

# **SOLID WASTE POLICY REPORT BACKGROUND AND STRAW POLICY PROPOSAL MEETING – OCT. 12**

Outline plan for day

Overall plan for policy report development

Geographic discussion

Source reduction

Recycling

Organic recovery

Waste to energy

Energy recovery from landfill gas

Burn barrels

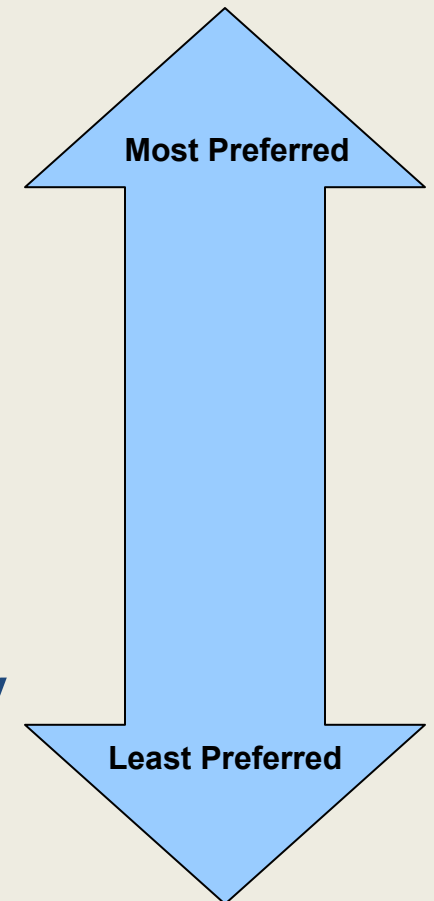
Discussion

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# Solid Waste Integrated Management System

Preference order from Minnesota Statute 115a.02

- Waste reduction and reuse
- Waste recycling
- Composting of yard waste and food waste
- Resource recovery through mixed MSW composting or incineration
- Land disposal with methane recovery
- Land disposal without methane recovery



# Themes of Solid Waste Policy Report

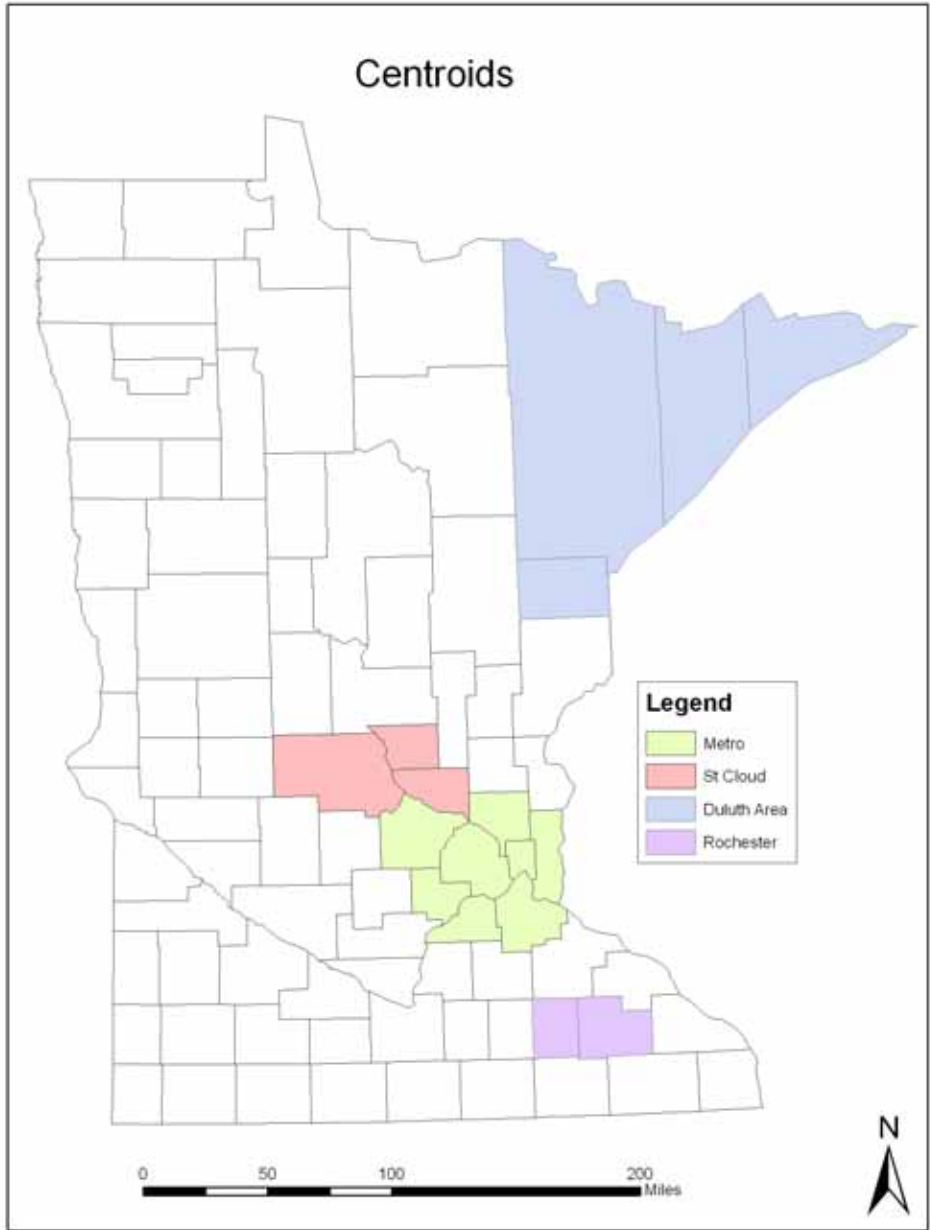
- Realize energy potential of MSW.
- Reduce MSW impact on GHG emissions.
- Discussion: How much garbage can do, and how fast, and at what cost?
- Minnesota legislated aggressive energy and GHG goals in '07.

# Emphasis on “Centroids”

- To evaluate the energy and GHG outcomes of any change proposed, MPCA leadership asked staff to consider goals, needs and policies not only statewide, but specifically for regions that have significant waste generation.
- Four waste “centroids” were identified that have significant waste generation.

# “Centroid” Approach

- These centroids are Metro, Rochester, greater St. Cloud area, and Duluth area.
- 13 counties generated 71% of the MMSW in 2006.



# Stakeholder Outreach

- MPCA staff and leadership met with sixteen stakeholder groups from June to September.
- All comments were noted on poster sheets.
- Five collated sets of the poster notes are available on the resource table today.
- The following is a list of common messages:

# Stakeholder Comments

- Landfill abatement has stalled, and if the state wants progress it must become an active player.
- Greenhouse gas cuts and energy gains are good themes for 2007 – might help us off the “plateau.”
- Waste Management Act hierarchy fits with energy and GHG generally but there must be a way to use energy and GHG factors to make good decisions on what to do with specific materials in specific areas.
- Counties are the key to improved waste management but their budgets are stretched.
- AG should explain effect of recent court decisions.
- Why not enforce processing statute (§473.848)?

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# Stakeholder Comments

- The current state law on local control of waste does not work from the governments' point of view. They want well-crafted designation-law amendments, post-*Oneida*.
- Is the state prepared or able to offer substantial subsidies for infrastructure?
- How solid is today's WTE infrastructure in Metro?
- What will be the specific GHG, energy and other environmental outcomes of new money spent?
- Packaging is a frustration – whatever happened to the laws passed in the 1990s?

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# Stakeholder Comments

- Don't boost recycling until markets are ready.
- Why ship glass 250 miles to the Cities? Can that money be allocated to other SCORE efforts, for better results? Still, full-loop recycling is good.
- Some new mandate ideas may work locally but not statewide.
- Source reduction has never gotten the attention or support that recycling and WTE have gotten.
- Landfills with usable gas need help selling it.
- Counties want SCORE payments to “catch up” and are willing to talk about incentive programs.

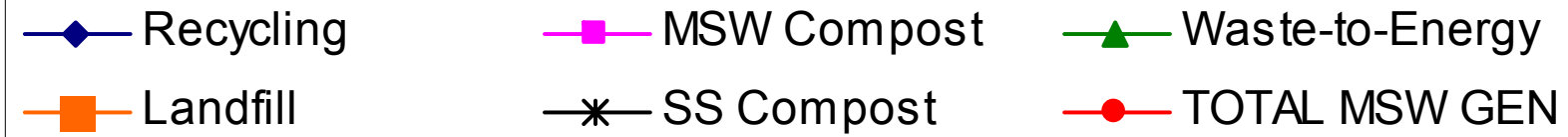
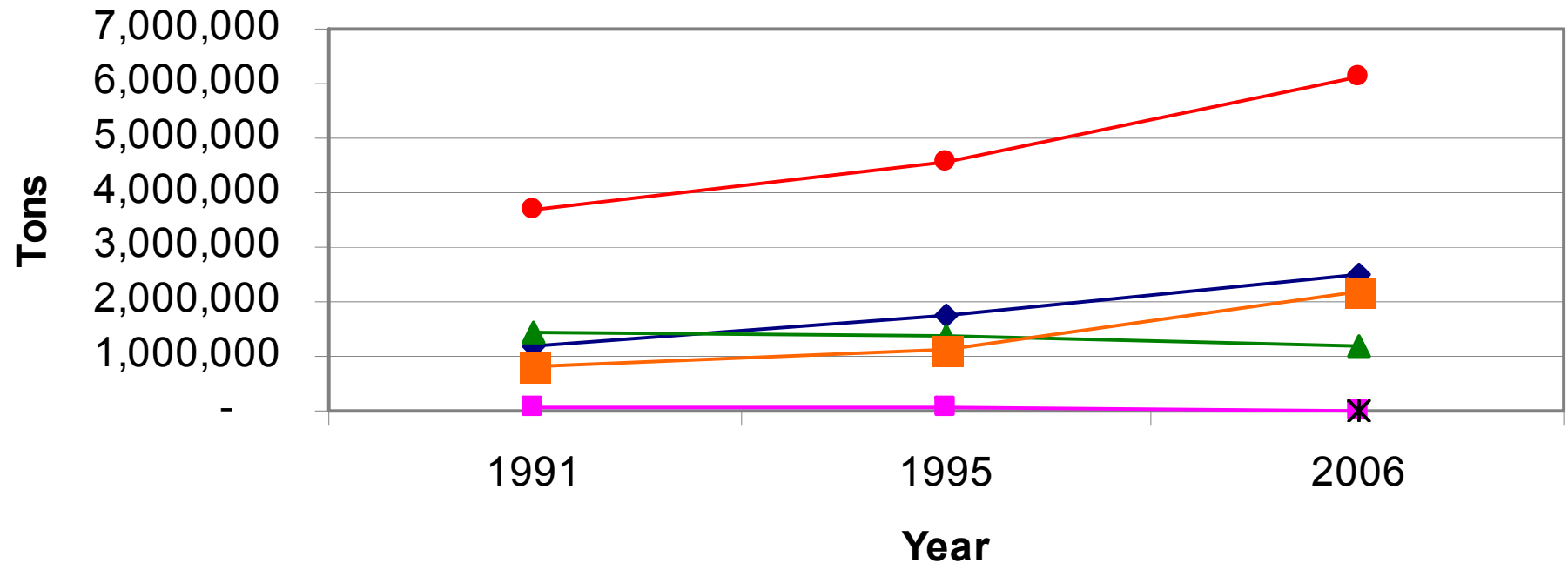
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# Strategic Plan Goals

## Statewide goals for 2011

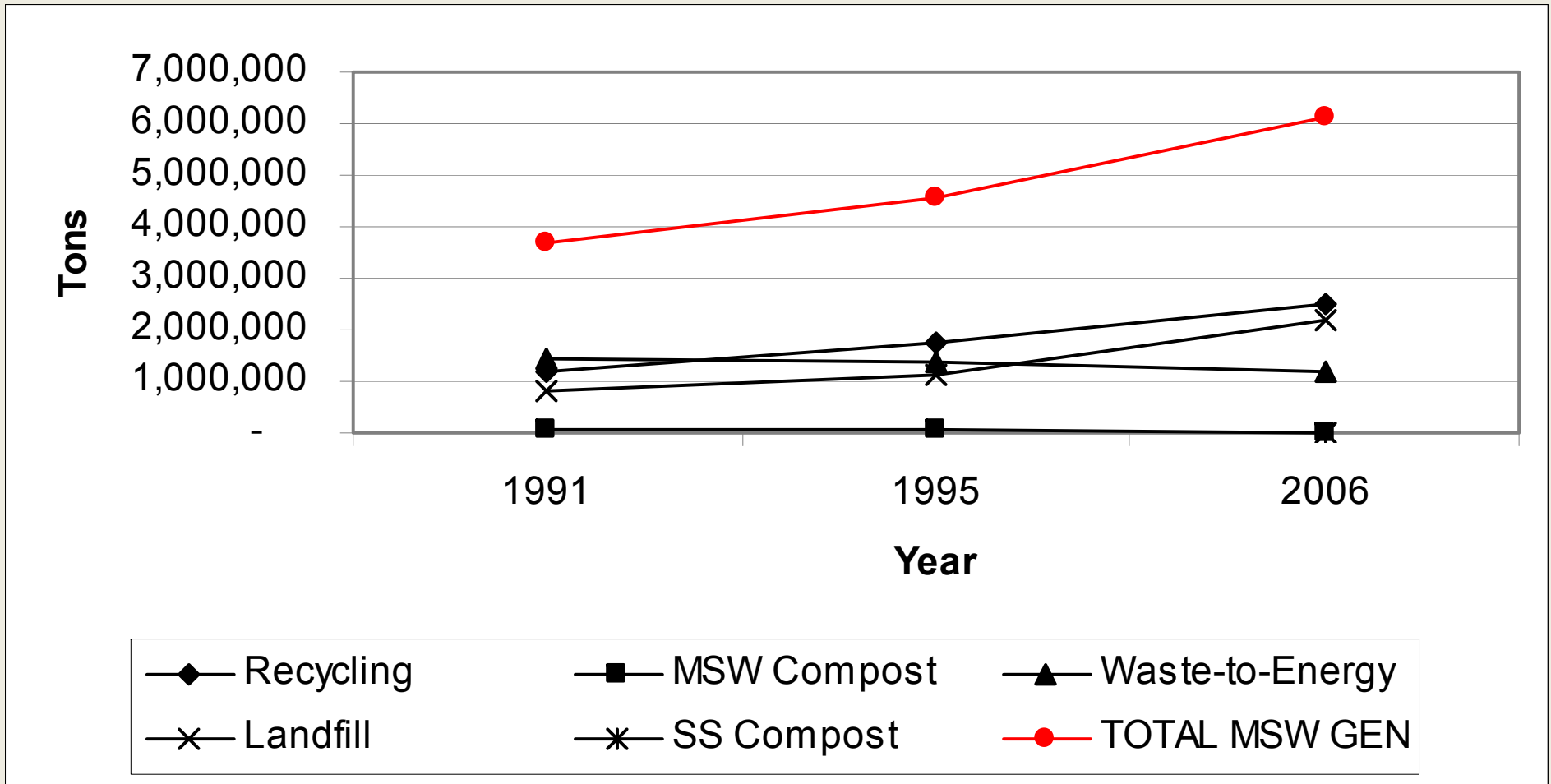
- Rate of waste generation will not exceed rate of population growth
- 50 percent Recycling
- 35 percent Organics Recovery and Waste-to-Energy

# Waste Management Methods



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# Source Reduction



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# Source Reduction

**Waste reduction or source reduction** means an activity that prevents generation of waste or the inclusion of toxic materials in waste, including:

- (1) reusing a product in its original form;
- (2) increasing the life span of a product;
- (3) reducing material or the toxicity of material used in production or packaging; or
- (4) changing procurement, consumption, or waste generation habits to result in smaller quantities or lower toxicity of waste generated.

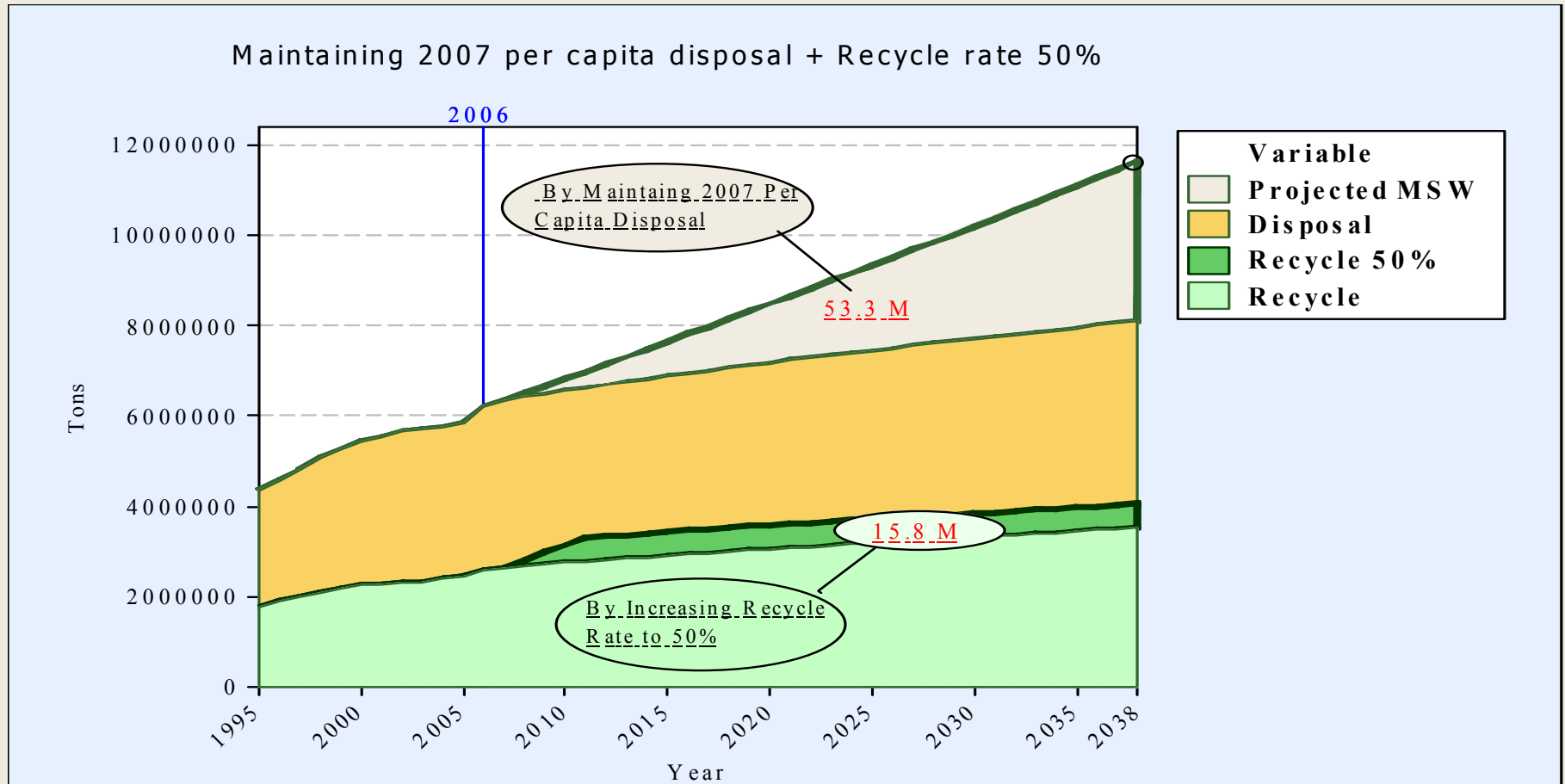
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# Source Reduction Data Analysis

MPCA efforts are directed with consideration of:

- Waste composition analysis
- Customer research
- Best practices
- Stakeholder input

# Source Reduction Future Trends



If the strategic plan goal is met:

- 374,753 tons of waste would be eliminated in 2011 alone.
- A cumulative 53.3 Million tons of waste would be avoided by 2038.

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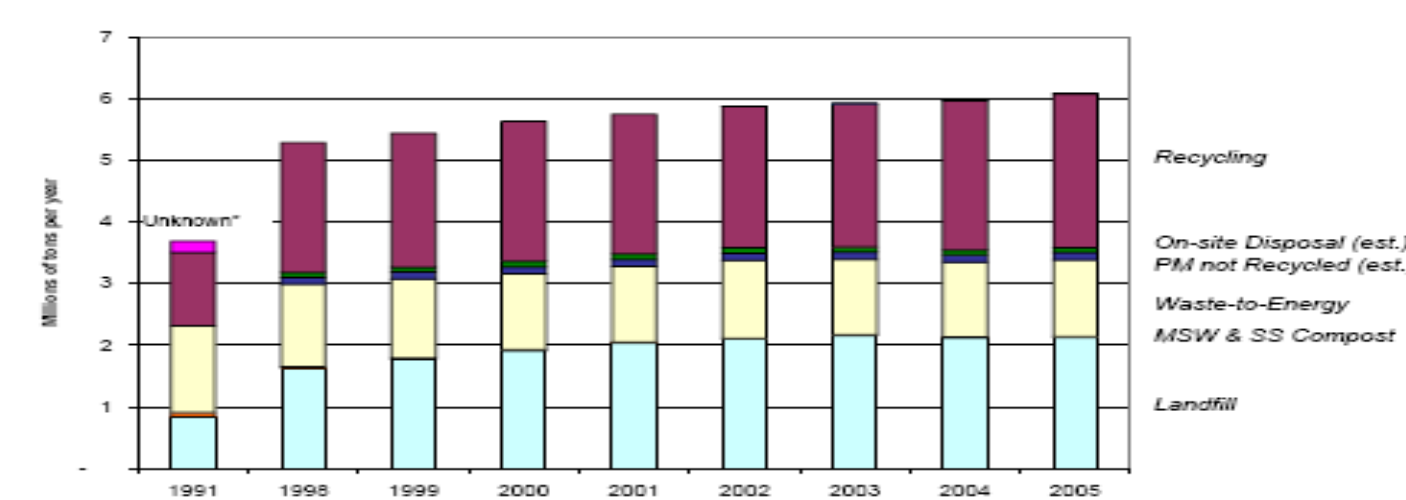
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16



# Source Reduction Future Trends

Figure 5: Trends in Minnesota Waste Management in Tons



- In 2005 generation exceeded 6 million tons (6,085,744 tons, +1.8%); state population increased just 1.2%.
- Per capita generation increased to 2,338 pounds (+0.6%)
- Top candidates for reduction include:
  - Packaging - 31.2% of waste stream
  - Paper - 34.2%
  - Organic material - 25% (food scraps & yard trimmings)

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# Source Reduction- Economic Benefits

- Source Reduction by definition requires use of fewer raw materials.
- Waste that is prevented at its source does not need to be collected, hauled, or otherwise managed or recycled.

## Case Studies:

- Tastefully Simple: saved \$100,000 in one year by instituting paper reduction practices.
- The ReUse Center: Gives second life to over 35,000 tons of construction materials saving customers and donors roughly \$30 million in the process.

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# Source Reduction- Energy and Climate Change Data

	Billion BTU's	MTCO2e
Reduce 100 tons HDPE	5.117	189
Reduce 100 tons office paper	3.068	652
Junk Mail campaign	27.4310 - 54.861	6,8120 -13,624
Phone book reduction	103.021	13,944

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# Source Reduction – Current Strategies

- Education Campaigns
  - If not you, who? (generic, junk mail, office paper and grocery sector)
- Technical Assistance to Businesses
  - Waste audits, office paper, Waste Wise, ReTAP and MnTAP
- Grants
- Partnerships
  - Local units of government, CISRR, businesses
- Government Modeling of Best Practices
  - IPPAT, Legislature

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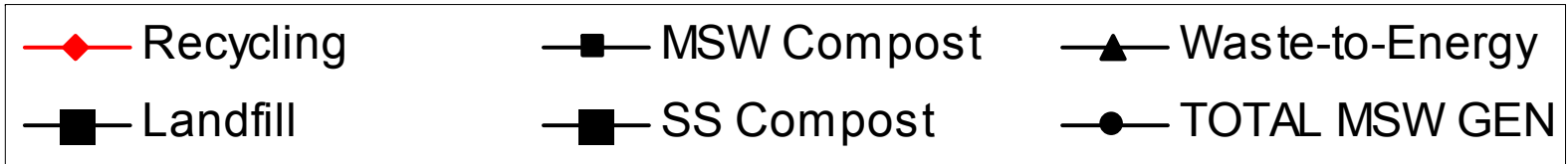
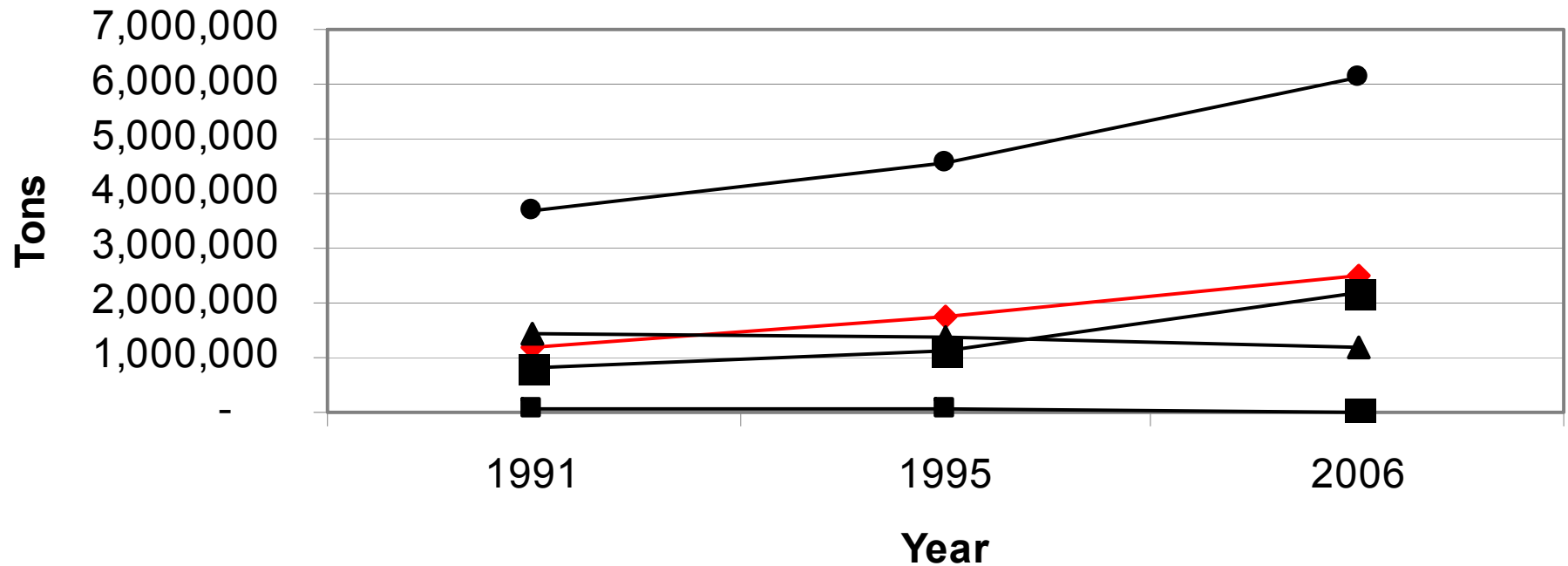
# Source Reduction – Straw Policy Proposals

- Develop executive order requiring state agencies to adopt paper reduction practices
- Standardize printers and copiers default to duplex print
- Promote product stewardship for packaging
- Create incentives for waste reduction and reuse efforts to be implemented
  - Source reduction is addressed in county plans
  - Committed staff assigned to work on source reduction at the local level

# Source Reduction – Straw Policy Proposals

- Partner with the national phone book reduction product stewardship initiative
- Work on zero waste for state government including: green meeting guide and water bottle policies
- Research existing commercial and residential “true” volume-based pricing

# Recycling



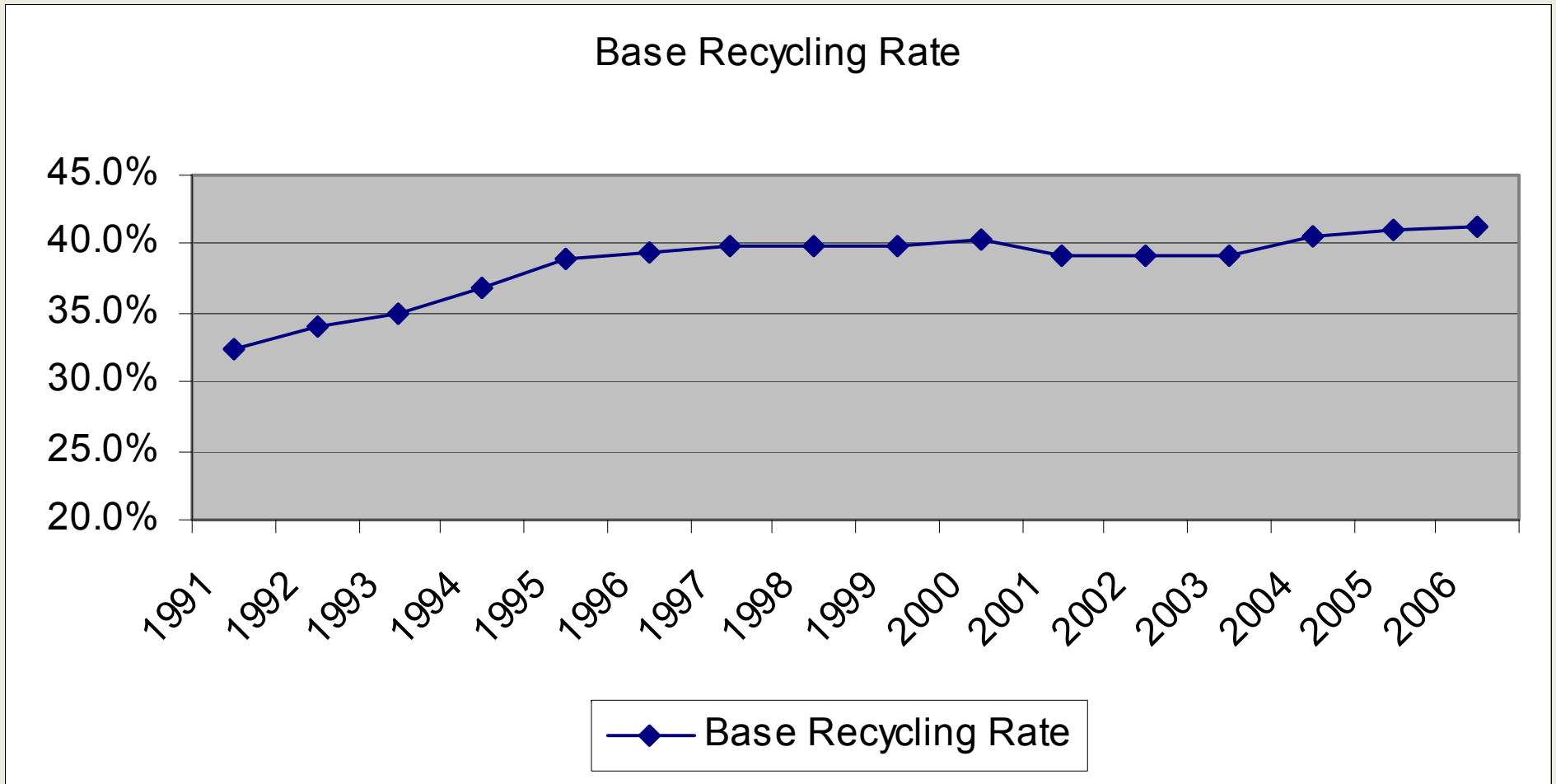
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# Recycling

Recycling means the process of collecting and preparing recyclable materials and reusing the materials in their original form or using them in manufacturing processes that do not cause the destruction of recyclable materials in a manner that precludes further use.



# Recycling – Rate Trends



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25

# Recycling – Rate Plateau

- The current 41 percent recycling rate reflects the investments made over the last twenty years.
- Recycling rate has not significantly changed since mid/late 1990's
  - Mature recycling systems
  - Lack of economic price signals
  - Funding cuts
  - Little focus on commercial sector
- In 2006, there was an additional 1.3 million tons available for recycling.
- Based on current MSW projections, state will need to recycle an additional 1 million tons to meet our 50% goal.

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# Recycling – Strong Markets

- State has adequate end markets for most materials.
- Market has shifted to export- China and other countries.
- Pressure on local markets to compete with China.
- Increased revenue for local recycling programs that use revenue sharing contracts .
- HDPE use by plastic lumber industry continues to grow.
- State collecting post-consumer carpet material at a rate of 9600 tons per year.
- Glass is better utilized with glass optical sorting technology.

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# Recycling Benefits: Energy, Economic, & Greenhouse Gas Savings

	2006 (41% Recycling)	2011 (Assumes 50%)	Gains
BTU savings	46 trillion	65 trillion	19 trillion
Energy savings (equiv households)	410,000	573,000	163,000
GHG savings CO2 equivalents (metric tons)	6.4 million	9.4 million	3 million
GHG reduction (equiv cars)	1.2 million	1.7 million	400,000
Mfg savings in energy costs	\$539 million	\$762 million	\$223 million

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# Recycling – Economics

## Minnesota Recycling Data (2004)

- 9,000 manufacturing jobs are tied to companies using recycled material in their manufacturing process
- \$2.98 billion State Gross Economic Activity.
- \$64 Million Estimated revenue
- \$760 Million in wages
- Value of material available for recycling that is disposed is \$300 million in 2006

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# Recycling – Current Strategies

- Education Campaigns
  - Recycle More MN, ReThink Recycling, etc.
- Technical Assistance to Businesses
- Grants and pilots
- Partnerships
- Market development

# Recycling – Straw Policy Proposals

- Implement disposal ban for beverage containers
- Require processing to recover recyclables
- Define product stewardship within Waste Management Act
- Require mandatory hauler licensing
- Require transparency of pricing

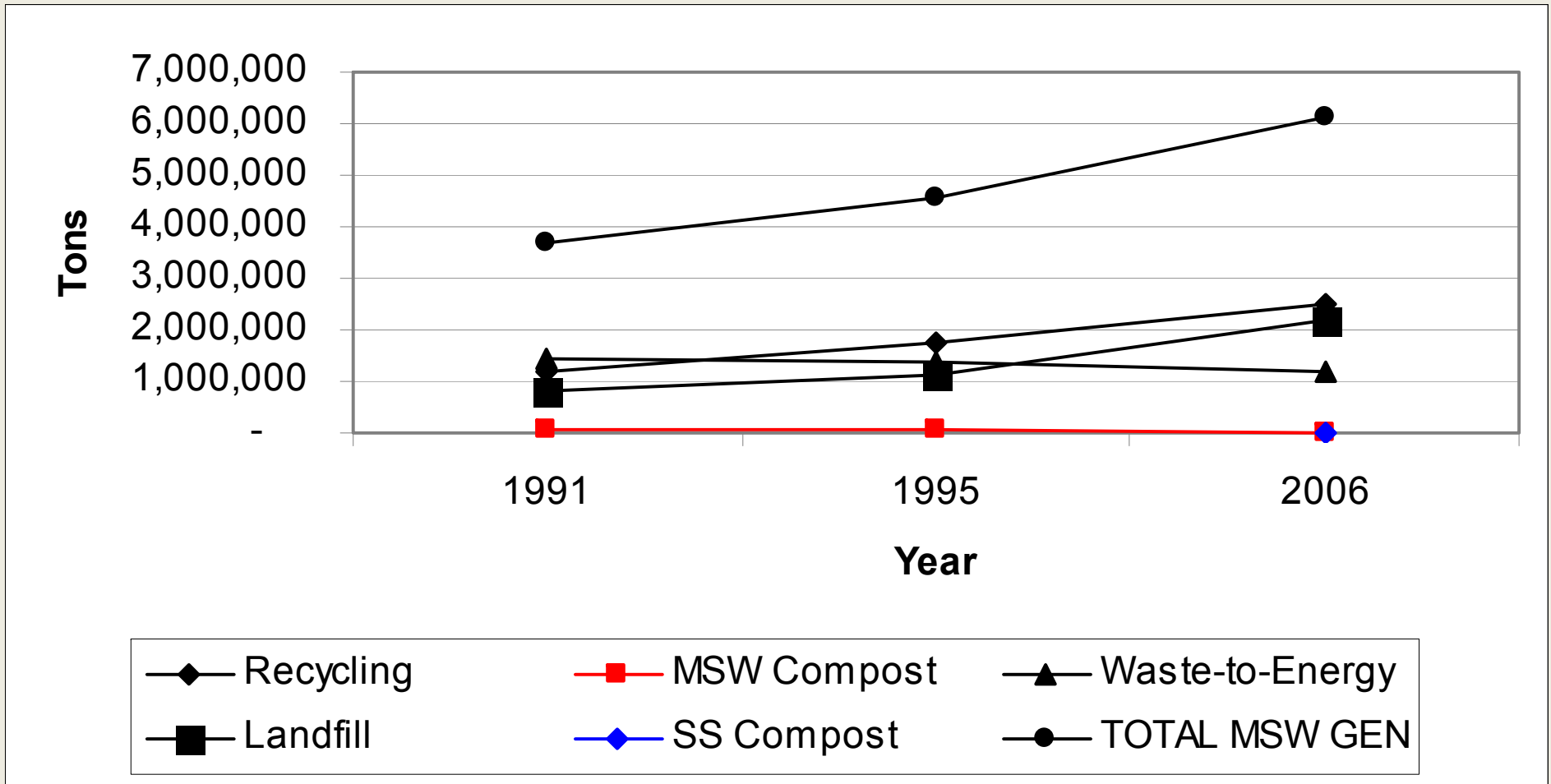
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# Recycling – Straw Policy Proposals

- Require “away from home” recycling
- Extend existing opportunity to recycle requirements to commercial entities
- Institute incentives for waste reduction, recycling, organics, etc.
- Revise SCORE goals
  - MRF reporting requirements



# Organics Recovery



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# Organics Recovery

## Management methods

- Food to people
- Recovery of food for animals or animal feed
- Source Separated food and non-recyclable paper for composting
- MSW composting
- Food grinders (garbage disposals)

# Organics Recovery – Data

In 2006, 196,954 tons of organic material was recovered. The composition of the recovered material was:

<b>Organics recovery</b>	<b>Tons</b>
Food to People	4,426
Livestock/Animal feed	166,966
<b>SS Composting</b>	<b>7,650</b>
MSW Composting	17,912

# Organics Recovery Future Trends

Based on the generation projection the recovery of 5% organics in 2011 would divert:

Organics recovery	Tons
Food to People	4,426
Livestock/Animal feed	186,870
<b>SS Composting</b>	<b>124,474</b>
MSW Composting	19,863

# Organics Recovery – Infrastructure

- Collections systems
  - Service offered by a limited number of haulers.
- Facility Capacity
  - There is adequate capacity for the short term.
  - Additional capacity will be needed to meet 2011 goal.
- Markets have been improving; stronger markets will be needed in the future.

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# Organics Recovery – Markets

## Traditional Markets

- Nurseries
- Agricultural soil amendments
- Bagged soils sold at retail outlets

## Emerging Markets

- Storm water management
- Erosion control
- Green roofs
- Rain gardens
- Landfill cover

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# Organics Recovery Energy and Climate Change Data

	2006 (3%)	2011 (Assumes 5%)	Gains
BTU used	249,447 mil	344,372 mil	94,925 mil
GHG savings CO2 equivalents (metric tons)	84,579	142,479	57,900
GHG reduction (equiv cars)	23,077	31,858	8,781

Note: This analysis includes only the collection and processing of organics. It does not include the benefits of using compost which includes the reduction of fertilizer use, carbon sequestration potential or the benefits provided to plant growth and water holding capacity.

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# Organics Recovery – Economic Benefits (2006)

Compost Metro	\$2,864,690
Compost Greater MN	<u>\$1,812,900</u>
Total value of finished compost	\$4,677,590



# Organics Recovery – Current Strategies

Removing barriers by:

- Technical assistance:
  - develop an intermediate compost facility for yard waste and SSOM
  - setting up collection programs – residential, institutional, businesses
  - Compost facility operators
- Grants to counties, schools and businesses to develop SSOM collection programs
- Promoting the use of compost & its benefits
- Developing soil standards as a BMP for attaining water quality goals
- General education on backyard composting
- Promoting collection of organics at large venues

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# Organics Recovery – Straw Policy Proposals

- Support legislation or regulations to removal of contaminants from the finished compost.
- Expand market development efforts for finished compost.
- Encourage innovative collection approaches.
- Feasibility of permitting facilities that co-compost yard waste and SSOM.
- Complete a life-cycle analysis of :
  - Food to People
  - Food to animals/animal feed
  - source separated organic materials composting

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# Organics Recovery – Straw Policy Proposals

- Evaluate the financial, regulatory and policy implications of the definition changes to promote organics recovery.
- Encourage residential, commercial and institutional organics programs.
- Provide training opportunities for compost facility operators.
- Evaluate the need to set an aggressive organics diversion goal, a mandate if the goal is not reached.

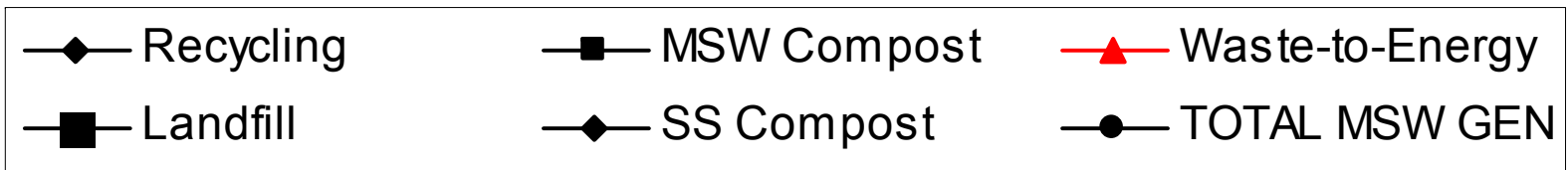
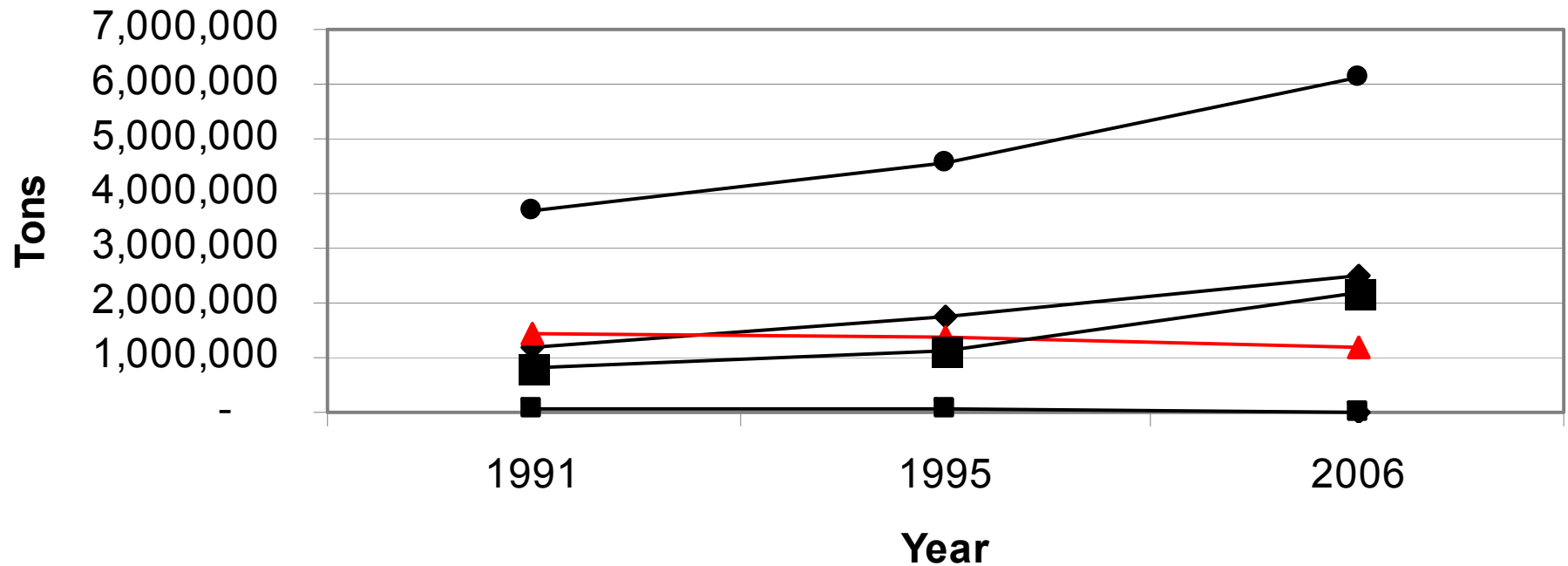
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# Organics Recovery – Straw Policy Proposals

- Provide assistance to counties and cities to cover start up cost of organics collection programs.
- Provide assistance to food rescue programs through education and grants to increase collection.
- Evaluate the role of economic pressure points of organic management systems.
- Evaluate the impact of discouraging/banning commercial garbage grinders/disposals.

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# Waste to Energy



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# Waste-To-Energy Definition

Energy and materials recovery from solid waste that generates steam and/or electricity through a controlled combustion or gasification process.

WTE is supported by an integrated waste management system with robust HHW, problem materials, recycling and organic recovery. WTE enhances the need for and practice of source separation.

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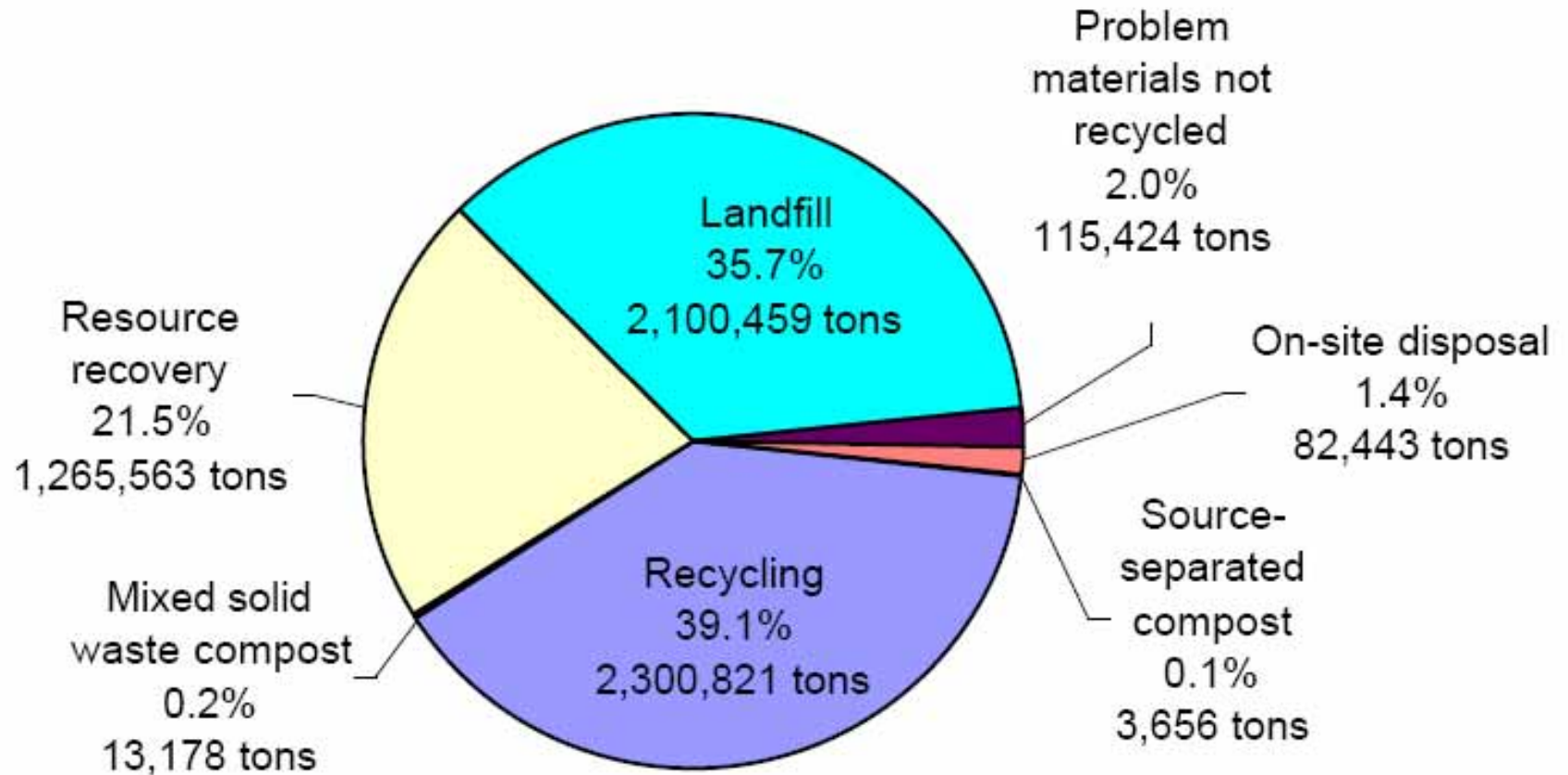
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47

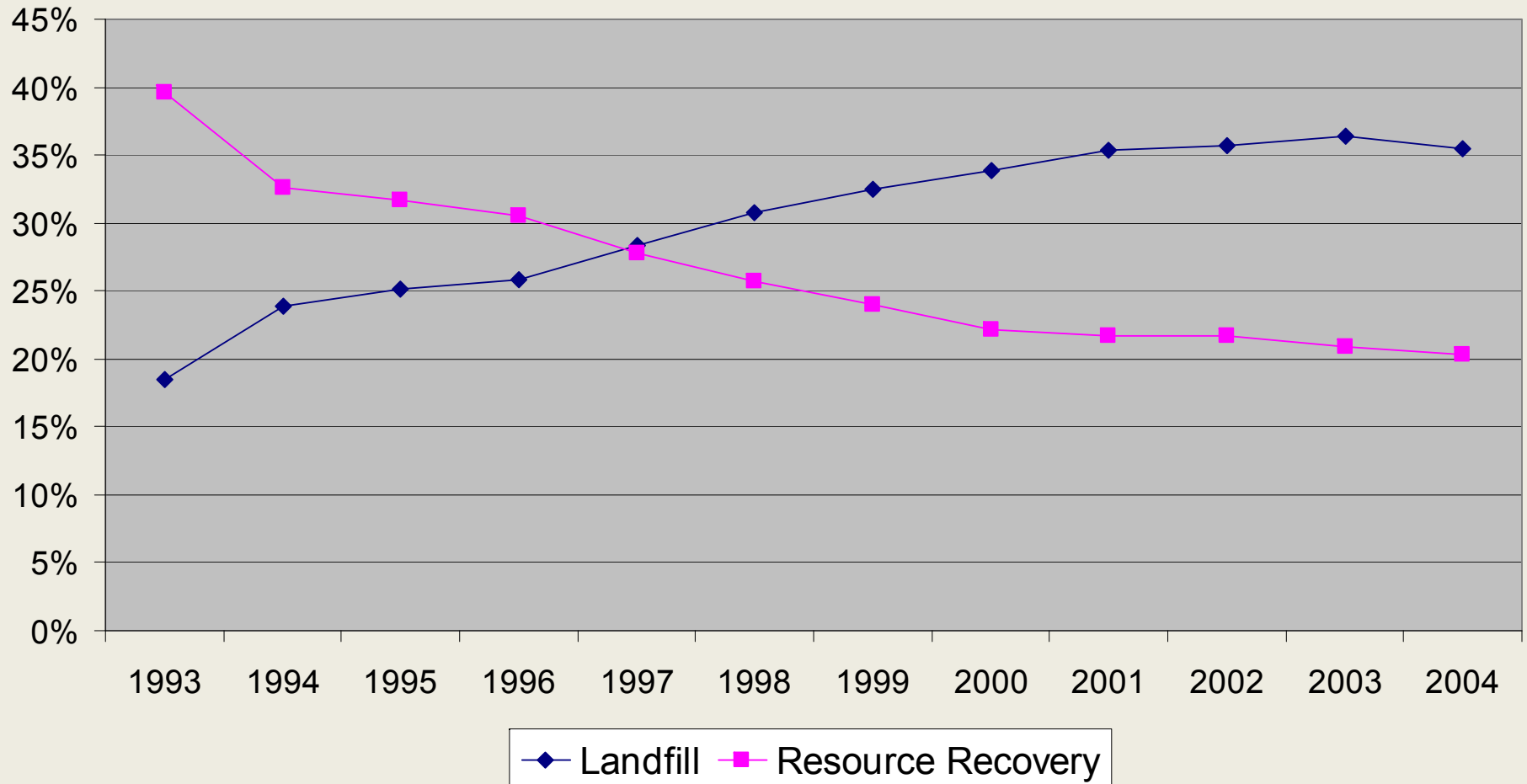
# MSW management in Minnesota



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# Waste to Energy Trends and Objectives



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49

# Waste to Energy

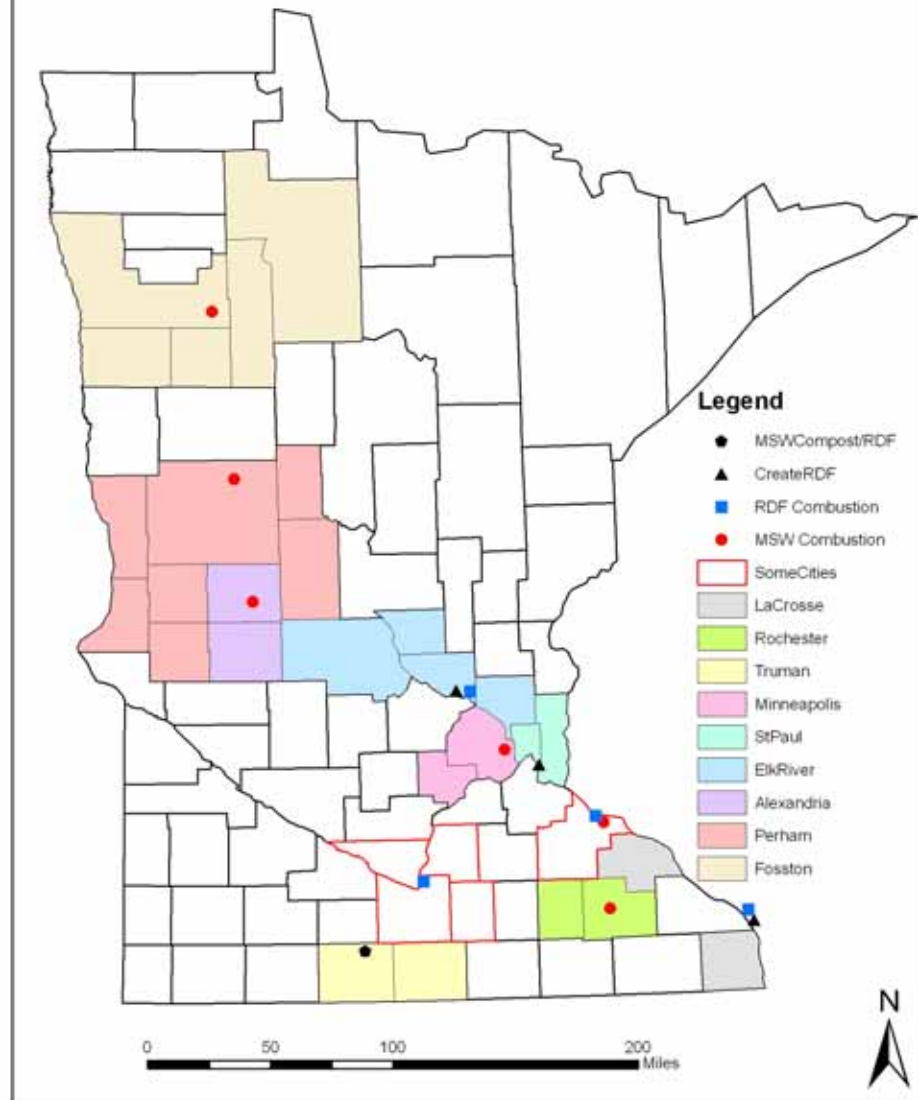
## Outline of 2007 Roadmap

- Assessment of existing system, possible expansions and new facility construction
- Waste generation and management forecasts
- Review of existing policies and legal framework
- Identify the building blocks for the expansion of mixed municipal solid waste recovery systems
- Assess the implications for state policies

# Waste to Energy Existing Systems

- 10 waste-to-energy facilities, plus three mixed municipal solid waste processing plants, totaling 1.2M tons/year
- More than 20 counties are served by waste-to-energy facilities or processing plants; However, largest WTE counties are also largest landfill counties

# Minnesota Waste Combustion Facilities



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52

# Waste to Energy Potential Systems

- Planned expansions
  - Olmsted/Dodge: add 200 tpd; total 400 tpd
  - Pope/Douglas: add 120 tpd; total 200 tpd
  - Perham: add 50 to 75 tpd; total 175 tpd
  - Red Wing: add 25 tpd; total 105 tpd
- HERC, Koochiching County, and Redwood Falls could develop potential expansions of the WTE system

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# Waste to Energy Roadmap Findings

- Focus on high growth and high per capita areas with 500 tpd or more of MMSW generation
- Site new projects near high waste generation areas to reduce transport requirements/costs
- Expand current waste-to-energy plants
- Maximize energy recovery; steam, waste heat, and electricity
- Investigate pro's and con's of pre-processing MMSW to remove recyclables and inerts
- Support proven technology and monitor developments of gasification systems

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# MPCA Strategic Plan (2005) – Waste Management Goals and Benefits

- 1) Recover 35% of waste stream by 2011 with waste-to-energy and organics recovery:

*Adding 3,000 tpd of MMSW processing capacity to reach approximately 30%*

- 2) Increase generation of renewable energy:

*Convert an additional 10 trillion BTUs to steam and electricity*

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# MPCA Strategic Plan (2005) – Waste Management Goals and Benefits

## 3) Reduce greenhouse gas releases

*abatement of land disposal; 90% reduction in methane,  
plus offset GHG emissions from “fossil fueled energy”*

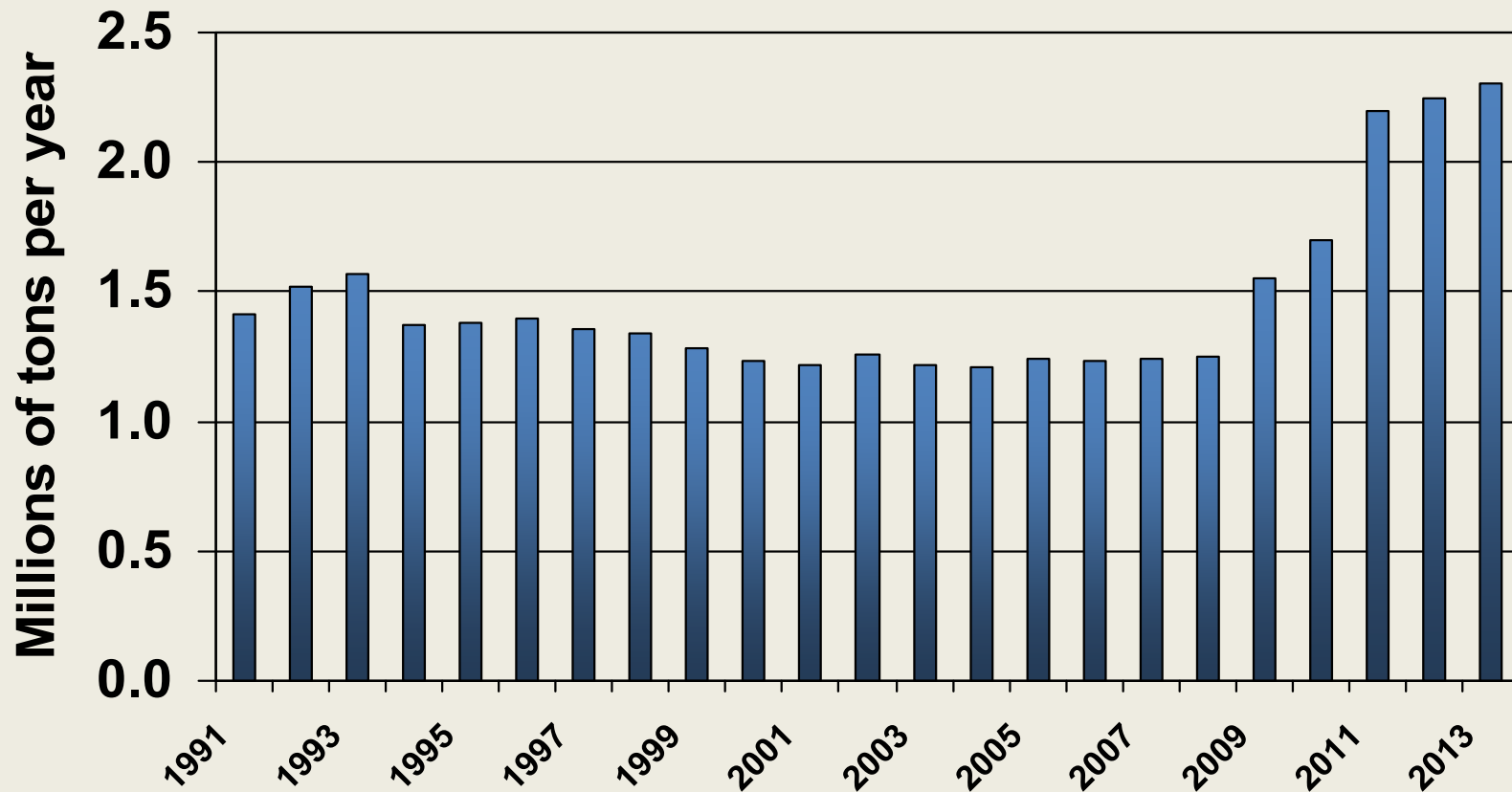
## 4) Create opportunities for new investment

*Heat and power projects create economic development, jobs, and stabilize fluctuating energy prices; Examples include energy parks, industrial processing, electrical power, and district heating/cooling*

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# Waste to Energy Trends and Objectives



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57

# Waste to Energy

## Current Strategies

- Need to renew waste designation as a joint state and local unit of government regulation
- Participate in development of WTE projects
- Need to implement the metro waste processing mandate (§473.848)
- Need to create more effective solid waste management authorities in the metro area and in greater Minnesota
- Need to expand our working relationship with Department of Commerce and local utilities

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# Waste to Energy

## Current Strategies

- Continue to support integration of HHW, problem materials, recycling, and organics with WTE
- Continue to minimize air emissions by working with WTE project owners and operators
- Track the development potential of new gasification and other emerging technology
- Expand our working relationship with potential sponsors of WTE projects
- Implement MPCA's WTE policy (2006)

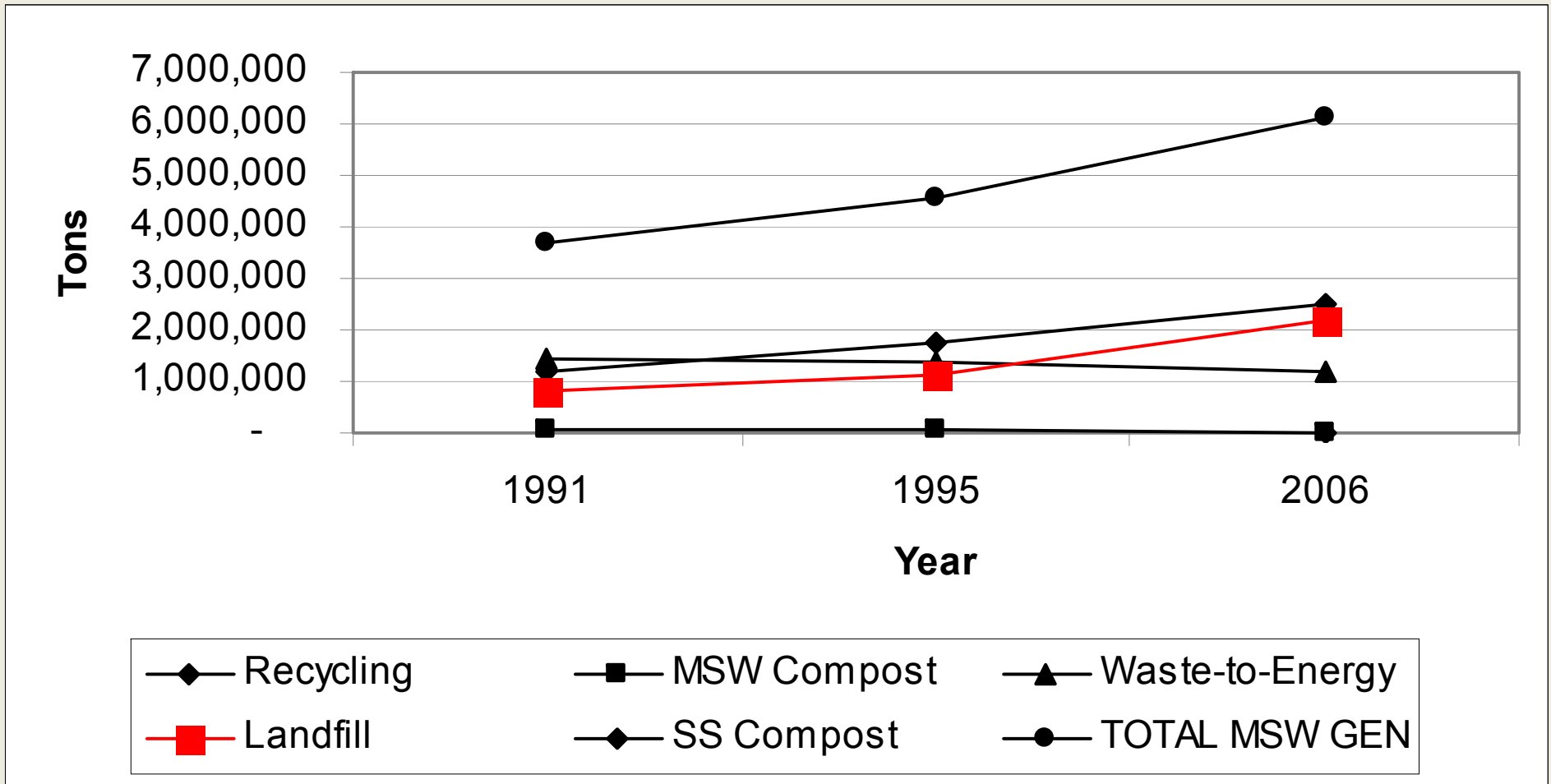
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# Waste to Energy Straw Policy Proposals

- Enhance incentives for recovery vs. disposal
- Support investments in WTE by the waste industry, utilities, and local government.
- Renew waste designation as an incentive to develop WTE projects and HHW, problem materials, recycling and organics programs
- Promote renewable energy credits
- Provide financial aid for development and construction of new and expanded capacity

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# Landfill Gas



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# Minnesotans are relying on landfills more than ever

- Landfills accepted over one third of all MMSW in 2006
- Comparing 2006 with 1996, landfills have begun pilot projects to re-circulate leachate. The rate of methane generation has increased.
- Large landfills: flare methane or gas-to-energy to meet federal requirements
- Small landfills: No remediation. Capital costs are a barrier.

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# Current LFG Operations in MN vs Neighbors

- Six landfills currently producing electricity:

- Pine Bend.....12.0 MW (Open)
- Burnsville..... 4.2 MW (Open)
- Elk River..... 3.2 MW (Open)
- Spruce Ridge . . . . .2.4 MW (Open)
- Anoka/Ramsey..... 1.5 MW (Closed)
- WDE..... 0.2 MW (Closed)

Total 23.5 MW

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- Operational landfill gas-to-energy systems in other states:

- Wisconsin = 18
- Iowa = 3
- Illinois = 36

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# Total Electrical Generation (2011)

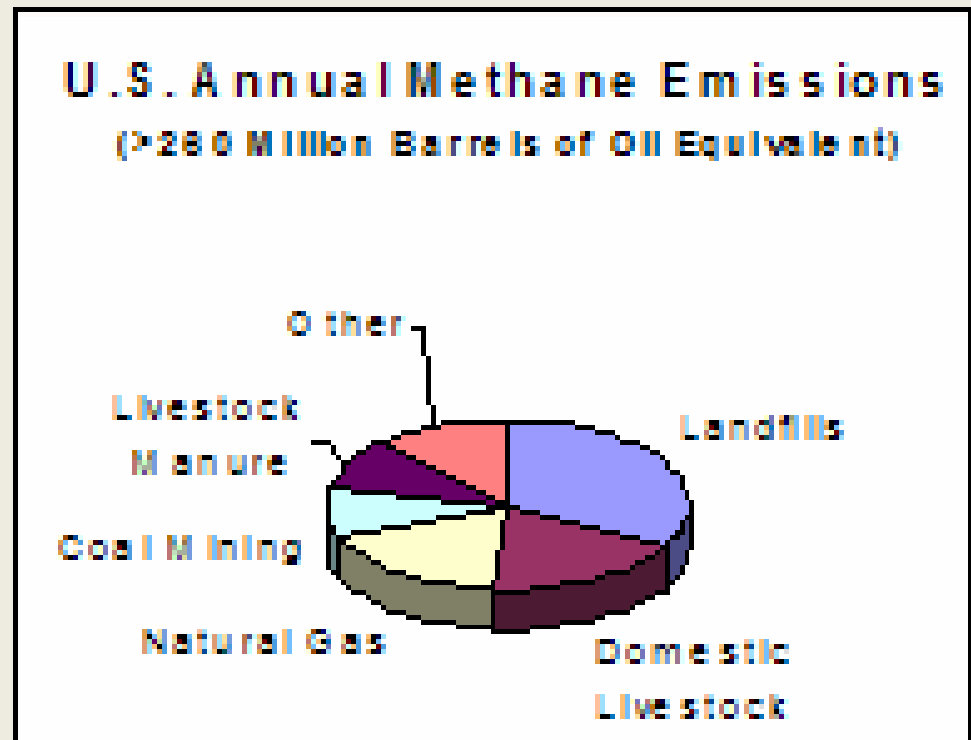
## Utilizing Available Methane

■ Existing	23.5	MW
■ 13 Closed Candidates	11.0	MW
■ Other Open LF Potential	<u>17.0</u>	<u>MW</u>
	51.5	MW



# Landfills are *the* major source of methane emissions in U.S.

- Methane (a greenhouse gas) has 21- 40 times atmospheric heat retention capability as CO<sub>2</sub>.
- LF gas is composed of about 50% methane and 50% CO<sub>2</sub>.



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# Estimated 2006 Landfill Methane Emissions

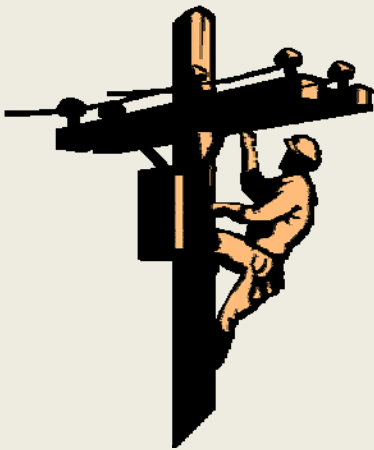
- In 2006, the 112 Closed Landfills in the MPCA Closed Landfill Program Emitted an estimated 66,213,682 m<sup>3</sup> of methane.
- In 2006, the 20 Closed Landfills in the MPCA Closed Landfill Program destroyed an estimated 17,802,650 m<sup>3</sup> of methane through active gas extraction and flaring.
- In 2006, the 22 Open Landfills regulated by the MPCA generated an estimated 171,222,487 m<sup>3</sup> of methane.
- By 2011, the 22 Open Landfills regulated by the MPCA will destroy approximately half of generated methane through combustion (flaring or engines).

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# Potential LFG End Use

Direct use as natural gas alternative is preferred by MPCA.

- 70 – 80% fuel efficient.
- Dependent on proximity to end users.



Fuel used in electric generation  
less dependent on location.  
25 -35% fuel efficient.



# Landfill Gas to Energy Straw Policy Proposals

- Include LFGTE in existing 1.5¢/kwh renewable energy production incentive currently provided to wind.
- Provide incentives.
- Work with CCX to allow methane offset projects
- Increase remuneration paid by utilities to generators for renewable energy for following 10 years.
- MPCA action encouraging destruction of all methane gas above 2006 levels each year.
  - After 2011: Annual Ambient Air User Fee of \$/MTCO<sub>2</sub>e for “excess” gas emitted above threshold.  
\$ determined by price at the CCX.

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# BURN BARREL ELIMINATION

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69

# Burn Barrel Elimination Straw Policy Proposals

- Continue grant and technical assistance to support local reduction initiatives.
- Revise Minn. Stat. 88.171 and 17.135 to close loophole and eliminate backyard garbage burning by January 31, 2010.
- Allow temporary exemptions for portions of counties who need additional time to close gaps in service and/or collection.

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# SUMMARY

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71

# Resource Conservation and Recovery Summation

- Support integrated waste management systems
- Support programs that are not provided by the current waste management marketplace
- Expand reduction, reuse, recycling and organic recovery programs
- Increase the recovery of resources and energy from waste, while reducing GHG releases and land disposal of waste

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# Resource Conservation and Recovery Summation

- Promote integrated solid waste management with state support for planning , development aids, flow control, and legal assistance
- Support efficient management by promoting alternative governance structures (e.g. multi-county waste authorities)
- Prioritize areas of the state that generate significant quantities of the solid waste for the creation of new integrated waste management systems

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