Paul Pabor, Vice-President Renewable Energy

Waste Management, Inc.

U.S. Inventory of LFG Projects

Type of Project	U.S.*	WM
Electricity Generation	300+	81
Medium BTU Fuel	100±	23
Process to Natural Gas	13	7
Totals	**420+**	**111**

*LMOP Database - March 2008

IN – KY – OH Inventory of LFG Projects*

Type of Project	IN	KY	OH
Electricity Generation	11	5	5
Medium BTU Fuel	7	1	9
Process to Natural Gas	0	0	2
Total Active projects**	**18**	**6**	**16**
Candidate Open Landfills	8	14	13

* LMOP Database - March 2008

** 29 projects initiated before 2003

WM Sustainable Growth Initiatives

- Double our waste based energy production
  - *Power 2 million homes by 2020 – currently 1 million.*
  - ***Short-term initiative to build 60 new renewable energy facilities over the next five years***
- Triple the tons of recyclable materials processed
  - *Process 20 million tons by 2020 – currently 8 million.*
- Preserve and restore more wildlife habitats across North America
  - *Increase the number of facilities to 100 – currently 33 across 19,000 acres.*
- Invest in cleaner technologies
  - *Direct capital expenditures of up to $500 million (over 10 years) to reduce emissions and increase fuel efficiency by 15%.*

Renewable Energy Plant

Fossil Fuel Value - $/MMBTU

Commodity	Coal	Natural Gas	Oil	LNG	Diesel	Wholesale Electricity
Product Units	Ton	MMBTU	Barrel	Gallon	Gallon	MWH
Value per Product Unit	**$40-$60**	**$6-$12**	**$80-$130**	**$1.00-$1.40**	**$3.50-$4.50**	**$35-$60**
Product Units per MMBTU	.043	1	0.17	12.0	7.7	0.293
Value per MMBTU	**$1.70 - $2.60**	**$6 - $12**	**$13 - $22**	**$12 - $17**	**$27 - $35**	**$10 - $18**

LFG Value per MMBTU

Project Type	Med BTU – Coal	Med BTU - Nat Gas	High BTU	Electricity
Fossil Fuel Value	$1.70 - $2.60	$6 - $12	$6 - $12	$10 - $18
Discount for LFG	0 – 30%	40% - 70%	0%	0%
Conversion Efficiency	95%	95%	80%	28%
LFG Value	**$1 - $2**	**$2 - $6**	**$5 - $9**	**$3 - $5**
Sec 45 Tax Credits	0	0	Possible	$1.30
RECs at $3 - $55	0	0	Possible	$0.1 - $4+
Final LFG Value	**$1 - $2**	**$2 - $6**	**$5 - $9**	**$4 -$10**
Price Volatility	**Site-specific**	**Site-specific**	**Seasonal, Weather**	**Fossil Fuel**

Historical Business Factors

- Low fossil fuel prices
- Low avoided costs (PURPA) for power
- Regulated energy markets
- No widespread support for Green Energy
- Section 29 credits for sale of gas

Market changes in the last few years

- High fossil fuel prices
- Increasing market prices for power
- Competitive energy markets
- Broad support for Green Energy
- Renewable Energy Credits
  - Compliance with State Renewable Portfolio Standards
  - Voluntary purchases by corporations and governments
- Section 45 credits for sale of energy from LFG

Project Considerations

Project Type Ranking: "1" is most favorable, "3" is least favorable

Project Type	Med BTU	High BTU	Power
Air Permitting Constraints	1	2	3
Benefit to Landfill Air Permitting	1	1	3
Compatibility with LFG Operations	1	3	2
Synergy with LF or other WM Operations	1	3	1
Stranded Asset Risk	3	1	1
Product Specification Risk	2	3	1

Maximizing Value from LFG

- Keep the number of parties to a minimum
- Choose an ownership structure that maximizes tax credits and other incentives to the project, then select a gas pricing schedule that shares these values
- Define gas quality specifications and responsibilities with priority to landfill compliance
- Share any potential market upside, once the return on capital by the investing party is achieved

Goal is to achieve both parties' interests in promoting green energy and meeting compliance, while sharing in financial returns

Challenges

- More strict emissions limits require more sophisticated prime movers

  >> increased maintenance, gas clean-up

- Higher costs and sophistication of electrical interconnects
- Increasing standards for pipeline quality gas
- Gas clean-up: H2S, siloxane
- Increasing capital costs

LFG Comparison to Wind and Solar

Type	Wind	Solar	LFG
Total Resource	High	High	Finite
Capacity Factor	25% - 45%	10% - 15%	>90%
Base Load Resource	No	No	Yes
Distributed Generation	No	Excellent	Good
Peak Load Generation	Poor-Mod	Good	Excellent
Transmission Cost	Can Be High	None	Negative

Benefits of Distributed Energy

- Reduced energy losses in transmission lines
- Reduced upstream congestion on transmission lines
- Reduced or deferred infrastructure (line and substation) upgrades
- Optimal use of existing grid assets
- Improved grid reliability
- Voltage support and stability

Landfills as a resource

- Enthusiastically support and promote "reduce, reuse, and recycle"
- Recognize that landfills are an environmentally sound part of the solution for a community's management of its solid waste
- Promote landfills as an energy resource

LFG Management

Landfill Gas Collection:

Participation

or

Commitment

WM Landfill Gas Initiative

- Long-term planning
- Appropriate operations staffing
- Training
- Capital
- Implementation

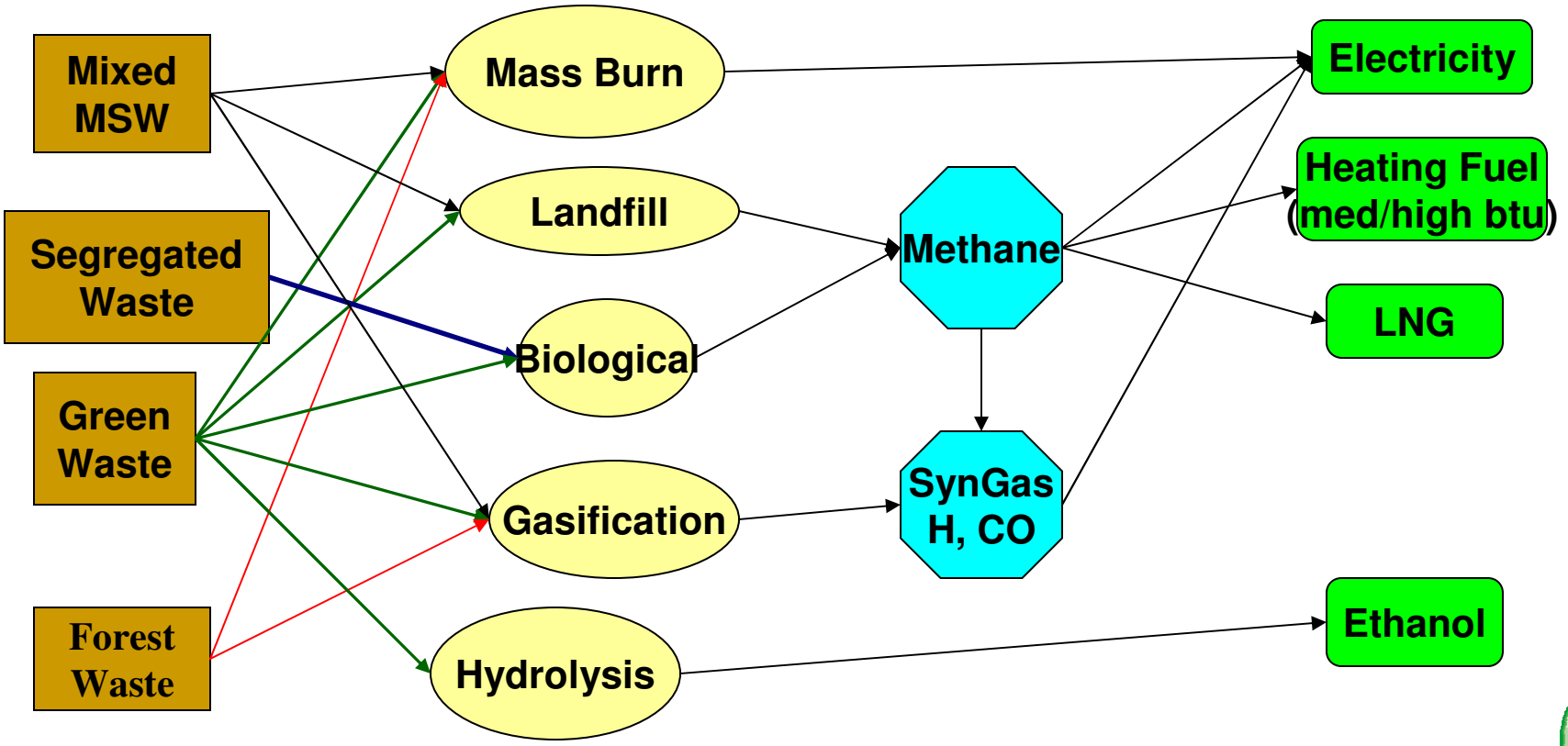
Other Biogas Applications

- Manure Biogas Operations *
  - Dairy operation with > 500 head
  - Swine operation with > 2,000 head
- Wastewater treatment plants with > 5 MM gpd **
- Waste Conversion To SynGas
  - Plasma Arc
  - Anaerobic digestors
  - Fermentation
  - Pyrolysis

* EPA AgSTAR Program – www.epa.gov/agstar

** "Biomass Combined heat and Power Catalog of Technologies, September 2007, Published by EPA CHP Partnership – www.epa.gov/chp

Waste-Based Energy Technology



Curbside to Power