

# MINNESOTA>ENVIRONMENTAL<INITIATIVE

## Appendix J: Waste-to-Energy Sub-Group Straw Proposals

### 4.1 POLICY/LEGISLATION

<b>4.1a</b>		<b>Waste-to-energy Defined as Renewable Energy</b>			
Description	Support inclusion of electric and thermal energy generated by waste-to-energy facilities in the state and federal definition of renewable energy. This will bring additional revenue to waste-to-energy facilities and discourages the landfilling of organic, recyclable or combustible waste materials.				
Measurement Method	If it is included in state and federal renewable energy laws.				
Timeframe/Mileposts	2010 legislative session				
Potential Implementation Parties	Local, State and Federal governments and facility owners.				
Costs	Staff and lobbyist time				
Funding Mechanisms					
Barriers/Issues	Public opposition				
Opportunities	Reduced GHG emissions as waste is moved up the waste disposal hierarchy Brings additional revenue to waste-to-energy facilities Increased recycling of ferrous and non-ferrous materials				
Feasibility					
General Comments	Waste-to-energy currently included in the definition of "eligible energy technologies in the 2008 Minnesota Renewable Energy Objective, Statute 216B.1691. Waste-to-energy is not included in all applicable federal renewable energy laws.				
<b>Centroid Information</b>	<b>Twin Cities</b>	<b>Duluth</b>	<b>St. Cloud</b>	<b>Rochester</b>	<b>Total</b>
Cumulative GHG Reduction Potential					Positive GHG reduction compared with landfilling MSW
Priority					
Centroid-Specific Comments					

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### 4.1 POLICY/LEGISLATION

<b>4.1b</b>	<b>Landfill Ban</b>				
Description	Combust with energy recovery all MSW not reduced, recycled, or composted.				
Measurement Method	Weigh all incoming waste.				
Timeframe/Mileposts	ASAP				
Potential Implementation Parties	State agency, county, or private party.				
Costs	Installed capacity cost of \$200,000 to \$500,000 per ton of daily installed capacity				
Funding Mechanisms	Tipping Fees				
Barriers/Issues	Competition from landfills Public opposition Limited existing waste-to-energy capacity				
Opportunities	District energy system potential near sources of waste generation GHG reduction compared with landfilling				
Feasibility	Technology proven and costs known.				
General Comments	Needs commitment by state leaders. Existing state statute 473.848 which prohibits landfilling of unprocessed mixed MSW has been determined to not be enforceable				
<b>Centroid Information</b>	<b>Twin Cities</b>	<b>Duluth</b>	<b>St. Cloud</b>	<b>Rochester</b>	<b>Total</b>
Cumulative GHG Reduction Potential					
Priority					
Centroid-Specific Comments					

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## 4.2 FINANCIAL INCENTIVES

<b>4.2a</b>		<b>Increased Landfill Disposal Fee</b>			
Description	Raise disposal fee for landfilling of unprocessed MSW. This will drive the disposal of waste higher up on waste hierarchy and reduce GHG emissions.				
Measurement Method	Law enacted				
Timeframe/Mileposts	Enforce processing of all waste prior to landfilling in the Minneapolis/St Paul centroid by 2015				
Potential Implementation Parties	State and local government and landfill owners				
Costs					
Funding Mechanisms	Tipping fees, Landfill tax				
Barriers/Issues	Higher tipping fees and higher landfill costs Create an enforceable law to support this proposal				
Opportunities	Increased recycling rates as demonstrated by similar European action Reduced GHG emissions from landfills				
Feasibility					
General Comments	Current state statute gives definition of unprocessed MSW				
<b>Centroid Information</b>	<b>Twin Cities</b>	<b>Duluth</b>	<b>St. Cloud</b>	<b>Rochester</b>	<b>Total</b>
Cumulative GHG Reduction Potential					
Priority					
Centroid-Specific Comments					

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## 4.4 REGULATION AND PERMITTING

<b>4.4a</b>	<b>Preprocessing of MSW Prior to Landfilling</b>
Description	See recycling proposal 2.4c

## 4.4 REGULATION AND PERMITTING

<b>4.4b</b>	<b>MSW Ash Utilization</b>				
Description	MPCA to prepare permanent rules for WTE combined ash (fly & bottom) or bottom ash utilizations.				
Measurement Method	Permanent rules are adopted to replace temporary demonstration permits.				
Timeframe/Mileposts	2010				
Potential Implementation Parties	MPCA				
Costs	MPCA staff time				
Funding Mechanisms	MPCA environmental fund/SWM tax revenues				
Barriers/Issues	Rule making process lengthy				
Opportunities	Reuse of waste ash (European Model) rather than mono landfilling. Ash substitute for non-renewable resource of aggregate materials for road base or bituminous mix that meets MnDOT specifications. Reduce operating cost and tipping fees for waste-to-energy facilities				
Feasibility	Many states and European nations use now.				
General Comments	Polk County has demonstrated ash use feasibility for many years.				
<b>Centroid Information</b>	<b>Twin Cities</b>	<b>Duluth</b>	<b>St. Cloud</b>	<b>Rochester</b>	<b>Total</b>
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### 4.5 COLLECTIONS AND PROCESSING

<b>4.5a</b>	<b>Flow control /Integrate the State into County Waste Designation</b>				
Description	The State enables counties and regional governments to implement waste designation within the four centroids to achieve the desired goals of greenhouse gas reduction. Counties petition the state to designate eligible areas for flow control. Based on criteria in statute, the state designates the eligible areas. (This replaces the County waste designation plan process.) Counties implement with ordinances.				
Measurement Method	Laws and ordinances enacted				
Timeframe/Mileposts	Implement in stages: - conduct designation-specific stakeholder input process in 2010 - legislative amendments in 2011/2012 session - implement specific designation ordinances on an as-needed basis as high priority end management facilities or systems are identified and developed.				
Potential Implementation Parties	Legislature, MPCA , local governments, and waste haulers				
Costs	No significant cost increase to amend process. Expected increased near-term end of life disposal costs as wastes directed to higher tipping fee facilities Expected decreased long-term management costs as wastes are directed away from facilities such as landfills that have embedded costs borne by future generations.				
Funding Mechanisms	State and local revenues Generator tipping fees				
Barriers/Issues	Opposition from landfill owners and waste haulers Opposition from generators to higher tipping fees Legal uncertainties depending upon specific case situations				
Opportunities	Increase tipping fees serving to drive abatement alternatives such as reduction and recycling Direct waste to waste to energy facilities that combust methane-producing organic materials Reduced GHG emissions from landfills Reduced GHG emissions from avoided coal/fossil fuel combustion				
Feasibility	Demonstrated legality and feasibility when implemented correctly				
General Comments					
<b>Centroid Information</b>	<b>Twin Cities</b>	<b>Duluth</b>	<b>St. Cloud</b>	<b>Rochester</b>	<b>Total</b>
Cumulative GHG Reduction Potential					
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### 4.7 RESEARCH

4.7a	Anaerobic Digestion				
Description	Evaluate viability of anaerobic digestion with thermal pretreatment and electric generation using mixed MSW as feed stock by supporting financially and through policy the construction and operation of one commercial scale anaerobic digestion facility in Minnesota				
Measurement Method	One unit built in proposed timeframe				
Timeframe/Mileposts	On line by end of 2010				
Potential Implementation Parties	State and local government and private industry				
Costs	Installed cost of \$150,000 to \$250,000 per ton on daily capacity				
Funding Mechanisms	Tipping fee, State or Federal grant/loan, SWMCB and private funds				
Barriers/Issues	Competes with existing landfills Funding could be an issue Not the lowest cost disposal method Getting sufficient MSW Diverted from other disposal methods to support this project				
Opportunities	Digester solids suitable for soil amendments Potentially lower GHG emissions than landfills High recycling rates for metals, plastics and glass				
Feasibility	Technically feasible				
General Comments					
Centroid Information	Twin Cities	Duluth	St. Cloud	Rochester	Total
Cumulative GHG Reduction Potential					
Priority					
Centroid-Specific Comments					

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### 4.7 RESEARCH

<b>4.7b</b>	<b>Plasma Gasification</b>				
Description	Evaluate viability of plasma gasification with electric generation using mixed MSW as feed stock by supporting financially and through policy the construction and operation of one commercial scale plasma gasification facility in Minnesota				
Measurement Method	One unit built in proposed time frame				
Timeframe/Mileposts	On line by end of 2010				
Potential Implementation Parties	State and local government and private industry				
Costs					
Funding Mechanisms	Tipping fee, State or Federal grant/loan, SWMCB and private funds				
Barriers/Issues	Competes with existing landfills Funding could be an issue Not the lowest cost disposal method Getting sufficient MSW Diverted from other disposal methods to support this project				
Opportunities	Potentially lower GHG emissions than landfills Potentially lower air emissions than other combustion technologies				
Feasibility	Technically feasible				
General Comments	Plasma gasification facilities are capable of producing either renewable fuel such as diesel fuel or electric generation or a combination of both				
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### 4.7 RESEARCH

<b>4.7c</b>		<b>Use Rochester Centroid as Case Study</b>			
Description	Run GHG (WARM) model calculations for the Rochester centroid quantifying GHG emissions from an integrated waste management system before and after a new state-of-the-art waste-to-energy facility was added to the disposal options.				
Measurement Method	Modified WARM model. Use Dodge/Olmsted inputs				
Timeframe/Mileposts	May 2009				
Potential Implementation Parties	MPCA Staff				
Costs	Low				
Funding Mechanisms	Stakeholder project budget				
Barriers/Issues	Time constraints				
Opportunities	Understand GHG emission levels for an existing integrated solid waste system that uses all elements of the hierarchy with 22 years of history				
Feasibility	Excellent				
General Comments	Increase understanding				
Centroid Information	Twin Cities	Duluth	St. Cloud	Rochester	Total
Cumulative GHG Reduction Potential					
Priority					
Centroid-Specific Comments					

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## 4.7 RESEARCH

<b>4.7d</b>	<b>Modify WARM Model to add Thermal Energy for Cogeneration WTE Facilities</b>				
Description	Run the WARM model to assess GHG emissions from waste-to-energy facilities in Minnesota that incorporate combined heat and power compared with waste-to-energy facilities that include only electric generation energy in the facility design.				
Measurement Method					
Timeframe/Mileposts					
Potential Implementation Parties					
Costs	Minor				
Funding Mechanisms					
Barriers/Issues					
Opportunities	Information useful to determine best solutions for waste disposal				
Feasibility	Very				
General Comments	Over half of the waste-to-energy facilities in Minnesota use the combined heat and power design to improve thermal efficiency and reduce GHG emissions				
<b>Centroid Information</b>	<b>Twin Cities</b>	<b>Duluth</b>	<b>St. Cloud</b>	<b>Rochester</b>	<b>Total</b>
Cumulative GHG Reduction Potential					
Priority					
Centroid-Specific Comments					