



MRFs: Mastering an Inconsistent Waste Stream

Quad State Conference 2015
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Gershman, Brickner & Bratton, Inc.



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Presentation Outline

- I – About GBB
- II – The Changing Wastestream
- III – Materials Recovery Facilities
- IV – Benefits of MRFs
- VI – One Bin



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Quality – Value – Ethics - Results

Established in 1980

Solid Waste Management and Technology Consultants

Helping Clients Turn Problems into Opportunities



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Economic, technical and environmental reviews

Procurements

Due diligence

Waste characterization and sourcing

Independent feasibility consultant



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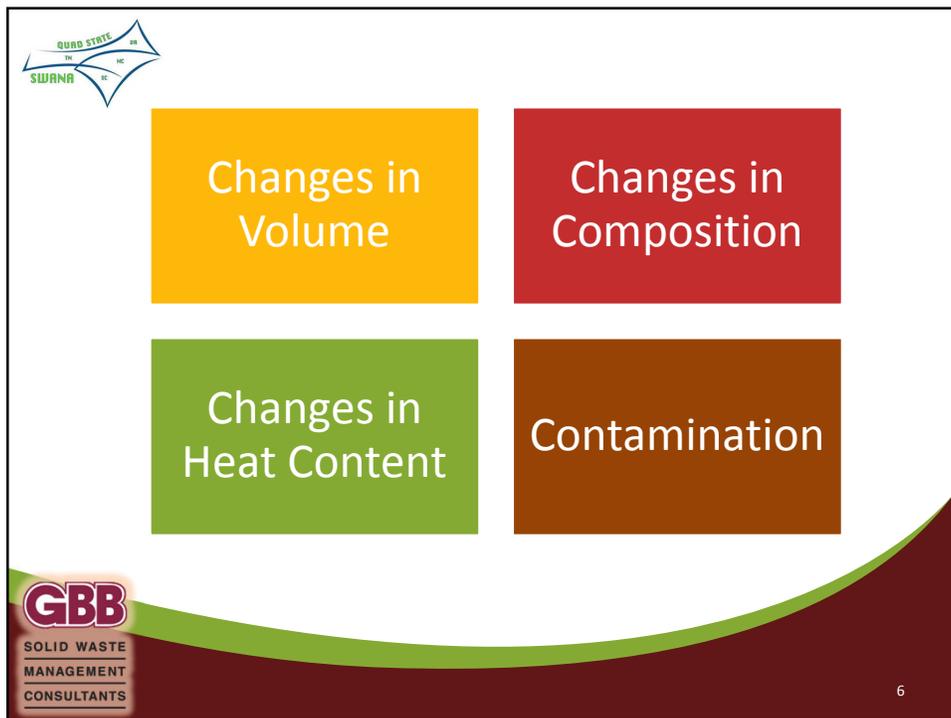


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THE INCONSISTENT WASTE STREAM

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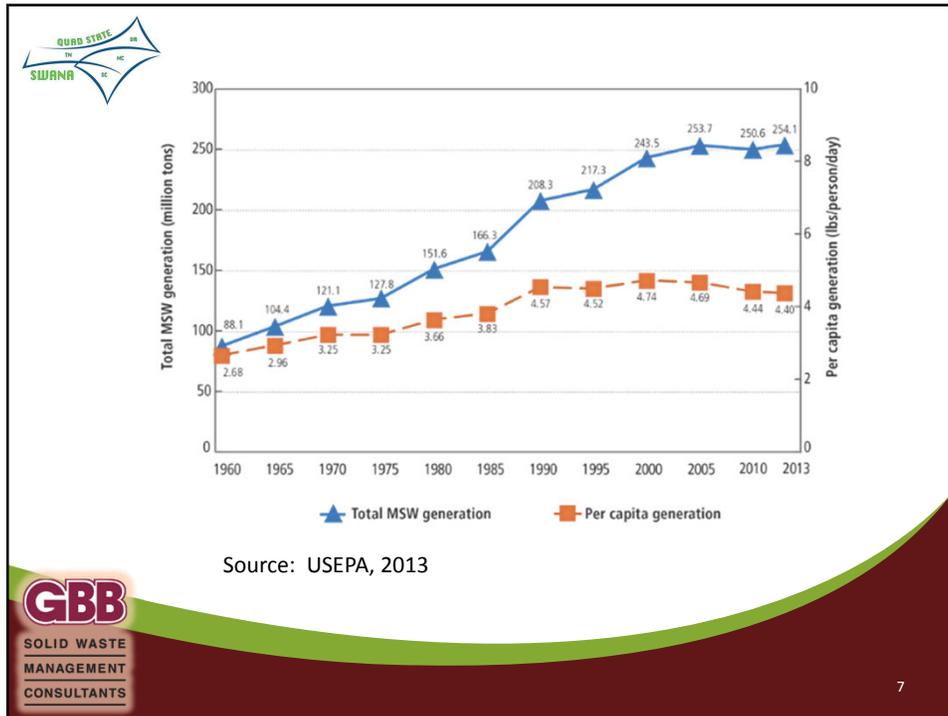


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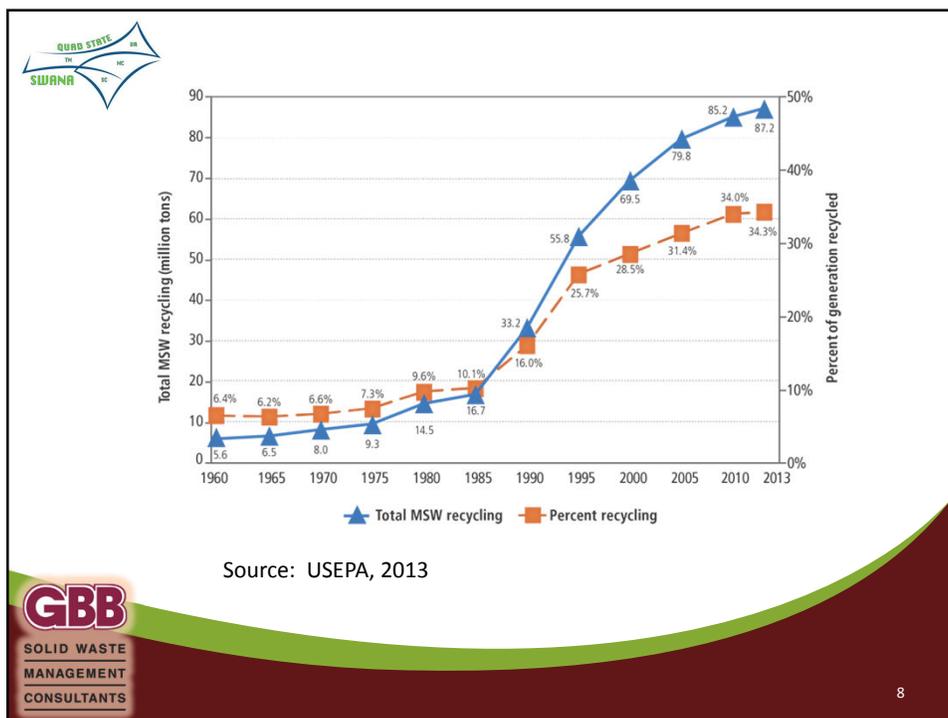
Changes in Volume	Changes in Composition
Changes in Heat Content	Contamination

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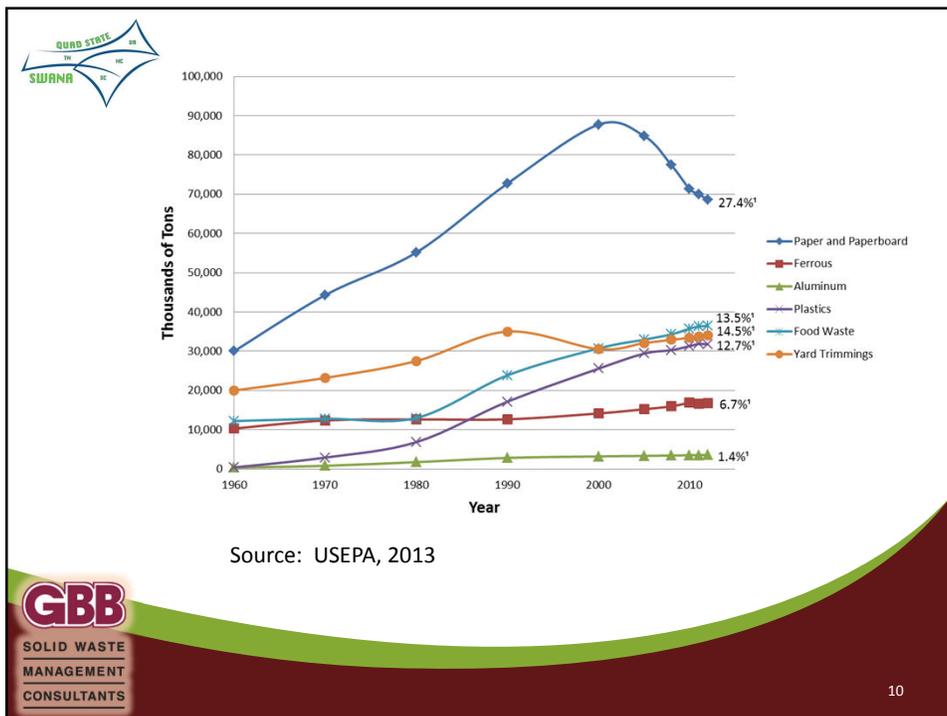
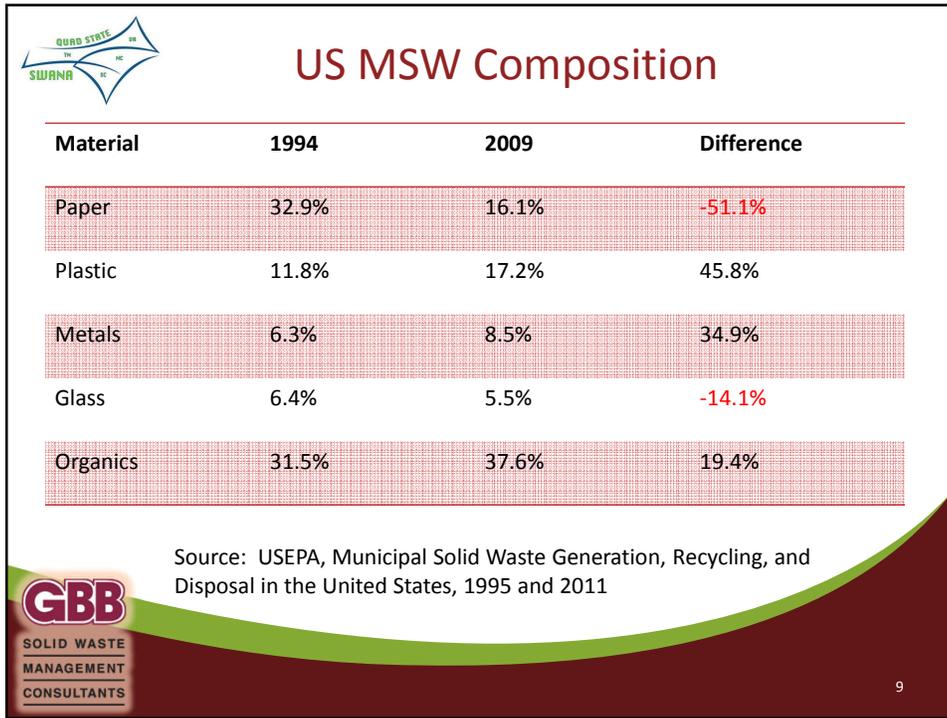
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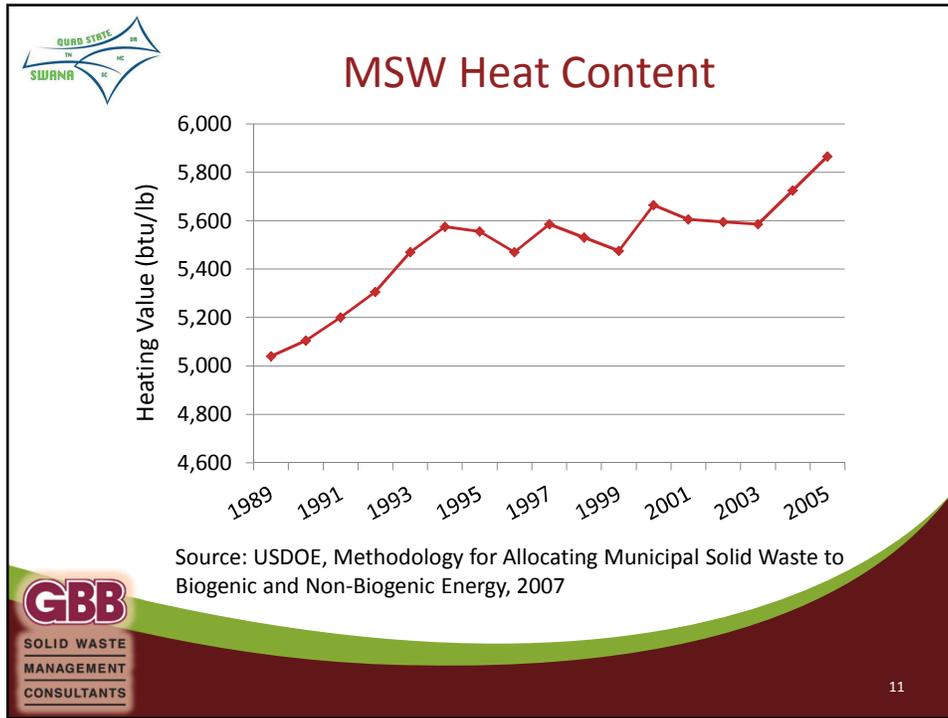


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The Washington Post

washingtonpost.com Sunday, June 21, 2015

American recycling is stalling, and the Big blue bin is one reason why

By: Aaron C. Davis

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City of Fort Worth, TX

Summary Information - All Materials As Setout by Residents

Commodity	Total Weight of Commodity (Both Carts)(lbs)	% of Commodity located in Garbage Bin	% of Commodity located in Recycling Bin	Commodity as % of Overall Collection Stream
Organics	5,350	95%	5%	29%
OCC	621	22%	78%	3%
Other Fibers	3,423	44%	56%	19%
Glass	1,412	32%	68%	8%
PET	575	51%	49%	3%
HDPE-(Natural)	174	28%	72%	1%
HDPE-(Colored)	279	42%	58%	2%
Mixed Plastic	703	69%	31%	4%
Bags and Film	686	80%	20%	4%
Aluminum	300	56%	44%	2%
Ferrous	551	69%	31%	3%
Other Residue	4,194	92%	8%	23%
Totals	18,267	72%	28%	100%


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Examples of MRF Contamination Issues



Food Waste & Vegetation



Contaminated Material & Food Waste



ONP Screen Jammed w/Plastic Waste



Household Trash, Electronics and Hoses

Source: ReCommunity


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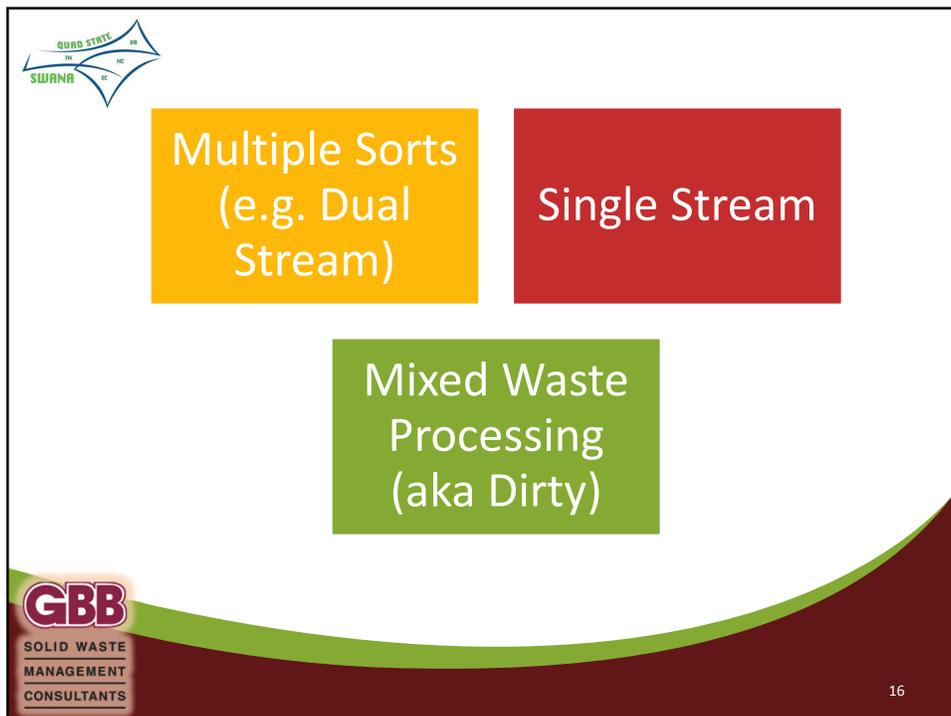


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MATERIALS RECOVERY FACILITIES (MRF)

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Multiple Sorts
(e.g. Dual
Stream)

Single Stream

Mixed Waste
Processing
(aka Dirty)

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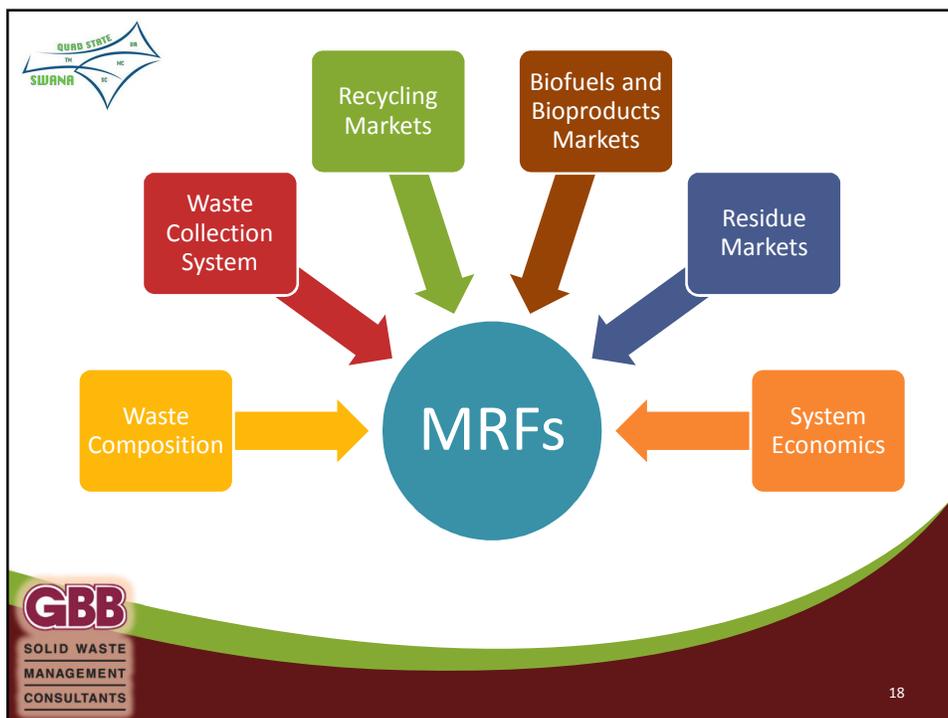


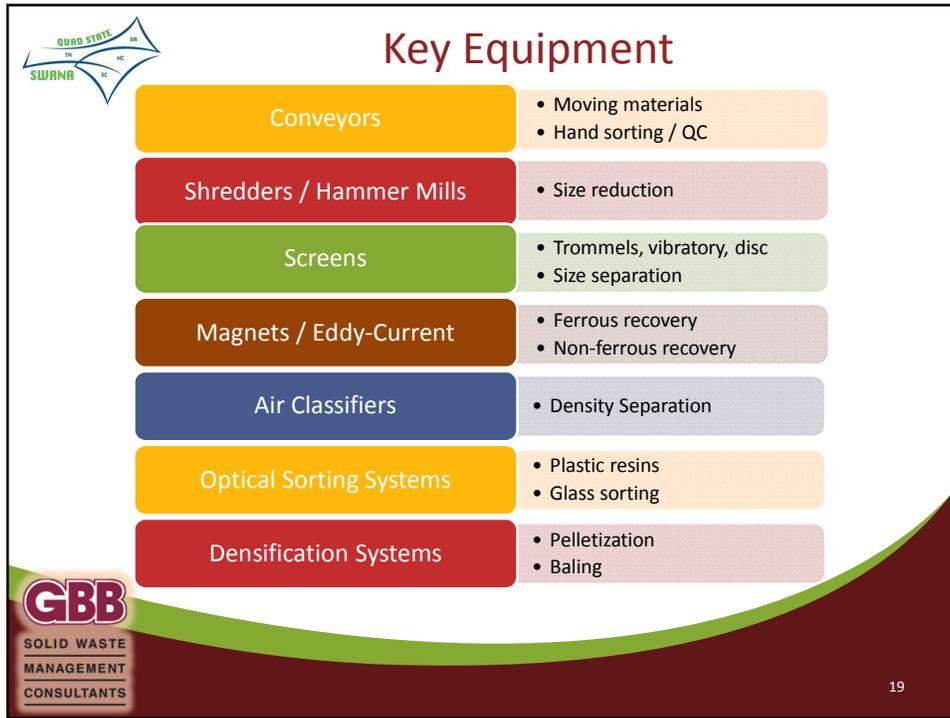
US Infrastructure

Technology	Number
Source Separation Collections	9,000
Material Recovery Facilities (MRF)	736
Composting	2,300
Mixed Waste Processing Facilities (MWPF)	51
Mass Burn WTE	65
Modular WTE	9
RDF -Processing &/ or Combustion	20
Anaerobic Digestion	19
Transfer Stations	3,350
Landfills	1,908



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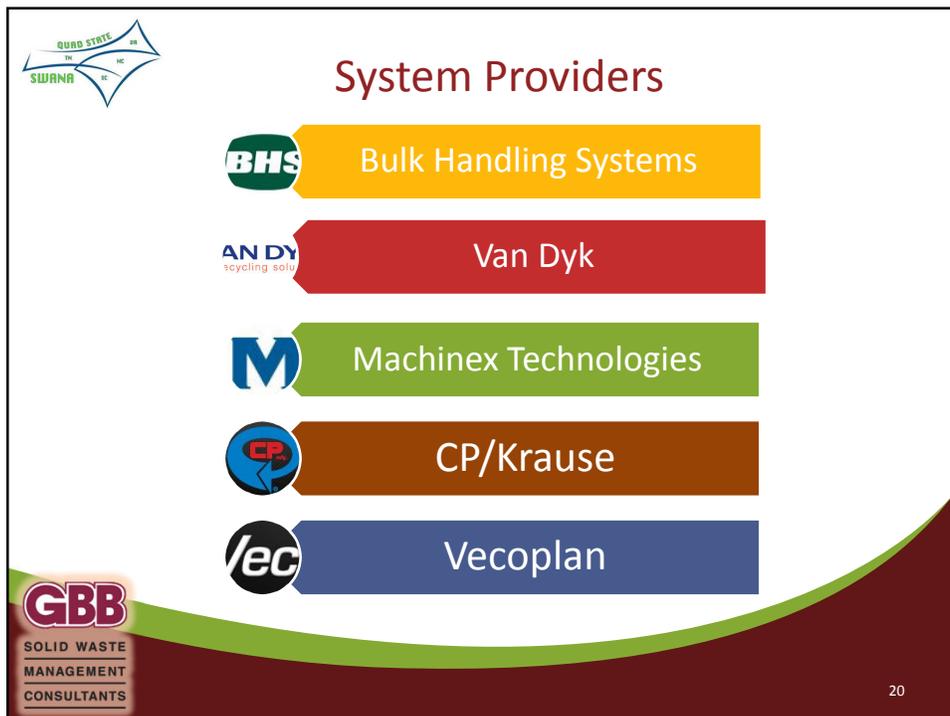


Key Equipment

Conveyors	<ul style="list-style-type: none"> Moving materials Hand sorting / QC
Shredders / Hammer Mills	<ul style="list-style-type: none"> Size reduction
Screens	<ul style="list-style-type: none"> Trommels, vibratory, disc Size separation
Magnets / Eddy-Current	<ul style="list-style-type: none"> Ferrous recovery Non-ferrous recovery
Air Classifiers	<ul style="list-style-type: none"> Density Separation
Optical Sorting Systems	<ul style="list-style-type: none"> Plastic resins Glass sorting
Densification Systems	<ul style="list-style-type: none"> Pelletization Baling

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System Providers

 Bulk Handling Systems
 Van Dyk
 Machinex Technologies
 CP/Krause
 Vecoplan

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BENEFITS OF MRFS

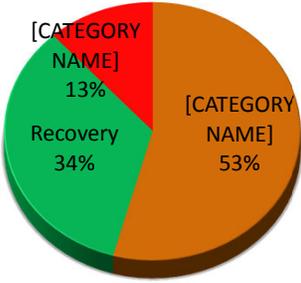


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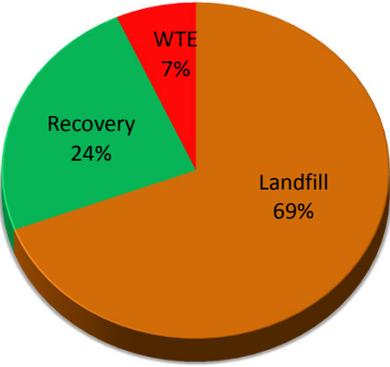
Lots of Opportunity

EPA: 254 million tons (2013)



Category	Percentage
[CATEGORY NAME]	13%
Recovery	34%
[CATEGORY NAME]	53%

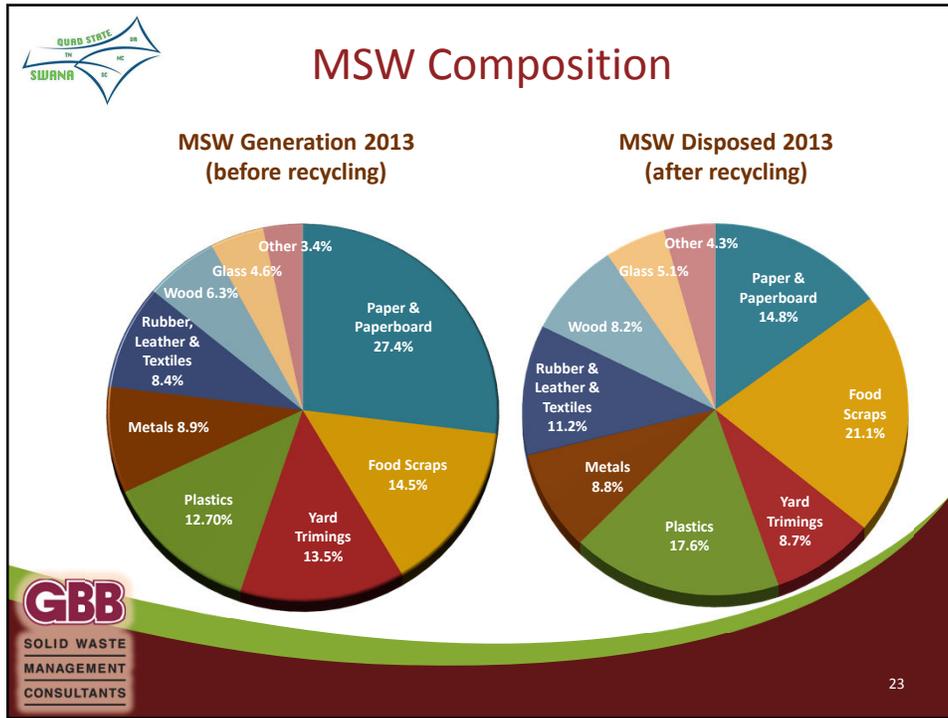
BioCycle: 389 million tons (2008)



Category	Percentage
WTE	7%
Recovery	24%
Landfill	69%



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Modern MWP Facilities

Location	Owner	Start-up Year
Region of York, Ontario, Canada	Lakeside/Borealis Infrastructure (Dongara)	2009
San Antonio, TX	Waste Management	2012
Philadelphia, PA	Waste Management	2014
Edmonton, Alberta, Canada	City of Edmonton	2014
Montgomery, AL	Infinitus	2014

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Increased Interest in Renewable Energy from Waste Technologies

>579 Technology and/or Project Development Companies Worldwide

150 Commercial or Demonstration Facilities with MSW Worldwide

- 67 Anaerobic Digestion
- 48 Gasification
- 19 Plasma Gasification
- 16 Pyrolysis

Contributing factors:

- Renewable energy policy
- Greater revenue potential
- Funding (grants/loans)
- Local governments desire to be greener
- GHG considerations
- Landfill waste diversion goals
- Local jobs
- Increasing collection/disposal fees



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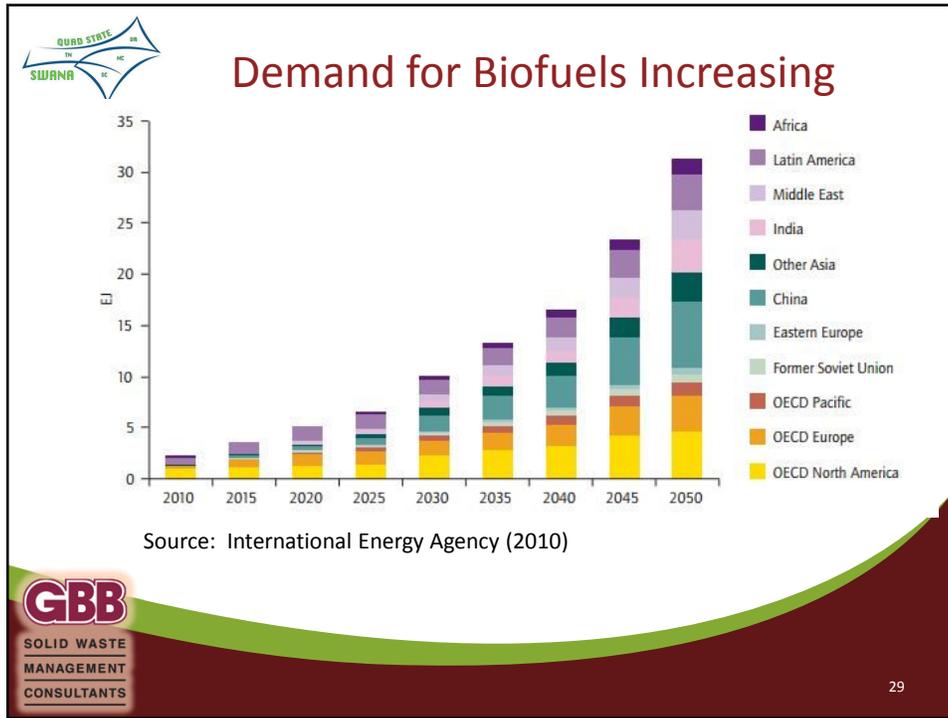
Energy/Fuel Product Values Are Key

Converting MSW to...	Product	1 ton MSW net yield	Value Per Production Unit	Revenue Per Ton
	Power	500-600 kWh	@ \$0.06 / kWh	\$30-\$36
	Synthetic Crude	1 barrel	@ \$80 / barrel	\$80.00
	Ethanol	80 gallons	@ \$2.50 / gallon	\$200.00

++ sale of chemical feedstocks, heat and/or recovered metals
but, System Capital Costs and O&M Costs impact the NET MSW costs



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ONE BIN

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ONE BIN FOR ALL
RECYCLING REIMAGINED IN HOUSTON

One Bin For All (OBFA) is the next evolution of recycling. It will allow Houston residents to place all trash, recyclables, and compostables in one bin, providing for a much higher rate of resource recovery.

WE CAN DO BETTER.
WASTE DIVERSION RATES

HOUSTON	NATIONAL AVERAGE	OBFA YEAR 1	OBFA YEAR 2
19%	34%	55%	75%
81% LANDFILL	66% LANDFILL	45% LANDFILL	25% LANDFILL

HOW DOES IT WORK?

- ONE COLLECTION BIN
- ONE COLLECTION TRUCK
- WASTE IS SORTED & RECYCLED
- WHAT'S NOT RECYCLABLE IS TURNED INTO ENERGY OR LANDFILLED

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WASTE & RECYCLING NEWS

Guest column: Houston's One Bin: It's no 'dirty MRF'
May 16, 2013
By Laura Spanjian, Houston's sustainability director

WASTE & RECYCLING NEWS

Guest column: Houston's One Bin: It's a dirty MRF
May 30, 2013
By Tyson Sowell | Texas Campaign for the Environment

WASTE & RECYCLING NEWS

Guest Column: Call it a 'dirty MRF' or not, a single-bin system can work
July 2, 2013
By Brian Wells | Bulk Handling Systems

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Thank you!



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