

Overview of Waste Management “State of Mind” In the U.S.

Presented at:

**The Science, Policy, and Politics of Waste
Revisiting Our Waste Management Infrastructure**

Seattle, Washington

By:

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President***

Gershman, Brickner & Bratton, Inc.

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GBB Overview



Headquartered in Fairfax, VA

- Established in 1980 as an objective adviser to governments, institutions, and businesses
- 30 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

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Harvey Gershman

- GBB Founder and President
- Almost 40 years solid waste management experience as advisor to local governments and solid waste agencies
- Instrumental in important financial and political turnarounds that produced success stories for:
 - Northeast Maryland Waste Disposal Authority for Baltimore and Harford County, MD
 - Town of Babylon, NY
 - Alexandria/Arlington (VA) Waste Disposal Trust Fund
 - Metro Nashville, TN
 - City of Ft. Worth, TX
 - Baton Rouge, LA
- Past advisor to City of Seattle, Snohomish County, Pierce County, and Metro Portland on resource recovery , WTE, recycling, and mixed waste composting
- Recently advised King County Council with Independent, Third Party Review for Transfer Station and Waste Export System Plan



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SOLID WASTE MANAGEMENT IN THE U.S. NOW

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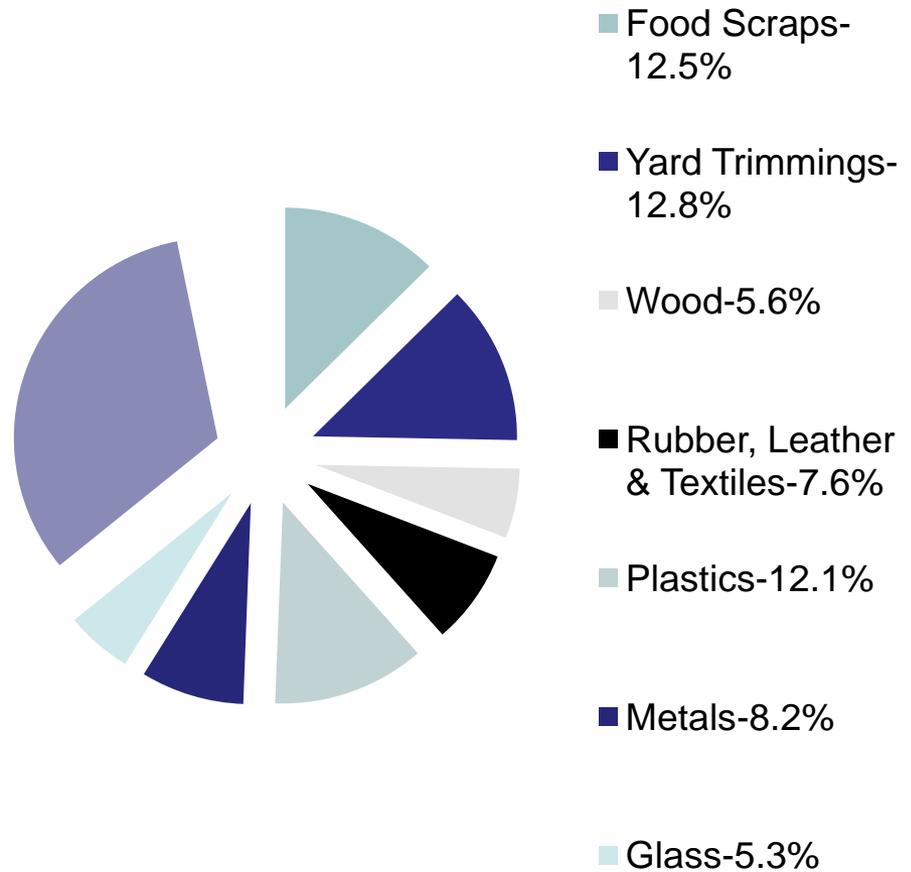
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Waste Facts

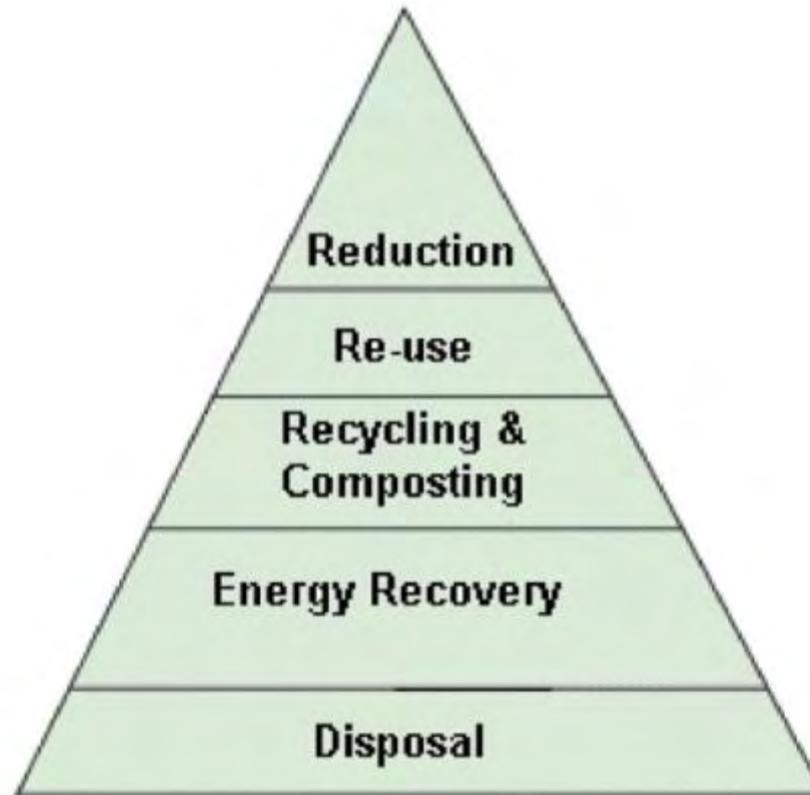
Source: U.S. EPA 2007

<http://www.epa.gov/waste/nonhaz/municipal/pubs/msw07-rpt.pdf>

- 254 million tons MSW generated before recycling
- Each Person in the U.S. generates approximately 1,686 lbs. per year
 - Estimated 1,752 lbs. per year by 2010
- *What's in our waste?*
 - Recyclables
 - Feasible to recycle 50-70 percent
 - Energy Content of remainder
 - 5,500 BTUs per pound (coal at 9,000 BTUs per pound)



Waste Management Hierarchy



In 2005, EPA designated WTE energy as renewable energy.

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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	1,831
Incineration	132	107	109	103
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

Residential Collection



Ontario, CA

Carts for Recyclables, Waste, Yard Waste

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Recycling When Not at Home

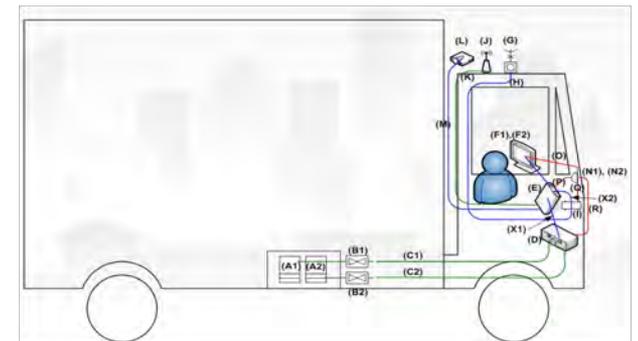
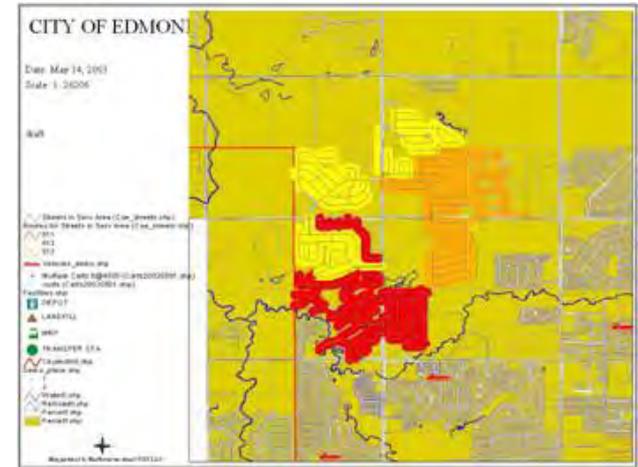


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Collection Technology Improvements

- ✓ Hardware
 - ✓ Semi-automation
 - ✓ Automation
 - ✓ Split packers
 - ✓ Split toters
 - ✓ Cell phones
- ✓ Software and services
 - ✓ Computerized Routing
 - ✓ GPS
 - ✓ Asset management
 - ✓ Customer service
 - ✓ Web site and email reminders for customers
 - ✓ Cell phones, especially Nextels
- ✓ Maintenance contracts
- ✓ Closed market contracting

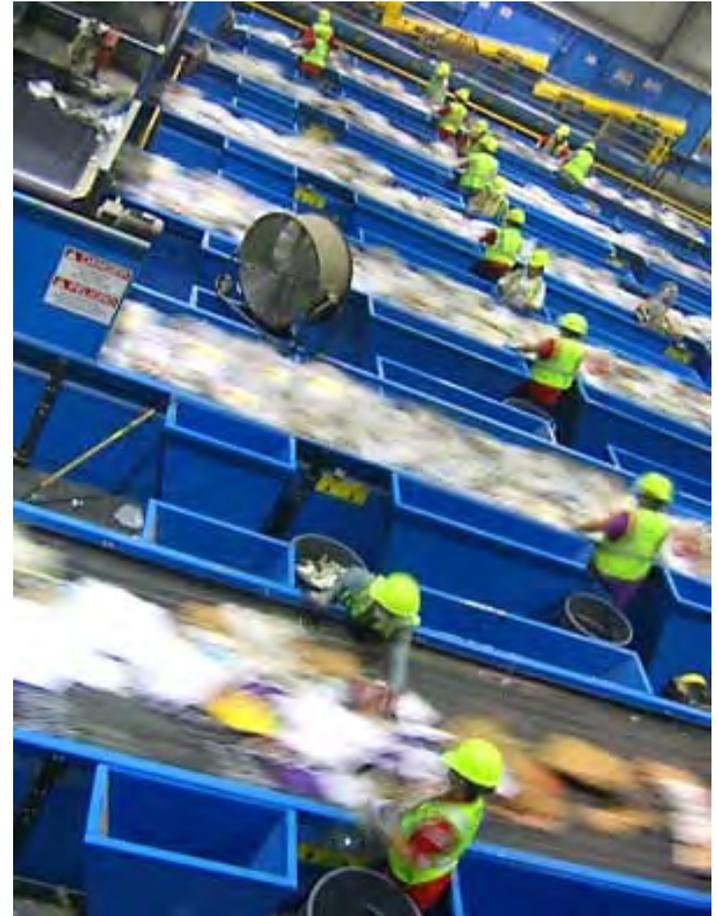


Recyclables Processing/MRF

MRF = Materials
Recovery Facility

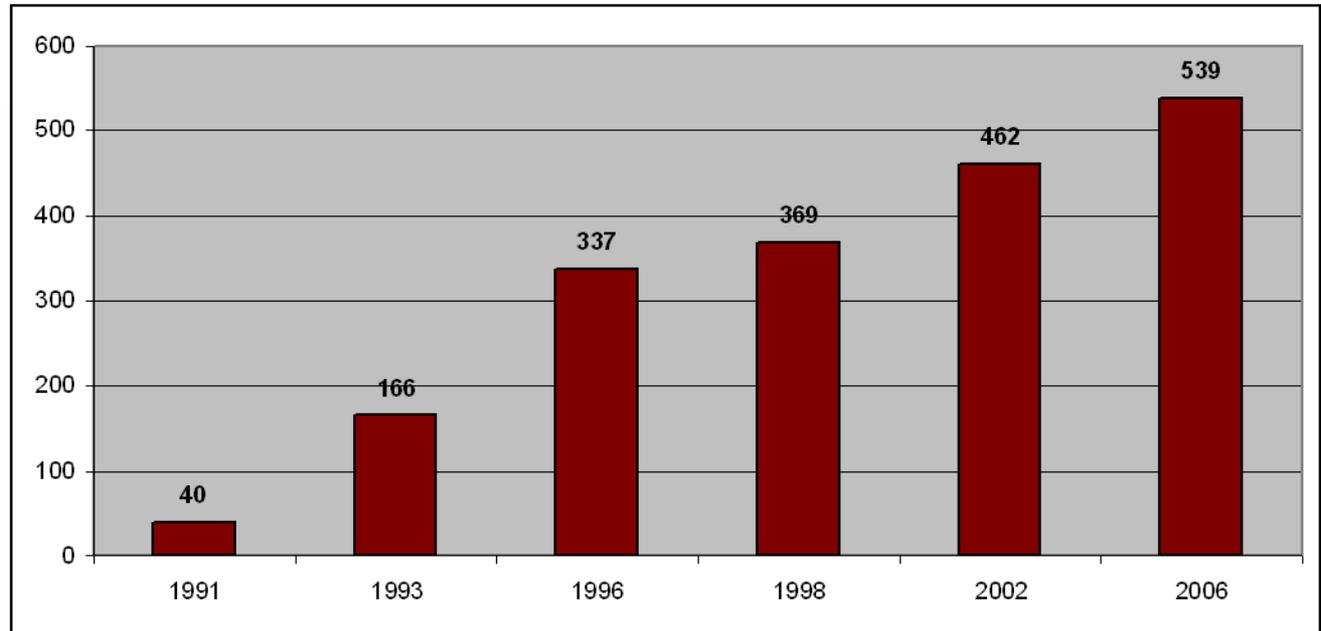
Recyclables sorted by
machine, air, magnet,
and hand into each
marketable material
category

Single-stream
processing trend now



Waste Management Recycle America, Elkridge, MD

MRFs Operating in the U.S.



Source: Governmental Advisory Associates, Inc.

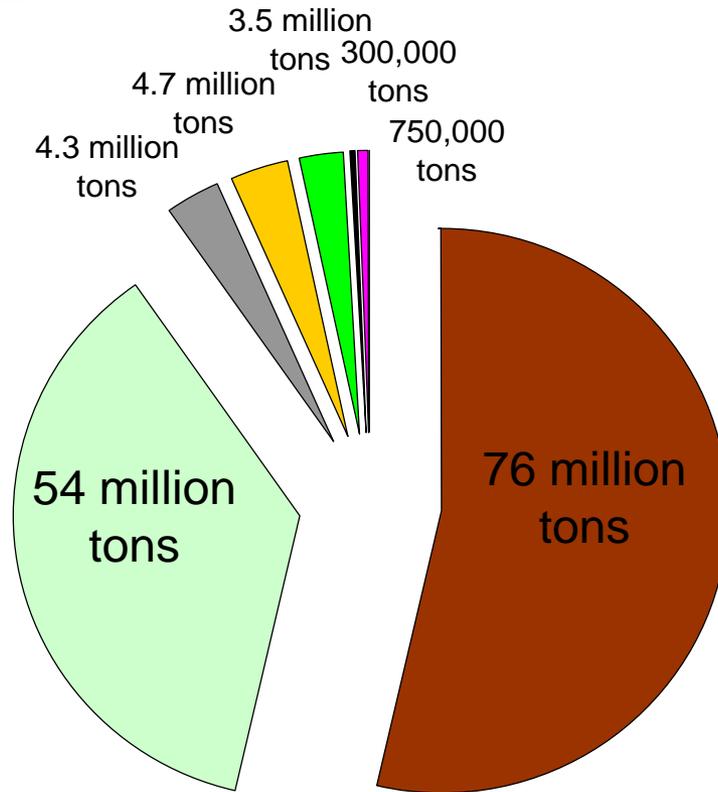


Loose Newsprint

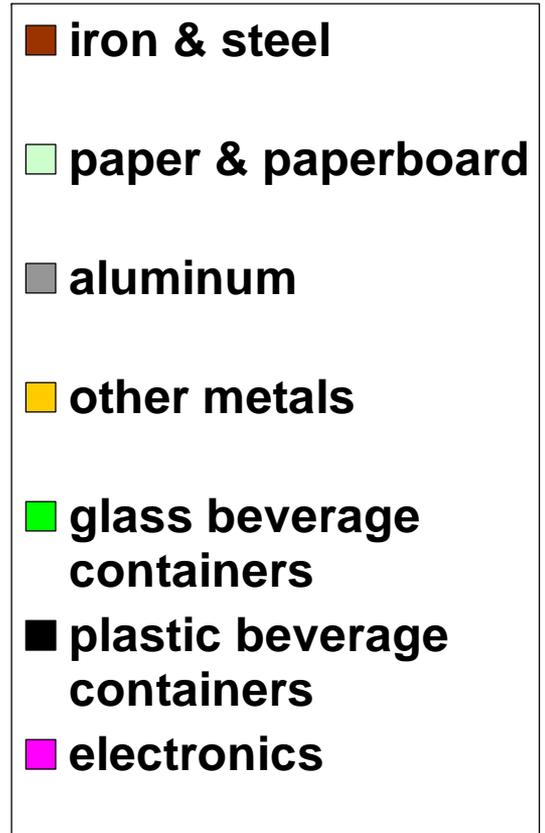


Mixed Paper and baled Aluminum Cans

2006 Recycled Materials



Total: 145 million tons



Source: www.isri.org

Value of Recyclables in One Ton of Waste Sorted and Sold to Markets

Year	\$ per Ton Equivalent
1994	\$40.00
1995	\$104.00
1998	\$48.00
2005	\$85.00
2008	\$150.00
2009	\$60.00
2010	\$145.00

Source: GBB internal data base; does not include any deposit redemption value.

Food Waste Collection

- Commercial Generators
 - Large generators segregate food scraps for collection to composters
 - Grocery, food manufacturers/packers,
 - Smaller food-based business collections
 - Restaurants, hotels, cafeterias, universities, institutions, places of worship, corporate cafeterias
- Residential Programs
 - Add food scraps in yard debris collection containers (over 90 reported)
 - Ann Arbor, Boulder, Cedar Rapids, Huron, San Francisco, Seattle, State College, etc.



Large Waste Transfer Facilities



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Rail Hauling Waste To Distant Disposal



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Landfill Disposal



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Waste-to-Energy: 89 Facilities with \$14 Billion of Productive Assets in the U.S.



North Broward County, FL



Alexandria/Arlington, VA



Springfield, MA



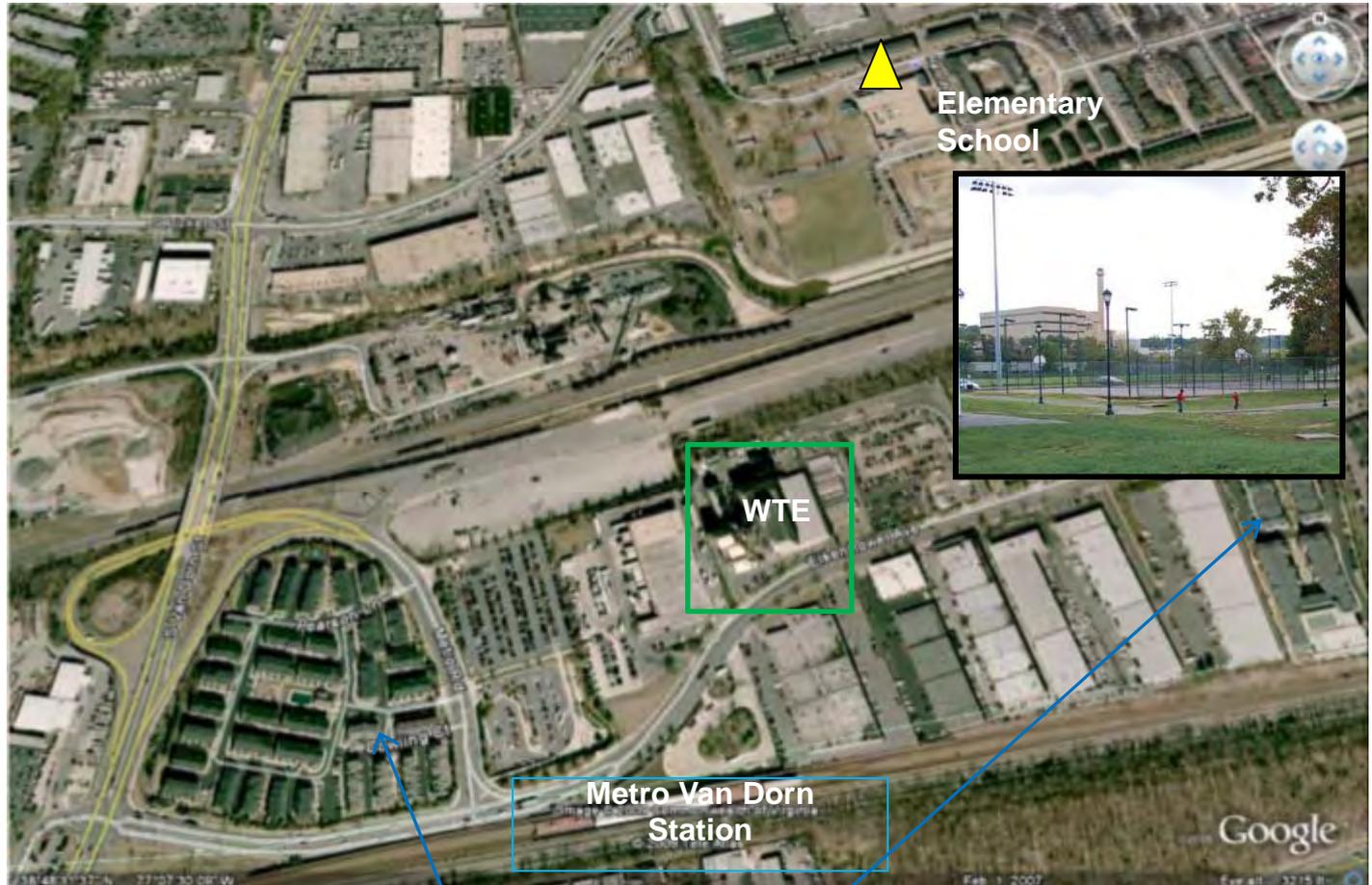
Baltimore, MD

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

Emission	WTE-A (mg/Nm²)	WTE-B (mg/Nm²)	WTE-C (mg/Nm²)	Average of 10 Finalists (mg/Nm²)	EU Standard (mg/Nm²)	US EPA Standard (mg/Nm²)
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.

Covanta Alexandria/Arlington (VA) WTE Facility Neighbors, Including Elementary School



Residential Properties

What if a clock was added to the stack?

Would the WTE Facility be called a “Clock Tower”?



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Energy Recovery and Recycling in the Pacific Northwest

Burnaby, B. C. (Greater Vancouver Regional District)

- 850 TPD since 1988
- 25 MW power
- 55 % recycling



Marion County, OR

- 550 TPD since 1987
- 13 MW power
- 56.5 % recycling

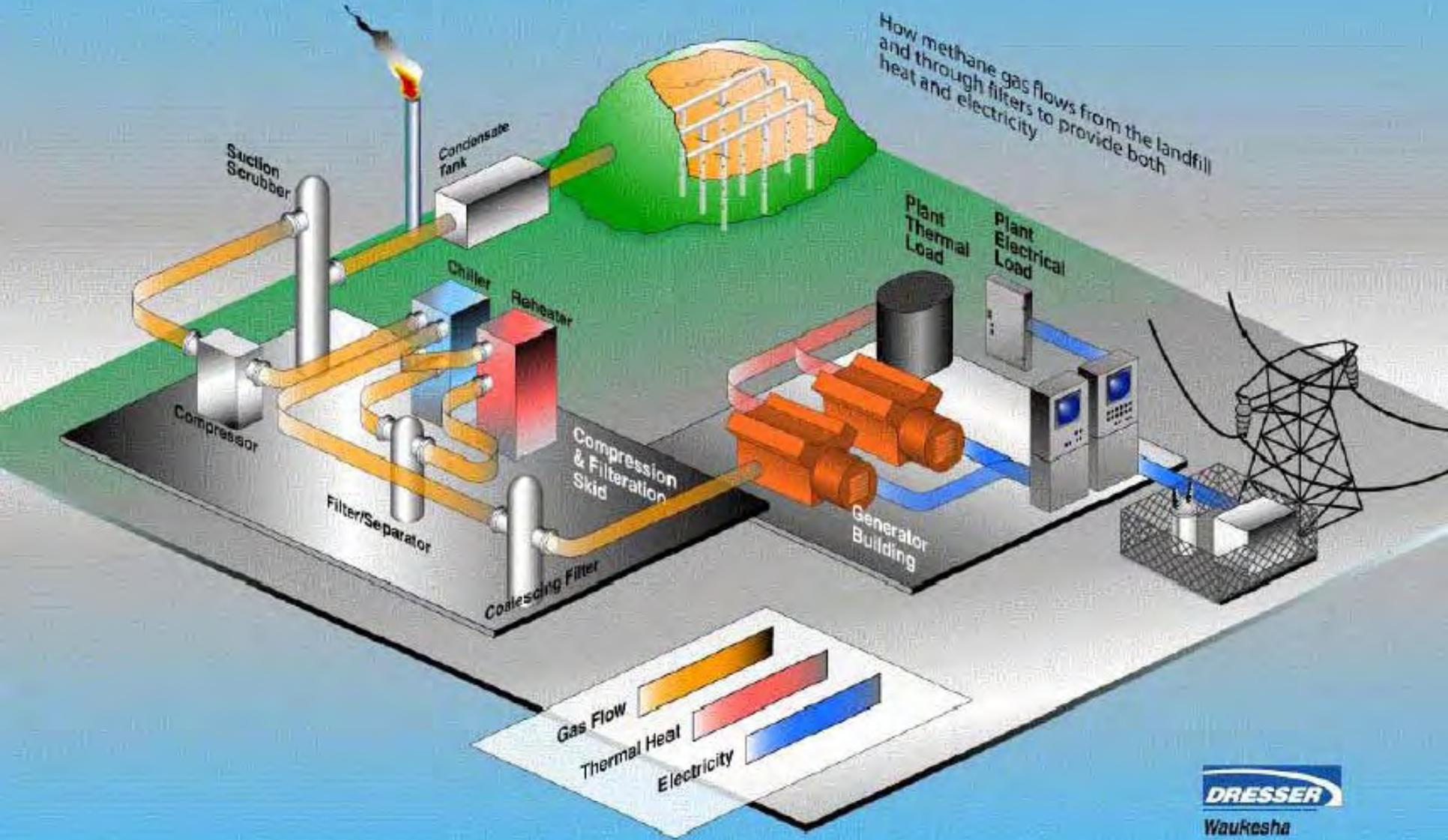


City of Spokane, WA

- 800 TPD since 1991
- 26 MW power
- 47 % recycling



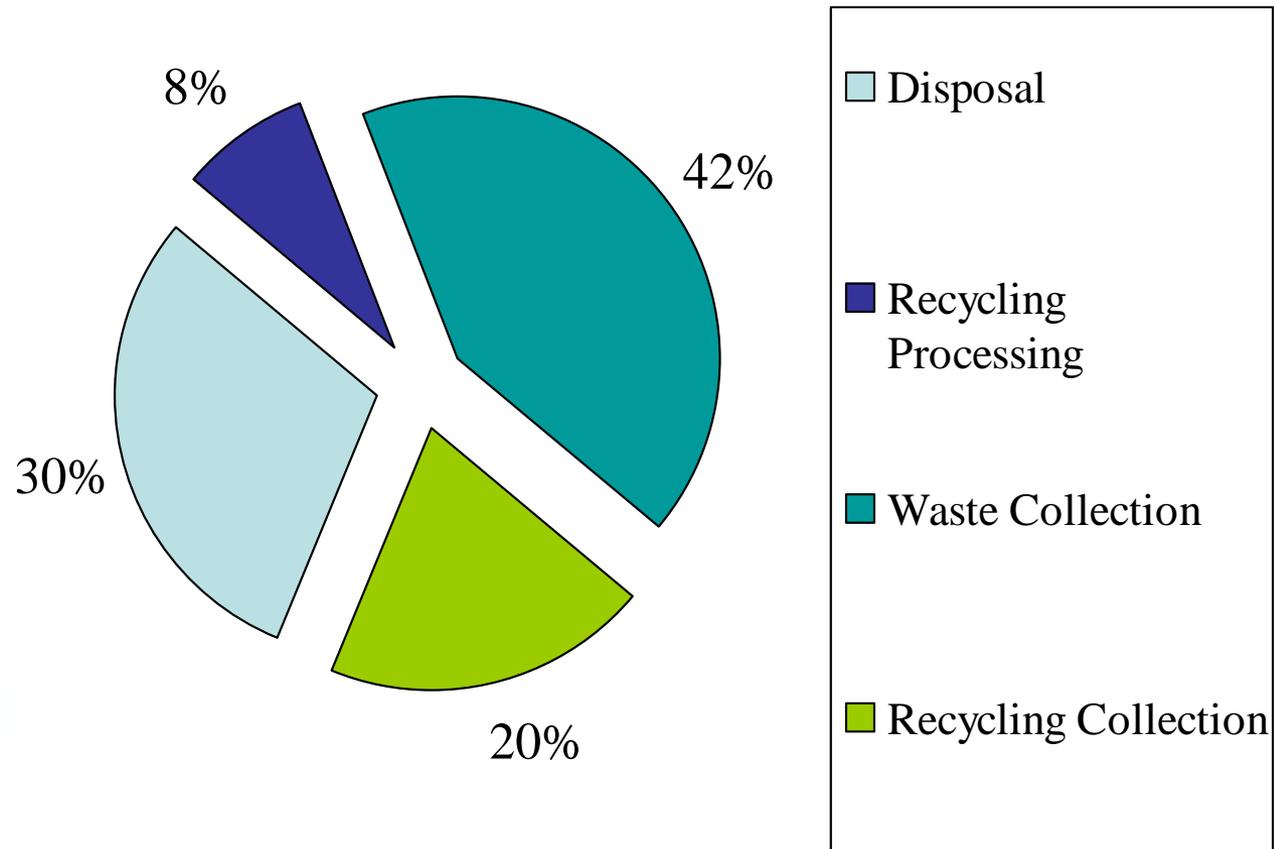
Landfill Gas to Energy



MSW Management System Costs

\$100 - \$400 per ton

Source: GBB, 2009



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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.



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



Recent Planning and Procurement Activities with Waste Processing Technologies in the U.S

- Locations with Planning/Procurements:
 - New York, NY; City of Los Angeles, CA; Los Angeles County, CA; St. Lucie County, FL; Hawaii County, HI; Frederick and Carroll Counties, MD (NMWDA) ; Harford County, MD (NMWDA); City of Sacramento, CA; Tallahassee, FL; Broward County, FL; Palm Beach County, FL; Taunton, MA; Santa Barbara, CA; San Bernardino County, CA
 - 80 different companies responded
- GBB database has over 185 companies offering alternative technologies
- Where costs requested, ranges reported in the \$136 to 900 per ton range (New York City, and City of Los Angeles)

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

The Road to Discovery and Implementation

- ✓ Proper solid waste management planning
- ✓ Enlightened Elected Officials
- ✓ Incremental Decision-Making
- ✓ Staff Resources
- ✓ Public Education
- ✓ Management & Operations Capability



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Why are we fighting with Zero Waste?

- Set aggressive and sustainable recycling goals
- *Do we need soil amendment or fossil fuels displaced?*
- Waiting for unrealistic recycling sends waste to landfills



*How much waste are we for?
...as little as possible!*

Future System Planning Considerations

- ❑ Set 'real' diversion/recycling goals higher (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
- ❑ 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

Federal Policy Considerations

- Make MSW “renewable”
- 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

Change Waste, Recycling, and Energy Economics

- Waste disposal is too cheap
 - Increase/create MSW Disposal Tax for every ton disposed in a landfill or incinerated without energy recovery
 - Use this funding to advance recycling and WTE goals
- Energy is too cheap
 - Add more tax on every gallon of gasoline sold to fund more recycling and renewable energy, including MSW



Thank you!!

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