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Integrated Solid Waste Management Stakeholder Process

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Outline

- Background Information and Work Group Charge
- Strategies Development Process
- Unanimously Supported Strategies and GHG Impacts
- Majority Supported Strategies and GHG Impacts
- MPCA Adjustments to WARM GHG Calculations and the Overall Estimated GHG Impact for the Process
- MPCA Estimates for 5-year Waste Tonnage Changes
- Link to Final Report

Lot of information in the slides. Presentation will go fairly quickly in the interest of time. Questions or further information can be covered later in seminar during Q&A if necessary.

Background

- 2007 MPCA Solid Waste Policy Report identified need for stakeholder process to bridge the goals of the Waste Management Act and MCCAG (GHG reductions)
- **Focus:** 4 major population areas/centroids where majority of waste is generated in state – Duluth, Rochester, St. Cloud, Twin Cities
- **GHG Goal:** 52.5 MMTCO2e for all 4 centroids by 2025 (MCCAG statewide goal = 75 MMTCO2e)
- MEI hired to design, lead and facilitate process
- 17 member Work Group
- **Charge:** Develop a plan to achieve the GHG emission reduction goal in solid waste sector for the four centroids

• Process stems from the 2007 MPCA Solid Waste Policy Report to the Minnesota Legislature that identified a need to convene a stakeholder group to develop strategies to bridge the goals of the Waste Management Act and the Minnesota Climate Change Advisory Group's (MCCAG) GHG emission reduction targets for the solid waste sector.

• MPCA chose for this process to focus on four major population areas, or "centroids", where the majority of the waste is generated in the state: Duluth, Rochester, St. Cloud, and the Twin Cities Metro Area, which combined make up approximately 70% of the waste generated in the state

• GHG emission reduction goal for the process for all four centroids combined is 52.5 MMTCO_2e by 2025 (70% of MCCAG's statewide goal for the solid waste sector of 75 MMTCO_2e)

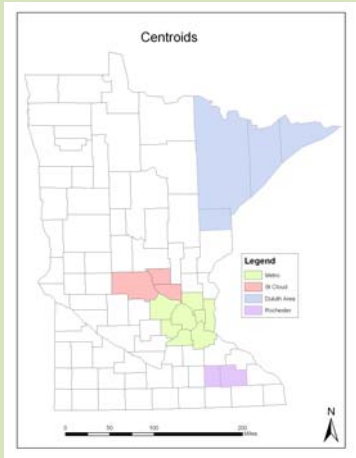
• In the fall of 2008, MEI was hired to design, lead and facilitate process

• MEI assembled a 17 member Work Group consisting of diverse representatives from industry, state and local governments, environmental organizations and others

• Work Group's charge is to develop a plan to achieve the GHG emission reduction goal in solid waste sector for the four centroids.

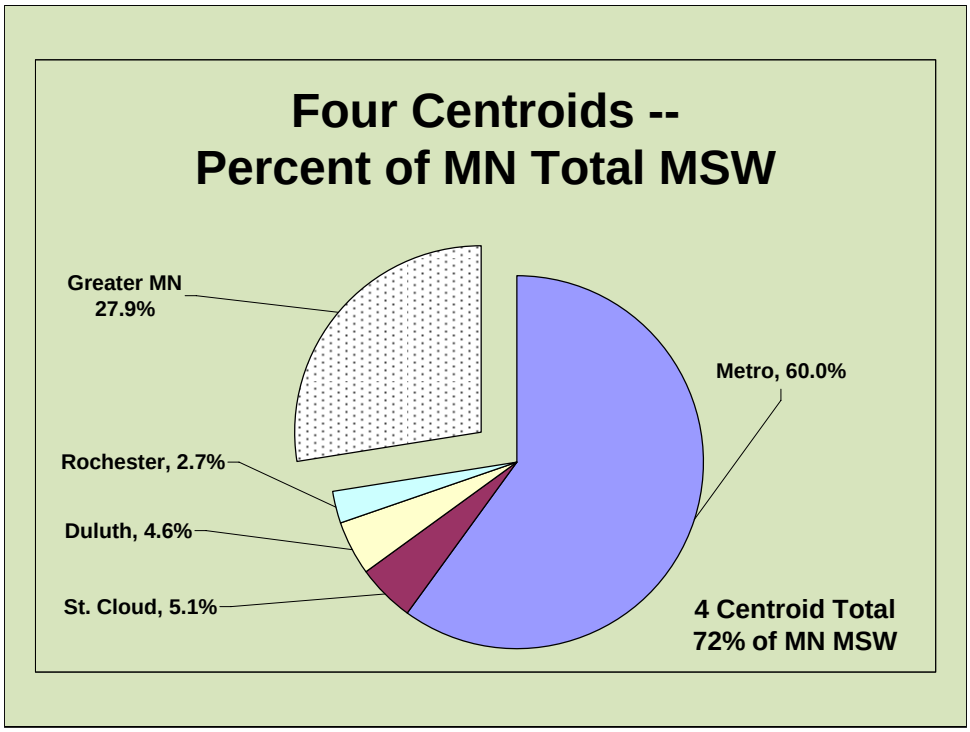
Centroids

- **Twin Cities Area:** Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington and Wright Counties
- **St. Cloud Area:** Benton, Sherburne and Stearns Counties
- **Duluth Area:** Carlton, Cook, Lake and St. Louis Counties, and the Western Lake Superior Sanitary District
- **Rochester Area:** Dodge and Olmsted Counties

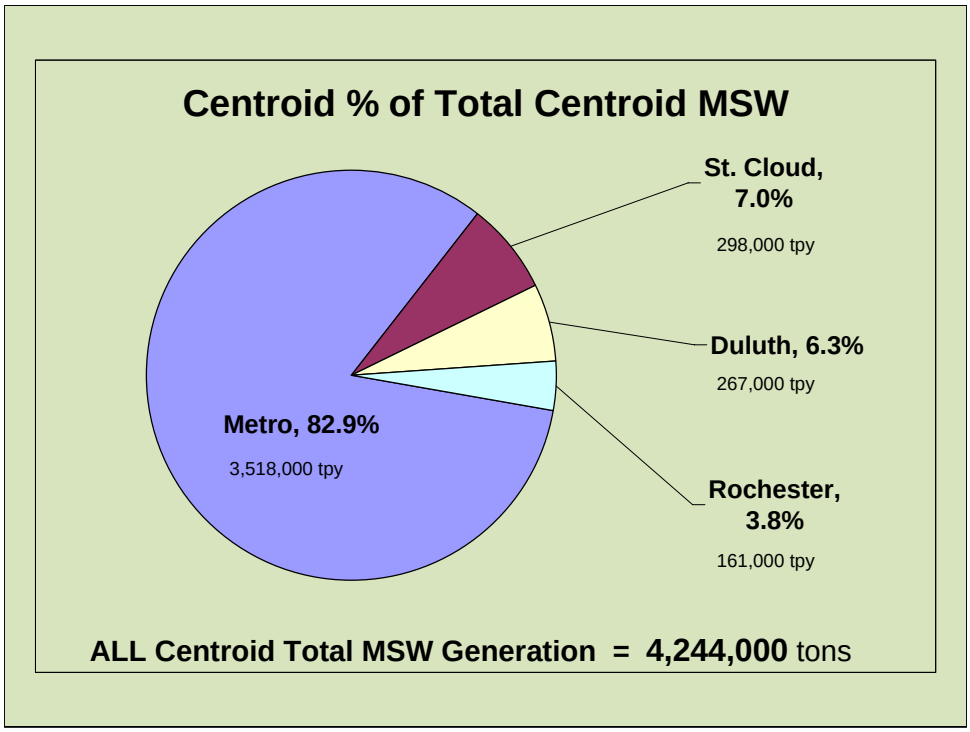


Four centroids encompass 17 counties and one sanitary district (WLSSD)

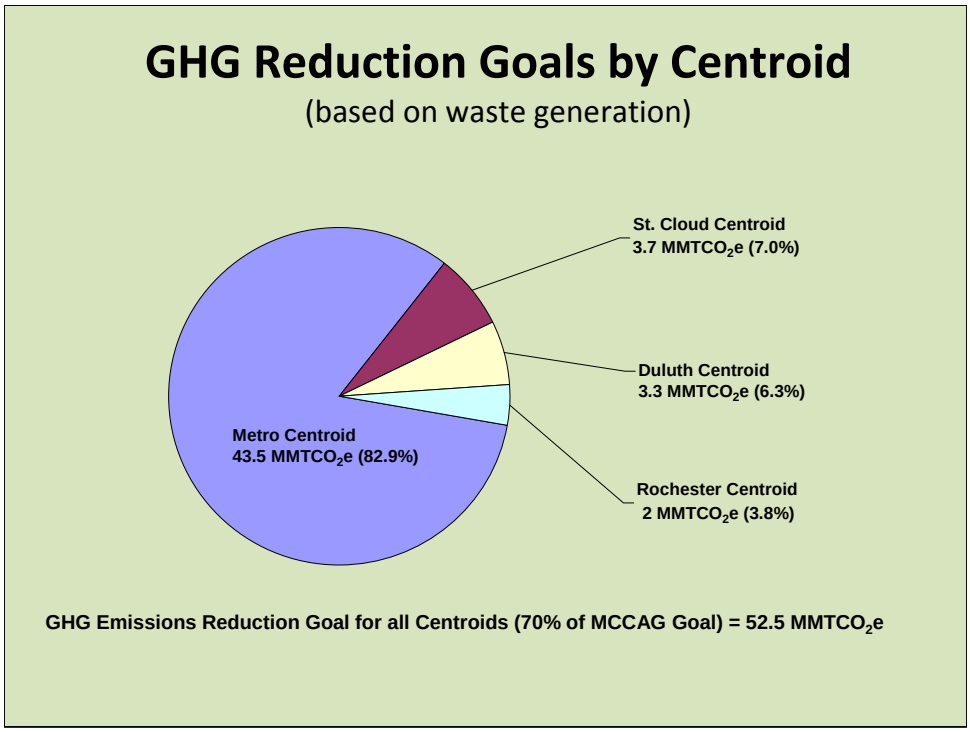
Twin Cities Metro centroid is 8 counties



4 Centroids combined % of Minnesota's overall statewide MSW tonnage – 72%



Within 4 Centroids, Metro has largest tonnage amounts and makes up 83% of the waste within the four centroids



Translating the last slide into individual centroid GHG goals gives approximations for each centroid's share of the overall GHG reduction goal for the process.

Again the metro area is the biggest GHG emitter and very important to reaching the overall goal for the process.

Strategies Development Process

- **Winter/Spring 2009:** Work Group reviewed information on management options and developed management method straw proposals
- **Summer 2009:** Sub-groups were formed in each centroid to develop scenarios to meet centroid GHG goals to present to Work Group, at least one public input meeting was held in each centroid
- **Fall 2009:** Work Group reviewed centroid plans and created their recommendations, two public input meetings were held (Duluth & Twin Cities), as well as an online public comment period
- **Dec 31:** Final Report was submitted to MPCA

•Overall, Process lasted just over 12 months and Work Group met 17 times, in addition to sub-group and offline survey work

•Winter/Spring of 2009: 10 Work Group meetings took place to develop common understanding and begin to discuss strategies, including creating numerous management method sub-group meetings that developed 80+ straw proposals

•Summer 2009: Work Group charged Sub-groups within each centroid to develop scenarios to meet centroid-specific GHG targets. This sub-groups were made up of solid waste practitioners and others, and each centroid sub-group held at least one public input meeting as they developed their proposed scenarios for the Work Group.

•Fall 2009: 7 additional Work Group meetings took place. Work Group created their recommendations based on centroid scenarios with modifications and additions. Two public input meetings were held: 1) Oct 12 in Duluth, 2) Nov 18 in Twin Cities. In addition, an online public comment period was hosted from Nov 24 to Dec 8.

Work Group Recommended Strategies

- **Overall:** 38 strategies, 22 unanimously supported, 16 by a majority
- **Source Reduction:** 13 in total, 8 unanimously supported, 5 supported by majority
- **Recycling:** 12 in total, 7 unanimously supported, 5 supported by majority
- **Organics:** 1 majority supported strategy
- **Waste-to-Energy:** 1 majority supported strategies
- **Landfill:** 2 majority supported strategies
- **Other:** 9 in total, 7 unanimously supported, 2 supported by majority

•In total there was 38 recommended strategies from the Work Group, 22 unanimously supported and 16 supported by a majority of Work Group members

•Most of the recommended strategies are Source Reduction and Recycling (25), and there are also a few Organics, WTE, Landfill Disposal Strategies, and Other Supported Strategies

Unanimously Supported Strategies – Source Reduction

- 1.3 Source Reduce Personal Computers
- 1.5 Source Reduce Phone Books
- 1.6 Source Reduce Cardboard
- 1.7 Source Reduce Junk Mail
- 1.8 Source Reduce Office Paper
- 1.9 Awards Program for Source Reduction
- 1.10 Food Waste Reduction Campaign
- 1.13 Expand Technical Assistance for Source Reduction

•Here's the 8 Unanimously supported SR Strategies

•Further details and specifics on individual strategies can be found in the Final Report

Unanimously Supported Strategies – Recycling

- 2.2 Commercial and Institutional Recycling
- 2.4 Incentives for Residential Recycling
- 2.5 Develop End Markets
- 2.8 Increase Reduction and Recycling Education
- 2.10 Increase Mattress Recycling
- 2.13 Support State Procurement Standards that Favor Products with Recycled Content
- 2.14 Increase Carpet Recycling through Producer Responsibility

•Here's the 7 unanimously supported Recycling strategies

•(if anyone was tracking process, during the last meeting, 2.7 Increase Carpet Recycling was removed b/c 2.14 called for higher recycling rates; and 2.12 Subsidize Locally-Sourced Recycled Materials to Be Used in New Products was merged into 2.5 as an "Opportunity")

•Further details and specifics on individual strategies can be found in the Final Report

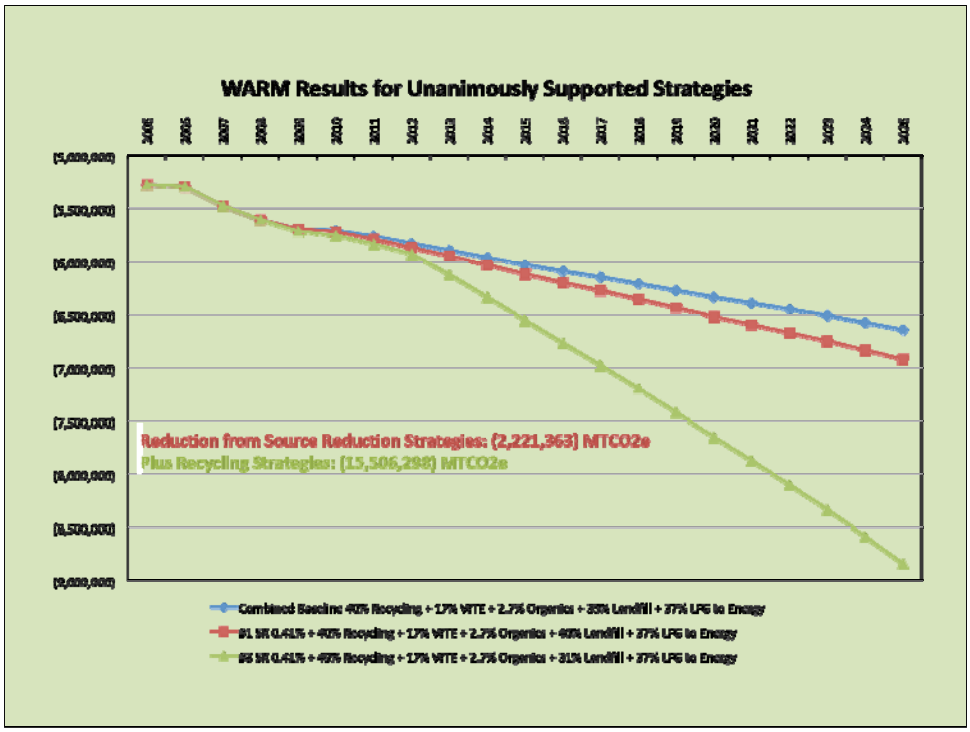
Unanimously Supported Strategies – Other Supporting Strategies

- 6.3 SCORE Funding Mechanism Repair and Enhancement
- 6.4 Promotion of Green Building
- 6.5 Increased Bonding Funding for Promotion of Green Building
- 6.6 Public Entity Requirement to Meet B-3 Standards
- 6.7 Promotion of Sustainable Development
- 6.8 Updated Statewide and Centroid Waste Sorts
- 6.9 Improvements to Information

- Here's the 7 unanimously supported Other Supporting Strategies

- This completes the Unanimously supported strategies

- Further details and specifics on individual strategies can be found in the Final Report



•This slide shows the WARM model GHG emission reduction potential results for the unanimously supported Source Reduction and Recycling Strategies. The unanimously supported Other Supporting Strategies were not modelable in WARM or the MPCA felt they had no GHG impact, thus they are not shown on this graph.

•Blue Line is a combined Business As Usual line for all four centroids: 40% recycling; 2.7% Organics; 17% WTE; 35% Landfill; and Average of 37% LFG capture

•Red line illustrates impacts from the 8 unanimously supported Source Reduction strategies – Estimated to yield 2.2 total MMTCO2e in GHG reductions by 2025

•Green Line illustrates impacts from adding the 7 unanimously supported Recycling strategies to Source Reduction strategies – Estimated to yield a total 15.5 MMTCO2e in GHG reductions by 2025, of which the Recycling strategies, by themselves, are estimated to increase the Recycling rate to 49% overall, and individually impact GHG's by 13.3 MMTCO2e by 2025.

Majority Supported Strategies – Source Reduction & Recycling

- 1.1 Enact the Minnesota Product Stewardship Framework Law
- 1.2 Volume-Based Pricing
- 1.11 Institute a Ban or Tax on Single-Use Plastic Shopping Bags
- 1.14 Resource Management Contracting
- 1.15 Promote Zero Waste Model Cities or Counties through Assistance and Special Grants
- 1.12 Require Retailers to Provide Plastic Bag Recycling
- 1.16 Increased Promotion and Expansion of Voluntary Plastic Bag Recycling Program
- 2.1 Recycling Legislation
- 2.9 Container Deposit Legislation
- 4.9 Maximize Recovery of Recyclable Material Prior to Disposal of Municipal Solid Waste

•5 Source Reduction and 5 Recycling Majority Supported Strategies

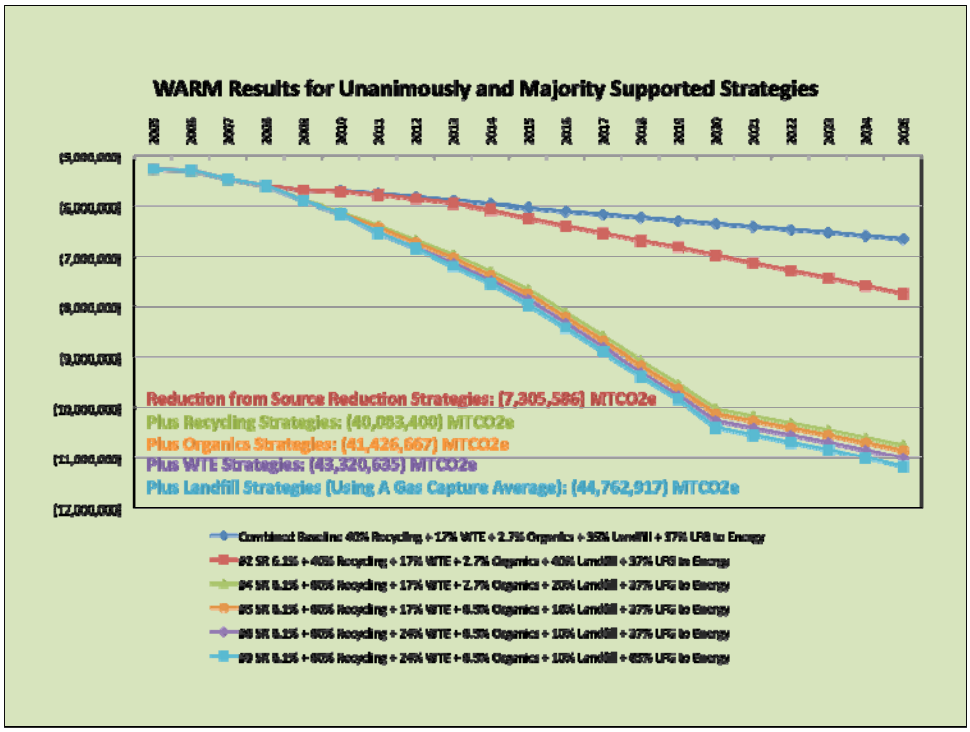
•Further details and specifics on individual strategies can be found in the Final Report

Majority Supported Strategies – Organics, WTE, Landfill and Other

- 3.1 Source Separated Organics Management
- 4.11 Existing Waste-to-Energy Infrastructure is Operated at High Efficiency
- 5.1 Methane Management at All Landfills
- 5.2 Increase Landfill Disposal Fees to Align Price Structure with Waste Management Hierarchy
- 6.1 Organized Collection
- 6.1A Industry Alternatives to Organized Collection

•1 Organics, 1 WTE, 2 Landfill Disposal, and 2 Other Supporting Strategies supported by a majority of Work Group members

•Further details and specifics on individual strategies can be found in the Final Report



•This slide shows the WARM model's GHG emission reduction potential results for the unanimously plus majority supported strategies.

•Blue Line is the same combined Business As Usual line for all four centroids used in the earlier slide: 40% recycling; 2.7% Organics; 17% WTE; 35% Landfill; and Average of 37% LFG capture

•Red line illustrates impacts from unanimous and majority supported Source Reduction strategies – Estimated to increase SR rate to a 7.3 total MMTCO2e in GHG reductions by 2025, so adding majority supported SR strategies yields approximately an additional 5.1 MMTCO2e as compared to just unanimously supported SR strategies (2.2)

•Green Line illustrates impacts from adding majority and unanimous supported Recycling strategies to Source Reduction strategies – Estimated to yield a total 40 MMTCO2e in GHG reductions by 2025, of which the Recycling strategies, by themselves, are estimated to increase the Recycling rate to 60% overall, and individually impact GHG's by 32.7 MMTCO2e by 2025. And the additional majority supported strategies yield approximately 19.5 MMTCO2e as compared to just the unanimously supported Recycling strategies (13.3)

•Orange is Organics: Currently WARM estimates the organics strategy would yield 1.3 MMTCO2e, bringing us to 41.4 MMTCO2e. In the next slide I will point out a MPCA adjustment to this calculation that adds approximately 2 MMTCO2e to the organics strategy impact, not shown on this graph.

•Purple: is the WTE strategy addition to the overall GHG reduction, bringing us to 43.3 MMTCO2e, and an individual reduction impact of 1.9 MMTCO2e. Similar to the Organics Strategy, in the next slide I will point out a MPCA adjustment to this WTE calculation that adds approximately 0.4 MMTCO2e to the WTE strategy impact, not shown on this graph.

•Light Blue: represents the LF strategies addition to the overall reduction, bringing us to 44.7 MMTCO2e, and an individual reduction impact of 1.4 MMTCO2e. Note: 5.1 Methane Management strategy calls for methane at LF's either to be flared or captured for GTE, for the sake of this model the MPCA assumed an average 65% LFGTE. If all LF's chose LFGTE the impact of the LF strategy would go up slightly, by approximately less than 1 MMTCO2e.

•As with the unanimously supported Other Supporting Strategies, the majority supported Other Supporting Strategies were either not modelable in WARM or the MPCA felt they had no GHG impact, thus they are not shown on this graph.

•Overall, total estimated GHG reductions gained by adding majority supported to unanimously supported strategies is 31.7 MMTCO2e (47.2-15.5)

MPCA Adjustments to WARM GHG Calculations and the Overall Estimated GHG Impact

- Two Adjustments:
  - Increasing GHG cuts/ton for composting organics from current WARM default of 0.2 MTCO2e, to projected new EPA WARM GHG cuts/ton of 0.5 MTCO2e. Yields additional ~2 MMTCO2e
  - Additions to account for higher efficiencies of MN WTE facilities (~28% average) as compared to WARM default (~18%). Yields additional ~0.4 MMTCO2e
- Final Overall Estimated GHG Reduction Potential of Work Group's Recommendations: 47.2 MMTCO2e by 2025

•According to the estimated impacts of the recommended strategies using the WARM model and the MPCA adjustments, implementation of the Work Group's recommended strategies will enable the state to achieve significant reductions in greenhouse gases totaling approximately 47.2 $MMTCO_2e$ by 2025, which is approximately 10% below the original Process goal of 52.5 $MMTCO_2e$.

•Work Group and MPCA acknowledged this shortfall and pointed to the imprecision and imperfections within the WARM model, which are described in detail in the Final Report, as a major contributing factor to the group not reaching 52.5 $MMTCO_2e$ in GHG emission reductions.

•As the projected impacts are merely model estimations, it is certainly conceivable that a 10% difference is within the margin of error for WARM's current GHG emission modeling capabilities.

•Therefore, it should be acknowledged that the Work Group, at a minimum, has adequately fulfilled its charge by recommending changes to the management of solid waste in the four centroids that will result in significant GHG reductions very near to the order of magnitude recommended by the MCCAG.

MPCA Estimates for 5-year Waste Tonnage Changes (by Percentage)

Management Method	Percentage of Waste Managed			
	2010	2015	2020	2025
Source Reduction (cumulative)	0.016%	1.02%	3.52%	6.08%
Recycling	43.2%	50%	60%	60%
Organics	3.8%	6.5%	6.5%	6.5%
Waste to Energy	21.6%	26%	25%	24.1%
Landfill	31.4%	17.5%	8.5%	9.4%

•In addition to the GHG reduction impacts of the Work Group's recommendations, the next two slides illustrate five-year projections of percentage and volume of waste changes by management method anticipated to result from implementation of the Work Group's recommendations

MPCA Estimates for 5-year Waste Tonnage Changes (by Volume)

Management Method	Volume of Waste Managed (in tons)			
	2010	2015	2020	2025
Source Reduction (cumulative)	701	47,303	167,106	294,573
Recycling	1.92 million	2.36 million	2.95 million	3.06 million
Organics	166,426	306,429	319,421	331,421
Waste-to-Energy	957,849	1.23 million	1.23 million	1.23 million
Landfill	1.39 million	822,717	418,246	480,091

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More Information and Process Final Report:
http://www.mn-ei.org/projects/solidwaste.html

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MPCA has or will be soon posting final report on their website