# Solid Waste Policy Report

## *WASTE AS A RESOURCE*

2002






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Minnesota Office of **Environmental Assistance**

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# Executive Summary

This is the seventh biennial *Solid Waste Policy Report* to the Minnesota Legislature by the Office of Environmental Assistance (OEA). The Waste Management Act (WMA) requires the director of the OEA to submit the report every two years to the Minnesota Legislature, Minnesota Statute § 115A.411 (2000). The purpose of this report, as specified by the WMA, is to:

- summarize the current status of solid waste management
- evaluate the extent and effectiveness of programs in accomplishing state policies and goals
- identify issues requiring further research and action
- make recommendations for establishing or modifying the state's solid waste management policies and programs

## State policy

The goal of the Waste Management Act (as stated in Minn. Stat. § 115A.02a) is to protect the state's land, air, water, and other natural resources and the public health by improving waste management in the state in order to reduce the amount and toxicity of waste generated, increase the separation and recovery of materials and energy from waste, coordinate the statewide management of solid waste, and the development and financial security of waste management facilities, including disposal facilities.

The waste management goal of the state is to foster an integrated waste management system in a manner appropriate to the characteristics of the waste stream, and thereby protect the environment and public health. The WMA ranks waste management practices in order of preference:

1. waste reduction and reuse
2. waste recycling
3. composting of yard waste and food waste
4. resource recovery through mixed municipal solid waste composting or incineration
5. land disposal which produces no measurable methane gas or which involves the retrieval of methane gas as a fuel for the production of energy to be used on-site or for sale
6. land disposal which produces measurable methane and which does *not* involve the retrieval of methane gas as a fuel for the production of energy to be used on-site or for sale

The best way to implement state policy and these waste management preferences is through treating waste as a resource.

## Waste as a resource

This *Solid Waste Policy Report* advocates a transition to a new paradigm for a new century, with a new way of thinking about waste based on the principles of sustainability and resource conservation. This transition must begin by unraveling the myth that waste, by its very nature, is inherently valueless.

The concept of viewing *waste as a resource* for purposes of this policy report can be broken down into three main thoughts:

1. Treating waste as a resource reduces pollution. Shifting waste management practices toward those that better treat waste as a resource, such as waste reduction, reuse, recycling, or composting, leads to reductions in the amount of air and water pollution released to the environment, including greenhouse gases.
2. Reducing waste saves money. Reducing and eliminating the generation of waste often creates significant cost savings by conserving raw materials and using resources more efficiently in the production of products.
3. Materials in waste often have value. If certain materials are either kept separate, or separated after disposal, these materials can be reused, recycled, or recovered for their highest and best use. For example, the organic portion of garbage can be kept separate at the source, before it gets to the curb, and processed into compost, which can then be used as a high quality soil amendment.

## Major conclusions and initiatives

The content of this report can be broken down into two main sections: the status of solid waste in Minnesota and the OEA's policy initiatives to address these issues.

### Status of solid waste: conclusions

Minnesota has many successes in implementing state solid waste policy: the state's recycling rate of 48 percent is the second highest in the country; over 20 percent of Minnesota waste is sent to resource recovery facilities, one of the highest rates in the nation; and high levels of yard waste are composted. However, there are still four areas in which much more progress in implementing state policy can potentially be made:

- Growth in waste generation. Minnesota's waste generation grows at an average rate of over 4 percent per year. Evidence indicates that most of this increase in waste is coming from the commercial sector rather than the residential sector.
- Recyclable and compostable materials are being landfilled or incinerated. Approximately 72 percent of the waste currently being landfilled or incinerated consists of materials that could be put to higher and better use through recycling or composting. Most of this material is paper, cardboard, non-recyclable paper, and food waste.
- Landfilling has surpassed resource recovery as the primary method of waste disposal. Despite the preference for resource recovery stated in state solid waste policy, 50 percent more waste is now landfilled than incinerated. Less than 10 years ago, resource recovery tonnages exceeded landfill tonnages by a factor of two.
- Waste exports to other states. These exports have tripled since 1993, increasing potential liability to Minnesotans as well as bypassing state solid waste policy.

## Policy Initiatives

OEA will address these problems through a combination of research and policy initiatives, a workgroup to look into the sources of waste growth, and the expertise of advisory groups.

### OEA policy and research initiatives

The OEA offers the following policy and research initiatives:

- Waste reduction. The OEA plans to implement targeted technical assistance to businesses and waste reduction media campaigns, and to develop waste reduction incentives.
- Business and multi-family recycling. There is evidence that waste growth may be predominantly coming from the commercial, industrial, and institutional sectors of the economy. Over the current biennium, the OEA plans further research into the sources of solid waste growth, and to establish a work group to determine the best strategies for increasing recycling in these sectors of the economy.
- Organics composting. The OEA supports the development of programs that promote the recovery of organics before they enter the waste stream. Compostable organics now constitute approximately 35 percent of waste that is landfilled or incinerated. Source-separated composting programs such as the one implemented in Hutchinson show considerable potential in their ability to capture a large proportion of these organics.
- Risk assessment and cost-benefit analysis. The OEA will be following up on its 1999 R. W. Beck report, "*Municipal Solid Waste and its Impact on Resource Conservation and Greenhouse Gas Emissions*," with research into the risks, costs, and benefits of those life-cycle impacts. This report will also look at the life-cycle impacts of the product categories targeted in the OEA's product stewardship plan.
- Evaluation of problem materials policy. The state currently prohibits certain products from the waste stream in order to eliminate potential air and water pollution from chemicals contained in those products. The OEA plans to evaluate the extent to which these bans have been successful in removing the products, or the presence of certain constituent toxic chemicals or elements, from the waste stream.

### Collection systems

Several local governments have recently explored or used changes in their collection systems as a tool for implementing state solid waste policy. Given this interest and potential, the OEA explored collection systems in Minnesota and came to the following conclusions:

Minnesota's organized collection law is outdated and should be amended to reflect today's solid waste management system. New collection strategies available to local governments demonstrate the potential to be less expensive than existing collection systems while remaining competitive. These strategies also support the policy that waste contains resources that should be managed by methods that maximize the highest and best use of those resources.

The choice of a collection system is critical to local government success in meeting the goals of the Waste Management Act, while having the potential to have a positive impact on other public policy areas as well, such as environmental policy, noise pollution, litter, hauling costs, and local government finances. The OEA encourages local governments to explore organized collection strategies as a tool that can be used to support the responsible management of waste. OEA intends to work with local governments to develop model organized collection ordinances.

### Recommendations of advisory groups

Three major efforts were undertaken in 2000-2001 in order to develop recommendations to improve the solid waste system: the Citizen's Jury, the Solid Waste Technical Advisory Group, and the Solid Waste Advisory Committee. Each of these advisory groups examined the state's solid waste management system and developed recommendations for improving the system. The OEA supports the most significant recommendations that emerged from these three projects.

## Part 1

# Introduction

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- evaluate the extent and effectiveness of programs in accomplishing state policies and goals
- identify issues requiring further research and action
- make recommendations for establishing or modifying the state's solid waste management policies and programs

State waste management policy is based on the Waste Management Act, Minn. Stat. § 115A. Full versions of state statutes, session laws and rules can be found online on the Minnesota State Legislature web site: *www.leg.state.mn.us/leg/statutes.htm.*

## State policy

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The waste management goal of the state is to foster an integrated waste management system in a manner appropriate to the characteristics of the waste stream, and thereby protect the environment and public health. The WMA ranks waste management practices in order of preference:

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6. land disposal which produces measurable methane and which does not involve the retrieval of methane gas as a fuel for the production of energy to be used on-site or for sale

The OEA believes that the best way to implement state policy and these waste management preferences is through treating waste as a resource.

# Waste as a resource

Despite fluctuations in our economy and changes in consumption and production, we remain a society that throws away vast amounts of materials—materials that in many instances could be redesigned to reduce waste or to be reused, recycled, or recovered for resource value. This increase in waste generation and disposal is a trend that must be reversed. Viewing waste as a resource is a first step.

This *Solid Waste Policy Report* advocates a transition to a new paradigm for a new century, with a new way of thinking about waste, based on the principles of sustainability and resource conservation. This transition must begin by unraveling the myth that waste, by its very nature, is inherently valueless. For the purposes of this report, the concept of viewing *waste as a resource* can be broken down into three main thoughts:

1. Treating waste as a resource reduces pollution. Shifting waste management practices toward higher and better uses of the materials, such as reduction, reuse, recycling, or composting, leads to reductions in the amount of air and water pollution released to the environment, including greenhouse gases.
2. Waste reduction can create cost savings by using resources more efficiently. Reducing and eliminating the generation of waste often creates significant cost savings by conserving raw materials and using resources more efficiently in the manufacture of products. For example, redesign of a product can reduce waste during the product's entire life cycle (manufacture, use, and disposal). These changes can result in the reduction or avoidance of air and water pollution, including greenhouse gases that contribute to global climate change.
3. Materials that have value can be recovered from waste. Waste is often made up of materials that have value if they are separated and later reused, recycled, or recovered for their highest and best use. For example, the organic portion of garbage can be separated out before it gets to the curb and processed into compost, which can then be used as a high quality soil amendment.

The key to attaining long-term waste reduction and resource conservation is to encourage businesses to think differently about the products they make, design, buy and use, so that manufacturers, retailers and consumers think about and treat by-products of their activities and products at the end of their useful lives as resources rather than waste.

## Case studies: Minnesota businesses using waste as a resource

Throughout the country, successful businesses have begun to understand the competitive edge that can come from recognizing that creating waste is both economically and environmentally inefficient. In Minnesota, a growing number of businesses are implementing comprehensive environmental programs within their companies (both large and small) to improve their bottom line, protect the environment, and gain an edge over their competitors. The following table identifies some of the Minnesota companies that are using waste as a resource to the advantage of both the environment and their bottom line.

### Figure 1-1. Sample of companies using waste as a resource

| Company | Financial savings | Environmental savings |
|---|---|---|
| Haubenschild Farms | By September, 2001, the farm made about $130,000 worth of electricity. The farm saves between $60,000 and $80,000 in fertilizer each year. | Haubenschild Farms is a pioneer in using anaerobic manure digestion to produce methane for generating electricity in Minnesota. This 800-cow farm produces enough power to run the entire farm, plus 78 homes in the Princeton area.<br><br>Green electricity saves 50 tons of coal each year, reducing greenhouse gas emissions by approximately 1,200 tons per year. |
| Honeywell | Saves a combined total of $457,000 per year for all programs. | Honeywell-Solid State Electronics Center (SSEC) develops and manufactures specialized semiconductor technologies and products. SSEC was established in 1965 and is based in Minneapolis, with design services in California and Columbia, Maryland.<br><br>Honeywell's projects include water use, solid waste disposal and energy use reduction efforts. Honeywell has invested in research and development and capital equipment to prevent pollution locally in their manufacturing operations and nationally to use secondary materials (post-consumer materials) as a resource.<br><br>For a separate program on carpet recycling, Honeywell estimates that it saves 700,000 barrels of oil each year, conserving 4.4 trillion BTUs of energy. |
| IBM, Rochester | $13 million | IBM's transition to glass substrate disks will save over $13 million annually from reduced chemical handling, water treatment, waste disposal, reduced charges for utilities, and includes annual savings of more than $10 million in nickel-plating chemicals and operating costs. |
| Target Stores | $250,000 | Since Target Stores formed its Environmental Department in 1992, it:<br>• was the first discount retailer to process all purchase orders electronically, saving 40 tons of paper annually<br>• worked with suppliers to reduce packaging<br>• used made-to-order wood pallets, eliminating 20,000 to 30,000 pallets annually<br>• used reusable corrugated boxes for internal distribution, eliminating over 3 tons of corrugated cardboard waste a year |
| Onan Corporation | $100,000 | Onan targeted its metal finishing operations (cleaning, pre-treatment and painting). Reduced 122 tons per year of VOCs, 100 tons per year of 1,1,1 trichloroethane, 18 million gallons per year of wastewater, 5 million gallons per year of cooling water, and 70 tons per year of hazardous waste. |
| Anderson Corporation | $1.4 million | Over an 8-year period, the company reduced solid waste by over 90%, hazardous waste by nearly 38%, toxic release inventory emissions by 85%, and VOC emissions by 85%. |
| Anagram International, Inc. | $100,000 | Reduced 40 tons of paper; 33% of electricity for lighting; 100% of waste from returned or damaged products; the use of recycled content in bags; reduced and recycled transport packaging; and reductions of toxic materials. |
| Genmar Holdings, Inc. | $438,000 | Decreased styrene emissions during lamination by 77%, or 30 tons per year; decreased generation of solid waste by over 70 tons per year; reduced the volume of personal protective equipment waste by 5 tons per year, and reduced waste by an estimated 50% by reducing mold production and disposal. |

## Policy implications

The state policy preference for waste management methods, commonly referred to as the waste hierarchy, is one tool for measuring our progress. But it has its limitations, since it is focused only within the confines of the waste management system and does not consider environmental or resource conservation outcomes. Not every material in the solid waste stream is necessarily best managed as a waste in

accordance with the hierarchy. Our decisions have impacts *beyond* the waste management system, and can only be understood when we look at how the materials are made, distributed, and enter the waste system. Our measures of success should not be based solely on determining the quantities of waste diverted from landfills and the landfill space saved.

Recent research by the OEA and others, including the U.S. Environmental Protection Agency, now enables us to measure the impacts of our waste management decisions. By using these life-cycle assessment methods, we can measure on a material-by-material basis the amount of air and water pollution avoided, and the tons of natural resources saved by treating waste as a resource. In addition, the tools are now available to analyze and compare the environmental risks and costs of waste management systems with reuse, resource recovery, and recycling systems. Analytical methods, such as various risk analyses, benefit-cost, and economic methods, enable us to measure and demonstrate progress toward much more precise and meaningful objectives.

By implementing this new paradigm of waste as a resource, and by using the new analytical tools available, decision makers will have more information on which to base their decisions. Equally important is that the paradigm of waste as a resource allows greater flexibility to deal with new challenges facing Minnesota's solid waste system, such as the emergence of new and different products and processes, changing social values, economic factors, and new technologies.

This *Solid Waste Policy Report*:

- identifies steps the state can take to achieve its policy goal of treating waste as a resource
- describes the extent to which the state is currently succeeding in this area
- presents OEA's strategies for making further progress

# Organization of report

The report is organized into the following sections:

- The Status of Solid Waste in Minnesota. This section discusses recent trends in solid waste management, from waste generation to waste disposal. This data-intensive discussion sheds light on the extent to which the state is currently achieving its solid waste policy goals.
- Policy Initiatives. In this section, the OEA presents its planned policy and research initiatives in order to make further progress in implementing solid waste policy. This section includes initiatives on waste reduction, business recycling, and organics composting; an analysis of the impact of the choice of collection systems on solid waste policy, along with recommendations; and the policy and research recommendations of the Citizen's Jury, the Solid Waste Technical Advisory Group, and the Solid Waste Advisory Committee.

The appendix contains two additional sections:

- Recent Accomplishments. This section, which highlights recent state and local efforts to meet the state's solid waste policy goals, is primarily qualitative and describes the results of many state and local policy initiatives. This will provide a more complete context for how well state policy goals are being met.
- Program Initiatives. This section discusses the tasks the OEA plans to complete over the next two years to accomplish its existing policy goals.

Part 2

# The Status of Solid Waste in Minnesota

In order to fully understand Minnesota's integrated waste management system, the system must be followed from generation, to collection, to recycling, to composting, to disposal, and finally to waste composition. The purpose is to demonstrate the extent to which progress is, or is not, being made in attaining the goals of the state.

## The solid waste management system

Minnesota's solid waste management system consists of interactions between state and local governments, commercial and residential waste generators, waste haulers, recyclers, and operators of landfills and recycling and resource recovery facilities.

### Roles of state and local government

The public sector is responsible for ensuring that the state's solid waste goals are implemented, thereby protecting public health, natural resources, and the environment. This includes the development of solid waste policy consistent with state law. Many different government organizations, at both the state and local levels, have roles in implementing state solid waste policy.

#### Local government

Minnesota counties have the primary role in planning and implementing solid waste management programs that ensure the proper management of solid waste generated within their jurisdictions. County activities may include all parts of an integrated waste management program, including waste and toxicity reduction, recycling, resource recovery, and the proper disposal of MSW.

Since the mid-1980s, many counties have chosen to form groups, either through joint-powers agreements or contracts, to manage their solid wastes. Fifteen inter-county solid waste groups exist in the state. These groups usually focus on a single aspect of solid waste management, such as recycling, household hazardous waste management, resource recovery, or land disposal. Some, but not all, management activities overlap. For example, a group of counties will often form a coalition to manage recyclables, yet a slightly different group of counties may manage household hazardous waste. The most common reasons for forming a group to manage components of the waste stream are to achieve economies of scale and reduce staffing needs.

In the Metropolitan Area, the Solid Waste Management Coordinating Board (SWMCB) guides the activities of six Metro counties through the Regional Solid Waste Management Policy Plan, developed jointly by SWMCB and the OEA, and adopted in 1997 by the director of the OEA. The Metro counties then developed a Regional Solid Waste Master Plan, which is based on the Regional Solid Waste Management Policy Plan and approved by the director of the OEA in 1999.

Cities and towns throughout the state play a major role in implementing County Solid Waste Management Plans, frequently undertaking curbside collection of recyclables. They also play a role in the collection of MSW and yard wastes, and have authority to collect fees to pay for solid waste services and may impose fees on operators of solid waste facilities.

### State agencies

At the state level, the OEA provides technical and financial assistance to local governments, businesses, and the general public to improve solid waste management. The OEA also provides planning assistance, approves county solid waste plans, and presents policy analysis to the Legislature.

The Minnesota Pollution Control Agency (MPCA) establishes and enforces solid waste regulations, issues facility permits, operates a grant program for the state's Household Hazardous Waste Program, and administers the Landfill Cleanup Program. The MPCA also provides technical assistance, training, and ground water monitoring.

### Public/private sector overlap

The public and private sectors have overlapping functions in the areas of collection, recycling, resource recovery, and land disposal. Collection of recyclables and municipal solid waste is largely done by the private sector. However, the public sector frequently contracts with private companies for the collection of both recyclables and MSW on a city or county-wide basis. In some communities, the public sector owns trucks and collects MSW. Resource recovery facilities are owned and operated by both the public and private sectors. Public sector ownership occurs at both the county and city levels.

Landfills are also owned by both the public and private sectors. Of the 22 landfills currently accepting MSW in Minnesota, counties operate 16 and the private sector operates the remaining six. However, private landfills accept a much higher percentage of waste. The six private Minnesota landfills accept 67 percent of the waste landfilled in Minnesota, and the vast majority of the waste exported out of state goes to privately owned landfills.

## Notes on data

The data used in this section comes primarily from the OEA's SCORE database. SCORE data is collected from all 87 counties in Minnesota and the Western Lake Superior Sanitary District (WLSSD)[1] using the annual SCORE survey, which is completed by county solid waste staff. The survey collects the following information on solid waste management and recycling:

- MSW delivered to transfer stations, processing and land disposal facilities
- estimates of wastes managed on-site or disposed of illegally
- residential, commercial, and institutional materials collected for recycling
- county efforts toward recycling, household hazardous wastes, yard wastes, and source reduction
- county revenues and expenditures relating to SCORE programs

In addition to the data collected through the SCORE survey, counties in the Twin Cities Metropolitan Area (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington) also submit annual Waste Certification Reports to the OEA, which provide added detail on waste processing in the region.

The OEA has an excellent national reputation for the quality of its solid waste data. After the completion of a 2000 solid waste project in Region 5, the U.S. Environmental Protection Agency complimented the OEA for providing "the best information in terms of accessibility and quality of data."

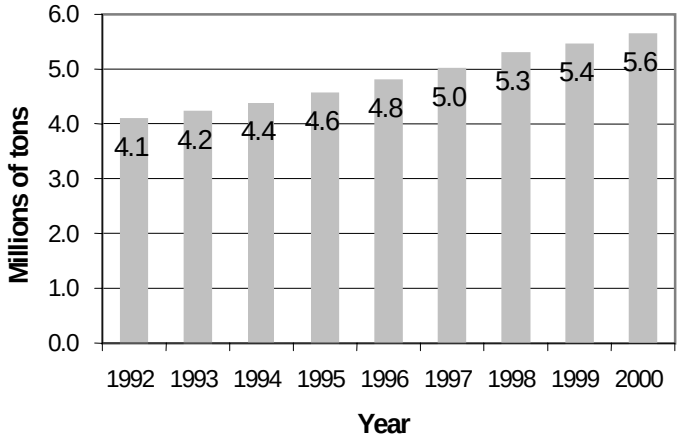
For more information on SCORE data, solid waste trends, and collection methods, see the *Report on 2000 SCORE Programs*, available on the OEA web site at *http://www.moea.state.mn.us.*

[1] *WLSSD is a special-purpose subdivision of the state that is charged with addressing water pollution, solid waste collection, and disposal of sewage. WLSSD, established in 1971, covers nearly 500 square miles in St. Louis County, and includes the cities of Duluth, Cloquet, Carlton, Scanlon, Wrenshall, Hermantown, Proctor, and Thompson. It coordinates programs for nearly 115,000 people in the region—60 percent of the county's population.*

# Waste generation and source reduction

This section first discusses trends in waste generation, and then explores the factors that are possibly driving those trends. Because it is difficult to measure source reduction resulting from state policy, the information in this section serves as only the broadest measure of the impact of waste reduction and reuse activities. For instance, the impact on waste reduction caused by the solid waste management tax or by variable rate pricing requirements would be very difficult to disentangle from the consistent upward pressure on waste generation caused by economic growth.

### Figure 2-1. Minnesota MSW generation, 1992-2000



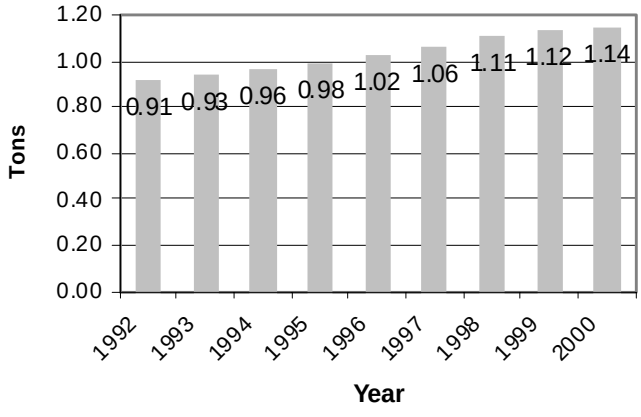

Source: OEA SCORE data

*Total growth in municipal solid waste was 2.9% in 1999 and 3.5% in 2000.*

## Trends

Municipal solid waste generation in Minnesota has grown steadily over the past nine years. Average growth from 1992 to 2000 has been 4.1 percent per year. Figure 2-2 shows that even when controlled for population growth, MSW generation growth remains substantial—increasing at an average rate of 2.9 percent per year.

### Figure 2-2. Per capita MSW generation growth, 1992-2000




Source: OEA SCORE data

*Minnesota's per capita waste generation is increasing at an average rate of 2.9 percent per year.*

Despite a statutory goal of reducing per capita waste generation by at least 10 percent of 1993 levels by the year 2000 (Minn. Stat. §115A.55, subd. 4), per capita waste generation has instead increased by 25

percent over that time period. Based on then-current waste and population growth trends, in the *2000 Policy Report,* the OEA projected that annual waste generation would grow between 2.6 and 5.1 percent per year. Recent waste growth trends continue to be within that range.

It should be clear from the above charts that current state policies and tools to reduce waste have not been sufficient to halt or reduce the growth of the waste stream. While source reduction is at the top of the waste hierarchy, almost all state legislation and funding on solid waste has focused on activities further down the hierarchy. For example, the SCORE legislation established a mandate and funding for both source reduction and recycling. However, because a target was set for recycling, but not for source reduction, early program planning and implementation focused on achieving the recycling targets in preference to source reduction activities. As a result, the funding provided by the state, and a significant amount of local government funding, was used to implement recycling programs, leaving little money for source reduction efforts.

This is not to say that existing source reduction efforts have been ineffective, as it is unknown what waste growth would have been in the absence of waste reduction efforts. Other waste reduction efforts have focused on reducing the toxicity of waste, which would have impacts not reflected in the above charts.

Given that the year 2000 time frame for achieving a per capita waste generation reduction of 10 percent has expired, and in the absence of any new numerical targets from the Legislature, the OEA has set a new waste reduction goal to eliminate growth in per capita generation of municipal solid waste by 2010. That is, the OEA's goal is for growth in the waste stream to be less than or equal to Minnesota population growth.

The OEA is evaluating a number of strategies for accomplishing this goal. Potential strategies are discussed on page 27, under "Waste reduction and reuse" in Part 3, Policy Initiatives.

## Sources of municipal solid waste

The amount of waste in Minnesota is growing. In order to create an effective waste management system, it is essential to understand the *source* of this growth.

Municipal solid waste is generated by two distinct economic sectors—residential; and commercial, industrial and institutional (CII). Because residential and CII wastes are frequently mixed together by the hauler, it has been difficult for the OEA to precisely determine how much waste each sector is generating. A recent OEA study, however, was able to estimate the trends in waste generation by economic sector by:

- looking at the sources of recycled materials, for which the OEA does have numbers that differentiate between economic sectors (Figure 2-3)
- comparing those numbers on the sources of recycled materials to the sources of waste generation in several Minnesota cities where residential waste generation is tracked separately

If the recycling trend in waste generation in those cities where residential waste is tracked separately follows the recycling trend statewide, it is likely (but not certain) that the sources of waste generation growth are similar as well.

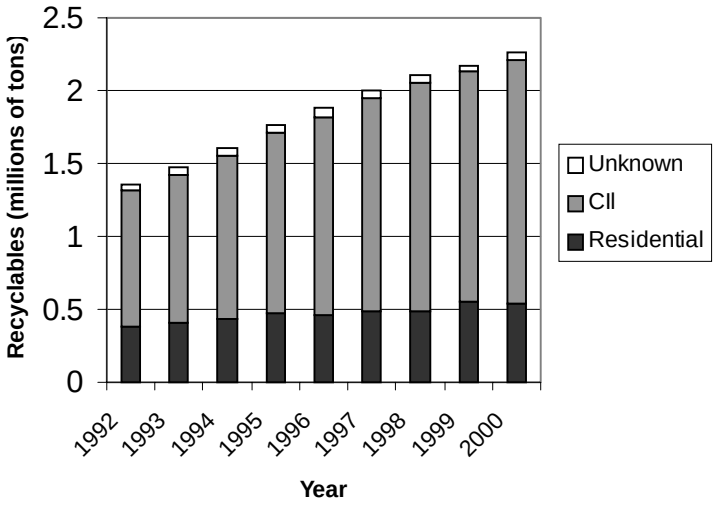
### Understanding the sources of growth in waste

The study first looked at trends in statewide recycling, by economic sector (see Figure 2-3). Growth in residential recycling is approximately half that of the CII sector (42 and 80 percent, respectively). At the same time, however, statewide recycling rates (recycling tonnage as a percent of total waste generated) have stayed level due to a proportionate increase in waste generation. While a small portion of the growth is caused by the discovery of previously missed recyclable materials, these new discoveries have not been substantial in recent years.

Therefore, the information in Figure 2-3 dictates one of two non-exclusive conclusions: either commercial waste generation is increasing as fast as, or faster than, recycling growth in that sector; *or* residential waste generation is increasing at a rate much faster than residential recycling growth.

While the OEA does not have access to commercial waste generation data, many cities do track *residential* waste generation separately. In order to determine where waste generation growth is coming from, the OEA collected and analyzed data from five cities in Minnesota (Minneapolis, St. Louis Park, Hopkins, St. Cloud, and Luverne) where residential waste generation is tracked separately. In all five cities, residential waste generation and recycling per household have stayed relatively level over time, which would *not* be the case if residential waste generation were driving waste generation growth. This provides evidence that the growth in waste generation cannot be explained by residential waste growth, and therefore is best explained by commercial, industrial and institutional waste growth.

**Figure 2-3. Recycling tonnages by economic sector**




Source: SCORE data

This finding is potentially important, as state and local recycling programs and funding have primarily been devoted to the residential sector, which is apparently the source of an increasingly small percentage of the state's total waste. To the credit of the private, nonprofit, and government sectors in Minnesota, Figure 2-3 also shows that despite the comparative lack of funding for CII recycling programs, these economic sectors are the source for a substantial majority of the recyclable materials collected every year, resulting in Minnesota's high recycling rate. However, the OEA believes that most of this recycled material comes from the industrial sector, with less recycling taking place in offices, retail stores, and multi-family dwellings.

In the Policy Initiatives section, this report will discuss what the OEA is doing to verify this research with more data from cities, as well as discuss OEA efforts to improve commercial recycling.

# Collection

A local government's choice of collection system potentially has a substantial impact on its ability to implement state solid waste policy. This section describes the broad types of collection systems used in Minnesota, and how frequently these systems are used for residential and commercial collection of both MSW and recyclables. One of the policy initiatives in Part 3, with discussion beginning on page 29, is devoted to the policy implications of the choice of collection systems.

There are three broad categories of collection models:

- Municipal collection. Public crews collect waste. With the exception of the city of Minneapolis, where half of the households receive waste service from public crews, and in St. Louis County, this

isn't common in Minnesota. The OEA only knows of two other communities in the Metro Area and five of the larger cities in Greater Minnesota that provide service with city crews.

- Organized collection. This is currently defined by Minn. Stat. § 115A.94 as "a system for collecting solid waste in which a specified collector, or member of an organization of collectors, is authorized to collect from a defined geographic service area or areas some or all of the solid waste that is released by generators for collection." In practice, this consists of one of two types of systems:
  - **Contracted.** Local governments contract with private haulers to provide waste collection on behalf of residents and/or businesses.
  - **Franchised.** Government grants private haulers exclusive franchises in one or more service areas.

  The distinction between the two is that in *contracted* systems, the government typically handles all billing and financing. In *franchised* systems, the haulers collect all fees, and residents can opt not to receive the collection services.
- Open collection. This consists of a system where residents and/or businesses choose their own waste hauler, usually from a list of haulers that may or may not be licensed by local government. Under an open collection system, multiple haulers can service the same neighborhoods and streets.

There are variants within these systems. The city of Minneapolis provides a good example. Minneapolis offers a mix of municipal and organized collection, depending on where one lives. The city is sectioned off into different collection zones. Some of these zones receive municipal service. Other zones are serviced by a private hauler chosen by the city through its contracting process, with different haulers serving different zones.

Additionally, the choice of collection strategies is not limited to MSW collection. While the majority of Metro Area cities use open collection for residential MSW collection, and an even larger majority use open collection for commercial MSW, very few cities use it for residential recycling collection, where organized collection systems are by far the norm.

## Comparison with nation

The distribution of collection systems in Minnesota is markedly different from how collection systems are distributed throughout the rest of the nation. The bulk of the nation relies mostly on organized and municipal collection systems, allowing the government to direct where and how waste is handled.

| Type of system | Twin Cities Metro (percent) | Nationwide cities (percent) |
|---|---|---|
| **Organized** | 21% | 38% |
| **Open** | 77.5% | 16% |
| **Municipal** | 2% | 33% |
| **Combination** | n/a | 12% |
| **Other** | n/a | 1% |
| **Total** | **100%** | **100%** |

In contrast, the table to the right shows that Minnesota has a much higher proportion of open/private collection systems, and a much lower proportion of municipal and organized collection systems.[2] This higher proportion of open collection makes it much more difficult for Minnesota government to direct waste in compliance with state policy and to the benefit of the environment and public health.

*[2] The table contrasts the distribution of collection systems in the Twin Cities Metro Area with the distribution nationwide in larger cities, the best comparison for which data was available. Twin Cities data comes from the GBB report cited in the text. Nationwide data come from a presentation by Jonathon Burgiel of R. W. Beck, presented at the SWANA Conference in New Orleans in 1999. The cities studied were mostly larger cities of over 30,000 people. The GBB report did not tally combined systems separately, but the one known combined system in the Metro Area is in Minneapolis. The nationwide "organized" numbers were calculated by taking the sum of the "contracted" and "franchised" percentages from the R. W. Beck presentation.*

# Collection systems in Minnesota

The discussion of collection systems in Minnesota can be divided into two sections. The first, on the Metro Area, describes previous studies of the region, with updates. The second section, on Greater Minnesota, contains a discussion of new research conducted by OEA. While there have been previous studies of collection systems in the Twin Cities Metro Area, explorations of collection systems in Greater Minnesota are not known to have been done.

## Metropolitan residential collection

According to a 1994 report, *Comparative Economic Analysis of MSW and Recycling Collection in the Twin Cities Metropolitan Area*, conducted for the OEA by Gershman, Brickner, and Bratton (the GBB report), the "overwhelming majority of collection systems in the region are privately owned and operated." According to the report, 155 municipalities had *open* systems, serving 1,654,273 persons, and 42 municipalities had *organized* systems serving 697,848 persons. At that time, approximately 88 percent of the population in the region was served by private waste haulers (either through open or organized systems), and only three communities (12 percent of the region's population) were served by municipal collection programs.[3]

The conclusions of this report with regard to the distribution of collection systems in the Twin Cities Metro Area holds true eight years later. In December 2001, the OEA conducted a follow-up telephone survey. Twenty Metro Area municipalities were randomly selected from a list of 116 respondents to the 1993 GBB survey. There was a 100 percent response rate. Ten communities were selected from the list of municipalities with open collection systems and 10 were selected from the list of municipalities with organized collection systems. In addition, data from Minneapolis and St. Paul were also collected. Of these 22 municipalities, only one had changed its MSW and recycling collection system—Rockford shifted from an open collection system to an organized one in 1994. This indicates that very few cities have changed from one type of residential collection system to another since the completion of the GBB report in 1994.

## Greater Minnesota residential collection

In December 2001, the OEA conducted a telephone survey of solid waste administrators from the 22 Greater Minnesota counties that contain the 25 Greater Minnesota cities with populations over ten thousand. With the exception of St. Louis County (excluding the WLSSD) where most cities had municipally run collection systems, the survey revealed that almost all of the solid waste collection systems within these counties are privately owned and operated, *not* municipally run. Among the larger cities in Greater Minnesota (population over 10,000), open collection systems were slightly more common.

According to the county solid waste administrators surveyed, a substantial majority of the smaller cities within the counties used an organized collection system. While most of the organized collection systems used private haulers, at least five of the larger cities and a number of smaller ones used municipal crews. Recycling was organized in all counties except one.

| Open collection systems | | Organized collection systems | |
|---|---|---|---|
| Albert Lea | Faribault | St. Cloud | Northfield |
| Austin | Marshall | Mankato | Hutchinson |
| Bemidji | New Ulm | North Mankato | Hibbing |
| Brainerd | Owatonna | Winona | Fergus Falls |
| Cloquet | Rochester | Moorhead | Worthington |
| Duluth | Willmar | Red Wing | |
| Fairmont | Sauk Rapids | | |

[3] *GBB Survey methodology: Municipalities within the Metropolitan Council's jurisdiction (7 counties in 1993) were mailed survey forms. Private haulers were identified through a review of county plans and discussions with county staff, and were also mailed survey forms. 102 municipalities responded to the survey, representing more than 69 percent of the region's total population.*

Due to the fact that there has been no statewide study done on collection systems, more accurate and complete information for Greater Minnesota is limited. The OEA hopes to address this inadequacy in the future.

### Commercial Metropolitan MSW collection systems

The 1994 GBB report also examined commercial MSW and recycling collection systems in the Metropolitan Area. At the time, commercial waste and recyclables accounted for approximately 55 percent of the total regional waste stream and were primarily collected through the private sector. Of the 52 communities identified with organized collection for all or part of their collection services, only 10 municipalities offered organized collection for commercially generated MSW and recyclables.[4]

Based on results of the OEA's follow-up survey, commercial collection systems have followed a trend toward increased privatization over the past eight years. Of the 22 municipalities contacted, four had shifted from organized commercial MSW and recycling collection to open collection systems. Only one of the 22 municipalities, Watertown, continues to use an organized commercial collection system.

# Recycling

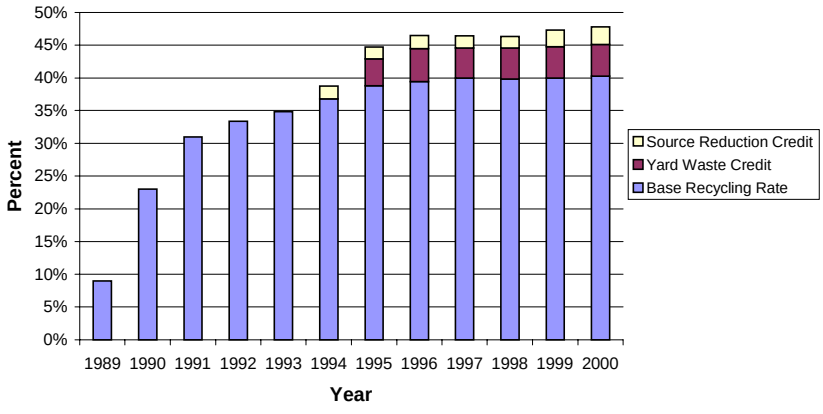
In 1989, the Minnesota Legislature adopted comprehensive legislation based on the recommendations of the Governor's *Select Committee on Recycling and the Environment*, commonly referred to as SCORE. These laws initiated state funding for waste reduction, recycling programs, and yard waste composting through a solid waste management tax. State funds were available for counties that provided at least a 25 percent match of state funds. In 2000, counties have exceeded the required match by a factor of eight.

Recycling tonnages have grown over the past nine years as seen in Figure 2-3 From the early to mid-1990s, this growth exceeded the growth of the waste stream. Since then, even though the average annual growth in recycling tonnage has exceeded 4 percent, recycling has just kept pace with waste growth, as can be seen in Figure 2-4. The recycling rate has plateaued at just below 50 percent since 1996.

Note that the recycling *rate* is very different from recycling *tonnage*. While recycling tonnage has increased steadily over the past decade, the recycling rate has stabilized because growth in recycling tonnage is keeping pace with growth in waste generation.

According to *BioCycle* magazine, Minnesota has one of the highest recycling rates in the nation—second highest rate if yard waste and source reduction credits are included and the sixth highest rate if they are not. Since implementation of SCORE in 1989, Minnesota's recycling volumes have

**Figure 2-4. Minnesota's recycling rate, 1989-2000**




Source: SCORE data (note: 1989-1991 data are for fiscal years)

[4] *GBB report,* Comparative Economic Analysis of MSW and Recycling Collection in the Twin Cities Metropolitan Area, *section II, page 18.*

increased 90 percent even though state funding has stayed level at $14 million since 1991, and the buying power of that $14 million, as measured by the national Consumer Price Index, has declined 21 percent.

This high recycling rate has been Minnesota's greatest success in implementing the state's solid waste policy. Minnesota's SCORE programs and funding, in conjunction with the programs and funding of local government, have been very successful in generating one of the highest recycling rates in the nation, with all associated environmental benefits.

This success indicates that these recycling rates would probably drop in the absence of state programs, and that even higher recycling rates could be obtained with additional funding, if properly focused. Data in the section on waste composition (see Figure 2-9) will show that there is still considerable room to increase the recycling rate just by improving the collection of commonly recyclable products such as paper and cardboard.

*Minnesota's recycling rate consists of 3 different components:*

- *the base recycling rate—tons recycled divided by the total tons of MSW generated*
- *a yard waste credit of up to five percentage points for counties which meet certain criteria regarding the management of yard waste*
- *a source reduction credit of up to 3 percentage points for counties which engage in certain source reduction activities*

### Legislative Auditor Report

A program evaluation report on *Recycling and Waste Reduction* was conducted by the Office of the Legislative Auditor (OLA) and presented on January 18, 2002, before the Legislative Audit Commission. This report (available on OLA's web site at *http://www.auditor.leg.state.mn.us/ped/2002/pe0201.htm)* provided a detailed review of the SCORE program.

The overall conclusions of the report were positive and the OLA concluded that SCORE is an important and generally effective program. However, to help the OEA gauge progress and target future efforts, the OLA made the following recommendations:

1. Determine how best to streamline waste management data reporting and recommend needed statutory changes by the end of 2002
2. Conduct periodic waste composition studies for both commercial and residential waste generators in the Metropolitan Area and Greater Minnesota counties
3. Continue to emphasize evaluation of specific recycling and waste reduction practices and increase efforts to synthesize research results and make them readily available to counties, cities, and other interested parties

# Composting

The recovery of organic materials through composting holds the promise of reducing the amount of mixed municipal solid waste requiring disposal, and the resulting methane emissions from organic waste deposited into landfills. Composting treats waste as a resource, by managing organics in a way that maximizes its highest and best use. In Minnesota, composting activities are divided into three different categories: yard waste composting, mixed MSW composting, and source-separated composting. Activities and progress in each category are discussed below.

## Yard waste composting

In 1994, the last year in which yard waste tonnage figures were collected, Minnesota collected over 400 thousand tons of yard waste, accounting for 9.7 percent of the waste stream. As yard waste was banned from MSW in 1995, except from MSW destined for processing and composting, precise figures on yard waste composting activities are no longer available.

While many other states include yard waste in their recycling calculations, Minnesota does not add the amount of yard waste collected through local programs to the amount of recyclable materials. However, in order to give counties at least partial credit for their yard waste activities, a yard waste credit of up to 5 percent is added to county recycling rates if they engage in certain yard waste collection activities.

The 2000 *MSW Composition Study* showed that yard waste makes up only 2.3 percent of non-recycled MSW in Minnesota.[5] Given yard waste tonnages prior to the ban, and the small percentage of yard waste at landfills or incinerators, it is a near certainty that Minnesota has succeeded in composting millions of tons of yard waste over the past 10 years.

Minnesota's yard waste diversion program is a model of cooperation between the waste industry and various levels of state, county, and municipal government. Roles and responsibilities have been sorted out since the yard waste ban took effect in 1995, with costs usually allocated to generators and billed by the haulers. In some cases, local units of government provided infrastructure and public information.

## Mixed MSW composting

Mixed MSW composting consists of taking MSW to a composting facility instead of to a landfill or incinerator, without source separation of organic materials. The MSW is then processed in order to separate waste into various categories, including recyclables, refuse-derived fuel, organic waste, and non-recoverable residues. The organic portion is then prepared and composted. Four large-scale MSW composting plants were developed in Minnesota. Three of these plants have closed because of problems stemming from odor control, loss of flow control, and cost issues. One facility, serving Martin and Faribault Counties, is still operating. The percentage of MSW going to MSW composting facilities has dropped from its peak of 2.7 percent in 1992 to less than 0.4 percent in 2000.

## Source-separated composting

Source-separated composting occurs when people separate organic waste (such as food and non-recyclable paper), either in their own composting bins, or through a municipally run source-separated composting program. While source-separated composting is more common in Europe (where some nations have banned food waste from MSW just as Minnesota has banned yard waste), it is less common in the United States. However, Minnesota is becoming a leader in the development of local source-separated composting programs, with several successful local government programs. Examples of source-separated programs in Minnesota include one in Hutchinson (see details below), and one by the WLSSD in Duluth.

The extent of source-separated composting that occurs in households is unknown, but there is considerable evidence that households are interested in composting more than just yard waste. The Solid Waste Management Coordinating Board has had great success with its sale of home composting bins in the Metro Area, selling 19,400 bins in 2001 to Metro Area residents, whose demand for the bins has greatly exceeded the supply.

[5] *Statewide* MSW Composition Study, *March 2000, pages 1-11, http://www.moea.state.mn.us/publications/wastesort2000.pdf.*

The source-separated programs that have been implemented in Minnesota have avoided the problems faced by mixed MSW composting programs for several reasons:

- Because of source separation, the quality of the composted product is higher, with fewer contaminants from the rest of the waste stream.
- It is less expensive, partly due to the higher price that can be obtained from the higher quality compost, but also due to lower processing cost. The cost paid by residents of Hutchinson is less now than it was before their composting program was implemented, with the city operating the program at a slight profit.
- The collection systems used by these local governments have not run afoul of constitutional restrictions on flow control, as the government takes ownership of the waste.

### Hutchinson's source-separated organics program

Early in 2001, the city of Hutchinson rolled out its source-separated organics program. This program is possible because the city contracts for the collection of recyclables, compostables, and MSW. It is similar in concept to how most cities conduct recycling collection. Residents and businesses sort recyclables, food and yard waste, and MSW into separate containers for curbside pickup.

The city's contracted hauler collects the compostable material and MSW and delivers them to the compost/transfer station. There the two waste streams are tipped in separate areas on the tip floor. The compostable materials are diverted to the compost facility for processing; and the MSW is loaded into a roll-off trailer for transport to the Spruce Ridge Land disposal facility.

Because the organics—food and yard waste—are source separated, there are few contaminants. The organics need only minimal processing prior to deposition into the in-vessel compost containers, and the resulting compost can demand a higher price. The compost remains in the in-vessel containers for two to four weeks, after which, it is transferred to a compost pad where it completes the compost process.

The city has structured the pricing system to minimize, to the greatest extent possible, the amount of MSW going to land disposal. It has done this by giving price breaks to businesses and residents for recycling and composting. Each of the trucks has a bar code scanner that is used to read the bar codes on the recycling and yard waste containers. This provides the city with an accurate system for tracking participation in the recycling and organics programs. This pricing structure, even with credits, allows the city to operate the program at a slight profit, which is placed in a maintenance and equipment replacement fund. The program is operating at a lower cost to residents and business than the previous recycling/land disposal system.

After only a few months of operation, the program was diverting an estimated 31 to 39 percent of the waste stream that would otherwise have been landfilled. This diversion rate is derived from six months worth of data. The annual diversion rate may be different because of the impact of seasonal fluctuations in waste generation.

The source-separated organics program in Hutchinson is fast becoming a nationwide model for municipal composting programs. If replicated in other cities in Minnesota, the state could make significant strides toward achieving the state's solid waste policy goals of reusing waste in the most appropriate manner, regarding waste as a resource, and diverting MSW from land disposal.

## Policy implications of composting

Minnesota has had considerable success in the composting of yard waste. While mixed MSW composting is becoming a less important method for composting organic materials, the city of Hutchinson and other source-separated composting programs in Minnesota provide viable models for how other cities could

improve their composting of organic materials and thereby better meet Minnesota's solid waste policy goals. These successes in meeting policy goals translate directly into environmental benefits, such as conserved natural resources and less pollution.

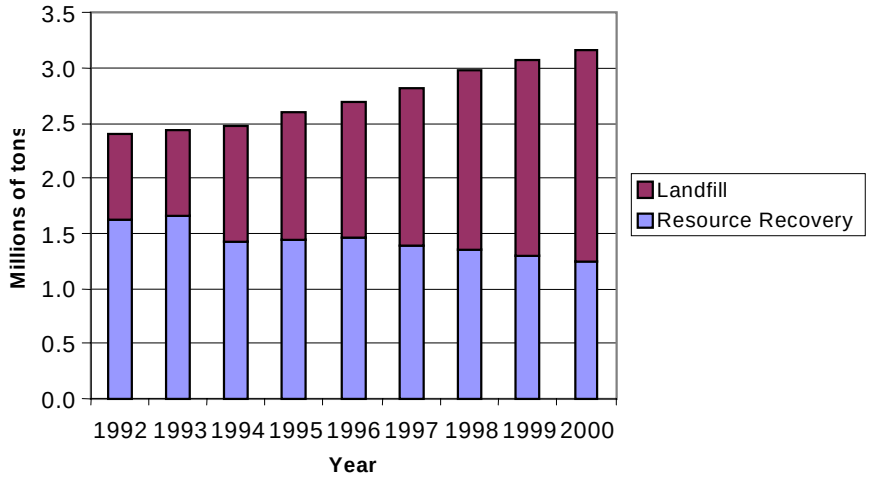
# Waste disposal

The vast majority of waste that is not recycled is either landfilled or sent to resource recovery facilities (waste-to-energy and refuse-derived fuel facilities). While resource recovery ranks above landfilling on the waste hierarchy, and while Minnesota had great success in increasing the amount of resource recovery in the late 1980s and early 1990s, the recent trend in Minnesota since 1994 has been toward *more* landfilling and *less* resource recovery, as shown in Figure 2-5.

The relative decline of resource recovery is even greater, as shown in Figure 2-6, which shows trends in the two primary disposal categories over the past 10 years.

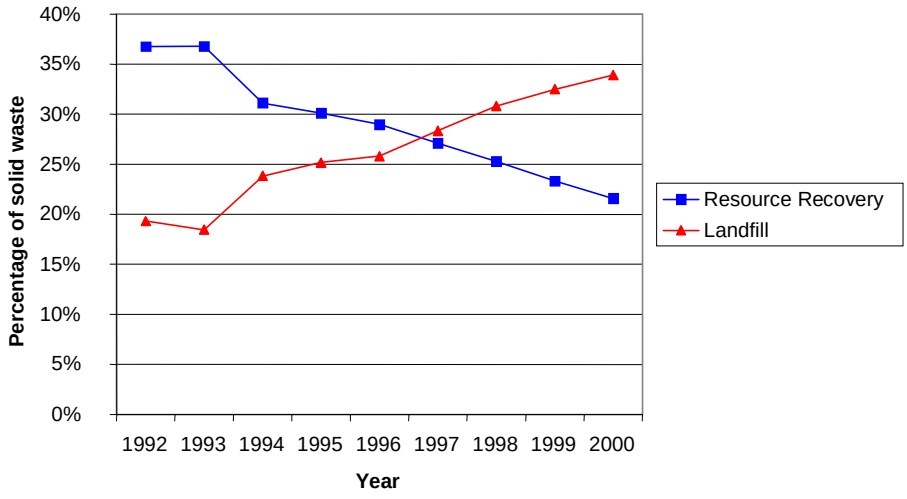
This graph shows that the percentage of MSW being landfilled has increased substantially in recent years, while the percentage being sent to resource recovery facilities has declined, from almost 37 percent in the early 1990s, to less than 22 percent in 2000. Prior to 1994, twice as much waste was being incinerated as was being landfilled. Today, landfilled tonnages now exceed those sent to resource recovery by 50 percent.

**Figure 2-5. Waste disposal trends in tonnages**




Source: SCORE data

**Figure 2-6. Waste disposal trends in percentages**




Source: SCORE data

The reasons for this decline in resource recovery are complex:

- Local government waste designation ordinances have been struck down. Prior to 1994, local governments with resource recovery facilities had the ability to direct waste to their facilities through designation (often referred to as "flow control") ordinances. Designation was deemed necessary because of fears that resource recovery facilities would otherwise find it difficult to compete with landfills, as landfills charged lower tipping fees. In 1994, however, the U.S. Supreme Court issued the *Carbone* decision, which ruled that certain types of designation ordinances are an unconstitutional restraint upon interstate commerce. While the exact definition of what constitutes a restriction of interstate commerce is still being litigated in the courts, local governments in Minnesota effectively lost their power to direct waste to resource recovery facilities.
- While constitutional means do exist for counties to ensure that waste goes to specific facilities (some examples are described in the policy initiatives section of this report, under collection systems), only a few local governments have taken this route.
- Landfills are subsidized through expenditures from the state's landfill cleanup program, which were $12.8 million in fiscal year 2001.
- Cheaper landfill tip fees in neighboring states (partially due to fewer financial assurance requirements) led to a continual drop in the percentage of waste going to resource recovery facilities. This trend is reflected in the above chart.
- The recent state and national trend is toward vertical integration and consolidation in the waste industry.[6] A larger percentage of the waste hauling market is now concentrated in the hands of a smaller number of haulers, and those large haulers have acquired landfills because of their high profit margins.[7] The large haulers can keep the profits within their own companies if they dispose of waste at their own landfills. They therefore have a financial incentive to prefer landfilling to resource recovery in areas where they own landfills.

The loss of revenue for resource recovery facilities has created serious financial problems for the local government and private facility owners who have invested hundreds of millions of dollars in resource recovery facilities. Resource recovery facilities have adapted to these challenges in a variety of different ways. Some resource recovery facilities have been closed, while others have been supported through property tax assessments and/or have undergone drastic operational changes.

The trend toward vertical integration and consolidation in the waste industry has caused concern at the OEA, as well as among some other solid waste stakeholder groups, such as environmental groups, recyclers, and small haulers. The concern is that a vertically integrated company that has both a waste hauling business, as well as a regional monopoly on disposal ownership, can potentially leverage that disposal monopoly into a regional hauler monopoly, by raising landfill fees and driving competing haulers out of business. Because of past environmental, public health, and aesthetic problems with landfills, and the resulting government regulation, the normal market response of increased disposal capacity would not be available. If the landfill-owning haulers were successful in this, they could

[6] *"Trash hauling: Industry consolidation could cost consumers,"* St. Paul Pioneer Press, *October 12, 2001.*

[7] *A recent equity research report on the environmental services industry by a leading financial services company describes landfills as "the big profit center," and "the most profitable segment of the waste management business." The report goes on to state that "while the disposal side of the business only represents between 22-25% of total revenues for the "Big 3," the impact these sites have on total profits is far more significant due to their high operating margins.* ***In fact we estimate that the profits disposal properties generate represent somewhere between 60-70% of the Big 3's total profits*** *(emphasis in original)." Source: "Landfills and Disposal Trends in the Western U.S.: Mountains of Garbage." Raymond James & Associates, December 13, 2000, page 4.*

similarly leverage the resulting hauling monopoly to divert materials from recycling toward landfills, which would be profitable for the companies but would create results counter to solid waste policy goals.[8]

At the present time, this concern is mostly hypothetical, as regional disposal monopolies do not exist in most of the state because of the presence of resource recovery facilities and publicly owned landfills. However, as the financial viability of many of these resource recovery facilities is precarious, particularly in the long run, regional disposal monopolies could become a reality. Minimally, even if the concerns of the OEA, environmental groups, small haulers, and recyclers about regional monopolies prove unfounded, the closure of resource recovery facilities would lead to a substantial reduction in the state's waste disposal capacity, which the laws of supply and demand dictate would result in higher landfill tipping fees.

## Recent events

There are, however, some recent positive trends for resource recovery that are not reflected in the above data. In 2001, the Legislature passed a processing credit, which provides financial incentives for sending waste to resource recovery facilities. This has led to lower tipping fees at resource recovery facilities and has led, at least partially, to higher volumes of waste being shipped to one resource recovery facility.[9] However, as the signed contracts for waste shipment to the facility are only for one year, it remains to be seen whether this will be an indication of lasting change, or a temporary aberration in the long-term decline of resource recovery.

## Policy implications

Events over the past decade have led to a substantial decline in Minnesota's rate of resource recovery, and has left many units of local government with serious financial difficulties as a consequence of trying to comply with state policy. If the state wishes to maintain its preference for resource recovery, and reap the resulting environmental and public health benefits, it needs to reaffirm its support by providing incentives (not necessarily financial) for resource recovery or more flexible tools that local units of government can use as alternatives to flow control mechanisms. This will be discussed in more detail in the "Analysis of Collection Systems" section of Part 3 of this report.

## Waste exports

The increase in landfilling has had other consequences as well for neighboring states. Over the past decade, an increasing percentage of Minnesota's waste has been disposed of in other states, as shown in Figure 2-7.

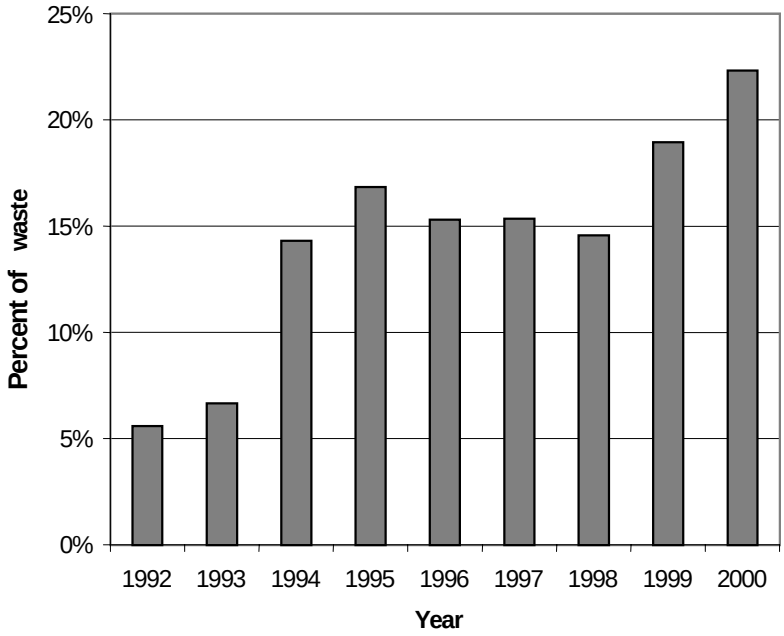
Almost all of the waste exported to other states is sent to landfills, rather than resource recovery facilities. In 2000, over 66 percent of the waste leaving the state was destined for Iowa, with an additional 22 percent destined for Wisconsin. The percentage of Minnesota's non-recycled MSW that is leaving the state has increased from a low of 5.6 percent in 1992 to 22.2 percent in 2000. Very little garbage flows from other states to Minnesota.

[8] *Documentation of examples of these concerns, and a more detailed economic analysis of waste industry incentives, which this paragraph summarizes, can be found in "The Impact of Waste Industry Consolidation on Recycling," from the June 2001 issue of* MSW Management*.*

[9] *"NEWPORT: Waste not, want not; garbage plant's cup overflows,"* St. Paul Pioneer Press, *January 3, 2002.*

This large increase in out-of-state disposal began in 1994, the same year that the U.S. Supreme Court eliminated flow control in the *Carbone* decision. Also during the same time period, the waste industry in Minnesota underwent a wave of consolidation and vertical integration. These events made it easier and created more financial incentives for larger waste haulers to send waste to the landfills they own in

**Figure 2-7. Percentage of waste disposal going out of state**




Source: SCORE data

neighboring states and take advantage of lower tipping fees, which are partially explained by fewer requirements for financial assurance. This trend has caused responses from at least one other state. In 2001, Wisconsin placed a $3 per ton surcharge on landfills. According to press accounts, this was partially in response to waste imports from neighboring states, including Minnesota.

There are three primary arguments for why waste leaving the state is a problem:

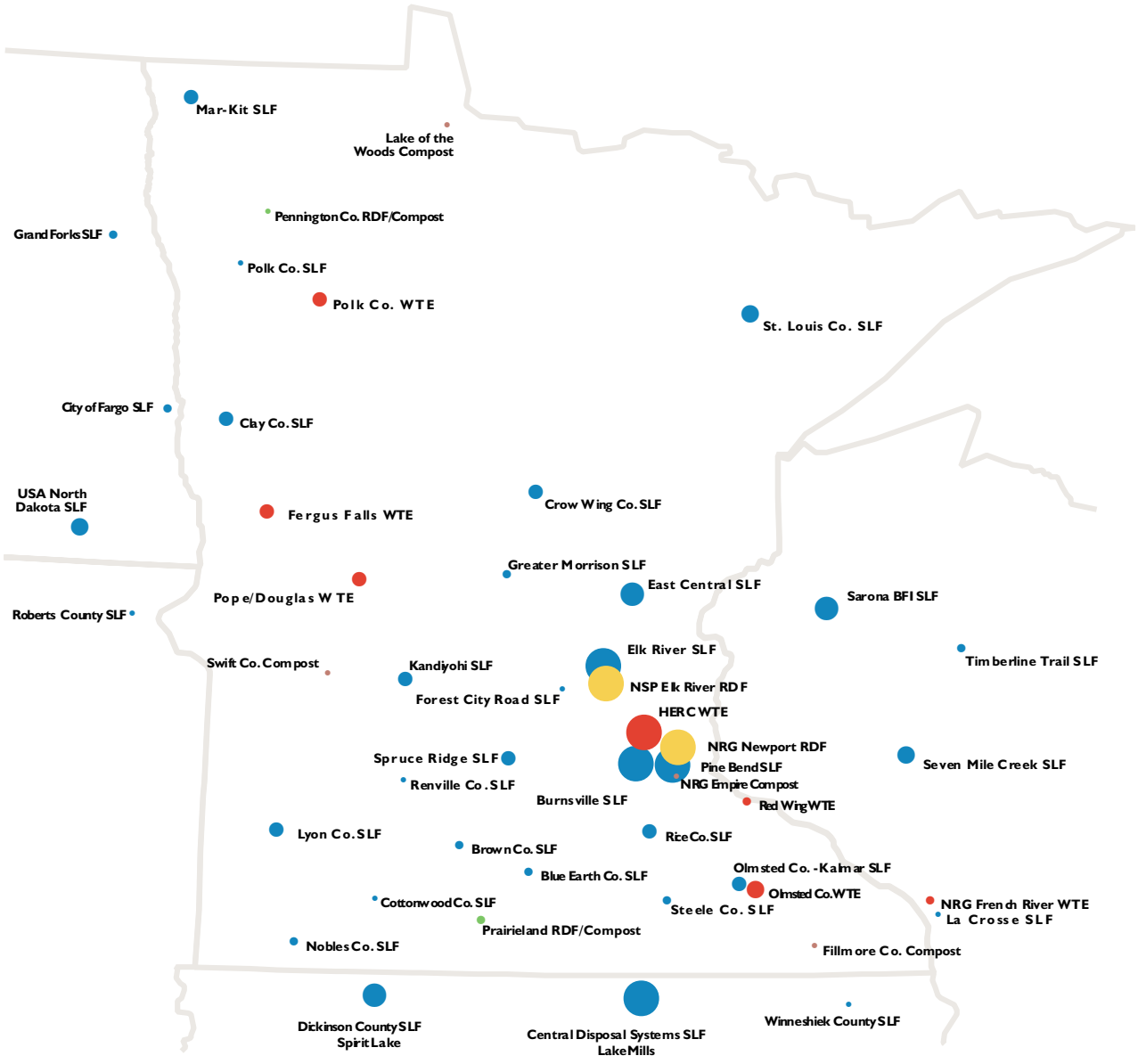
- There is a potential legal and financial liability for Minnesotans if out-of-state landfills leak or become Superfund sites.
- The waste leaving the state is bypassing state solid waste policy, and is therefore not being treated as a resource, or managed in accordance with the hierarchy.
- Waste exports are unpopular with residents and governments of other states.[10]

[10] *"Your trash in their backyard,"* St. Paul Pioneer Press, *October 14, 2001.*

## Facility locations

Figure 2-8 shows the location, the comparative tons of MSW received, and the type of all facilities that received Minnesota's MSW in the year 2000. This map shows that the major disposal facilities are primarily in the Metropolitan Area, northern Iowa, and northwestern Wisconsin.

### Figure 2-8. Facilities receiving Minnesota's MSW in 2000




**Facility Type**

- Sanitary Landfill (SLF)
- Waste-to-Energy (WTE)
- MSW Compost
- Refuse Derived Fuel (RDF)
- Combination Facility

**Tons Received**

- 1-10,000
- 10,000 - 20,000
- 20,000 - 40,000
- 40,000 - 60,000
- 60,000 - 100,000
- 100,000 - 500,000

## Waste composition

The *Statewide MSW Composition Study* examines in detail what Minnesotans throw away as garbage. This study, which was conducted by the R. W. Beck consulting firm at the request of the OEA and the Solid Waste Management Coordinating Board, took samples from landfills, transfer stations, and waste-to-energy facilities around the state to estimate the composition of statewide and regional solid waste. Statewide results, by weight, are shown Figure 2-9.

The percentages in the chart reflect only the material going to recovery facilities and landfills, and do not include recycled materials. While most paper, metals, and plastics are recyclable, this is not true for all subcategories of those materials. Further examination of the subcategories was conducted to identify which materials are commonly recycled or composted. Subcategories were placed into one of three groups:

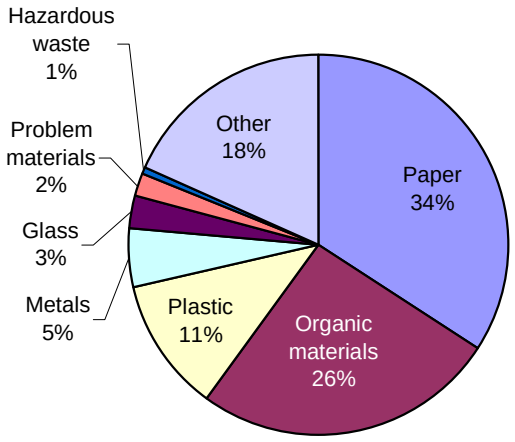
- commonly recyclable
- not commonly recyclable, but compostable
- other (not commonly recyclable or compostable)

The relative proportions of these groups are shown in Figure 2-10. From this figure, we can see that approximately 72 percent of the MSW currently being landfilled or incinerated consists of potentially recyclable or compostable materials.

There are several conclusions that can be drawn from this:

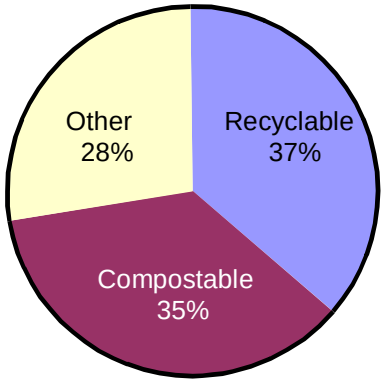
- Comparing the estimated recyclable tonnage remaining in the waste stream to known recycling tonnage demonstrates that Minnesota has succeeded in recycling approximately two-thirds of all waste that is commonly recyclable. This demonstrates the great strides Minnesota has made in recycling since the late 1980s.
- There is still potential for further growth in recycling in the state, as most of the "recyclable" category consists of paper products. If only half of the recyclable materials currently being discarded could be recycled, the state could increase its recycling rate by 11 percentage points.
- It is clear that Minnesotans, except for yard waste, are only composting a tiny fraction of the compostable waste that is generated. Non-yard waste composting totals are very small, yet compostable materials accounted for more than one-third of the discarded waste stream (mostly consisting of food waste and non-recyclable paper).

**Figure 2-9. Minnesota MSW composition, by weight, 2000**




Source: Statewide *MSW Composition Study*, R. W. Beck

**Figure 2-10. Waste composition categories, by weight**




Source: Statewide *MSW Composition Study*, R. W. Beck and the OEA

These conclusions show that there is much more the state could do in treating waste as a resource. Capturing a substantial percentage of these recyclable and compostable materials would go a long way to accomplishing state policy goals, with all the ensuing environmental, natural resource, public health, and aesthetic benefits.

# Other policy successes

The previous sections illustrate the broadest measures of success the state has had in implementing solid waste policy. But there are other successes as well, with results that are not necessarily reflected in these preceding measures. Examples of these successes are: product stewardship, where the OEA has led national efforts to get electronics and carpet manufacturers to take responsibility for the products they make; and the OEA's waste reduction campaign on junk mail, which succeeded in eliminating tens of thousands of Minnesota households from national mailing lists. These and other accomplishments, as well as descriptions of what these programs are planning for the current biennium, are discussed in detail in the appendix.

# Conclusions

While Minnesota has been successful in its high recycling rate, large capacity for resource recovery, and its high levels of yard waste composting, there are still four areas in which much more progress in implementing state policy can potentially be made:

1. Growth in waste generation. Minnesota's waste generation grows at an average rate of over 4 percent per year. There is some evidence indicating that most of this increase in waste is coming from the commercial sector rather than the residential sector.
2. Recyclable and compostable materials are being landfilled or incinerated. Approximately 72 percent of the waste currently being landfilled or incinerated consists of materials that could be put to higher and better use through recycling or composting. Most of this material is office paper, cardboard, non-recyclable paper, and food waste.
3. Landfilling has surpassed resource recovery as the primary method of waste disposal. Despite the preference for resource recovery stated in state solid waste policy, 50 percent more waste is now landfilled than incinerated. Less than 10 years ago, resource recovery tonnages exceeded landfill tonnages by a factor of two.
4. Waste exports to other states. These exports have tripled since the *Carbone* decision, increasing potential liability to Minnesotans as well as bypassing state solid waste policy.

OEA recommendations for how the state can address these problems are discussed in the next section of this report.

## Part 3

# Policy Initiatives

As discussed in the last section, there are four key problems facing the successful implementation of the state's solid waste policy:

- growth in waste generation
- recyclable and compostable materials are being landfilled or incinerated
- landfilling has surpassed resource recovery as the primary method of waste disposal
- waste exports to other states

OEA initiatives to address these problems fall into three categories:

1. OEA's policy and research initiatives
2. OEA analysis of the impact of the choice of collection systems on solid waste policy, along with recommendations
3. An endorsement of the recommendations of three advisory groups

## OEA policy and research initiatives

The OEA is developing several policy initiatives that address the problems with the solid waste system outlined in the previous section.

### Waste reduction and reuse

As the time frame of the waste reduction goal specified in statute has expired, and no new goals have been set by the Legislature, the OEA has set a new waste reduction goal of eliminating per capita growth in waste generation by the year 2010 (for more information, see the Governor's Department Results web site at *http://www.departmentresults.state.mn.us/pca/index.html#8*).

The OEA intends to accomplish this goal with the following strategies:

- Implement two education strategies for waste reduction via targeted campaigns, following the model of the junk mail campaign. Two possibilities are waste-free lawns and smart shopping.
- Target waste reduction in technical assistance. This would involve three primary tasks:
  1. expand on the OEA's research into waste generation (mentioned in Part 2, The Status of Solid Waste) beyond the original five cities for commercial and residential MSW generation trends.
  2. identify the specific sectors of the economy that are creating the greatest increases in waste generation.
  3. increase waste reduction technical assistance to major solid waste generators.
- Provide waste reduction incentives to business, industry, and government. This would first involve considering what incentives to offer to encourage waste reduction, and second what penalties could be implemented if waste reduction does not happen. The OEA will research this during the present biennium.

- In 2000, the OEA, with support from U.S. EPA Region 5, began providing seed funding for start-up of the Minnesota Retired Engineers Technical Assistance Program (Minnesota ReTAP). Through this two-year demonstration project, highly experienced retirees will provide technical advice on waste reduction to state businesses. Based on results from the demonstration phase, OEA will decide on continued funding and expansion of the program.
- Examine the results of these waste reduction strategies over the next year and determine if more is needed to accomplish this goal.

## Business and multi-family recycling

As has been mentioned, there is evidence that most of the recent growth in waste generation has been coming from commercial, institutional, and industrial generators. Previous estimates of the proportion of waste generated by this sector of the economy have been in the 45 to 55 percent range, but it now seems very possible that this is an underestimate of current waste generation patterns. This poses a particular problem because residential generators receive the vast majority of policy attention and funding from state and local government. Because waste disposal costs per unit of volume are much cheaper for commercial generators than they are for residential generators, due to the greater amounts of waste at a given location, this is potentially a high leverage area for state policy or funding.

Increased commercial recycling may represent the best opportunity Minnesota has for substantial increases in its recycling rate. In addition to the expansion of its study of commercial waste generation, mentioned in the previous section, the OEA will also establish a work group to determine the best strategies to increase commercial recycling. This work group will solicit input from cities, counties, nonprofits, and the commercial sector, and present its findings in a report. The OEA will take those findings and develop any recommendations for changes in state law to implement them.

## Organics composting

The OEA supports the development of public and private programs and/or initiatives, including pilot projects, that promote the recovery of organics before they enter the waste stream. According to the OEA's analysis of waste composition data, discussed in Part 2, approximately 35 percent of discarded material consists of compostable organics. The removal of organics from the waste stream supports the concept of treating waste as a resource. As described in the composting section, the city of Hutchinson's source-separated organics program is a cost-effective program for recovering a significant amount of organic material for a higher and better use than landfilling.

Both the Solid Waste Technical Advisory Group and the Citizen's Jury identified composting of organic materials as a priority area. As recyclables, yard waste, and household hazardous waste materials have been removed from the waste stream over the past decades, organics have now risen to 35 percent of the waste stream (see Figure 2-9).

As a result, the OEA has dedicated a staff person to work on improving the organics composting system in Minnesota. That staff person will assist existing composting operations as needed, assist in the start-up of new composting programs, and help develop markets for compost use.

## Research initiatives

In order to better measure the extent to which the state uses waste as a resource, the OEA has two research initiatives planned for the coming biennium.

### Risk assessment and cost-benefit analysis

The OEA will be following up on its 1999 R. W. Beck report with research into the risks, costs, and benefits of the life-cycle impacts of various waste management methods. This report will also look at the life-cycle impacts of the product categories targeted in the OEA's product stewardship plan—electronics, carpet, and paint. The OEA expects to complete the report by the end of the biennium, along with recommended legislative changes.

### Evaluation of problem materials policy

The state currently prohibits certain products from the waste stream in order to eliminate potential air and water pollution from chemicals contained in those products. The OEA plans to evaluate the extent to which these bans have been successful in removing the products, or the presence of certain constituent toxic chemicals or elements, from the waste stream.

# Analysis of collection systems

The choice of collection system has an impact on the ability of local government to meet state solid waste policy goals and to address the challenges faced by Minnesota's solid waste system—growth in waste generation, the leveling off of the state's recycling rate, minimal composting of organics except for yard waste, exports of waste for landfilling in other states, etc. Both the Solid Waste Technical Advisory Group and the State Solid Waste Advisory Committee discussed the policy impacts of changes in waste collection systems.

As such, several counties have recently explored or made changes in their collection systems. In 1998 and 1999, respectively, Stearns and Wabasha Counties implemented changes to their collection systems, and Ramsey and Washington Counties very recently explored the policy implications of different collection systems.

Because of this interest in collection systems, and the potential that the choice of collection system has as a local government tool for implementing solid waste policy, the OEA has devoted this section of the policy report to its research and analysis of various collection systems. This section will address current state law on collection systems and the policy implications of different collection systems.

## Minnesota's organized collection law

Minnesota Statute § 115A.94, which was written in 1987 and last updated in 1993, gives cities and towns the authority to organize solid waste collection. According to the law, cities or towns must provide 180 days notice before implementing an ordinance or a contract for organized collection. There are a number of steps to follow in the process:

- The city or town must give notice of a public hearing at least two weeks in advance of the meeting.
- After the hearing, a resolution of intent must be adopted.
- The city or town develops plans or proposals for organized collection with the input of all interested parties for a period of 90 days after the resolution of intent.
- For another 90 days after the end of the planning period, the city or town must discuss arrangements with all licensed collectors operating in the city or town who have expressed interest.
- If the parties are unable to agree on an organized collection arrangement, the city or town may propose implementation of an alternate method of organizing collection.

- Finally, the city or town must describe the procedures it used for planning and implementation, evaluate the process and outcomes, and provide notice of all proceedings upon request.

## Assessment of the law

The law has been described, in interviews with local government and legal experts in waste collection, as complex and very prescriptive in the planning and negotiation process. These experts have indicated that the law should be updated to make it easier and more efficient for counties to work with cities and towns to implement organized collection. At least partially due to the complexity of the process and the political obstacles it creates, the OEA has found no city that has followed this process to implement organized collection.

The OEA has heard from some counties that the law creates a long, cumbersome process due to the timeline that must be followed by communities. Ramsey County estimated that the process would take about 26 months for a county that follows the statute.

Another complaint with the statute is that counties' authority to implement the process to organize collection is unclear. Subdivision 5 of the statute acknowledges a county's authority to require organized collection, but does not provide explicit details on the procedure and process of working with a city or town to organize collection. For example, there is no authority provided to set a deadline for local compliance. If a city chooses not to comply with a county ordinance, the county has to start the entire organized collection process from the beginning, as required by law.

## Case studies

Minn. Stat. § 115.94, subd 6, does not require the organized collection statute to be used to organize collection, saying "the authority granted in this section to organize solid waste collection is optional and is in addition to authority to govern solid waste collection granted by other law." As a result, two Minnesota counties have opted to use other legal authority to change their collection systems. Stearns and Wabasha Counties have used Minn. Stat. § 400.08 and the Local Public Health Act (chapter 145A) to provide authority for their countywide ordinances which establish that the county assumes control of solid waste collection, delivery, and disposal. However, the two counties implemented organized collection in different ways, and for somewhat different reasons.

### Stearns County

In April 1998, two ordinances relating to municipal solid waste collection went into effect in this central Minnesota county. Haulers sign a contract with the county that requires them to make deliveries to the county's designated disposal destination. By taking ownership of the waste, the Stearns County system should avoid the legal problems of flow control from the *Carbone* decision. No legal challenge to the ordinances' constitutionality has been made since the law went into effect in 1998. The private haulers compete for residential and commercial business almost anywhere in the county. Haulers bill collection services, although an uncollected bill can be turned over to the county, and haulers are responsible for paying the tipping fees at the disposal site. Approximately 10 haulers contract with the county, and others contract through the tri-county solid waste commission.

The ordinance provides exceptions for cities that already had collection systems in place that fulfilled the county's waste goals. For instance, St. Cloud uses municipal crews to collect MSW and recyclables.

Stearns County gave the following reasons for implementing the countywide ordinance:

- The county wanted to eliminate a property tax surcharge previously used to subsidize tipping fees.
- The county wanted to fulfill its contract with a local waste-to-energy facility.
- There were concerns about illegal dumping throughout the county.

Stearns County's collection system is a good example of a hybrid organized and open system. The system does not grant exclusive rights to collection routes, as most organized systems do, but does designate waste destinations, unlike most open collection systems post-*Carbone*.

#### Wabasha County

In 1999, Wabasha County enacted an ordinance to establish regional solid waste collection districts within the county and to determine the method of collection for each district. The county was divided into seven solid waste districts. Haulers sign a contract with the county, which gives them exclusive access to a district and specifies where the solid waste is to be delivered.

The stated reasons for implementing the ordinance are:

- to provide collection in a cost-effective manner
- to reduce the impact of transportation on county roads
- to reduce the county's financial and environmental long-term liability
- to ensure commitment to the County Solid Waste Management Plan and the state of Minnesota's solid waste management hierarchy

## Policy implications

The choice of collection system has potential ramifications for a host of different policy issues:

- solid waste policy
- impacts on local government finances
- environmental and social impacts
- consumer choice and competition

Each of these potential impacts, and an assessment of the extent to which these potential impacts exist in Minnesota, will now be discussed.

### Solid waste policy

The choice of collection system can have a significant impact on the ability of local governments to implement state solid waste policy.

As we saw in Part 2, The Status of Solid Waste, while the state has made great strides in recycling and yard waste composting, Minnesota has not been as successful in encouraging resource recovery and the composting of other organic materials. In fact, since flow control was struck down in the 1994 *Carbone* decision, and consolidation and vertical integration has increased in the waste industry, the share of the waste stream going to resource recovery has been declining, resource recovery facilities have faced financial difficulties, and more waste is now landfilled than incinerated. Given the higher ranking of resource recovery and composting on the waste hierarchy, and that the Legislature has stated its intent to ensure "orderly and deliberate development and financial security of waste facilities including disposal facilities," the loss of flow control has had a clearly detrimental impact on state solid waste policy.

Choosing a different collection system can potentially give local governments the ability to better meet the goals of solid waste policy, as local governments can then direct waste to its highest and best use, such as to resource recovery or composting facilities, without running afoul of the *Carbone* decision on flow control. The courts have upheld the constitutionality of organized collection systems when local governments act in a proprietary rather than governmental capacity—meaning that local government accepts *ownership* of the waste, instead of seeking to control its destination through regulation without

taking ownership. Additionally, municipalities can alleviate the problem of waste exports to neighboring states through organized collection.

### Hutchinson's source-separated organics program

Other potential impacts of collection system choice on state policy goals can be seen by looking at the recent creation of a source-separated organics program by the city of Hutchinson. The details of this program were discussed earlier in the report.

The relevance of the Hutchinson program with regard to collection systems is that Hutchinson could not have designated waste to its organics composting facility under a purely open collection system, without taking ownership of the waste. Curbside composting is not available under any open collection system in the state, even though the high participation rates in Hutchinson indicate that many residents want it.

## Financial impacts

According to the 1994 GBB report, "organized collection systems were characterized by lower charges to residential customers."[11] The following table shows higher average charges under open MSW collection systems than under organized systems for all categories of containers.

### Figure 3-1. Average regional residential MSW collection charges in 1993 ($/household/month)

| Container size | Organized systems | Open systems | Percent difference |
|---|---|---|---|
| 30-gallon | $12.12 | $13.72 | 13.20% |
| 60-gallon | $14.78 | $16.08 | 8.80% |
| 90-gallon | $15.69 | $18.25 | 16.32% |
| More than 90-gallon | $19.14 | $20.01 | 4.55% |
| Median | $15.23 | $17.16 | 16.61% |

The difference in charges varied among Metro counties and with the container size, but in every county and for each container size, organized collection was less expensive than open collection, with the median value of the price difference being 16.6 percent. This is not to say that open collection systems were more expensive than organized collection in *all* cities, as there were a few exceptions.

The economics of the waste industry have changed considerably since the 1994 study (primarily due to vertical integration, consolidation, the *Carbone* decision, and lagged effects of federal landfill regulations), and it would therefore not be possible to conclusively state that the same difference in price exists today, without a new study. However, the 1994 GBB study represents the most systematic comparison of the cost of collection systems done to date for the Twin Cities Metro Area. At a minimum it shows that open collection systems are not necessarily less expensive—they can be *more* expensive.

An additional cost of open collection that does not show up on residential garbage bills is the increased cost of road maintenance caused by extra truck traffic on residential streets. MnDOT data state that a MSW collection vehicle has a road impact equivalent to 1125 automobiles.[12] According to MnDOT, weekly traffic on minor residential streets is in the 4200 to 7000 range,[13] this means that just one collection vehicle represents a significant proportion of vehicular wear on residential streets. If the street is served by multiple haulers, as is common in the Twin Cities Metro Area, this can quickly add up to a

[11] *GBB, Part III, page 2.*
[12] *As cited in the* City of Chanhassen Organized Collection Study Final Report, *September 1993, page 20.*
[13] *Ibid, page 21.*

substantial percentage of the vehicular wear being caused by MSW collection vehicles on many residential streets. This can have a significant impact on the costs of local road maintenance.

## Environmental and social impacts

Environmental and social impacts of choice of collection system are grouped in three broad categories:

- Environmental benefits of state solid waste policy goals. The ability under organized collection systems to have greater control over the destination of waste will also yield the greater environmental benefits associated with following state solid waste policy. For instance, diverting organic materials from landfills to composting or resource recovery facilities can yield the life-cycle environmental benefits documented in the OEA's 2000 Greenhouse Gas Report done by R. W. Beck, such as reduced natural resource extraction and the reduced emissions of certain pollutants. The Hutchinson model mentioned previously is one use of organized collection that yields these benefits. The city of Minneapolis' periodic collection of electronics, which remove certain toxic materials from the waste stream, is another.
- Emissions. Emissions and oil leaks from collection vehicles are greater when more than one vehicle is serving the same route. Collection vehicles get low gas mileage, and multiple trucks running partially duplicated routes generate higher emissions of these pollutants, which are linked to public health problems.
- Other environmental and social impacts. Multiple trucks providing collection services on the same streets create more noise pollution. Noise is a frequent residential complaint about waste collection, as it tends to occur in the morning hours. Additional concerns are the greater ability to control traffic, illegal dumping, litter, and the appearance of residential neighborhoods.

## Consumer choice and competition

Open collection systems usually allow more consumer choice than in most organized collection systems. If residents are not happy with their hauler, they can switch at will. Under most organized collection systems, they do not have this option (although some organized systems have been configured so that consumers maintain their choice of haulers, although this means that more than one hauler is potentially running the same route). This limitation can be exacerbated in a "low bid" contracted system, if the winning company chooses to reduce its price at the expense of service.

Additionally, many small haulers believe that organized collection systems make it very difficult for them to stay in business. Their concern is that while larger haulers can absorb the risk of losing a collection contract by bidding in a sufficiently large number of municipalities, smaller haulers lack their capacity to spread this risk. Also, smaller haulers have claimed that they have trouble competing with larger haulers on price—that they tend to compete more on quality of service and relationships with customers. In the "low cost bid" process commonly found in public contracting, they fear that their strengths will be ignored. As support for their claims, they point to the dominance of larger haulers in the organized collection market for recycling. If smaller haulers indeed leave the market, this could affect the prices in organized collection contracts, as there may be less competition for contracts.

However, these potential problems can be avoided by going through a well-designed contracting process. Few contracts are based solely on price, and many cities have well-designed performance-based contracts that create incentives for service, provide accountability, and allow for the strengths of smaller haulers.

A case study is the recent contracting process in the city of Shakopee. Shakopee used a proposal instead of a bid system, with the contract containing better performance incentives than were used in their previous contract. A smaller hauler ended up winning the contract, even though it did not have the lowest-cost proposal. Survey results show higher customer satisfaction and a dramatic decrease in customer complaints to the city about the hauler. The lesson is that an organized collection system can yield high

levels of customer satisfaction while maintaining market share for small haulers, so long as the contracting process and the contract itself are well designed.

Additionally, smaller haulers will find it easier to stay in the market if there are a larger number of collection districts for which contracts are available. This can be done by breaking up larger cities into collection zones, or organizing collection at the county level, with the counties potentially creating districts that cross city boundaries.

## Conclusions

Minnesota's organized collection law is outdated and should be amended to reflect today's solid waste management system. New collection strategies available to local governments demonstrate the potential to be less expensive than existing collection systems while remaining competitive. These strategies also support the policy that waste contains resources that should be managed by methods that maximize the highest and best use of those resources.

The choice of a collection system is critical to local government success in meeting the goals of the Waste Management Act while having the potential to have a positive impact on other public policy areas as well, such as environmental policy, hauling costs, and local government finances. The OEA encourages local governments to explore organized collection strategies as a tool that can be used to support the responsible management of waste. OEA intends to work with local governments to develop model organized collection ordinances.

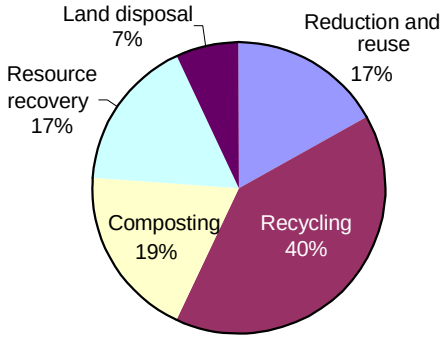
# Advisory group recommendations

Three major efforts were undertaken in 2000-2001 in order to develop recommendations to improve the solid waste system: the Citizen's Jury, the Solid Waste Technical Advisory Group, and the Solid Waste Advisory Committee. Each of these advisory groups examined the state's solid waste management system and developed recommendations for improving the system. The OEA supports the most significant recommendations that emerged from these three projects.

## Citizen's Jury

In June of 2001, the Solid Waste Management Coordinating Board (SWMCB) contracted with the Jefferson Center to conduct a Citizen's Jury on Metropolitan Solid Waste. Eighteen Metro Area citizens were chosen from a randomly selected jury pool to hear expert witness presentations on a range of solid waste issues. The jury then deliberated the various proposals, as well as the current waste hierarchy, and developed recommendations for managing the Metro Area's solid waste, including strategies such as source reduction, reuse, recycling, composting, resource recovery, and landfilling.

**Figure 3-2. Citizen's Jury recommended strategy**




Source: Citizen's Jury on Metro Solid Waste report, p.16

Each juror recommended percentage goals for

each of the state's waste major waste management practices. The recommended goals were then averaged. The results, shown in the Jefferson Center's report,[14] are reproduced in Figure 3-2.

The Citizen's Jury recommendations strongly support the goals of the waste hierarchy. In fact, the Citizen's Jury recommended that much more should be done to shift waste practices higher up the hierarchy, with less landfilling, more composting, and more source reduction. This is consistent with the state's solid waste policy as contained in the Waste Management Act, the recommendations of this report, and the use of waste as a resource.

## Technical Advisory Group

A key recommendation in the *2000 Solid Waste Policy Report* was to "research and analyze the solid waste system to develop specific strategies to conserve and recover resources." In 2001, the governor appointed a Solid Waste Technical Work Group to accomplish this. This 27-member group met early in 2001 and was comprised of varied stakeholders of Minnesota's solid waste system. Their charge was to analyze the solid waste system and develop recommendations for improvement. The work group forwarded ten recommendations to the Governor's Solid Waste Advisory Committee for their consideration as they continue this process to increase conservation and recovery of resources.

The Solid Waste Technical Work Group's recommendations are as follows:

- Provide incentives for organizations that make investments in environmental products, processes, and technologies, or in marketing programs, to reduce, reuse, recycle or reduce toxicity.
- Recommend the creation of partnerships among government, corporations, higher educational institutions, and nongovernmental organizations to research and collect data, to improve the understanding of life-cycle costs, and to develop new product and processing technologies.
- Provide tools to influence the flow of waste to protect Minnesota's environmental and public health.
- Increase the use of incentives (tools) to protect the environment.
- Change MPCA rules to recognize source-separated composting, and provide incentives to encourage the reduction of organics sent to landfills or resource recovery facilities, and to divert them to composting or other higher or better use.
- Provide flexibility in policy because one size does not fit all, specifically with respect to Metro Area and Greater Minnesota counties.
- Increase the funding levels to counties to meet the current SCORE requirements, specifically reduce, reuse, and recycle.
- Enable OEA to be a strong stable advisory body to develop and recommend policy with the involvement of industry, local governments, nongovernment organizations, businesses, and citizens.
- Explore container deposit program to determine if it would significantly increase total container recycling without undermining other existing recycling programs.
- Recommend a periodic, ongoing process with stakeholder involvement to continue this work and to evaluate the success of new programs developed from recommendations in this report.

## Solid Waste Advisory Committee

Following the work of the Citizen's Jury and recommendations of the Systems Mapping group, a task force was formed to conduct the second phase of the waste industry analysis. This group was made up of

[14] *Available online at http://www.jefferson-center.org/metro%20solid%20waste.htm.*

waste generators, haulers, processors, recyclers, landfill operators, local government staff, and legislators. They met from October 2001 to January 2002 to outline the options that the state might adopt to develop a fully integrated waste management system that would be able to handle the state's growing waste stream.

The recommendations of the state's Solid Waste Advisory Committee were presented to the chairs of the House and Senate Environment and Natural Resource Policy Committees in February 2002. The recommendations are in three parts: a restatement of the principles established by the Legislature in Minn. Stat. § 115A.02, the need to develop goals for the state's waste management system, and specific recommendations on items that need changes. The recommendations are contained below.

## Restatement of principles of the Waste Management Act

The Solid Waste Advisory Committee reaffirmed the concepts embodied in Minnesota's integrated waste management system as outlined in Minnesota statute. The committee also reaffirmed that the fundamentals of the waste management hierarchy are based upon reduction of waste and toxicity, reuse of materials, recycling, and source-separated compostable material. In addition, the committee made the following recommendations:

- Waste as a resource. Amend Minn. Stat. § 115A.02 to reflect the belief that we should treat our waste as a resource:

  (a) It is the goal of this chapter to protect the state's land, air, water, and other natural resources and the public health by treating our waste as a resource and by improving waste management in the state to serve the following purposes…

- Source-separated compostable materials. Amend Minn. Stat. § 115A.02 to clearly indicate that source-separated compostable materials are comparable in priority to food and yard waste composting.

- Flexibility in the hierarchy. Amend Minn. Stat. § 115A.02 to permit sufficient flexibility in the application of the hierarchy to allow for pilot projects testing new technologies that involve other processing and bioreactor landfills options and explore ranking them as preferable to landfilling with no methane recovery.

- Integrated waste management system. Define integrated waste management as follows:

  "Integrated waste management system" means the systematic, coordinated management of solid waste that incorporates multiple processes and technology in a manner that:

  (1) Enables the state to meet the waste management goals established in section 115A.02, paragraph (a), and reflects the waste management hierarchy established in section 115A.02, paragraph (b);

  (2) Seeks to match waste management processes and technologies with particular waste streams in a manner that most appropriately fits the characteristics of those waste streams; and

  (3) Optimizes the design and utilization of those processes and technologies through the comprehensive analysis of all reasonable alternatives, so as to minimize the cost of managing waste appropriately while maximizing the public health and environmental benefits.

## Goals for the waste management system

By January 1, 2003, the Minnesota Office of Environmental Assistance, in consultation with the stakeholders group, should develop statewide five-year goals to improve the management of solid waste, consistent with an integrated solid waste management system.

## Specific recommendations

- Require the various agencies involved in the waste management system to improve data collection such that accurate year-to-year comparisons can be made and trends can be identified in a timely manner.
- Provide reporting consistency among state agencies to avoid overlap as much as possible.
- Require that state agencies rely upon the successful models from previous programs to build future programs and policies and avoid additional investment in programs that have not been as successful.
- Dedicate 100 percent of the revenue generated by the Solid Waste Management Tax to waste management purposes.
- Support the OEA and MPCA as two necessary and distinct agencies that protect Minnesota's environment.
- Support and extend the Office of Environmental Assistance's work on product stewardship including its work on the proper management of consumer electronics. In addition, the state should explore additional tools as necessary to address the problems of product stewardship as it relates to consumer electronics.
- Recommend a periodic ongoing process that includes legislators and stakeholders to evaluate solid waste governance and finance matters. (The OEA anticipates establishing the stakeholder group during the first and second quarters of 2002.)
- By January 1, 2003, the MPCA should prepare a report on the issue of long-term liability for public and private landfills in Minnesota and out of state.

## Appendix 1

# Recent Accomplishments

Since the *2000 Solid Waste Policy Report* was published, the OEA has made some progress in meeting the state's goals by continuing to implement effective programs. These programs include:

- SCORE
- product stewardship
- Capital Assistance Program
- waste reduction campaign
- pollution prevention and toxicity reduction
- multi-state solid waste summit
- county solid waste planning
- consolidated grants
- recycling market development
- state agency waste reduction, reuse, and recycling
- environmentally preferable products
- environmental information and outreach
- green buildings
- sustainable communities

The following is a summary of those accomplishments and how they relate to Waste Management Act's environmental goals and the waste hierarchy, as outlined on page 5.

## SCORE program

A key part of Minnesota's integrated waste management system has been the establishment of recycling programs and disposal options that increase the recovery of resources from waste, reducing the state's reliance on landfills. Statewide recycling efforts began in earnest in 1989 when the SCORE laws were adopted (see the discussion of recycling on page 16). This set of laws initiated state funding for programs for recycling, waste reduction and the improved management of household hazardous wastes, yard wastes, and problem materials. SCORE funds also provided the basis for local programs that are long-term and flexible. (See the *Report on 2000 SCORE Programs* for highlights of the main components of SCORE—source reduction, recycling, waste management and waste generation.)

Counties, in partnership with cities, townships, and other local units of government, work to implement the goals of the SCORE program through the Solid Waste Management Planning Process. In addition, all 87 Minnesota counties and the Western Lake Superior Sanitary District (WLSSD) submit annual surveys to the OEA. Information from these surveys helps determine the state's recycling rates and details trends in waste generation and disposal. In the last decade, the statewide recycling rate has more than doubled between 1990 and 2000—from a recycling rate of 23 percent in 1990 to the rate of nearly 48 percent in 2000. Throughout the state in 2000, recycling programs collected almost 2.3 million tons of recyclable materials—paper, metals, glass, plastic, food, and more.

Minnesota's 2000 recycling rate consisted of a 40.3 percent base recycling rate (percentage of MSW that was recycled), plus a 4.8 percent average yard waste credit, and a 2.7 percent average source reduction credit,[15] yielding a final state recycling rate of 47.8 percent. This places Minnesota second in the nation when the yard waste and source reduction credits are included.

[15] *The yard waste credit consists of up to five percentage points for counties that meet certain criteria regarding the management of yard waste. The source reduction credit consists of up to 3 percentage points for counties that engage in certain source reduction activities.*

## SCORE report highlights

For 2000, counties reported the largest increases in recycled tonnage for polystyrene, PET (polyethylene terephthalate, a very common type of plastic), electronics, and various grades of paper, most notably office paper.

- Total tons of polystyrene collected for recycling increased to over 2,600 tons in 2000, a 1400-ton increase from 1999 (118 percent).
- PET increased similarly (107 percent), growing from 1,300 tons in 1999 to over 2,700 in 2000. Increases in plastics and polystyrene recycling can be attributed to several factors, including increased capacity and demand, and education efforts such as those spearheaded by America Recycles Day.
- Collection of electronics once again increased significantly (73 percent) going from 1,500 tons in 1999 to over 2,700 in 2000. Electronics recycling also more than doubled the previous year from 1998 to 1999 in part due to increased collection events, local electronics programs, and partnerships with industry.

## Per capita recycling

Minnesotans recycled 922 pounds per person in 2000, an increase of 3 percent from 1999. While the tons of material collected for recycling continues to rise each year (over 4 percent between 1999 and 2000), the level of increase has remained fairly steady. Per capita recycling has increased by 35 percent since 1991 with gains leveling out over the last few years (matching the trend in overall tons recycled) at about 2 percent in 1999 and 2000.

## Commercial recycling

The commercial, industrial, and institutional sector was the source of 75 percent of the recyclable materials collected in Minnesota in 2000—1,669,544 tons. This is an increase of just over 40,000 tons from 1999. As was stated in the waste generation section on page 12, the OEA sees commercial recycling as a source of potential growth in the recycling rate. The OEA's plans in this area are discussed in Part 3, Policy Initiatives.

## Environmental Benefits

The recycling efforts of Minnesota residents and businesses have a positive impact on the environment, through cleaner air and water, avoided material consumption and energy consumption, more forested land and open space, and reduced greenhouse gases. By inputting Minnesota's SCORE recycling data for 2000 into the environmental benefits calculator developed through a partnership with Recycling Association of Minnesota and the National Recycling Coalition, these environmental benefits can be quantified. The following is a summary of some of the measured benefits:

- Recycling in Minnesota conserves energy. The 1.34 million tons of paper, glass, metals, plastic, and other material recycled in 2000 saved a total of about 22 million BTUs of energy, enough energy to power nearly 220,000 homes for one year. In addition recycling also resulted in reduction of net greenhouse gas emissions of approximately 930,000 tons.
- By using recycled materials instead of trees, metal ores, minerals, oil, and other raw materials harvested from the earth, recycling-based manufacturing conserves the world's scarce natural resources. For example material consumption of natural resources for making steel was reduced by approximately 490,000 tons as a result of Minnesota's recycling efforts.
- Recycling in Minnesota reduces air and water pollution. Last year, recycling reduced overall emissions (excluding carbon dioxide and methane) by around 36,000 tons. In addition, waterborne waste was reduced by almost 6,000 tons.

# Product stewardship

A key to attaining long-term waste reduction and resource conservation is to encourage manufacturers, retailers, and consumers to think differently about the products they make, buy and use—to treat products as *resources* rather than waste. Minnesota is the first state to develop and implement such a product stewardship policy.

The OEA's policy seeks to reduce the environmental impacts of manufactured products throughout their life cycles in an economically efficient and environmentally beneficial manner. The OEA is developing partnerships and initiatives with manufacturers and retailers to create recovery and recycling systems and to promote innovative product design and manufacture. In addition, by sharing the costs of recycling products, manufacturers have an incentive to use recycled materials in new products and to design products to be less toxic and easier to recycle, incorporating environmental concerns into the earliest phases of product design.

***Product stewardship** means that everyone involved in designing, manufacturing, selling and using a product takes responsibility for the environmental impacts at every stage of that product's life. In particular, product stewardship asks manufacturers to design and manufacture environmentally responsible products, as well as to share in the financial and physical responsibility for recovering and recycling products when people are done using them.*

## Priority products

The OEA decided to first address carpet, electronic products that contain cathode ray tubes, and paint within a product stewardship framework. These were chosen based on factors such as toxicity, volume discarded, and potential for increased recycling.

### Carpet

In February 2000, the OEA, with the states of Minnesota, Iowa and Wisconsin, convened the Midwestern Workgroup on Carpet Recycling to explore product stewardship opportunities for discarded carpet, which currently accounts for at least 77,000 tons, or 2.4 percent, of the municipal solid waste stream in Minnesota. The work group was composed of manufacturers, retailers, recyclers, local governments, U.S. EPA, and representatives from environmental advocacy organizations. In January 2001, they signed an agreement to create a third party, industry-funded organization, CARE, (Carpet America Recovery Effort) that was charged with developing national collection and recycling programs for used carpet and is responsible for achieving the work group's reuse and recycling goals. Nationally, less than five percent of carpet is recycled, even though nylon fiber, the most commonly used component of carpet, can be used in a wide variety of value-added applications (see sidebar).

The Midwestern Workgroup also began work on the development of model

### Carpet recycling in Minnesota

*Nylon Board Manufacturing (NBM) is currently the only facility in Minnesota that is recycling carpet. Located in Medford, Minnesota, NBM will produce Ny-Board, an extruded 4' x 8' sheet of plastic resin made from recycled carpet. This plastic sheet, a substitute for plywood, will be produced primarily for the construction industry. The company expects to begin production in the first quarter of 2002. At full capacity, the Nylon Board Manufacturing facility will be able to recycle 12,500 tons of carpet annually.*

*Initially, NBM will process only two types of carpet face fiber, Nylon 6,6 and Nylon 6, which make up approximately 70 to 80 percent of all carpet fiber. As their product line and manufacturing capabilities expand in the future, the company's ability to process other types of materials will also increase.*

*For further information on carpet recycling, visit the OEA Web site at* http://www.moea.state.mn.us/carpet.

procurement guidelines to be adopted by public entities. These guidelines will support the development of environmentally preferable carpet products as well as emphasize reclamation and recycling programs. The guidelines are expected to be completed and available in 2002.

On January 8, 2002, the OEA along with seven other states, U.S. EPA, and the carpet industry signed a Memorandum of Understanding for Carpet Stewardship in Atlanta, Georgia. This national agreement, the first of its kind, establishes a ten-year schedule of recovery and recycling goals for carpet and assigns responsibility for meeting those goals to the carpet industry. The agreement also stipulates an evaluation and performance measurement procedure, and ultimately calls for establishing goals beyond 2012. The agreement concludes a two-year dialogue and negotiations process with the carpet industry to develop a product stewardship-based approach to managing carpet.

### Electronics

A 1999 study by the National Safety Council estimates that nearly 500 million computers will become obsolete between 1997 and 2007. Unfortunately, few old household electronic products are recycled; most are either in storage or are thrown in landfills. Electronic products with cathode ray tubes (CRTs), such as televisions and computer monitors, contain lead and other heavy metals that are toxic if released into the environment. They also contain valuable glass, metals, and plastics that can be used to make new products, rather than wasted.

The OEA's product stewardship work on electronics has evolved from a state initiative to a national one. In 2000, the OEA, working with local governments, retailers, recyclers and manufacturers, concluded several state-level efforts focused on electronics. These projects and pilot programs are interim measures that provide useful information and experience to help achieve the state's waste reduction goals. They are important steps toward establishing a statewide collection and recycling system for electronics that shares responsibility and costs among the consumers and producers of the products.

In early 2001, the OEA helped launch a national product stewardship initiative for electronic products involving the electronics industry, federal, state and local governments, national environmental and recycling organizations, and electronics retailers and recyclers. The goal of this negotiated process is to develop a national collection system for electronics.

Task Force on Electronic Products Containing Cathode Ray Tubes (CRT Task Force). The OEA and the Solid Waste Management Coordinating Board of the Metropolitan Counties convened the CRT Task Force, which included electronics manufacturers, retailers, recyclers, and local and state government representatives. The task force met from September 1999 to October 2000 to explore collection, recycling, and financing options for managing old electronic products.

In 1999, OEA formed a partnership with Sony Electronics, Panasonic, Waste Management's Asset Recovery Group, and the American Plastics Council to conduct a statewide collection and recycling project for used residential electronics. *Recycling Used Electronics: Report on Minnesota's Demonstration Project*, is available on the OEA's web site at *http://www.moea.state.mn.us/plugin/report.cfm.*

Takeback programs. In October 2000, the OEA's product stewardship initiatives for electronics resulted in a landmark agreement between the state of Minnesota, Sony Electronics, and Waste Management Inc. to recycle all Sony products collected from Minnesota residents. To date, Waste Management has named 13 sites in central and southern Minnesota where residents can drop off Sony products for recycling free of charge.

Minnesota-based electronics retailer Best Buy conducted a collection event at a Best Buy store in Woodbury, Minnesota, in September 2000 in partnership with Washington County. In 2001, Best Buy announced a national collection program for old consumer electronics, and started their national program with three collection events in Minnesota.

Recycling Engineering Plastics Project. The OEA was awarded a small grant from U.S. EPA Region 5 in late 2001 to explore the barriers to, and opportunities for, the recycling engineering plastics from used electronic products. The project planners seek to advance the establishment of closed-loop recycling for these plastics by using them in the manufacture of new electronic products. The project is designed to use existing markets to create new, competitive domestic demand for engineering plastics. Upon completion of the project, participants expect that new domestic markets for recycled engineering plastics will exist as self-sustaining, non-subsidized markets.

The OEA will manage this project in cooperation with other states in Region 5, the U.S. EPA, Sony Electronics, Inc., a plastics processor, and electronics recyclers. The project will be evaluated for success based on the ability of participants to meet the production schedule of a large original equipment manufacturer for a specified period of time. Potential greenhouse gas (GHG) savings will also be evaluated. Climatic benefits will be measured as a result of closed-loop recycling engineering plastics; for example, the measurable cumulative energy savings throughout the supply chain that is generated by using recycled material.

National Electronics Product Stewardship Initiative (NEPSI). Minnesota, through the OEA, is one of ten states participating in the National Electronics Product Stewardship Initiative (NEPSI). NEPSI is a series of meetings between the electronics industry, government and national environmental organizations. The purpose of the dialogue is to reach agreement on a national system for collecting, reusing and recycling electronics, and on how that system will be financed. The OEA helped lay the groundwork for the national initiative with its product stewardship policy, and by developing partnerships and projects with electronics manufacturers and retailers over the last three years. The initiative began with a planning meeting in April 2001, and is expected to conclude in early fall of 2002.

### Paint

Paint is the largest volume item collected by city and county household hazardous waste (HHW) programs. Disposal of liquid latex paint as a mixed municipal solid waste is prohibited due to the possible leaching of toxic materials that can occur with liquids.

However, leftover paint is typically still a valuable material that can be recycled back into usable paint, which may be less expensive than virgin paint. For example, the recycled latex paint listed on the state contract may be nearly 50 percent cheaper than virgin options.

The OEA and the Solid Waste Management Coordinating Board convened the Paint Solutions Taskforce in 1999 and 2000 to examine product stewardship options for discarded paint. The task force decided to pursue a consumer-based education program to encourage the purchase of recycled content paint. The OEA is continuing to examine options to pursue product stewardship initiatives for paint.

#### Paint recycling programs

*Amazon Environmental and Hirshfield's are two local paint manufacturers in Minnesota involved in paint recycling programs. Amazon Environmental is located in Roseville, Minnesota and produces reblended paint, known as Amazon Select™, which contains a minimum of 80 percent post-consumer recycled content material. Amazon Select™ reblended paint is listed on the state contract as much less expensive than virgin paint, while still adhering to testing standards that ensure quality.*

*Hirshfield's Paint Manufacturing, located in Minneapolis, creates reprocessed paint called RenewWall™. The reprocessed paint typically contains a minimum of 20 percent post-consumer recycled material and undergoes extensive testing to ensure performance that matches or exceeds virgin paints of the same grade.*

# Capital Assistance Program

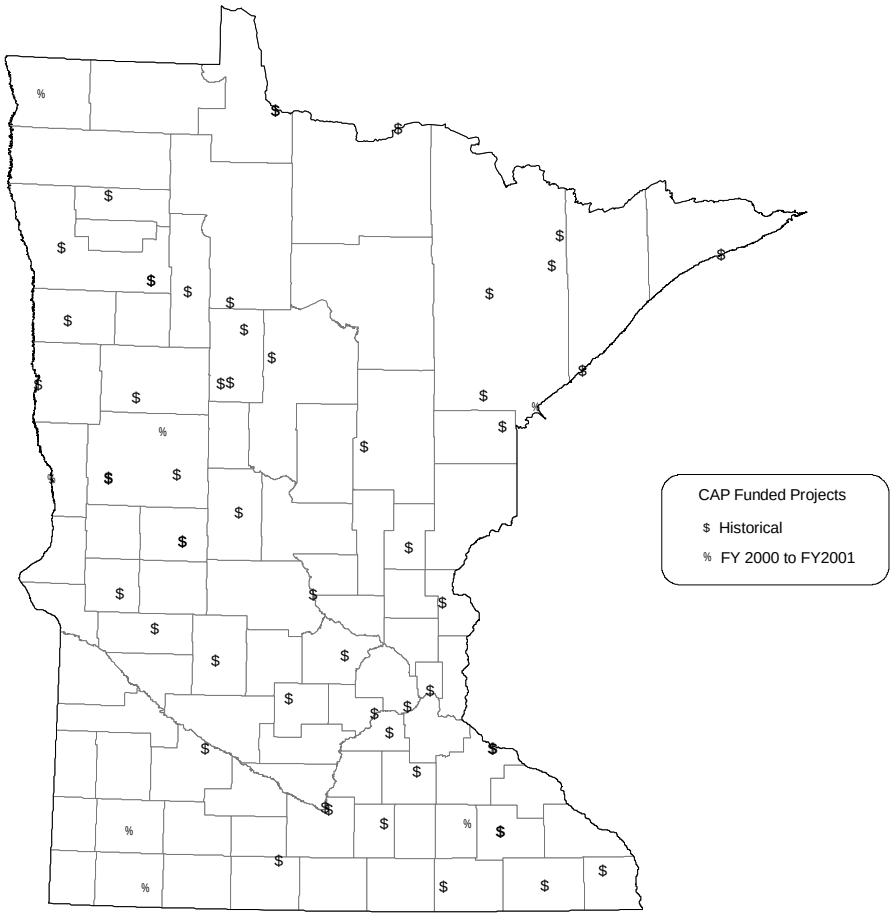
The OEA's Solid Waste Processing Facilities Capital Assistance Program (CAP) provides financial assistance to local governments for developing various types of solid waste processing facilities that conserve and recover resources and energy, reducing the need for land disposal. These facilities, owned by cities, counties, and solid waste management districts, are often set up to serve a number of counties. Recycling facilities, waste-to-energy projects, household hazardous waste centers, composting projects, and special waste recovery projects are all eligible for these funds.

CAP grants help local governments build integrated solid waste management systems, by providing direction, encouragement, and financial incentives. An integrated solid waste management system uses a blend of waste management methods such as waste reduction, reuse, recycling, composting, waste-to-energy, and land disposal. This approach results in recovery of resources from waste, reducing the overall risk and burden to the environment. Building new public attitudes and cost-effective systems has resulted in converting approximately 70 percent of Minnesota's waste into resources, energy, and new products (if source reduction and yard waste credits are excluded).

CAP funds helped finance the construction costs of seven projects around the state during the past biennium. These grants totaled $5.1 million and leveraged over $6.3 million from local sources.

The figure below shows the location of these grants over the lifetime of CAP, and over the past biennium.

### CAP-funded projects



Three highlights from the past biennium are the city of Hutchinson's composting facility, the city of Perham's waste-to-energy facility, and Murray County's recycling facility. Hutchinson's program is discussed in Part 2, but the other two facilities are discussed below.

### City of Perham waste-to-energy facility

When the private waste-to-energy facility (Quadrant) closed in 1998, it affected the landfill abatement cooperative efforts in the seven-county region of Otter Tail, Todd, Wadena, Grant, Stevens, Wilkin, and Traverse. Because of the negative impact of this closing on landfill abatement efforts, the region sought to retrofit and restart the facility. Perham negotiated a transfer of ownership from the private owner to the city and applied to the OEA for a CAP grant for facility retrofit. The facility required significant modifications in order to comply with Minnesota and federal air emission rules.

With a CAP grant of $3 million, Perham was able to retrofit the facility and expects to start redirecting more than 100 tons per day of waste from landfilling to processing by April 2002. The processed waste will generate steam energy that will be sold to local energy users for their heating and cooling needs.

Without the commitment of the local units of government and the assistance of the CAP grant program, Minnesota would have lost more than 100 tons per day of processing capacity.

### Murray County recycling/household hazardous waste facility

With the aid of a CAP grant, the counties of Murray, Pipestone and Cottonwood are able to continue to provide quality service, while expanding their participation in Minnesota's integrated waste management system.

Murray County has been operating a recycling facility since 1991, servicing Murray, Pipestone and Cottonwood counties. Its 1991 facility was designed to process up to 1,100 tons of materials per year. By 1999, the recycling facility was expected to exceed its capacity by more than 300 tons. The county had clearly outgrown its existing facility and recycling efforts were beginning to suffer. The overall system was in need of expansion for increased materials recovery, storage, operational safety, and household hazardous waste management.

The county pledged to help finance and implement the project to construct and equip a new recycling facility, which would process and market recyclable materials from the three-county area, provide short-term storage of household hazardous waste, and product exchange opportunities for Murray County residents. The total cost of the project was estimated at $360,000, and the county was awarded a CAP grant of $180,000. The new facility in the city of Slayton opened in November 2001 and now processes recyclables, including aluminum, tin, glass, newsprint, office paper, cardboard, plastics, and magazines.

## Waste reduction campaign

Over the last three years, the OEA has worked with local governments, businesses, and consumers to increase waste reduction through the statewide campaign—*Reduce Waste: If not you, who?* The campaign, targeted at families with children, used advertising, public relations, grassroots education, social marketing, and the *Waste-Free Fridays* pilot project to increase public awareness of the need to reduce and prevent waste. After the initial efforts increased awareness by over 14 percent, the campaign shifted its focus to changing behavior that directly affects waste generation.

### Junk mail campaign

According to a survey conducted after the end of the advertising campaign, Minnesotans are concerned about the amount of waste they generate, frustrated by the quantity of throwaway packaging, and

interested in actively reducing the amount of waste they generate. In response to public concern, the OEA conducted a focused residential campaign to reduce the amount of unwanted mail residents receive. The OEA distributed postcards explaining how to stop unwanted mail. Individuals could fill out the postcard, stamp and mail it to remove their names from the database of the Direct Marketing Association, the largest marketer of mailing list names in the country.

During this campaign, there was a significant increase in hits to the OEA's *www.reduce.org* web site—21,000 hits between June and September 2001—a fourfold increase over 2000. Over 10,725 users downloaded OEA's junk mail reduction postcard. Over the duration of the campaign, the OEA fielded over 2,000 phone calls on unwanted mail and sent out over 4,000 cards, many of which were collected from Minnesota residents at the State Fair.

A market research analyst conducted 400 pre- and post-wave interviews to measure the success of the campaign. The post-wave interviews revealed that over half (52 percent) of the 400 statewide respondents claimed they had heard of the campaign. More importantly, the campaign succeeded in changing attitudes, as 62 percent of the survey respondents strongly agreed with the statement, "Junk mail is causing disposal problems and filling up landfills." This represented a statistically significant increase from the pre-campaign level. Also, 73 percent of the respondents indicated that they now shred unwanted mail to protect their privacy. The effort has resulted in very real waste reduction action by Minnesotans.

Early in 2002, the OEA checked with the Direct Marketing Association to determine the amount of increase in the number of Minnesotans who had signed up for their mail preference service. In 2001, the DMA saw a 40 percent increase, from 115,000 in 2001 to 164,000 in 2002.

The Waste Reduction Campaign will continue in 2002 and 2003. Future focused topic areas are being discussed and evaluated regarding their potential for best solid waste impact and behavioral change.

# Pollution prevention and toxicity reduction

Pollution prevention (P2) and toxicity reduction programs strive to eliminate or reduce *at the source* the use, generation, or release of toxic chemicals, hazardous substances, and hazardous waste. By reducing these wastes, OEA achieves two objectives of the state's solid waste policy: reducing the quantity and toxicity of waste, as well as reducing the associated air and water pollution. Toxicity reduction is important because hazardous and toxic materials in our waste stream often prevent or limit our ability to recycle, reuse, or otherwise recover materials or energy from waste. In addition, businesses may realize significant cost savings by redesigning processes to reduce waste and use less toxic components.

The OEA uses two principal strategies to achieve its P2 goal:

- providing financial and technical assistance to businesses and other organizations to promote new technologies and implement pollution prevention strategies.
- partnering with other organizations to promote beneficial design and manufacturing changes and environmentally friendly products and services.

While the primary focus of the OEA's P2 activities is in the area of hazardous waste reduction and toxicity reduction, which are discussed in the *2002 Pollution Prevention Evaluation Report* (draft copy available on OEA's web site at http://www.moea.state.mn.us/publications/02p2evaluation/), there are several activities that have a direct impact on the reduction of the amount or toxicity of solid waste. These activities are technical assistance, design for the environment, mercury reduction, and materials exchange. Each of these is discussed below.

## Technical assistance

The OEA provides technical assistance primarily through the Minnesota Technical Assistance Program (MnTAP). MnTAP operates through an OEA grant to the University of Minnesota and provides technical and research assistance for generators of hazardous and industrial waste in the state. MnTAP's focus is on the prevention and reduction of hazardous waste and toxic chemicals. But MnTAP's efforts sometimes result in a reduction of solid waste as well as the removal of hazardous and toxic materials from the waste stream, thereby helping to achieve the state's solid waste policy goals.

*For every dollar spent on MnTAP, industry was able to show a $2 savings as a result of implementing pollution prevention practices with assistance from MnTAP. For more details, visit MnTAP's web site at* http://www.mntap.umn.edu.

MnTAP works with businesses to find ways to reduce waste and pollution through a variety of methods, including site visits, telephone assistance, on-site interns, workshops, materials exchange, and research into process and raw material alternatives. MnTAP thus develops partnerships with industry trade associations, businesses, state agencies, and local governments. During 2000-2001, staff responded to 2,116 calls and made 260 site visits at 24 different types of businesses.

A particularly effective MnTAP intern project resulted in recycling 1,134 pounds of mercury through a coordinated project involving the Departments of Agriculture and Administration and the PCA. To date, 1,353 (87 percent of those identified) mercury-containing manometers in Minnesota dairy barns have been replaced with non-mercury gauges through the Agricultural Department's reimbursement program. As a result, manometer dealers are requesting more information on how to properly handle mercury manometers that they have already removed. This success in reducing mercury has led to substantial reductions in the amount of the toxic material that could potentially enter the state's air and water resources.

Overall, during 2000-2001, MnTAP waste and pollution prevention activities resulted in reductions of 4,850 tons of waste and 78 million gallons of water. As a result of these reductions, MnTAP was able to save companies $4.4 million.

## Design for the Environment

Design for Environment (DfE) considers the potential environmental impacts of a product throughout its life cycle and systematically incorporates environmental attributes into the design of that product. A product's potential environmental impact includes the release of toxic chemicals into the environment through manufacturing, distribution, and disposal, as well as the consumption of natural resources and energy.

Manufacturers are increasingly using DfE tools. The OEA's often cited *DfE Tool Kit* was downloaded more than 9,000 times in 2001. Recently, in a joint project, the OEA and Medtronic Corporation successfully integrated DfE concepts into the design of some of the company's medical products. The new coating process will potentially save Medtronic $3.8 million annually and reduce chemical usage by 75 to 85 percent.

## Mercury reduction

Mercury is an air and water pollutant, a persistent bioaccumulative toxic (PBT), and presents acute and chronic health risks to humans and wildlife. Mercury is a potent neurotoxin and can cause permanent damage to the developing nervous systems of fetuses and children. In adults, it can cause temporary or permanent damage to the nervous system, brain, and other organs. Mercury has been used for centuries in products and processes, including lighting, measurement devices, switches, pharmaceuticals, and chemicals.

Under its Comprehensive Mercury Contamination Reduction Initiative, the state has targeted mercury for source reduction and public education efforts. The OEA is the lead agency for these product and use-related efforts. Source reduction is the primary goal since continuing use of mercury in commerce always results in release when one accounts for the entire use cycle. Several mercury products and uses are also subject to product stewardship requirements under state law. The OEA and PCA are involved in regional and national efforts to increase product stewardship requirements for mercury products and applications. Product stewardship requirements for mercury and other toxics provide an incentive for manufacturers to eliminate toxic materials.

The following programs describe activities the OEA has undertaken to reduce the amount of mercury in solid waste, and thereby accomplish the state's policy goal of reducing the toxicity of the waste stream.

#### Dental amalgam waste management

A grant to the Minnesota Dental Association supported the development of a dental amalgam management training video and associated Continuing Dental Education credit for all dental office staff. Amalgam waste represents a significant and easily controllable source of mercury to various waste streams—municipal solid waste, infectious waste, and wastewater. OEA staff also served on an advisory committee for an advanced amalgam recovery equipment evaluation project conducted by the Minnesota Dental Association and Metropolitan Council Environmental Services.

#### Health care workshops and mercury reduction

The OEA and MnTAP conducted three health care workshops in 2001 to introduce the Hospitals for a Healthy Environment (H2E) training materials and further mercury reduction in health care settings.

#### HealthSystems Minnesota mercury reduction

MnTAP funded a summer 2000 intern project at HealthSystems Minnesota to identify all mercury-containing items and develop a mercury elimination plan. The final report (available from MnTAP) outlines an excellent mercury identification and elimination model for other health care facilities and organizations.

#### Mercury thermometer sales ban

The OEA helped develop legislation to ban the sale of most mercury thermometers in Minnesota. The bill passed the Legislature in 2001, with the sales prohibition starting January 1, 2002. While there are no reliable estimates of the total amount of mercury contained in thermometers sold or broken annually in Minnesota, we do know that fever thermometers contain slightly less than a gram of mercury, and the typical school laboratory thermometer contains 1 to 3 grams of mercury. Replacing these instruments will substantially reduce the amount of mercury in the solid waste stream and thereby reduce the public health and environmental risks of mercury.

#### Mercury reduction technical assistance

In the spring of 2000, air emissions monitoring at the Fergus Falls waste-to-energy facility indicated that one unit of the facility was out of compliance with permit limits for mercury emissions. To resolve the problem, the OEA provided technical assistance to Otter Tail County to help them develop public information materials for households and businesses, conduct a survey of businesses to identify generators of waste that contained mercury, expand and publicize collection methods for mercury-containing waste, and identify and publicize the availability of other (private) mercury waste collection facilities in the region. Fergus Falls and Otter Tail County residents and businesses welcomed the expanded publicity and collection opportunities. As a result of these efforts to remove mercury from the solid waste stream, as well as the rebuilding of the facility, subsequent air emissions testing demonstrated mercury levels well below the permit limit.

### Materials exchange

Minnesota Materials Exchange works to connect businesses and organizations seeking to exchange reusable materials and prevent them from being disposed of as solid or hazardous waste. Working through MnTAP's materials exchange program, businesses and organizations exchanged more than 1000 tons of material, saving customers over $470,000 in avoided purchase and disposal costs. Catalog and web listings resulted in a total of 300 exchanges.

*MnTAP's Materials Exchange web site can be visited at* http://www.mnexchange.org.

The web site and database have become very effective in conducting, tracking, and measuring exchanges and printing the catalog. Web self-referrals have become a larger part of materials exchange activity, totaling over 4,000 referrals in 2001 alone.

# Multi-state solid waste summit

The OEA began discussions with Iowa and Wisconsin in 2000 about various environmental concerns including out-of-state waste flow. After some initial discussion, the three states organized a Midwest solid waste summit that was held in Des Moines, Iowa in December 2000. The summit also included the states of North Dakota, South Dakota, Illinois, Indiana, Michigan, Nebraska, and Ohio, as well as U.S. EPA Region 5.

The group's primary goal was to advance a multi-state, regional approach for addressing solid waste issues. After each state summarized its current solid waste programs and policy, participants discussed key issues common to all. The group identified seven key areas on which to work together:

1. Develop a common vision and policies among the states on issues such as disposal bans, waste toxicity, and "bioreactor" landfills.
2. Address the growing amount of waste transported for disposal across state lines.
3. Improve the sharing of data and information among the states, such as developing methods for standardizing information and for tracking waste.
4. Develop recycling markets and implement procurement practices at a regional level.
5. Improve regional awareness of solid waste issues by educating the public and decision makers.
6. Develop an approach to address the impact of consolidation by the waste management industry.
7. Work with major manufacturers on product stewardship issues, such as creating takeback programs.

A second solid waste summit was held in December 2001 to address these priority areas, share solid waste trend data, and discuss potential partnerships on common issues. At this summit, the states agreed to develop a multi-state solid waste survey, refine data sharing, and develop a multi-state solid waste report. The next meeting is scheduled for December 2002 in Minnesota.

# County solid waste planning

The OEA oversees the solid waste planning for all 87 counties and the Western Lake Superior Sanitary District. Most of Minnesota's progress in developing integrated solid waste systems can be credited to the counties and local units of government. These units of government have systematically planned and effectively used state and local funds to build a waste management system that strives to divert as much waste as possible from landfills.

Solid waste planning is a fundamental tool that supports the state's solid waste policy goals. In 1975, the Legislature mandated solid waste planning in the Metro Area (Minn. Stat. §473.149). Solid waste planning was mandated in Greater Minnesota in 1984 (Minn. Stat. §115A.46). Initially, planning focused on the development of new integrated solid waste systems to abate landfilling. Meeting the SCORE recycling goals was a major component of the planning. As integrated solid waste management systems were implemented, planning has evolved to look more toward improving the existing systems.

Currently, solid waste planning addresses the management of mixed MSW, but not other waste streams, such as construction and demolition waste and industrial solid waste. The waste hierarchy, statutory goals, and bans form the basis for the content of county solid waste plans. Changes to the goals and bans automatically become part of an update to existing county solid waste plans. The OEA and counties use the solid waste planning process to increase the cost-effectiveness of local programs and to identify the type of technical assistance counties will need.

During 1999 and 2001, the OEA approved 24 solid waste management plans. These plans outlined improvements to waste reduction and recycling programs and identified counties interested in establishing organics recycling programs. The OEA plans to develop a backyard composting manual for local governments to use to help raise the number and quality of backyard composting programs.

Planning plays an important role in coordinating and guiding the best integrated waste management practices that are appropriate for each locality. Over time, the solid waste management planning process has assisted many counties in implementing waste assurance strategies that help move MSW to processing facilities in Minnesota and Wisconsin. The planning process has also continued to identify a trend of disposing of Minnesota MSW at land disposal facilities in surrounding states.

# Grant assistance

Each year the OEA awards money for projects that focus on specific aspects of the waste management hierarchy. These grants extend the OEA's reach and add to its ability to attain the state's environmental goals. Grant awards, which are prioritized according to waste trends and revisions to the OEA's strategic goals, go to support innovative projects in environmental education, pollution prevention, waste reduction and reuse, source separation, recycling and market development of recyclables, and resource conservation. These funds are *not* for traditional treatment, control and disposal of wastes and pollution. Instead, the OEA uses grants as seed money for new programs and projects, to support and showcase local efforts, to transfer technology and results to others in Minnesota, and to challenge and support innovation.

*A list of grants awarded since 1997 is posted on the OEA web page* http://www.moea.state.mn.us/grants/awarded.cfm.

Since 1985, the OEA and its predecessors have awarded more than $10 million in grants to entities across Minnesota. In fiscal years 1999 to 2000, the OEA awarded $2.5 million in competitive grant funds to 70 organizations, leveraging more than $3.2 million in matching funds. Aside from the measurable benefit to the environment, these projects tend to bring public and private interests into partnership, often because of the required cash or in-kind match. Grant-funded projects raise awareness about and encourage greater local commitment to environmental issues.

The program is a proven tool to encourage multi-stakeholder efforts, to develop creative environmental solutions, and to support pollution prevention approaches that are transferable to others. The OEA continues to improve the grant process, tools and reporting system, including making grant summaries easier to access through the OEA web page.

A 1999 OEA survey asked grantees to further report on the results that they achieved after the expenditure of their grant funds. Some of the more significant *quantitative* results show substantial progress toward the state's environmental goals, including:

- abatement of approximately 383,000 tons of waste through source reduction, pollution prevention, and recycling
- exposure of approximately 277,000 people to messages on reduction, prevention, recycling, and proper waste management through exhibits, mailings, courses and other educational efforts
- recycling or reduction of over 31,000 gallons of problem wastes such as used oil or solvents
- handling of close to 1,000 phone inquiries
- obtaining over $1 million in gross revenue from recycling

Grant assistance advanced the state's environmental goals in many less obvious ways, too. The *qualitative* results reported by grantees include:

- longer-term improvements to projects and programs
- higher participation levels and/or greater awareness of waste issues
- demonstrated viability of a technology or recycling application
- fostering cooperative efforts

Most encouraging of all, 57 percent of the grantees reported that they are sharing information and at least some of the information is being transferred to and used constructively by others. In addition, the OEA determined that initial funding often helped recipients establish programs they were able to continue, indicating longer-term project success and improvements in solid waste systems.

# Recycling market development

As emphasized earlier, Minnesota's recycling programs keep almost half of the state's solid waste out of the disposal system, conserving resources. The OEA's market development program helps direct those collected resources to remanufacturing businesses, creating new businesses in the process. The market development program is crucial to "closing the loop" in the cycle of collecting, remanufacturing and selling of recycled-content products. The success of Minnesota's recycling and recovery programs depends upon establishing markets to give *value* to those recovered materials collected from curbsides and drop-off sites statewide.

According to the new Minnesota and U.S. Recycling Economic Information (REI) Study, Minnesota's valued-added recycling manufacturers represent a major force in the state's economy, contributing approximately $3.48 billion in gross economic activity and $93 million in tax revenues within the state.

Working directly with businesses to develop manufacturing capacity for recyclable materials, the OEA offers financial and technical assistance for business development, recycled product development, and market research. The REI study also found that in 2000 this assistance helped establish an estimated 8,700 direct jobs in industries that used recycled feedstock, including glass, asphalt shingles, wood, and plastic. These jobs in turn support an estimated 19,941 in indirect jobs. Altogether these jobs pay an estimated $1.19 billion in wages.

Currently, the largest value-added recycling manufacturers are those using recycled paper, post-consumer paper, and old corrugated cardboard as raw material. Over the last two years, the market development program has helped increase capacity to growing secondary manufacturers that use high-density

polyethylene (HDPE). These efforts have made Minnesota one of the leading states using post-consumer HDPE material. Minnesota manufacturers now use 15,000 tons per year.

The OEA's market development activities also include wood waste and the recycling or reuse of construction and demolition material. In conjunction with OEA product stewardship activities, the state has developed 12,500 tons of manufacturing capacity to recycle carpet into a new building material (see Nylon Board Manufacturing sidebar under "Product Stewardship").

The OEA also supports the market development of recycled materials by awarding grants for projects that expand market development efforts, including:

- establishment of a reuse center for Hubbard and Cass counties
- assistance for tear-off shingle processing and reuse
- support for a pilot project on deconstruction and recovery of building materials

# State agency waste reduction, reuse, and recycling

The Department of Administration plays a strong role in leading state agencies toward state environmental goals. Through education and joint efforts with the OEA, Administration is demonstrating many ways agencies can expand waste reduction, resource conservation, recycling, and recovery through state government.

In October of 2000, the OEA and the Department of Commerce submitted its report, *State Resource Recovery Program Recommendations* (available from the OEA) to the Legislature, as required by Minn. Stat. §115A.15, subd. 5(b). The recommendations of this report in regard to promoting the reduction, reuse, and recycling of waste generated by state agencies, and progress made toward implementing those recommendations, are discussed below.

## Waste and toxicity reduction

As part of its waste and toxicity reduction efforts, Administration, with the help of materials developed by the OEA, encourages office paper reduction in all agencies through conferences, a purchasing product show, and in displays.

Administration has taken advantage of technology by posting solicitation notices online and implementing online vendor registration. The use of technology has saved the state and businesses substantial time and money. The Resource Recovery Office's electronic paper waste reduction initiative includes investigating technologies to reduce the use of faxes and photocopying, and measuring and promoting recycling progress.

## Reuse of materials

State employees were educated about waste reduction, toxicity reduction and recycling in more than 20 public venues. Used electronics were collected for reuse or recycling or managed as hazardous waste during office cleanup events. Administration staff participated in the OEA's Interagency Pollution Prevention Advisory Team. The permit application was prepared for the Capitol Complex vegetation composting operation, and training was provided to staff. Thirteen agencies have obtained free, reusable office supplies from the State Recycling Center.

Regarding food waste, Administration is requesting bids from food service vendors for the six cafeterias in the Capitol Complex, which must include options for food waste redistribution, reuse, recycling, or composting.

### Recycling efforts

The State Recycling Center strives to be a model of sustainability. Sustainability efforts include worker safety meetings and employee review of recycling efficiency and pending purchases. Center employees also implement continuous improvement and ergonomic redesign of their workflow and job rotation. Safety equipment and three workstations were constructed using 100 percent post-consumer plastic lumber.

State agencies on the Capitol Complex achieved a new recycling record by recycling 68 percent. In fiscal year 2001 the State Recycling Center managed 2,287 tons, discarding less than one fifth of one percent of the materials brought into the Center. Employees initiated service expansion, rescheduled transportation routes to improve operational efficiency, and arranged for installation of a programmable thermostat and automatic overhead door controls to save heating energy.

# Environmentally preferable products

The *State Resource Recovery Program Recommendations Report*, mentioned in the previous section, also contained recommendations for state procurement activities. These recommendations were on three topics: incorporating environmental criteria into state contracts, training for waste reduction and environmental purchasing, and tracking and evaluation of environmental purchasing. This section discusses what has been done to implement these recommendations.

### Incorporating environmental criteria into state contracts

With assistance from the OEA, the Materials Management Division (MMD) recently refined its environmental purchasing processes to provide a statutorily allowable preference (Minn. Stat. § 16B.121) in each bid and proposal, based on the post-consumer content of the products under consideration. For example, products that contain 100 percent post-consumer content will receive the full 10 percent preference allowed. Products that contain 50 percent post-consumer content will receive a 5 percent preference.

The OEA worked with MMD to incorporate mercury content guidelines into its contract solicitation documents. This information will be used to make specification decisions in future solicitations. The division will also include mercury content information on the contract release to help inform buyers in the case of multiple award contracts so they can make informed decisions on the products that they are purchasing.

### Training for waste reduction and environmental purchasing

During fiscal year 2001, the Materials Management Division, as a part of its Authority for Local Purchasing (ALP) Training and ALP Management Overview programs, trained more than 1100 state agency staff in pollution prevention and procurement of environmentally responsible goods and services. The OEA and MMD have updated the environmentally responsible purchasing section of the ALP training manual that is provided to state employees. The OEA and MMD participated in trade shows and conferences to promote environmentally preferable purchasing.

The MMD maintains a section on its web site[16] dedicated to environmental purchasing. This web site, which was expanded last year with input from OEA and the Environmentally Responsible Work Group, features environmentally preferable goods and services lists, legislative requirements, news about new products and contracts, case studies on environmentally preferable products, and links to other web sites helpful in environmental purchasing.

[16] *http://www.mmd.admin.state.mn.us/envir.htm*

The MMD's Central Stores now stock a 100 percent post-consumer recycled content copy paper. The paper is processed chlorine-free, acid-free for a long bright life, and has outstanding opacity for two-sided copying. Sales for fiscal year 2001 totaled $92,241 (over 27,000 reams). Because of the higher cost of this product, Central Stores subsidizes the price to its customers by charging a smaller markup to cost. This allows the environmentally friendly and waste-reducing paper to be competitively priced. Through the joint efforts of OEA, the Environmentally Responsible Work Group members, and MMD, there has been a large increase in the use of recycled paper over virgin paper. The purchase of 30 percent to 100 percent post-consumer recycled copier paper has now reached 90 percent.

The *Environmentally Preferable Purchasing Guide* was developed by the Solid Waste Management Coordinating Board in conjunction with the OEA and the Department of Administration, to promote the purchase of environmentally preferable products. The guide is distributed to all certified purchasers, and MMD promotes it at all of its ALP training sessions.

*The* Environmentally Preferable Purchasing Guide *is available online at the Solid Waste Management Coordinating Board's web site at* http://www.swmcb.org/EPPG/1_1.htm.

In May 2000, Central Stores rolled out its new e-catalog. This electronic online catalog with graphics reduces paper consumption by allowing customers to order online without the need to fax or mail an actual order form. A convenient, express order form allows faster order placement without the need to have a printed catalog. Because the e-catalog is now available, Central Stores will be able to decrease the number of printed catalogs required.

### Tracking and evaluation of environmental purchasing

The state exceeds $70 million per year in purchases of environmentally preferable goods and services from state contracts. As a result of MMD modifications, the Minnesota Accounting and Procurement System (MAPS) now requires the buyer to code each purchase order with an environmental code. MMD solicitation documents require responding vendors to include environmental codes for the goods and services they offer.

These codes are used to generate reports that will allow MMD and OEA to more effectively track environmental purchases made by the state, and thereby gain valuable information on the marketplace. This information can be used to structure future specifications so contracts will include more environmentally preferable goods and services. These efforts will contribute greatly to making state agencies more aware of waste reduction and environmental purchasing. As state government models this behavior and shows measurable progress, others will follow.

# Environmental information and outreach

Information sharing and outreach are key tools to accomplishing the state's environmental goals and integral to meeting the state's solid waste policy goals.

The OEA's web site (*www.moea.state.mn.us*) gives Minnesotans immediate access to key topics and resources, while making it easier to share these resources with interested parties anywhere in the world. By electronically distributing the same information that is available in printed documents such as fact sheets, reports, and other materials on current solid waste topics, the OEA reduces costs and paper use. In addition to its main web site, the OEA has created special web sites to

*OEA offers a wide variety of resources, information and links through its web sites:*

- www.moea.state.mn.us
- www.mnseek.net
- www.nextstep.state.mn.us
- www.moea.state.mn.us/greenbuilding
- www.reduce.org

provide specific assistance and tools to some of OEA's targeted audiences, including environmental educators (SEEK: Sharing Environmental Education Knowledge, *www.seek.state.mn.us*), sustainable communities (NextStep, *www.nextstep.state.mn.us*), and the waste reduction campaign (*www.reduce.org*).

The OEA's Education Clearinghouse is a resource center for environmental information and educational materials. It provides assistance, information, an environmental reference library, tabletop displays, videos, and referrals for students, educators, businesses, and government officials. Clearinghouse staffers receive an average of 150 requests per month on a variety of environmental topics. In just one month, during a major media push of the junk mail waste reduction campaign, 1100 consumers contacted the Clearinghouse for assistance and resources.

The OEA float, the Reduce Mobile, traveled to 32 parades, reaching over one million citizens with its waste reduction message throughout Minnesota in 2001. The float's waste reduction theme supplements the messages of OEA's statewide public education campaign, *Reduce Waste: If not you, who?* The OEA's booth at the Minnesota State Fair is also a primary outreach tool, featuring the waste reduction theme and promoting products with recycled content. The booth includes consumer-friendly educational displays such as a calendar with waste reduction tips, handouts on priority solid waste topics, educational games, and a drawing for environmentally friendly prizes. OEA staff answer questions on waste reduction, reuse, and recycling. In 2001, the OEA estimates that over 112,000 fairgoers were exposed to the OEA exhibit.

Although the impact of environmental information sharing and outreach is difficult to quantify, the OEA's assistance helps make the public familiar with waste issues, and the actions they can take to reduce waste or the environmental impact of the waste they generate. These outreach efforts supplement other solid waste policy efforts by the state, local governments, and private and nonprofit organizations.

# Green building

Minnesota loses 27,000 acres of farm, forest and open space land every year to new development.[17] In the United States, we generate an estimated 2.8 pounds of building-related construction and demolition debris per person per day.[18] Globally, building construction consumes 25 percent of virgin wood used each year.[19] Therefore, the OEA has focused on establishing a "green building" program in Minnesota to reduce the loss of Minnesota's natural and reusable resources.

Green building design, construction, and deconstruction can have a substantial impact on removing reusable, recyclable, and toxic materials from the construction and demolition waste stream. Green building practices also achieve reduced greenhouse gas emissions, resource and energy conservation, market development of recycled-content products, and an overall more sustainable approach to our structures and their operations. To help communities find creative environmental solutions that are economically viable and meet social needs, the OEA has created a wealth of Minnesota-specific information to guide green building efforts.

*The OEA defines a green building as one that is healthy and comfortable for its occupants and is economical to operate. It conserves resources (including energy, water, raw materials and land) and minimizes the generation of toxic materials and waste in its design, construction, landscaping, and operation. A green building also considers historic preservation and access to public infrastructure systems, as well as the entire life cycle of the building and its components.*

[17] *1000 Friends of Minnesota organization.*
[18] Characterization of Building-Related Construction and Demolition Debris in the U.S., *Franklin and Associates for the U.S. EPA, June 1998.*
[19] The Worldwatch Institute.

### Grants

The OEA's green building program has focused significant resources on developing the "building blocks" that will make it easier for practitioners and state and local governments in Minnesota to incorporate green building principles into their construction projects.

OEA grants have helped fund the following activities:

- creation of the online Minnesota Sustainable Design Guide
- training of architects and government professionals to use the guide
- expansion of deconstruction services
- development of the ReUse Center's reclaimed wood redressing facility
- creation of Sustainable Schools Minnesota, a pre-design guide for school officials
- demonstration projects of affordable green housing built by Habitat for Humanity in Minneapolis and the Rondo Community Land Trust in St. Paul

A current OEA grant is funding development of the Minnesota Sustainable Building Materials Database by the University of Minnesota Center for Sustainable Building Research. Such a database was identified as a remaining critical need for Minnesota-specific information. This database is intended to provide product-specific data, as well as information about how changing a particular building component interrelates with other material choices.

### Technical assistance for state construction and leasing

The OEA's green building program also has devoted considerable effort to increasing the use of green building design, construction, and leasing practices.

The OEA has encouraged the Department of Administration to use the *Minnesota Sustainable Design Guide* as a roadmap to incorporate green building design and construction practices into state building projects. The Department of Administration currently is contracting with the authors of the guide to help with some state pre-design projects. In partnership with several state agencies, the OEA helped to incorporate "smart" or "high performance" building guidelines into the capital budget process for 2002.

The OEA also worked to "green" state leasing practices. An informal team from the Department of Administration, DNR, University of Minnesota, and OEA began creating the structure for a green lease RFP. The OEA also provided a green lease checklist and Internet links to the Department of Administration for use in encouraging property management companies leasing space to state agencies to employ green building and maintenance practices.

## Green building web site

With the creation of an OEA green building web site at *www.moea.state.mn.us/greenbuilding*, the wealth of Minnesota-specific green building information, developed with OEA funding and technical assistance, now is becoming easily accessible to other state agencies and local governments.

# Sustainable communities

Through its sustainable communities program, the OEA works with communities to promote resource conservation and pollution and waste prevention, as well as to ensure that environmental considerations are balanced with social and economic concerns. Currently, the OEA is providing grant and technical assistance to over 30 sustainable community projects that advance these environmental practices,

especially early on in comprehensive or "big picture" planning in communities throughout Minnesota. The program works closely with sustainable design and green building projects, and overlaps with most of the other OEA programs.

More than 2,000 members have joined the Minnesota Sustainable Communities Network (MnSCN) and a similar number receive the biweekly e-mail newsletter, *MnSCN Update*. A new web-based assistance tool, called NextStep, addresses the economic, social and environmental aspects of topic areas; and contains tools and resources, case studies, calendar listings, short articles, and threaded conversations. NextStep serves both the MnSCN membership and the general public.

In addition, the OEA annually hosts a conference to provide presentations, direct networking, and resource booths to bolster and further expand interest and membership in sustainable communities. Over 500 individuals attended the fall 2001 conference, which showcased premier projects or activities, and encouraged networking and learning among the participants.

Interest in sustainable concepts is strong and continues to grow. This interest strengthens the efforts of government and private entities to include environmental goals, such as integrated waste management, in their future development and expansion.

## Appendix 2

# Program Initiatives

In order to continue to accomplish its goals over the next two years, the OEA has initiatives planned in several of its programs. These initiatives discussed in this section, include the following program areas:

- product stewardship
- county solid waste planning
- organics recycling
- MnTAP
- recycling market development
- environmentally preferable products
- green building

## Product stewardship

In the next two years, the OEA's product stewardship policy framework and objectives will continue to guide the state's efforts to engage manufacturers, retailers, and consumers in developing sustainable systems to recover, reuse, and recycle products and materials.

The OEA will continue to help steer and participate in national initiatives to achieve product stewardship agreements between government and industry.

### Carpet

The OEA considers the Memorandum of Understanding on Carpet Stewardship with the carpet industry, signed in January 2002, as a model for product stewardship agreements with other industries. Through these nationally negotiated agreements, manufacturers will work to establish convenient collection systems for their products in Minnesota and other states, and to ensure that collected materials are recycled into new products.

For example, the carpet industry has established a third-party organization, CARE, which will help develop a collection system for old carpet in Minnesota. Carpet manufacturers are also finding ways to use increasing amounts of recycled fibers in producing new carpet. In addition, CARE may invest in recycling businesses that turn old carpet into other products, such as the Nylon Board Manufacturing Company in Medford, Minnesota.

### Electronics

By September 2002, the stakeholders in the National Electronics Product Stewardship Initiative (NEPSI) expect to reach an agreement on how to establish and finance collection, reuse, and recycling systems for old electronics. As the agreement takes shape, NEPSI participants will determine whether any federal or state legislative action will be necessary to help support the outcomes of the process. The OEA will keep Minnesota legislators and the Governor's Office informed of the electronics initiative's progress and any steps the state might take to help ensure its success.

### Developing new product initiatives

The OEA is working with local governments, other states, manufacturers, recyclers and environmental organizations to develop product stewardship initiatives for other products. In particular, the OEA expects to help develop and participate in multi-stakeholder initiatives focused on the following products.

Beverage containers. In 2001, a coalition of industry, government and environmental organizations to complete the first phase of a product stewardship initiative focused on beverage container recovery and recycling. In January 2002, the Multi-Stakeholder Recovery Project released a *Value Chain Assessment Report*[20] that examines the costs and benefits of different beverage container recovery programs. The second phase of the initiative is expected to start in spring 2002.

Paint. Paint is the highest-volume material collected through Minnesota's household hazardous waste programs; and the amount of leftover paint collected from residents increases by about 10 percent every year. In 2002, the OEA will seek to develop partnerships with paint manufacturers to assess various methods of collecting and recycling leftover paint. OEA will work with other states that are interested in developing product stewardship initiatives for paint. Projects and partnerships with paint manufacturers and retailers will be helpful in a national negotiation process.

Automobiles. The OEA will evaluate a possible initiative with auto manufacturers to focus on decreasing the use of toxic materials and increasing the use of recycled-content materials. The OEA will work with the Minnesota Pollution Control Agency, other states, auto manufacturers, U.S. EPA, environmental organizations, and recyclers to develop this partnership in the next 18 months.

The OEA and MPCA have been working with other states and organizations on the issue of automotive mercury components for several years. Despite these efforts, vehicle manufacturers have continued to install mercury components in vehicles and have introduced some new uses of mercury in vehicles. Minnesota is one of about a half dozen states participating in ongoing discussions with vehicle manufacturers, with the goal of having the manufacturers support mercury switch recovery in on-the-road and end-of-life vehicles.

These efforts may provide a foundation for ongoing motor vehicle product stewardship policies and programs in the state and nationwide. The OEA is also considering a product stewardship initiative on small engines.

# County solid waste planning

The OEA has created two committees (one for Greater Minnesota and one for the Metro Area) to recommend ways to improve the county solid waste planning process. These two committees are working with OEA staff to make the solid waste plan preparation and review process more responsive to present-day needs. The objectives are:

- to improve solid waste planning consistent with the objectives of the Waste Management Act
- to make the planning process responsive to mature solid waste systems
- to make the planning process responsive to regional differences
- to make the planning process less onerous

The two committees are evaluating various options to improve planning and solid waste management, and they will recommend necessary changes to the current statutes, rules, and processes. The OEA is working very closely with the Association of Minnesota Counties on the planning revision process, and will present its recommendations for the 2002 legislative session.

[20] *Available online at http://www.globalgreen.org/BEAR.*

# MnTAP

MnTAP provides assistance to businesses of all types and sizes, helping them assess and reduce toxicity and waste—hazardous waste, solid waste, air emissions, and wastewater.

### Ongoing technical assistance

MnTAP will provide ongoing technical assistance tailored to individual businesses through a variety of services.

Phone assistance. MnTAP's goal is to respond to at least 1200 customer calls per year, with a focus on pollution prevention solutions as a way to meet customer's needs. MnTAP will use phone contact and follow-up as a way to communicate information on upcoming resources and programs, such as MnTAP interns, OEA grants, and the Governor's Award program.

Site visits. Staff will conduct at least 150 site visits each year using a variety of tools, including internal teams, technology diffusion projects, and equipment demonstrations. Site visits and follow-up to site visits will be used to identify opportunities for interns and grants.

Student interns. MnTAP will continue to place up to 8 students in companies each year to work on pollution prevention projects. Besides providing good experience for the students and introducing them to the benefits of pollution prevention, companies are able to accomplish significant implementation as a result of the project, which MnTAP can document as a measure of success.

Materials exchange. MnTAP will facilitate materials exchanges through active staff work, a web-based database, and a catalog that comes out twice per year. MnTAP conducts at least 140 exchanges each year for a total weight exchanged of 440 tons. The majority of these materials would otherwise go into the solid waste stream.

### Proactive outreach and focus areas

Over the next two to three years, MnTAP will target four areas for outreach and assistance:

- Hospitals for a Healthy Environment (for mercury and solid waste reduction)
- companies with potential for quality or EMS initiatives (with a pollution prevention focus)
- companies/facilities/industry sectors with increases in reported TRI emissions
- facilities affected by the Metal Products and Machinery Rule (Clean Water Act)

Outreach activities may include letters, resource development, mini-newsletters, and cold calls. Assistance activities will make use of standard MnTAP assistance services with an emphasis on on-site assistance.

### Measurement and information dissemination

Results from successful projects, documented in the form of case studies and success stories, will be shared in the MnTAP newsletter, *SOURCE*, posted on the web site, and shared through exhibits or presentations at conferences.

# Recycling market development

The market development program will concentrate on strengthening the connections between local supply of materials and the manufacturers. Manufacturers using recycled materials have grown in the last five

years, particularly those using HDPE plastic. Minnesota has one the largest concentration of companies using post-consumer/post-industrial plastic in the United States. These companies produce products such as plastic decking, plastic lumber, patio furniture, plastic sheeting, picnic tables and windows. This has created greater opportunities to market material locally rather than marketing out of state.

The OEA will also look at marketing opportunities identified in the 2000 *MSW Composition Study*. Those recyclable materials that still have a substantial presence in the waste stream will be examined for market development opportunities.

The collaboration of the market development program and the product stewardship program created new markets for carpet in the last year, including the creation of a company that will use over 12,000 tons of post-consumer/post-industrial carpet per year. This company, along with a Georgia company in the formative stages, has created a whole new category of construction sheeting. The OEA will look for additional market development opportunities in current and future product stewardship activities.

# Environmentally preferable purchasing

The OEA and Administration have a joint work plan to improve on the gains the state has made in reducing the amount and toxicity of its own waste. The OEA and Administration will focus on the following activities.

### Incorporating environmental criteria into state contracts

- With assistance from the OEA, the Department of Administration will continue to develop and incorporate environmental criteria into state contracts.
- The OEA will continue to target toxic and hazardous products currently available on contract and work with Materials Management Division (MMD) to find alternatives.
- The OEA will continue to promote recycled content and recyclable materials on state contract, as well as create language that promotes bio-based products.

### Training for environmental purchasing

- The OEA and the Department of Administration will continue to expand training in environmental purchasing as part of state certification classes.
- With assistance from the OEA, MMD will continue to promote environmentally preferable contracts to state agencies and local units of government.
- The OEA and MMD will continue to participate in trade shows and conferences to promote environmentally preferable purchasing.
- The OEA and MMD will continue to promote and help distribute the Environmentally Preferable Purchasing Guide to state and local governments.
- The OEA, MMD, and other agencies will continue to use the Environmentally Responsible Work Group as a vehicle to encourage environmentally preferable purchasing.

### Tracking and evaluation of environmental purchasing

- The OEA will continue to work with MMD to help implement and enhance measures for tracking environmental purchases.

# Green building

One of the OEA's strategic goals is to incorporate green building design into important state and local projects. The OEA has a solid working relationship with the Department of Administration's Materials Management Division in developing environmentally preferable specifications and solicitations. The OEA green building program will expand on this relationship by negotiating a joint work plan with the Department of Administration's Building Construction Division to further integrate green building principles and practices throughout the state's building, leasing, and maintenance activities.

The OEA intends to provide recommendations and technical assistance to implement the joint work plan, which initially will focus on three areas:

- Request for lease proposal. Last fall, efforts began to develop a joint Request for Lease Proposal (Lease RFP) for a combined DNR, PCA and OEA facility. The OEA and DNR created a "Green Team" in partnership with the University of Minnesota Center for Sustainable Building Research to develop the green building language for the Lease RFP, to fine tune technical assistance information available to applicants, and to develop evaluation criteria to rate proposals. Although relocation funding was not included in the Governor's budget, the RFP will be issued this year with the requirement that relocation costs be included in the proposals. If appropriate, the OEA will develop this Lease RFP into a model document for use by the state and other public entities in Minnesota. This effort should encourage property management companies leasing space to government agencies to employ green building practices.
- Sustainable building guidelines. Chapter 212 (S.F. 722, Article 1) of the 2001 Session Laws requires the Department of Administration, with the assistance of other state agencies, to develop Sustainable Building Guidelines for all new state buildings by January 15, 2003. Use of these guidelines is mandatory for all new buildings receiving funding from the bond proceeds fund after January 1, 2004. The OEA will work with the Department of Administration's Building Construction Division to incorporate the research and development and experience gained from implementing the *Minnesota Sustainable Design Guide*, (created with grant funding and technical assistance from the OEA), into the state's Sustainable Building Guidelines.
- Green campus. The state is pursuing development of a "green campus" for the state environmental agencies, and is working to convert the majority of state agencies from leased facilities to state-owned buildings. OEA hopes to negotiate a joint work plan with the Department of Administration's Building Construction Division to increase the use of green building design and construction practices by identifying all the pressure points within the state building process. The OEA would assist the Department of Administration in reviewing each step of the process so that green building principles and practices can be incorporated throughout. OEA intends to provide recommendations and technical assistance for implementing changes.

Over the longer term, OEA hopes to use the informational materials developed through this joint effort with the Department of Administration's Building Construction Division (RFPs, specifications, procedures manuals, designer selection criteria, certification procedures, evaluation criteria) to provide enhanced technical assistance to other public entities to implement green building throughout Minnesota. OEA also will examine the need for legislative initiatives to facilitate green building efforts by public entities.