





**Learning from Waste  
Conversion Technology  
Demonstration/Commercial  
Projects**

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**By**  
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**Session Outline**

- WCT Demonstration Projects – What We Hope To Learn
- Enerkem, Inc.
- Entec Biogas USA
- Q&A
- Break
- BIOFerm Energy Systems
- Agilyx
- ICM, Inc.
- Q&A



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## Recent Activities Investigating Conversion Technologies in the U.S.

- Some locations that have investigated technology:
  - Broward County, FL
  - City of Los Angeles, CA
  - City of Sacramento, CA
  - King County, WA
  - Los Angeles County, CA
  - City of New York, NY
  - City of Tallahassee, FL
- Some locations that are currently investigating technologies:
  - City of Allentown, PA
  - City of Glendale, CA
  - City of Plano, TX
  - City of San Antonio, TX
  - Los Angeles County, CA (second time)
  - Santa Barbara County, CA
  - San Bernardino County, CA

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## 563 (and counting) Companies Offering Technology and/or Development Services

- 30 Aerobic Composting
- 106 Anaerobic Digestion
- 34 Ethanol Fermentation
- 170 Gasification
- 47 Plasma Gasification
- 47 Pyrolysis
- 61 WTE: mass burn, modular, dedicated boilers, and RDF
- 68 Others (agglomeration, autoclave, depolymerization, thermal cracking, steam reforming, hydrolysis)

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


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### 58 Conversion Locations Claimed to Be Operating Commercially with MSW

- 31 Anaerobic Digestion
- 17 Gasification
- 2 Plasma Gasification
- 6 Pyrolysis
- 2 Other (agglomeration, autoclave, depolymerization, thermal cracking, steam reforming, hydrolysis)



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### Issues to Consider in Technology Development

- Performance history and size
- Scaling uncertainties
- Environmental impacts
- Siting and permitting needs
- Cost uncertainties and their \$ coverage
- Product market uncertainties
- Process guarantees
- Financial resources of developer and/or guarantor
- Community acceptance
- Other risks and unknowns



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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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## Grants and Loans

Federal

- In December 2009, 19 alternative technologies received a total of \$564 million from DOE for pilot, demonstration and commercial Projects
- *Federal Loan Guarantee Programs*
  - U.S. Department of Agriculture (USDA) Renewable Energy loan guarantee programs
  - U.S. Department of Energy (DOE) Renewable Energy loan guarantee programs

States

- California, Mississippi and Pennsylvania as examples



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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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