What the Future of Solid Waste Management May Hold

Presented at the

Maryland Recycling Network & SWANA Mid-Atlantic Chapter

7th Joint Conference

by

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Gershman, Brickner & Bratton, Inc.

June 17, 2011

Outline

- Introduction
- Solid Waste Management
  - Looking back
  - Today
  - In Maryland
- Solid Waste Management Tomorrow
- Summary

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INTRODUCTION

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GBB Overview

Celebrating our 30th Anniversary

- 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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Overview of GBB Assignments

- 200+ solid waste management plans and feasibility studies
- 100+ recycling plans, technical assistance, and/or local waste collection assignments
- 20+ recyclable materials processing facility vendor procurements; 10+ waste-to-energy vendor procurements
- 15+ waste composition analyses
- 25+ composting studies, plans, and/or procurements
- 100+ C&D waste related studies, plans and/or equipment/system evaluations
- 1,000+ material markets surveyed
- 30+ landfill and transfer station cost evaluation and siting studies, operations reviews, operator training, and procurements
- Collection routing and procurements for cities of all sizes
- Landfill lease, operations, and landfill gas recovery procurements

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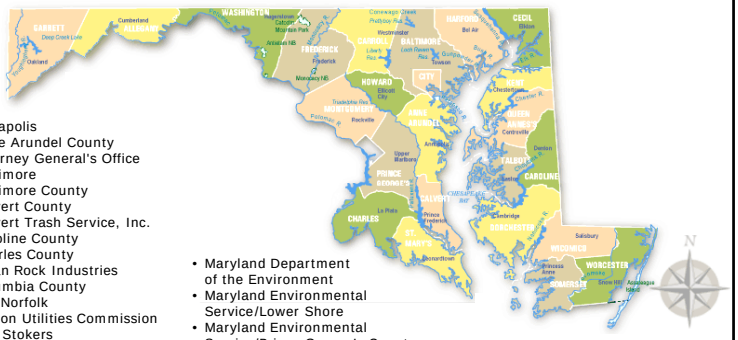
GBB Clients in Maryland



- Annapolis
- Anne Arundel County
- Attorney General's Office
- Baltimore
- Baltimore County
- Calvert County
- Calvert Trash Service, Inc.
- Caroline County
- Charles County
- Clean Rock Industries
- Columbia County
- CSI Norfolk
- Easton Utilities Commission
- F&E Stokers
- Fort Meade
- Frederick County
- Gaithersburg
- Gatlinburg
- Geosyntec
- Harford County
- Howard County
- Johns Hopkins Medical Center
- Legg Mason Wood Walker, Inc.
- Leimbach Development
- Waste News
- Marriott Corporation

- Maryland Department of the Environment
- Maryland Environmental Service/Lower Shore
- Maryland Environmental Service/Prince George's County
- Maryland Reclamation LLC
- Maryland Recyclers Coalition
- Maryland Recycling Conference
- McCormick and Company
- McGuire, Woods, Battle & Booth
- Mitchell Petersen
- Montgomery County
- Northeast Maryland Waste Disposal Authority (NMWDA)
- Ocean City
- Office Paper Systems , Inc.
- OREG Site Work Services, LLC
- Prince George's County
- Queen Anne's County
- Recycling Inc.
- Reese & Carney, LLP
- Rogers Golden Halprin / NMWDA
- Somerset County

- St. Mary's County
- Stark & Keenan/Town of Bel Air
- State of Maryland
- SWANA
- SWANA (as GRCDA)
- Talbot County
- The Recycling Center
- Town of Easton
- URS/Maryland Environmental Service
- US Postal Service-Baltimore Division
- University of Maryland
- Washington County
- Wicomico County

GBB Maryland Project Descriptions

Action Plan
Alternatives Development
Analysis of Market Potential & Strategy/Physical Operations/Financial Feasibility of Expansion
Annual Review
Appeal Landfill Closure & Post-closure Care Cost Estimate
Assist Planning Recycling
Bale Fill Feasibility Analysis
Blue Bag Collection Systems Analysis
Budget Review
Business Planning/Sludge Processing
C&D Primer
C&D Project Planning
C&D Waste Workshop
Collection Analysis and Assistance
Collection Efficiencies Study
Collection Manual
Commercial Recycling Programs
Commercial Waste/Recycle Plan & Implementation/HH Hazardous Waste Assessment/Contaminated Soil Mgmt
Compost Assistance
Compost Facility Case Studies
Cost of Service Evaluation and Guidance In Establishing Fees
Cost Workshop
Develop RFP for Transfer Station
Develop WTE Ash Supply & Business Expansion
Development of Training Course "Economics, Costs & Full Cost Accounting Methods for IMSWMS
Drop-off Collection Study
Energy Park for Renewable Energy
Enterprise Fund Case Study
Expanding Recycling Programs
Expert Witness
Feasibility Evaluation of a Small-scale WTE Project
Feasibility Report for Limited Obligation SW Facility Recycling Rev. Bonds
Feasibility Study for Transfer Station
Four-county Study
Four-season Waste Sampling
Funding Assistance
Hazardous Waste Facilities Analysis
Hydro Geological Investigation and Permitting of Landfill
Landfill Bid Document Preparation
Landfill Construction / Operation Cost Analysis
Landfill Design, Permitting, Procurement Assistance, and Municipal Solid Waste User Fee and Tip Fee Analysis
Landfill Operator Training Course
Landfill Privatization Assistance
Landfill Redesign
Landfill RFP
Landfill Subsurface Investigation, Environmental Review, and Feasibility and Cost Analysis
Local Impact Study
Logo Design and Public Outreach Assistance
Marketing & Public Relations
Materials Recovery Facility Study
Media Planning and Budget Assistance
MRF Development & Operation
Multi-family Recycling Public Ed Program
Office Recycling
Paying Course
Pilot Program
Planning Waste Reduction
Project Feasibility
Public Hearing Attendance on Solid Waste Disposal Alternatives
Publication Education
Rail Costs
Recyclable Materials Market Study
Recycling Drop-off Collection Analysis
Recycling Logo and Brochure Design
Recycling Market Development Programs
Recycling Planning and Implementation
Regional Waste Reduction Education Plan
Research Costs/Arrange Routes-Pharmaceutical & Special Wastes
Review Curbside Collection System
Review Host Community Fees for Existing WTE Facilities
Routing
Rubble Disposal Pricing & Quantity Review
Seasonal Waste Characterization Studies
Site Assessment
Site Plan/Traffic Study
Solid Waste Disposal Study
Solid Waste Management Study / Business Solution Plan for Solid Waste Program
Solid Waste Mgmt Plan Update
Solid Waste Transportation and Transfer Station Analysis
Strategic Planning
SWMP Update & Implementation
Transfer Station / Transfer Haul Study
Transfer Station/Disposal Services Procurement
Waste Reduction Assistance
Waste Sort Analysis
Waste-to-energy Facility Planning
Waste-to-energy Study
Yard Waste Recycling

GBB's Connection to MRN

- Tim Bratton served as founding board member of Maryland Recyclers Coalition in 1989
- GBB put on MRC's first annual conference
- Harvey Gershman served as MRC co-president in 1994-95

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Maryland Recycling Conference (Started by GBB in 1989)

20 years ago this past month was the 3rd Annual MRC…

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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
- Current Federal Court receiver for solid waste system of Guam (www.guamsolidwastereceiver.org)

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SOLID WASTE MANAGEMENT LOOKING BACK

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Solid Waste Management Before Earth Day 1970

- Backyard burn barrels
- Garbage collected for pig farmers
- Open dumps; set on fire to conserve space
- Town/City/building incinerators … without air pollution control
- Reusable milk and soda bottles; deposits for soda bottles
- Some newspaper and tin can recycling left over from World War II programs
- Scrap yards and paper recyclers generally for industrial and manufacturing materials

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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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'70s into the '80s

- Early projects publicly owned
- A/E designed and constructed
- Publicly operated
- If energy recovery, steam the primary product
- First public – private partnership, catalyzed by industry
  - Waste Management, Inc. and City of New Orleans
- RCRA passes – 1976
- Federal and private funding to demonstrate materials recovery and pyrolysis technology

Nashville Thermal, 1974

Recovery 1, New Orleans, 1978

Monsanto Baltimore, 1980

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'80s into the '90s

- Reaction to energy and garbage crises, shifted focus on electricity producing waste-to-energy facilities
- Tax laws for accelerated depreciation, energy tax credits and tax-exempt financing fueled many public-private partnerships for WTE Facilities
- The desire to recycle and fear of air pollution, created impetus for stopping more WTE and created impetus for more recycling
- Many states pass recycling laws

Mobro 1987

BRESCO (Baltimore), 1986

Montgomery County, MD , 1992

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'90s into 2000

- WTE Facilities stop being implemented
- Carbone decision creates opportunity for remote 'mega' landfills offering very low tipping fees
- Clean Air Act Amendment causes many WTE to close (especially smaller ones) while others are successfully retrofitted to meet more stringent air pollution limits
- Collection and processing efficiencies needed to support sustainable recycling – carts and 'single stream'
- Recycling growth plateaus
- Industry demand for recyclables grows and value increases
- Oneida-Herkimer decision gives flow control for publicly owned facilities

Covanta Alexandria/Arlington WTE Facility, 2000

Ontario, CA

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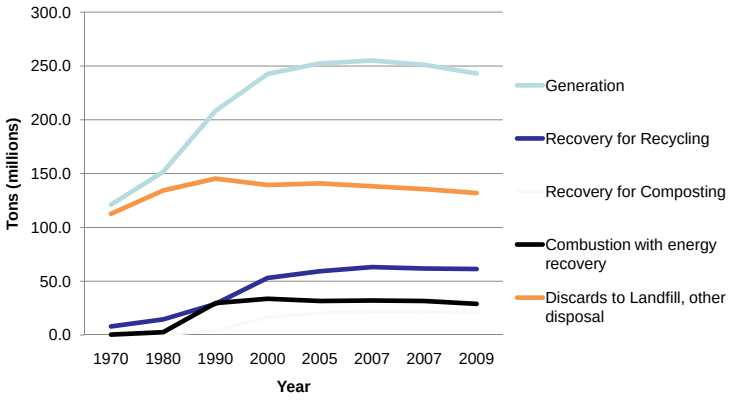
Generation, Materials Recovery, Composting, Combustion with energy Recovery, and Discards of Municipal Solid Waste, 1970 – 2009 (In millions of tons)



Source: US EPA, Municipal Solid Waste in the United States, 2009 Facts and Figures

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SOLID WASTE MANAGEMENT TODAY

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EPA's Waste Management Policy Changes in 2005

Previous:

- Source reduction
- Recycling
- Landfilling and incineration

Current:

- Source reduction
- Recycling **(35% goal established)**
- **Incineration/thermal processing with energy recovery (defined as renewable)**
- Landfilling and incineration (without energy recovery)

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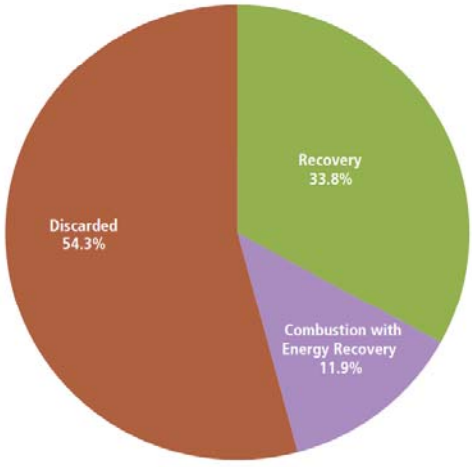
MSW Disposal in America



Source: USEPA 2009

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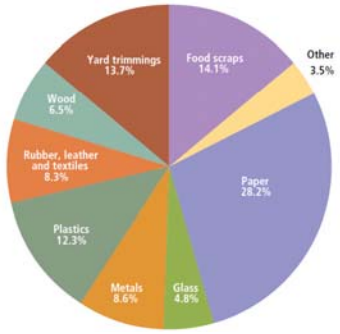
Waste Facts

- Each person in U.S. today generates 1,584 lbs. per year
  - Decreased from 1,643 lbs per person per year in 2008
- What is in our waste?
  - Recyclables
    - Feasible now to recycle up to 50-70%
  - Energy content of remainder: 5,500 BTUs per pound
    - Coal at 9,000 BTUs per pound



Total: 243 Million Tons (Before Recycling)

Source: US EPA, 2009 data

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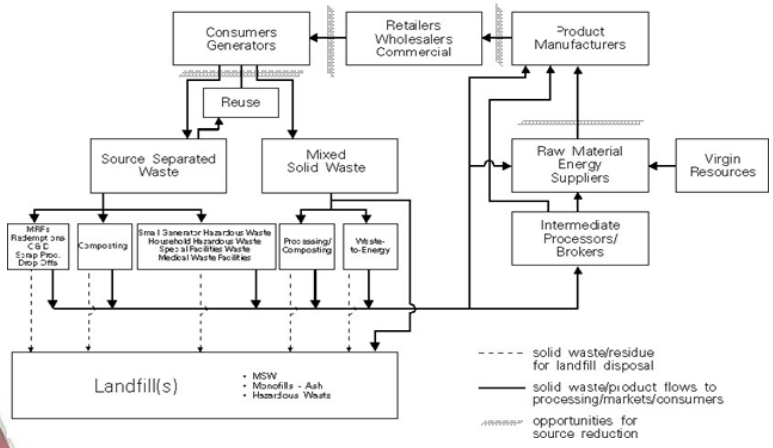
The Integrated Solid Waste Management System



Note: Biomass handling, treatment, reuse and disposal can be incorporated into this system as a separate waste stream

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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	1,908
Incineration	132	107	109	115
Landfills (C&D)	1,825	1,931	1,574	-
Transfer Station	3,970	3,895	3,744	-

*Source: BioCycle, State of Garbage; various years

Materials Recycling Facilities in U.S.
Source: Governmental Advisory Associates, Inc.

2002 - 462	**2086** -563

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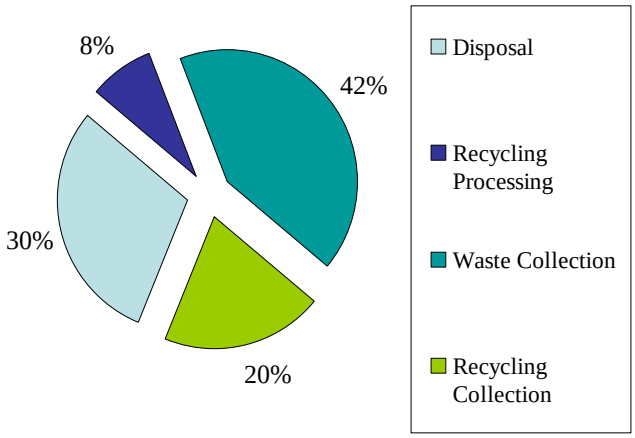
MSW Management System Costs $100 - $200 per ton

Source: GBB, 2011



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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

*Does not include any redemption values some states rebate to processors.

Source: GBB internal data base.

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86 U.S. WTE Plants - $14 Billion is Assets Generating approx. 2,700 MWs

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	13	16,928	5.3
RDF – Coal Combustion	2	4,592	1.4
Total U.S. Plants	86	94,216	29.2

(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.

Source: IWSA (now Energy Recovery Council), 2010 Directory

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Air Emissions of Contenders for WTERT Award in 2006

Emission	WTE-A (mg/Nm³)	WTE-B (mg/Nm³)	WTE-C (mg/Nm³)	Average of 10 Finalists (mg/Nm³)	EU Standard (mg/Nm³)	US EPA Standard (mg/Nm³)
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/m³	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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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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The Zero Waste Movement….Real or Religion?

- Waiting for unrealistic recycling levels sends waste to landfills

How much waste are we for?

…as little as possible!

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SOLID WASTE MANAGEMENT IN MARYLAND

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Maryland Waste Disposal and Sources of Origination - 2007

Solid Waste Category	Tons of Solid Waste Imported Into Maryland	Jurisdictions Where the Solid Waste Originated	Total Tons Accepted From All Sources
MSW	14,319	NY, PA, WV, District of Columbia	4,655,405
C&D	443,942	DE, NJ, NY, PA, VA, WV, District of Columbia	2,023,145
Miscellaneous	22,385	DE, NJ, NY, OH, PA, VA, WV, District of Columbia	1,570,636
Total (Tons)	480,646		8,249,186

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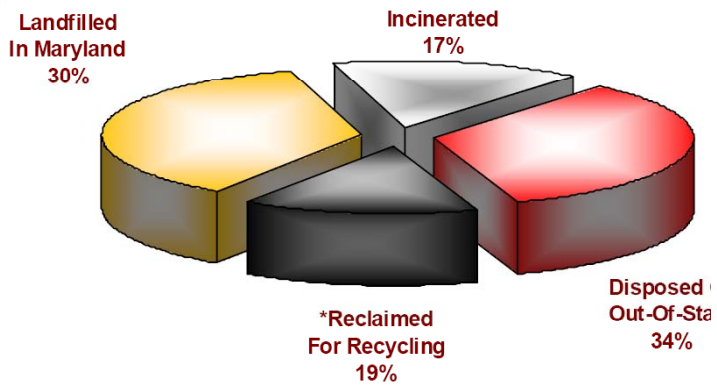
How Solid Waste Was Managed In Maryland In Calendar Year 2007



*Note: These figures only include materials that are recycled or reused following separation from the waste stream at permitted solid waste acceptance facilities and does not include recyclable items that are separately collected for recycling. For a breakdown of all Statewide recycling information please see the "Maryland Waste Diversion Activities Report".

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Solid Waste Management Method in Maryland - 2007

Solid Waste Management Method	Tons
Transported Out-of-State	2,844,102
Landfilling	2,503,610
Recycled / Re-used	1,532,286
Incineration	1,369,188
TOTAL	8,249,186

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2009 MRA Totals by County

County	Total MRA (tons)*	MRA Recyclables (tons)	Non-MRA Recyclables (tons)	Non-MRA Waste (tons)	Total Waste (tons)^^
Allegany	86,485.74	25,953.74	131,309.05	14,415.00	232,209.79
Anne Arundel	617,678.83	243,366.79	301,513.86	172,590.71	1,091,783.40
Baltimore City	756,559.48	251,764.26	382,309.40	149,073.04	1,287,941.92
Baltimore County	1,021,889.93	386,089.50	2,032,835.34	484,409.27	3,539,134.54
Calvert	63,864.39	16,554.39	35,414.76	30,930.66	130,209.81
Carroll	171,969.59	65,426.98	194,663.99	13,353.05	379,986.63
Cecil	159,763.23	73,829.74	25,847.83	17,955.84	203,566.90
Charles	101,462.81	51,537.41	154,548.85	35,541.59	291,553.25
Dorchester	43,702.60	9,347.60	10,143.25	17,456.18	71,302.03
Frederick	244,384.41	101,734.65	64,560.43	57,019.03	365,963.87
Garrett	41,893.48	19,984.48	5,572.72	7,344.00	54,810.20
Harford	299,201.80	176,623.57	16,348.00	41,553.69	357,103.49
Howard	458,409.50	195,803.85	7,673.40	93,451.35	559,534.25
Mid-Shore1	236,401.61	126,013.55	179,177.14	28,495.48	444,074.23
Montgomery	1,031,256.26	433,507.14	90,820.47	234,522.99	1,356,599.72
Prince George's	738,930.20	277,582.18	298,695.78	202,001.82	1,239,627.80
Somerset	20,620.30	3,094.70	8,725.10	6,790.00	36,135.40
St. Mary's	77,078.42	19,482.85	15,006.39	19,483.67	111,568.48
Washington	125,642.59	37,292.59	28,048.60	37,616.95	191,308.14
Wicomico	117,627.97	21,843.97	3,456.89	3,415.54	124,500.40
Worcester	98,621.48	31,481.48	39,236.63	29,360.76	167,218.87
Roads data	0.00	-	185,885.00	-	185,885.00
TOTAL*	6,513,444.62	2,568,315.42	4,211,792.88	1,696,780.62	12,422,018.12

* Total MRA = MRA Recyclables + MRA Waste - MSW Ash Recycled

^^ Total Waste (tons) = Total MRA (tons) + Non-MRA Recyclables (tons) + Non-MRA Waste (tons)

Source: MDE Solid Waste Program

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Solid Waste Facilities in Maryland

GBB SOLID WASTE MANAGEMENT CONSULTANTS

MRFs in Maryland

1. BFI Baltimore Processing Center, Baltimore, MD
2. Weyerhaeuser Recycling Services, Baltimore, MD
3. Prince George's County Recycling (Recycle America Alliance), Capital Heights, MD
4. Baltimore County Resource Recovery Facility, Cockeysville, MD
5. Montgomery County Recycling Center, Deerwood, MD
6. Recycle America Alliance-Dry Commercial Waste, Elkridge, MD
7. Recycle America-Single Stream Facility, Elkridge, MD
8. Office Paper Systems, Inc. Fiber MRF, Gaithersburg, MD
9. Carroll County-Northern Landfill Processing Facility, Westminster, MD

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MRFs – U.S. vs. Maryland

	U.S.	MD
Number	651	9
Avg. TPD	152	363
Total TPD	80,789	3,271
Public/Private	112/451	3/6
Single/Dual	160/354	6/3

Source: GAA MRF Yearbook, 2010.

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Waste-to-Energy Facilities in Maryland

1. Harford Waste-to-Energy Facility, Joppa, MD
2. Baltimore Refuse Energy Systems Company (BRESCO), Baltimore, MD
3. Montgomery County Resource Recovery Facility, Dickerson, MD

NMWDA Montgomery County Resource Recovery Facility

- Part of integrated system
- 44% recycling rate
  - Mandatory residential, multi-family and commercial recycling
- Received SWANA Gold Excellence Awards for WTE in 2005 and 2010

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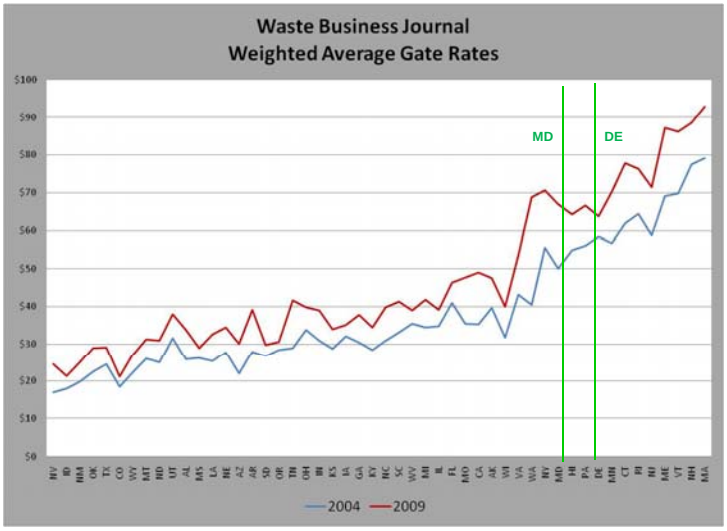
Landfills in Maryland

1. Mountainview Municipal LF, Frostburg, MD
2. Millersville Municipal Landfill, Severn, MD
3. Quarantine Road Municipal LF, Baltimore, MD
4. Eastern Municipal Landfill , White Marsh, MD
5. Appeal Municipal Landfill, Lusby, MD
6. Midshore II Regional Municipal LF, Ridgely, MD
7. Northern Municipal LF, Westminister, MD
8. Cecil Co. Central Municipal LF, Elkton, MD
9. Charles Co. Municipal LF No. 2, Waldorf, MD
10. Beulah Municipal LF, Hurlock, MD
11. Garrett Co. SWD&RF , Oakland, MD
12. Harford Waste Disposal Ctr. , MD
13. Alpha Ridge Municipal Landfill, Marriottsville, MD
14. Brown Station Road Municipal LF, Upper Marlboro, MD
15. Fairmount Rd. Municipal Landfill, Westover, MD
16. Forty West Municipal Landfill, Hagerstown MD
17. Newland Park Municipal Landfill, Salisbury, MD
18. Central Municipal Landfill, Newark, MD
19. Fort Detrick Site B Municipal Landfill – VE, Frederick, MD

Landfill Gate Rates per Ton in the U.S. 2009 Compared to 2004



Source: Waste Business Journal: www.wastebusinessjournal.com

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SOLID WASTE MANAGEMENT LOOKING AHEAD

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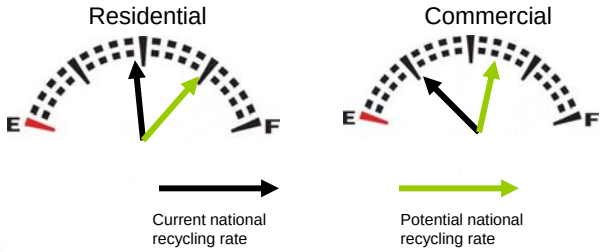
Challenge: Move the Recycling Needle to 50% - 60%

Objectives:

- Increase recycling of all curbside commodities
  - Currently,
    - Plastics 25-27%
    - Glass 34.5%
    - Aluminum cans 54.7%
    - Steel cans 63%
    - Paper 63.4%
- Create jobs and expanded recycling infrastructure



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Moving the Needle

What's needed to increase residential and commercial recycling (incl. multifamily and C&D):

- Change federal policies
  - Add to current energy and environment bills: disposal taxes, investment tax credits for recycling infrastructure
  - Add EPA seminars, technical assistance and grants (as in the 1970s)
- Provide support for local governments
  - Help to enact mandatory recycling ordinances, landfill bans
  - Provide technical assistance
  - Provide money for planning, education, carts, contractor procurement

AMERICAN POWER ACT

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Moving the Needle (con'td)

- Provide incentives for industry
  - Institute tax credits and incentives to purchase equipment, provide services to meet additional demand
  - Provide incentives to keep recycled commodities in the U.S., which creates jobs (i.e., reduce export of recycled materials)
    - In 2010, 628,000 tons of recovered paper exported from Baltimore port (Source: Bill Moore, 6/2/11)

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Best Practices for Moving the Needle to 50%-60%

- Single stream recycling (residential and commercial) of clean/dry paper, containers, foil, all plastics
- Increase separate collection of organics, especially food waste
- Opportunities to recycle HHW, electronics, and appliances
- Efficient collection routing and services for waste, recyclables, bulky waste
- Enterprise funds, PAYT
- Long-term contracting for waste and recycling collection/disposal
- Development of ordinances, including C&D-related
- Incentive programs

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Converting Recyclables Can Bring Green Jobs to Maryland

- Convert recyclables into products in Maryland rather than exporting them
- Keeping recyclables in the state = jobs and economic benefits

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Energy in 1 Ton of MSW

- Has 11 million BTUs with 30% moisture
- Equivalent to:
  - 1 barrel of oil
  - ½ ton of coal
  - 11 DT natural gas
- Can make:
  - 5,500 lbs. of steam
  - 400 to 600 KWHrs of electricity
  - 48 gallons of ethanol

What if half of the waste landfilled went to WTE?

…that's 200,000 tons per day of new capacity needed!

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Locations Advancing "Proven' Technologies in the U.S.

- Mass burn expansions
  - Completed:
    - Hillsborough County, FL - Covanta
    - Lee County, FL - Covanta
    - Olmsted County, MN – Olmsted County
  - Under construction: Honolulu, HI – Covanta
- Locations advancing new facilities with 'proven' technologies:
  - Baltimore, MD – Energy Answers
  - City of Los Angeles, CA – Green Conversion Systems LLC
  - Frederick County, MD (NMWDA) - Wheelabrator
  - Harford County, MD (NMWDA) - Wheelabrator
  - Palm Beach County, FL (SWAPBC) – B&W
  - Puerto Rico – Energy Answers
  - U.S. Virgin Islands – Alpine Energy/EPI

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Now - 2011

- Several WTE expansions/new projects being undertaken (some 5-7)
- Some 563 (and counting) different companies offering proven and alternative conversion technologies
- Some local governments pursuing proven and/or alternative conversion technologies (some 10-15)
- USDOE and USDA loan/grants supporting several alternative conversion technologies (some 4-6)
- U.S. wants to reduce dependence on foreign oil and reduce greenhouse gases and carbon emissions
- U.S. needs more clean and renewable energy
- Additional Federal legislative incentives 'firmly up in the air'

ARROWECOLOGY THE WAY TO ZERO WASTE
ALTERNRG
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Enerkem
ENTECH RENEWABLE ENERGY SOLUTIONS
Fiberight
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PlascoEnergy GROUP
IWT INTERSTATE WASTE TECHNOLOGIES
R3 ENVIRONMENTAL RECLAIM. RECYCLE. REUSE.
Wheelabrator Technologies Inc. A Waste Management Company

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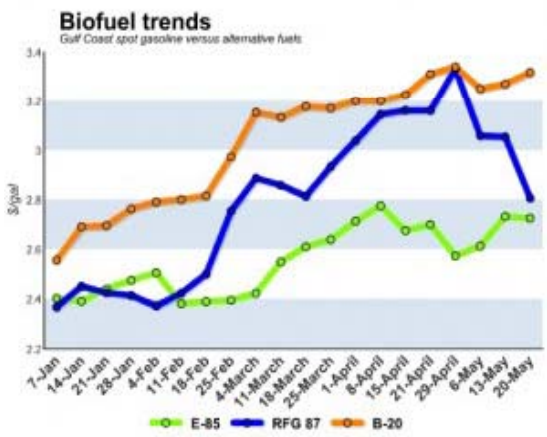
Biofuel Pricing Trends



Source: http://www.ethanolmarket.com/.

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Technologies and Risk

Source: Gershman, Brickner & Bratton, Inc. September 2010

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

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WTE in Maryland

- Note: 2.5 million tons Maryland waste sent to landfills in 2009
- Continued implementation of new WTE capacity
  - GHG and energy benefits
- Develop markets for WTE ash
  - ICC to use 2.6 million tons of aggregate when completed

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STATEMENT FROM GOVERNOR MARTIN O'MALLEY ON HIS DECISION TO SIGN SENATE BILL 690

ANNAPOLIS, MD (May 17, 2011) – Governor Martin O'Malley issued this statement today regarding Senate Bill 690 - Renewable Energy Portfolio - Waste-to-Energy and Refuse-Derived Fuel:

"After careful deliberation, I have decided to sign Senate Bill 690. Our State has an aggressive goal of generating 20% of our energy from Tier I renewable sources by 2022 and we intend to achieve that goal through as much in-state energy generation as possible. This will require a diverse fuel mix including onshore and offshore wind, solar, biomass including poultry litter, and now waste-to-energy if we are to realize our 20% goal. …"

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Maryland Counties Landfilling Significant Tonnages

- Anne Arundel
- Baltimore
- Carroll
- Cecil
- Frederick
- Howard
- Prince George's
- Washington

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WTE – What's Coming in Maryland?

- Frederick/Carroll Counties WTE Facility
  - 1,500 TPD
  - MSW from Frederick and Carroll Counties and biosolids from Frederick
  - Through NMWDA; Wheelabrator selected
  - Part of an integrated system with high diversion

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Energy Answers – Baltimore, MD

- Developing the Fairfield Renewable Energy Power Plant on 90-acre "brownfield" site on the Fairfield Peninsula in Baltimore, MD
- 4,000 tons per day of Processed Refuse Fuel
- RDF preparation offsite; locations under development
- Received all major permits and approvals for dedicated boiler and recycling operations
- Outputs:
  - 160 MW combined heat and power plant;
  - 350 tons/day of recovered, recyclable metals; and
  - 800 TPD construction-ready aggregate and other building materials
- Schedule
  - Construction expected to begin spring 2011
  - Power production expected to begin spring 2013
  - Commercial operation late 2013

Source: Energy Answers

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Renewable Energy at Waste Facilities

- NMWDA solar project at Montgomery County Transfer Station
- Howard County New Cut Road Landfill/Worthington Elementary School Solar Energy Project
- Annapolis Renewable Energy Park at closed landfill

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SUMMARY

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Trend for Future

- Continued demand for recyclables; industry wants more paper, aluminum, and plastics
- Set 'real' diversion/recycling goals at 50-60% level with supporting policies and services
- Make collection as efficient as possible while supporting robust recycling
- Set up services to a greater share of revenues

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Trends for Future (cont'd)

- Conversion technologies will need 4-6 years to learn if they work and if lower costs than traditional WTE result…so stay tuned
- Low risk assumption by public sector until new technologies proven
- Added economic benefit of placing value on carbon credits and power from waste as 'renewable energy'
  - Possible impetus for more proven technologies that are now too expensive
- Renewable fuel standards from EPA

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Trend for Future (Cont'd)

- Consider RDF in existing coal-fired electric utility boilers or cement kilns
- Have landfill disposal capacity secured for long-term access
- 'Environmentalists' and 'Zero Waste' proponents will continue to fight WTE and alternative technologies calling them all "incineration"

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The Ultimate Goal:

Fully Integrated and Efficient Waste Management System with Significant Diversion and WTE …in a 50-50 partnership!

…for more jobs, better environment, and energy independence!

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Thank you!!

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