, Inc. Organic Waste Remediation, L.L.C. Organic Waste Systems OWS nv Orgaworld Pacific Biodiesel Pan American Resources, Inc. Pearl Earth Sciences Corp. PEAT International, Inc. Pennam Diversified Manufacturing Corp Phoenix Solutions Company Primus BioTechnology Plasco Energy Group Plasma Classification Technologies, LLC POET BioRefinery Precision Energy Services Primenergy, LLC Princeton Environmental Group PRM Energy Systems, Inc. PureVision Technology Range Fuels Recovered Energy Resources, Inc. Recovered Energy, Inc. ReEnergy Holdings LLC Rentech	Seghers Koppel Technology, Inc. Seneca, LLC Smart Ethanol Solutions, LLC SMUDA Technologies Solena Group StarTech Environmental Corporation Strimac Energy Sun Energy Group SunOpta BioProcess Inc. Synyx Energy Solutions, Inc. Taylor Biomass Recovery Terrabon, L.L.C. Tetrico, LLC The Babcock & Wilcox Company ThermoChem Recovery International ThermoChem, Inc. Thermagreen, Inc. TorTech (Canada) Ltd U.S. Science & Technology Corp (USST) US Plasma, Inc. Valorga International Veolia Environmental Services (VES) Vulcanus Ireland Ltd W2 Energy, Inc. WZE Waste Recovery Seattle, Inc. Waste Recovery Systems Waste Technology Partnership Waste To Energy WasteAway Services WasteGen (UK) Ltd. WET Systems, Inc. Wheelabrator Technologies Inc. Witten Group International/Neon Environmental World Waste of America, Inc. Wright Environmental Management, Inc. Xanthrol Ze-gen Inc. Zeros, Inc.
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Geoplasma Plasma Converter System Process

The Five (5) Step PCS Process

Step 1 Feed Step 2 Dissociate Step 3 Cool Step 4 Neutralize Step 5 Filter

Generates a SYNGAS that is available **For Use** in power generation

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Issues in Technology Development

- Performance history and size
- Scaling uncertainties
- Environmental impacts
- Cost uncertainties
- Product market uncertainties
- Siting and permitting needs
- Process guarantees
- Resources of developer/guarantor
- Community acceptance
- Other risks and unknowns

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Waste-to-Energy Technologies and Risk

Alternative	Risks/Liability	Risk Summary
Mass Burn/WaterWall	Proven commercial technology	Very Low
Mass Burn/Modular	Proven commercial technology	Low
RDF/ Dedicated Boiler	Proven commercial technology	Low
RDF/Fluid Bed	Proven technology; limited U.S. commercial experience	Moderate
Pyrolysis	Previous failures at scale, uncertain commercial potential; no operating experience with large scale operations	High
Gasification	Limited operating experience at only small scale; subject to scale-up issues	High
Anaerobic Digestion	Limited operating experience at small scale; subject to scale-up issues	High
Mixed-Waste Composting	Previous large failures; No large-scale commercially viable plants in operation; subject to scale-up issues	Moderate to high
Chemical Decomposition	Technology under development; not a commercial option at this time	High

Source: GBB; December 2008.




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Recent U.S. Planning and Procurement Activities

- Broward County, FL – information; negotiating extensions to mass burn
- **City of Los Angeles, CA – advancing alternative technologies premised on resource recovery**
- City of Sacramento, CA – cancelled conversion
- City of Tallahassee, FL – advancing conversion
- **City of Taunton, MA – advancing conversion**
- **Frederick and Carroll Counties, MD (NMWDA) – advancing mass burn**
- **Harford County, MD (NMWDA) – advancing mass burn**
- Hawaii County, HI – cancelled mass burn
- King County, WA – information
- **Los Angeles County, CA – advancing 'conversion'**
- Marion County, FL – evaluating proposals from three companies who responded to RFP for thermal conversion technology that produces steam, electricity, syngas, or other beneficial by-products
- New York, NY - information
- Santa Barbara County, CA – advancing conversion
- San Diego County, CA – information
- **Solid Waste Authority of Palm Beach County, FL – refurbishing RDF/DB, procuring mass burn, and asking for information on other 'proven'**
- **St. Lucie County, FL – advancing conversion**
- **U.S. Virgin Islands – just signed contracts for two RDF and Pet Coke fluidized bed facilities**




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Project Building Blocks

- Limited and High Alternative Disposal Costs, e.g. approaching \$100 per ton
- High level of recycling – 50-60 percent
- Waste Supply and Control for non-recycled materials
- Energy/Fuel and Materials Market(s)
- Site for Facility
 - Good logistics for waste receipt, energy market(s), and residue disposal
 - Can be permitted
 - Accepted by neighbors
- Landfill for ash and by-pass
- Contractor
- Capital
- Financeability
- Political Will





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The American Recovery and Reinvestment Act of 2009 (ARRA) (aka The Stimulus Bill)

- Signed into law February 17, 2009
- ARRA targets investments towards key areas that will save and create good jobs (immediately), while also laying the groundwork for long-term economic growth
- Key Goals is to revive the renewable energy industry and provide the capital over the next three years to double the domestic renewable energy capacity
- To be eligible for funds, projects must be "shovel-ready," projects in planning stage only will not be eligible
- In some cases, federal departments award money; in others, state governments are allowed to choose the projects
- Complete information and legislation text is available at: www.recovery.gov



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Renewable Portfolio States That Include MSW in RPS

California	Michigan
Connecticut	Minnesota
District of Columbia	Nevada
Hawaii	New Jersey
Kansas	Ohio (25% by 2025)
Maine	Pennsylvania
Maryland	South Dakota
Massachusetts	Virginia

- The North Carolina Solar Center published a synopsis of incentives provided by state



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Federal Waxman-Markey Bill

- House has passed one
- Senate is considering one
- Joint Committee consideration follows Senate approval of one
- May be into 2nd Quarter of 2010 before final version can be considered as law
- For summaries, Google for reports by:
 - The Energy Information Administration (EIA)
 - The National Association of Manufacturers (NAM)

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Waxman-Markey Bill H.R. 2454 Substitute

American Clean Energy and Security Act of 2009 (ACES):

- Amends the Public Utility Regulatory Policies Act of 1978 (PURPA)
- Applies to energy and efficiency across all sectors of energy production and use.
- Intent is to create energy independence from foreign oil.
- Goal is to combat global warming through the reduction of greenhouse gas emissions.
- In the process will create clean energy jobs.
- Requires utilities to obtain 15 to 20% of power from renewable sources
- Applies to qualified WTE facilities
- Applies to biogenic portion of Waste
 - DOE has estimated biogenic portion to be 50-60% of MSW

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Waxman-Markey Bill H.R. 2454 Substitute (cont'd)

Provisions Included in the bill:

- A cap-and-trade global warming reduction plan
 - Places a limit on emissions of heat-trapping pollutants
 - Designed to reduce greenhouse gas emissions 17 percent by 2020
- Places requirements on utilities that an incremental percent of demand be met through a combination of efficiency savings and renewable energy
 - 6 percent by 2012
 - 9.5 percent by 2014
 - 13 percent by 2016
 - 16.5 percent by 2018
 - 20 percent by 2021 through 2039
- Provides for studies and incentives in carbon sequestration technologies
- Has incentives for energy efficiency in homes/ buildings.
- Provides government grants for green jobs

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Renewable Energy and Carbon Credits

Sale of renewable energy or carbon credits could provide revenue

- Renewable Energy Credits (ERC'S)
 - WTE facilities eligible for Renewable Energy Credits in some of the 26 states the have adopted Renewable Portfolio Standards
- Carbon Credits
 - WTE would be eligible for carbon credits under federal legislation currently under consideration
 - Electrical production tax credit or grant
 - MSW – 1.1 cents per kWh for non-burn technologies

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Biogenic Credit Portion for Renewable Energy*

- Biogenic credit language is included in House version of Waxman-Markey Bill
- Biogenic language is Not included in the Senate version of the Waxman-Markey Bill
- Current versions of each states' RPS documents to date and do not include any Biogenic language



*Source: Ted Michaels, Energy Recovery Council; September 8, 2009

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OHIO

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Ohio Overview

Source: "The State of Garbage";
BioCycle, December 2008; all data 2006


- Population: 11.5 million
- MSW (includes residential, commercial, industrial, agricultural, CDD, and tires; no imports): 28.2 million tons
- MSW: 16.9 million tons
 - Recycled: 3.5 million tons (20.9%)
 - WTE: 0 (Was one in Columbus!)
 - Landfilled: 13.4 million tons
 - 42 landfills
 - \$32 per ton average tipping fee
- Generation rate: 1.47 tons/person/year
- Imports: 3.8 million tons
- Exports: 1.1 million tons
- Landfill bans:
 - Yard trimmings when separately collected
 - Whole tires

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Tracking and Reporting Functions of Ohio DSIWM

- Disposal and waste flows
 - 41 MSW landfills
 - 14 Industrial landfills
 - 58 Transfer Facilities
 - Construction and Demolition Debris
- Statewide Capacity
- Out-of-state waste
- Statewide and SWMD Recycling rates
- Maps


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Ohio

- Recycling Goals:
 - 25% residential and commercial
 - 66% industrial
- State solid waste management plan every 3 years
- Ohio EPA chairs Solid Waste Management Advisory Council to advise and assist in State Plan
- 88 counties form 52 solid waste management districts; update plans every 3-5 years






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CD&D in Ohio

- **1990-1996:** C&DD Law passed; some Health Dept. rules
- **1996 – 2002:** Ohio EPA rules adopted after “reg-neg” process; licensing begins 1997
- **2002-2004:** Ohio sees increase in C&DD disposal, long-haul and rail transfer



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Ohio DSIWM Fee Collection

- Solid Waste Disposal Fee is \$4.75* per ton, regardless of the origin of the waste:
 - One dollar of the fee goes to fund state hazardous waste cleanup activities
 - One dollar per ton funds Ohio EPA’s solid waste, infectious waste and construction demolition debris regulatory programs
 - The remaining \$2.50 per ton goes into Ohio’s Environmental Protection Fund
 - \$0.25 to fund soil and water conservation programs through the Ohio Department of Natural Resources

*Increased from \$3.50 per ton effective August 1, 2009

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What Was Learned at Central State October 2008 Emerging Technologies Conference?

- ✓ Ohio wants jobs and sustainable industry added here
- ✓ Ohio wants to be energy independent
- ✓ Ohio is energy dependent; fuels predominantly imported
- ✓ Jobs lost to other states/countries
- ✓ Ohio a crossroads state to >50% of U.S. mainland population within 6 hours by road




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What Was Learned at Central State October 2008 Emerging Technologies Conference? (cont'd)

- ✓ Some interesting new technologies for alternative materials and fuels, and energy in Ohio and elsewhere
- ✓ Ohio state policies and programs appear abundant and advanced to help emerging technologies and bringing companies with emerging technologies into Ohio




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*What Was Learned at Central State
October 2008 Emerging
Technologies Conference? (Cont'd)*

- ✓ Waste disposal very abundant and inexpensive
- ✓ Low level of recycling; lots of materials being landfilled
- ✓ Recyclables are valuable
- ✓ Brownfield sites across the state without funding to be cleaned up for re-used




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*What Was Learned at Central State
October 2008 Emerging
Technologies Conference? (Cont'd)*

- ✓ Central State University wants to
 - ✓ Help provide a technically competent workforce
 - ✓ Recycle more on campus
 - ✓ Use renewable energy for the campus



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Ohio Waste Stream

Waste Component	%	Tonnage In Ohio
Paper	34	3,740,000
Yard	13	1,430,000
Food	12	1,320,000
Plastic	12	1,320,000
Metal	8	880,000
Textiles, Rubber, Leather	7	770,000
Glass	5	550,000
Wood	6	660,000
Other	3	330,000
Total	100	11,000,000




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Ohio Recyclables for New Re-Manufacturing

Waste Component	%	Tonnage to 50% Reduce/Reuse/Recycle
Paper	34	1,870,000
Yard	13	715,000
Food	12	660,000
Plastic	12	660,000
Metal	8	440,000
Textiles, Rubber, Leather	7	385,000
Glass	5	275,000
Wood	6	330,000
Other	3	165,000
Total	100	5,500,000

•\$1.3 Billion in Capital Needed
•Jobs: 1,500 at MRFs alone; re-manufacturing add more; plus multiplication factor.
*•**5X available within 6 hours road time from Ohio***



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Ohio Energy from Waste


WTE Tons Per Year Or BBLs Oil Equivalent	KWHrs Per Year	MWs Capacity
5,500,000	3,025,000,000	377

•\$3.8 Billion in Capital Needed

•Jobs: about 1,000 at Facilities; plus multiplication factor




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Change Energy and Waste Economics

- Energy is too cheap
 - Add \$0.25 tax on every gallon of gasoline sold
 - 1,406 million gallons sold in Ohio* = \$352 million per year in capital
- Waste disposal is too cheap
 - Increase the MSW Disposal Tax to \$25 per ton for every ton disposed in a landfill or incinerated without energy recovery
 - \$275 million per year in capital; \$5 billion needed
- Apply \$\$ to advance this agenda

* Based on 3,852,900 gallons delivered by refineries in 2008; U.S. DOE Energy Information Agency



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What to Use the \$\$ For?

Waste Related:

- Clean up brown fields sites and use sites for energy, waste, recycling, and related industries
- Provide capital for publicly owned waste-to-energy, materials recovery facilities, and composting facilities preferably to be located on the cleaned up brown fields sites
- Provide planning and equipment grants for changing collection services for efficient collection of recyclables

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What to Use the \$\$ For?

Emerging Technologies for Renewable Energy and Waste

- Make sure the Ohio State grants, programs, and services to catalyze this and are already in place, are more widely known
- Provide loan/grants for advancing Research, Development, Testing & Demonstration for Conversion and Emerging Technologies
- Enable feedstock acquisition for Conversion and Emerging Technologies so that they can be developed further
- Frequent meetings like this to share information and network

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What to Use the \$\$ For?

For Universities and Colleges



- Grants to establish curricula to provide an educated workforce for these areas and provide for internships
- Campuses become
 - Commercial locations to demonstrate renewable energy use and energy independence
 - Examples of high levels of reduce/reuse/recycle

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Summary Points



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Establish New Ohio Goals

- Ohio already has the 25% by 2025 for renewable energy goal – great!
 - Just make sure MSW stays as renewable fuel
- Add one for waste:
 - 50% recycling and 50% WTE by 2025 too!


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WTE Planning Considerations


- Set 'real' diversion/recycling goals at higher levels, say real 50-60%, with supporting policies, programs, and services
- Squeeze down money spent on collection part of the solid waste dollar to support and sustain recycling
- Public ownership structure to assure waste flow control and keep a greater share of revenues
- Consider RDF in existing coal-fired electric utility boilers or cement kilns as supplemental fuel
- Current disposal cost environment needs to be high to support WTE economically, approaching \$100 per ton
- Do long-term contracts with service providers with track record
- Beware of vendors offering unproven technologies with attractive economics and promises
- Landfill disposal capacity always required – have it or secure it under long-term contracts

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Federal Policy Considerations

- Make MSW “renewable” in all states
- Increase recycling goals and establish WTE goal also
- Share WTE renewable \$ benefits to increase recycling
- Create individual and business federal tax credits if your jurisdiction meets federal recycling goal
- Waxman-Markey federal legislation as currently written could provide significant benefits



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Thank you!!

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