



Selecting the Best Front-end Technology

MSW to Biofuels Summit
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Presentation Outline

- I – About GBB
- II – Why Mixed Waste Processing
- III – The Changing Wastestream
- IV – Selecting Technology
- V – Questions





**SOLID WASTE
MANAGEMENT
CONSULTANTS**

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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WHY MIXED WASTE PROCESSING?

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Lots of Opportunity

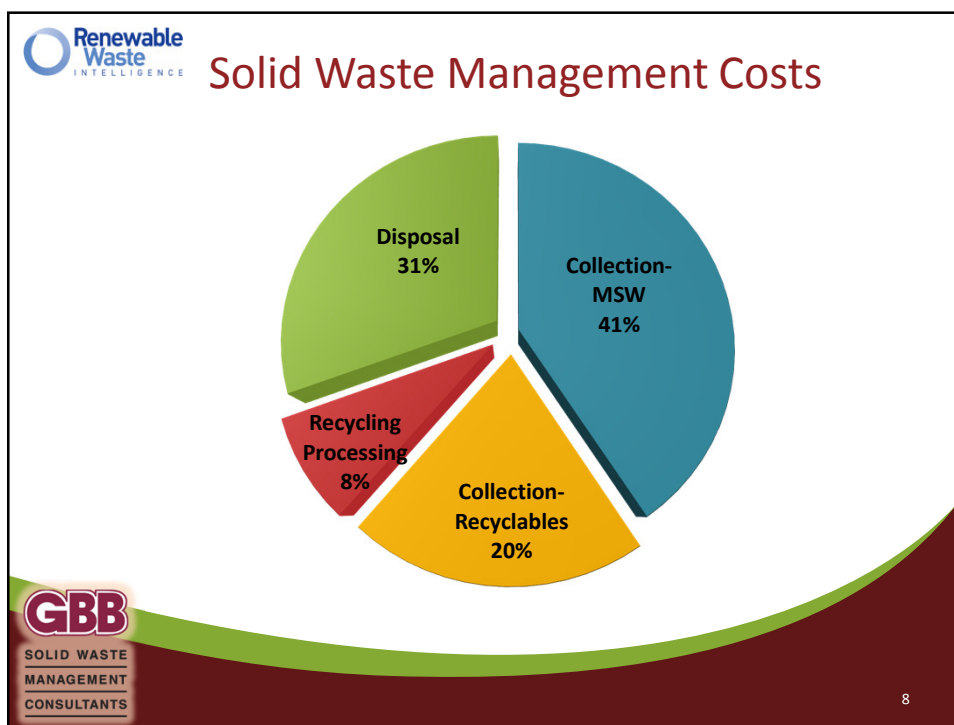
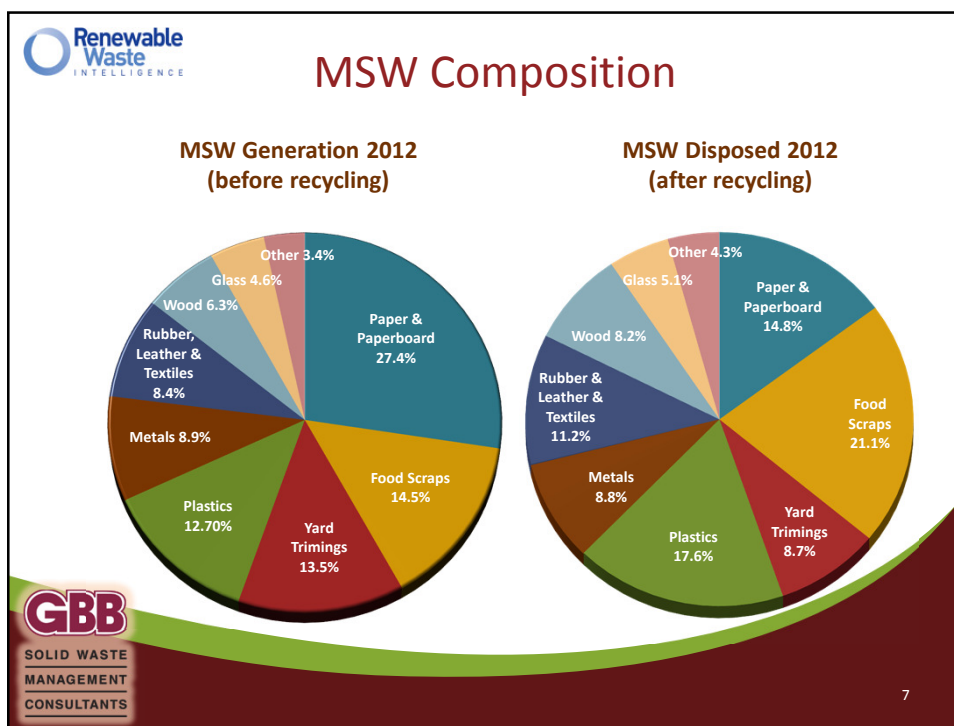
EPA: 251 million tons (2012)

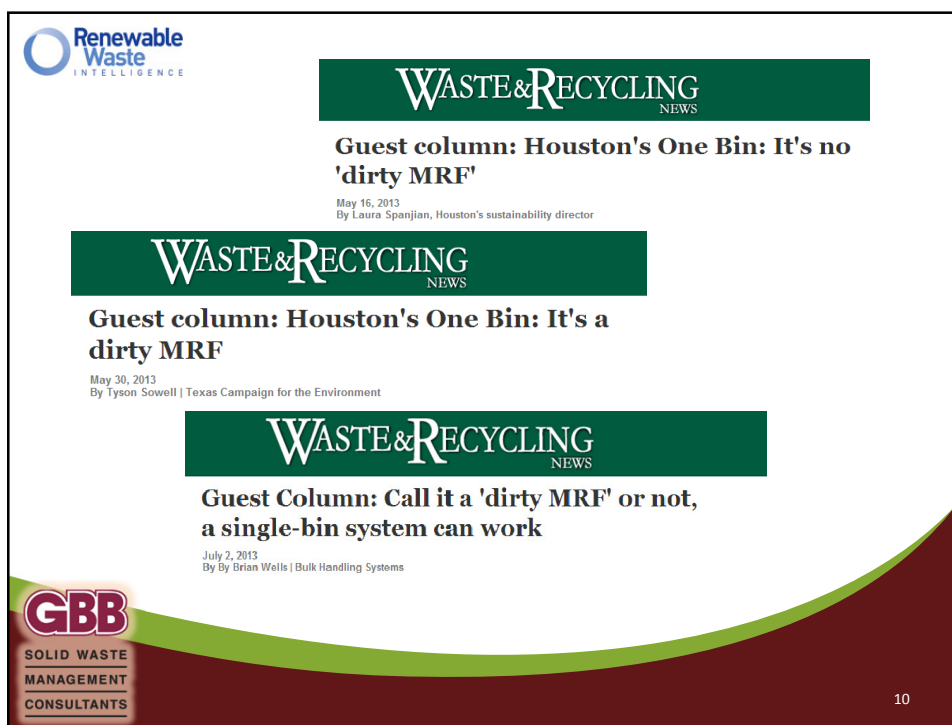
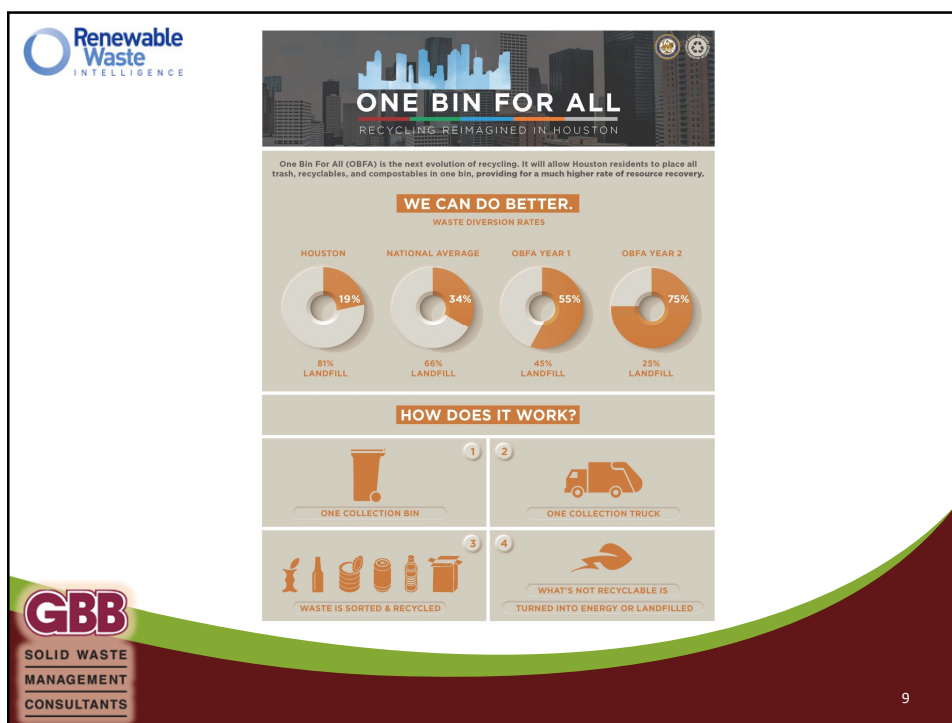
Management Method	Percentage
Landfill	54%
Recovery	34%
WTE	12%

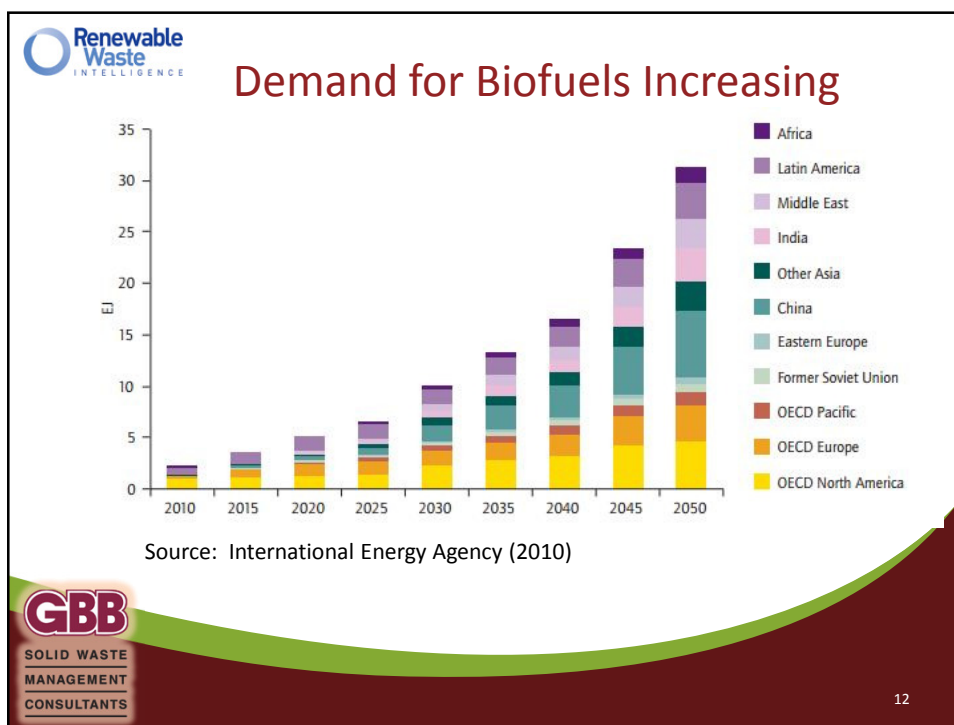
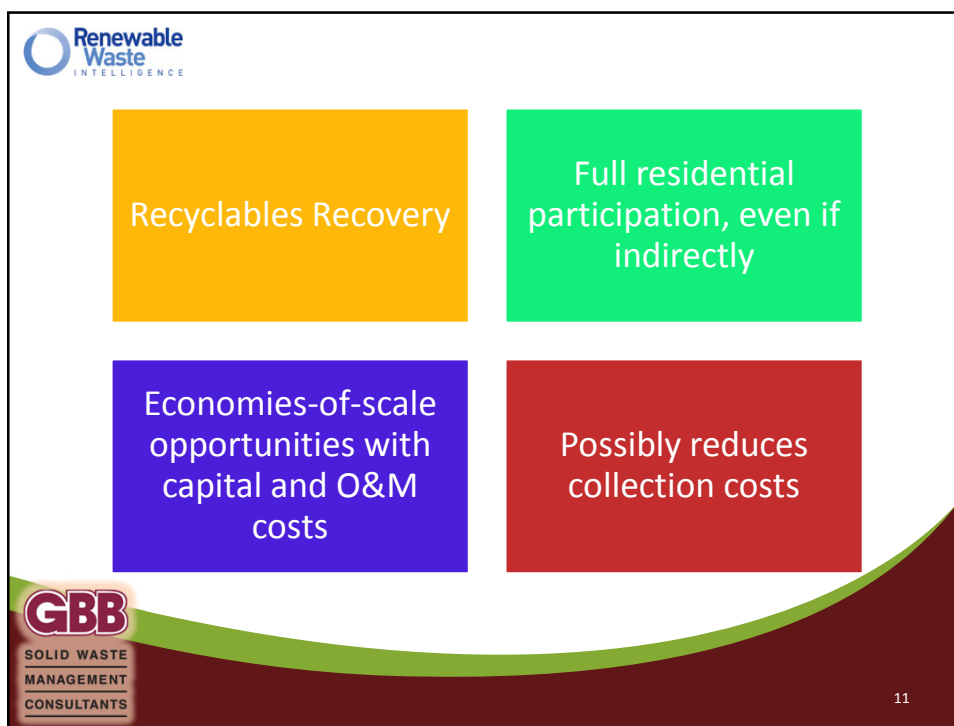
Management Method	Percentage
Landfill	69%
Recovery	24%
WTE	7%

BioCycle: 389 million tons (2008)

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THE CHANGING WASTESTREAM




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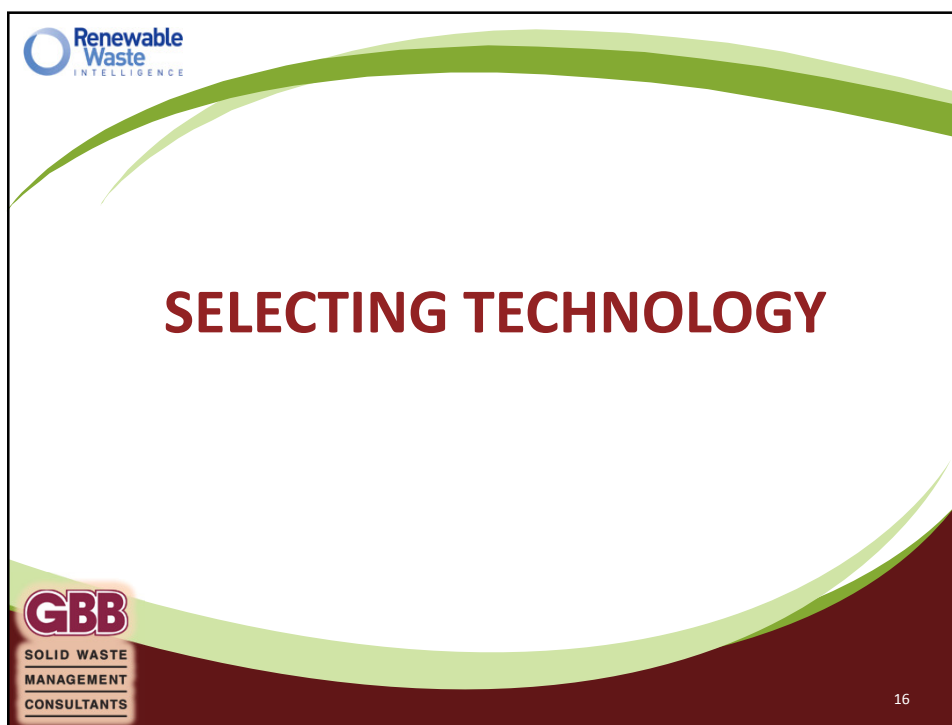
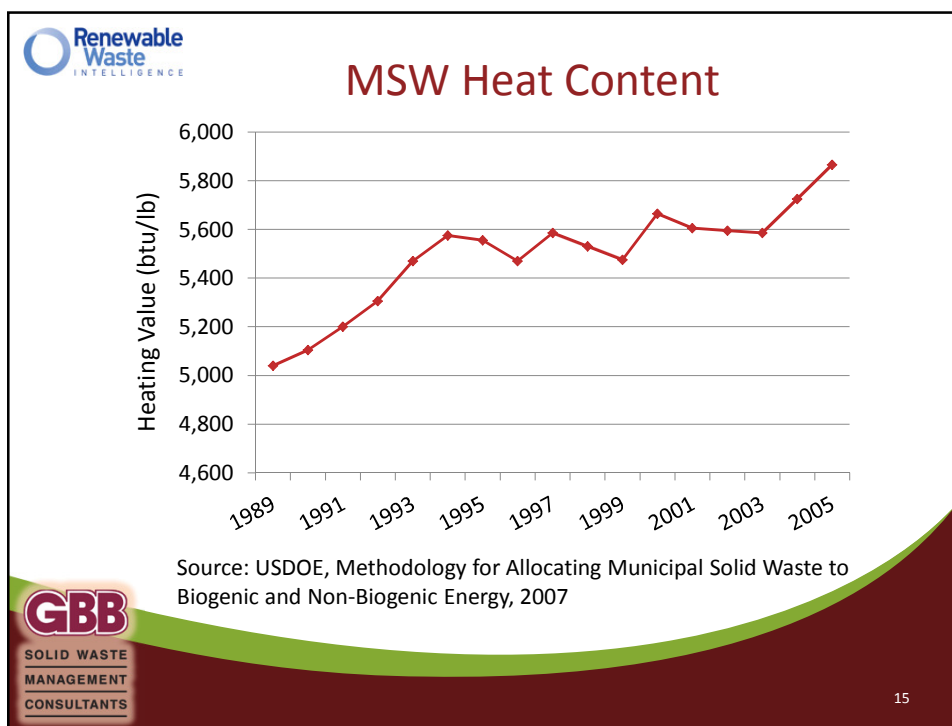
US MSW Composition

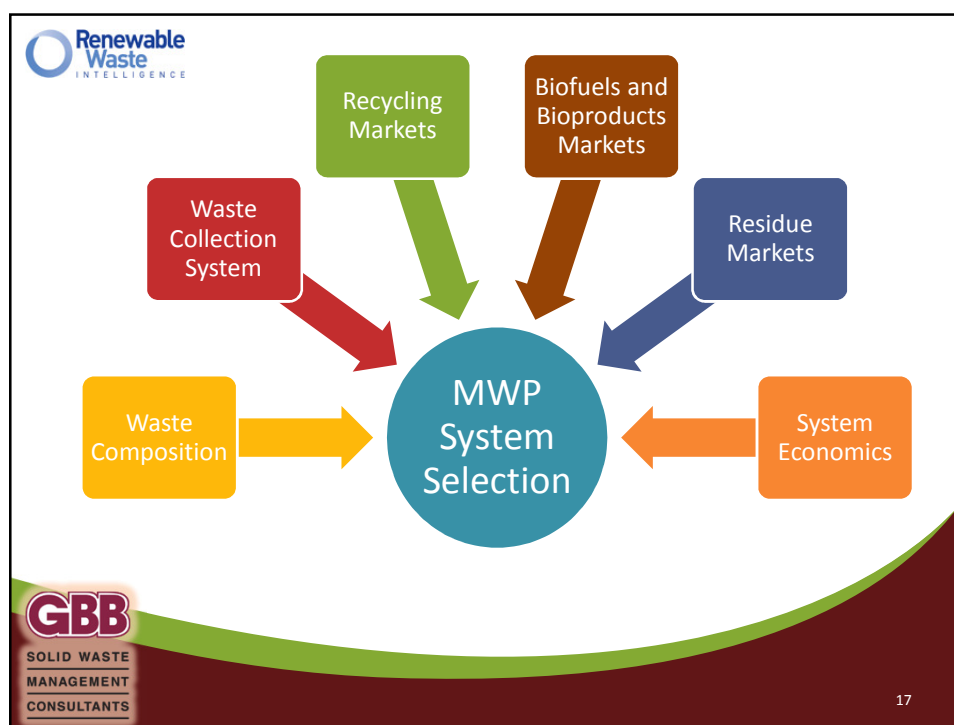
Material	1994	2009	Difference
Paper	32.9%	16.1%	-51.1%
Plastic	11.8%	17.2%	45.8%
Metals	6.3%	8.5%	34.9%
Glass	6.4%	5.5%	-14.1%
Organics	31.5%	37.6%	19.4%

Source: USEPA, Municipal Solid Waste Generation, Recycling, and Disposal in the United States, 1995 and 2011



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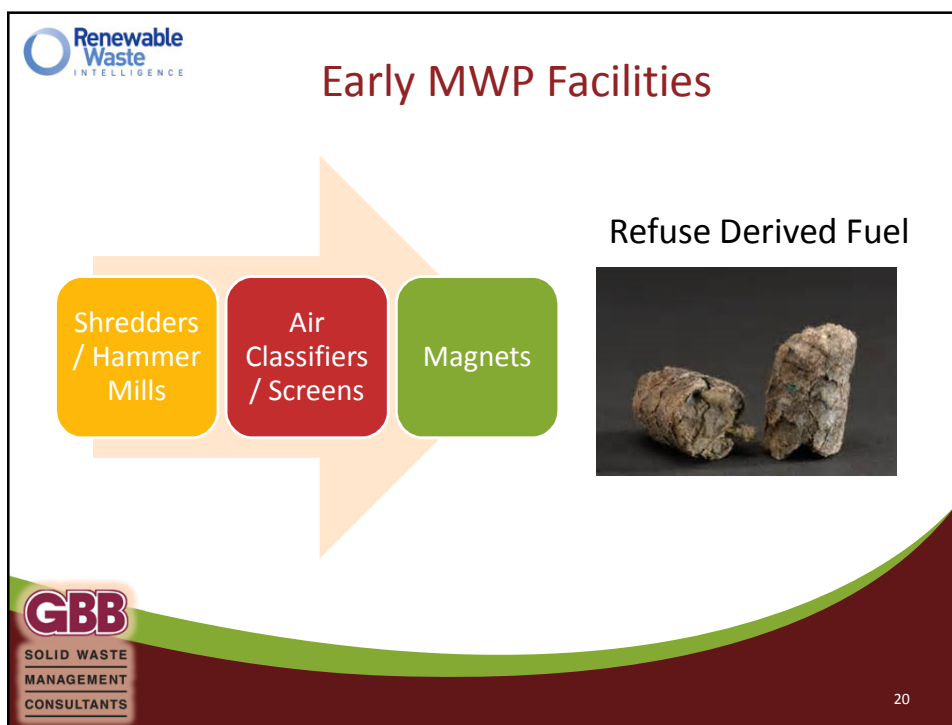
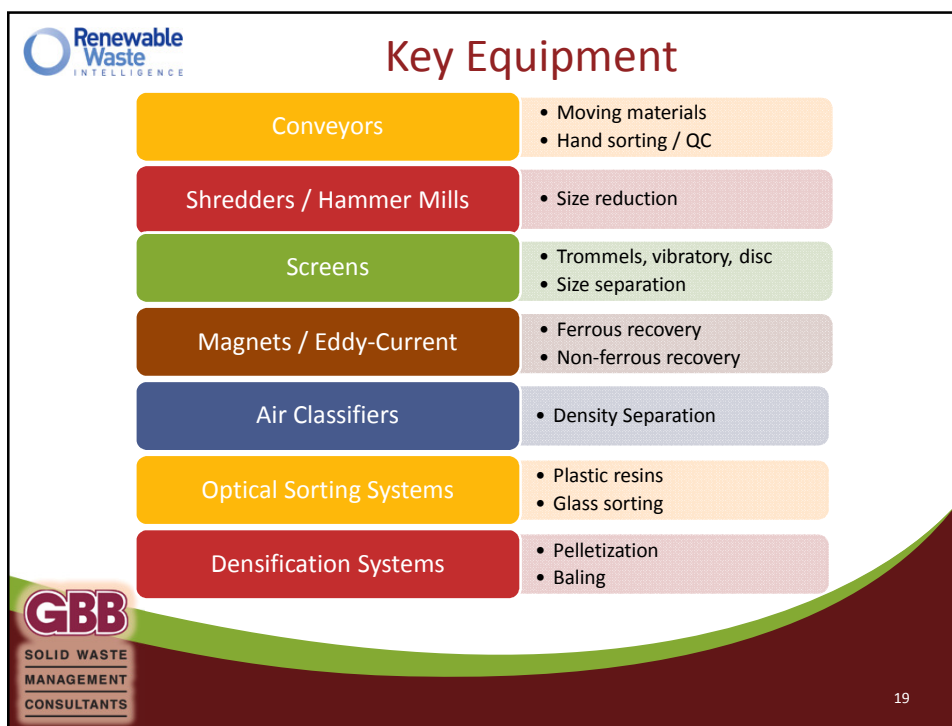
Renewable Waste INTELLIGENCE

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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Early MWPF to RDF/Dedicated Boilers



Rochester, MA (SEMASS)



Hartford, CT (CRRA)




West Palm Beach, FL




La Crosse, WI (NSP)




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System Providers




Bulk Handling Systems




Van Dyk




Machinex Technologies



CP/Krause



Vecoplan



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Modern MWP Facilities

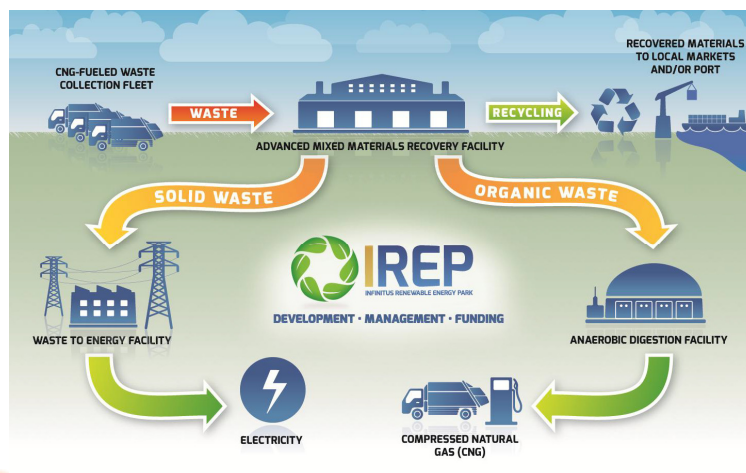
Location	Owner	Start-up Year
Region of York, Ontario, Canada	Lakeside/Borealis Infrastructure (Dongara)	2009
San Antonio, TX	Waste Management	2012
Philadelphia, PA	Waste Management	2014
Edmonton, Alberta, Canada	City of Edmonton	2014
Montgomery, AL	Infinitus	2014



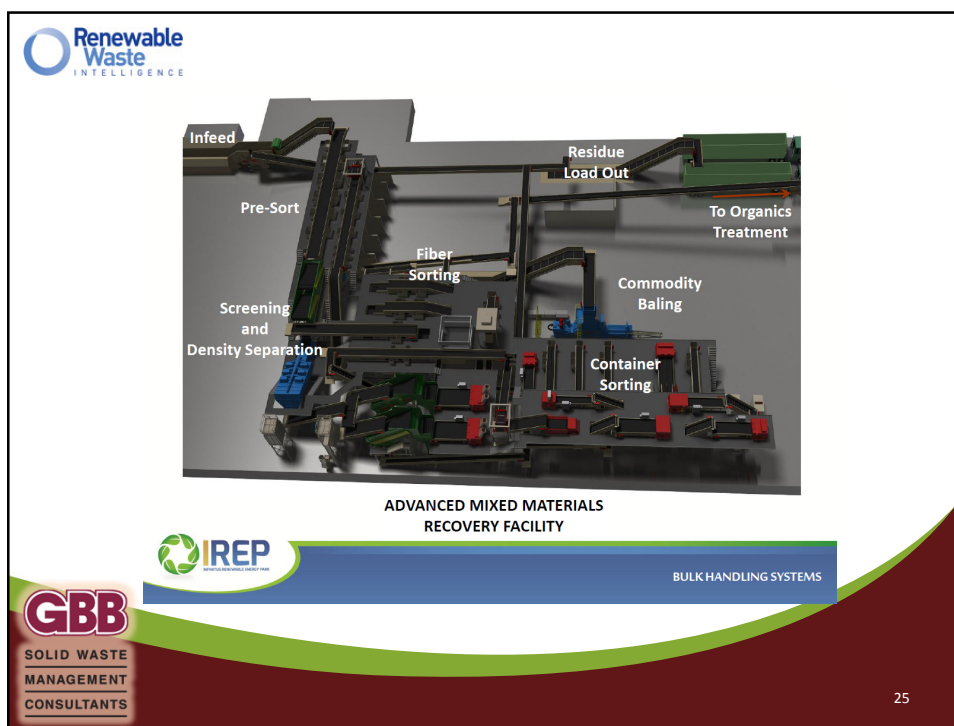
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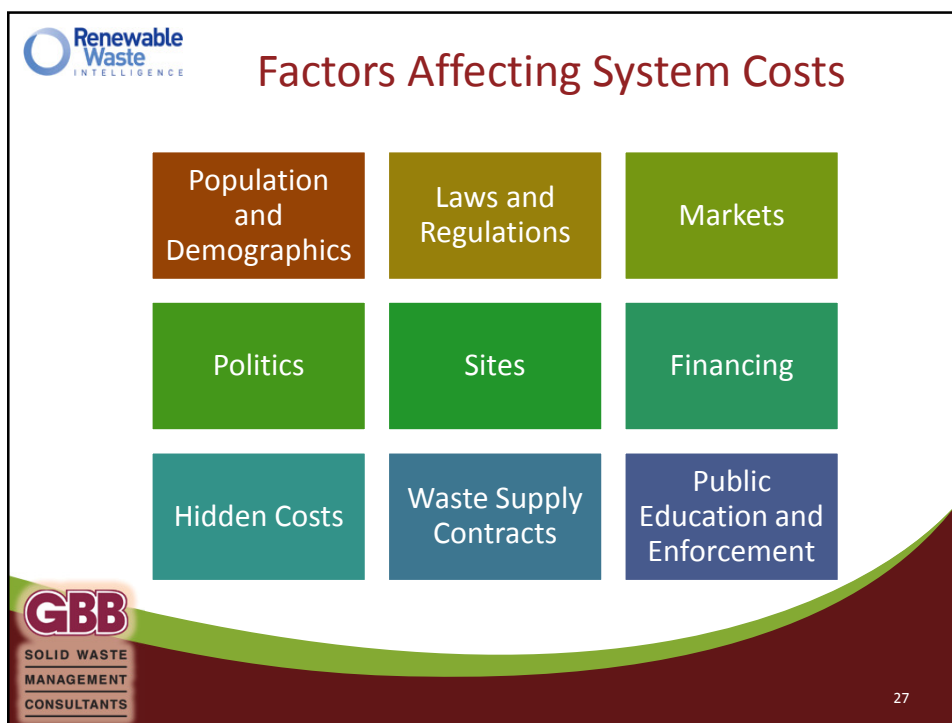


Montgomery , Alabama



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Renewable Waste INTELLIGENCE

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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 Renewable Waste INTELLIGENCE

Thank you!



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