



Minnesota Office of **Environmental Assistance**

Responding to new challenges

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More information about the OEA and its activities can be found online at:

www.moea.state.mn.us

Contact

Minnesota Office of Environmental Assistance
520 Lafayette Rd. N.
St. Paul, MN 55155-4100
651-296-3417 or 800-657-3843
www.moea.state.mn.us

Responding to new challenges

Summary of OEA's Innovations and Achievements

The MINNESOTA OFFICE OF ENVIRONMENTAL ASSISTANCE's work in environmental education, pollution prevention, waste management, market development, and sustainable development has created projects that save energy, reduce harmful pollutants to both air and water, and reduce waste, while also creating jobs and saving businesses and communities money. The following projects illustrate how OEA is pioneering the development of new approaches to today's problems, while also working to strengthen our existing waste management and recycling programs.



The OEA product stewardship program is working on initiatives for carpet, electronics, paint, mercury-containing products, and beverage containers.

Product stewardship

Looking for new ways to handle problem materials while also conserving energy, resources, and public funds, OEA adopted the nation's first product stewardship policy in 1999. Product stewardship asks those who produce and use products, rather than government, to be responsible for the economic and environmental impacts of producing, using, and discarding products. Through this non-regulatory partnership framework, the OEA works with manufacturers, retailers, recyclers, local units of government, non-governmental organizations, and others to establish programs to recover products at the end of their useful lives—reducing pollutants while diverting them from disposal.

A product stewardship program saves business and government funds, while also creating economic opportunities. Minnesota cities and counties spend \$7 million each year to handle consumer products that pose problems for waste systems, such as



used motor oil, unused or old paint, fluorescent light bulbs, and old televisions. Businesses now pay up to \$15 to \$20 to recycle or safely dispose of computer products such as monitors that cannot be disposed of as garbage.

Manufacturers who operate under product stewardship principles will save money through more efficient use of raw materials and energy. Better management of discarded products can yield additional jobs, economic wealth, and tax revenue to the state.

The OEA product stewardship program is working on product stewardship initiatives for carpet, electronics, paint, mercury-containing products, and beverage containers. In January 2002, the OEA, nine other states, and U.S. EPA signed a landmark agreement with the carpet industry that establishes national recovery goals for discarded carpet. To achieve these goals, the carpet industry is funding a third-party organization, the Carpet America Recovery Effort (CARE). CARE plans to meet the goals through an ambitious market development initiative to enhance the recovery of post-consumer carpet, and foster development of value-added products, such as auto parts and construction products, made from post-consumer carpet.

OEA is also leading a national initiative to establish a nationwide take-back program for consumer electronics. The National Electronics Product Stewardship Initiative



(NEPSI) consists of OEA, ten other states, electronics manufacturers, the federal government, and national environmental organizations. The goal of NEPSI is to reach agreement on a national system for establishing and financing the collection, reuse, and recycling of electronic products such as televisions and computers. OEA is also working on national product stewardship initiatives for beverage containers, paint, and automobiles. The OEA, in partnership with the states of Massachusetts, California, Oregon, New York, and Florida, is in the process of developing a national policy on product stewardship.



Minnesota Technical Assistance Program (MnTAP) works with industries to adopt pollution prevention and conservation practices that reduce costs while also protecting the environment.

Pollution prevention

The most effective means to protect our air, water, land, and long-term economic health is to avoid pollution by using manufacturing processes and products that are the least harmful to the environment. OEA is responsible for providing

assistance to businesses to prevent pollution (Minn. Stat. § 115D.) OEA's Minnesota Technical Assistance Program (MnTAP), operating since 1984, works with industries to adopt pollution prevention and conservation practices that reduce costs while also protecting the environment. In just the last two years, MnTAP has helped businesses reduce air and water pollution (including toxics), and waste generation by over 11 million pounds, reduce water use by over 90 million gallons, and save over \$5.2 million.

OEA's Design for the Environment activities recently resulted in an annual savings of almost \$4 million in a single project. Medtronic used an OEA grant to develop a coating process that resulted in a 75 to 85 percent reduction in chemical usage and wastewater loading, a reduction of materials use of 30 to 35 percent, and an annual cost savings to Medtronic of \$2.1 million. Approximately 70 percent of a product's life-cycle costs is determined during its design.

OEA also works with other states, federal agencies, and the National Pollution Prevention Roundtable to assure that OEA's pollution prevention activities will influence and leverage regional and national opportunities. For instance, OEA partnered with the U.S. Department of Energy to sponsor the first regional DOE Hydrogen Infrastructure Forum in October 2002. The OEA is also a member of the Minnesota Hydrogen Infrastructure Initiative. This work group, which also includes the Department of Commerce, industry, and public interest groups, meets quarterly to coordinate technical, economic, policy research and planning. OEA's work in this area strives to assure that Minnesota is positioned to take advantage of opportunities created by the approaching hydrogen economy.

Fossil-fuel power plants and vehicles emit toxic pollutants and 80 percent of our greenhouse gas emissions. The largest source of mercury in Minnesota's

air comes from coal-fired power plants, that provide our electricity. OEA is promoting energy-efficient manufacturing processes, alternative energy such as solar/hydrogen power demonstration fuel cells, energy conservation through its green building program, E85 fuels, and other alternatives that save energy and have environmental benefits.



Medtronic used an OEA grant to reduce waste and chemical use, saving the company \$2.1 million annually.

Our pollution prevention efforts not only have favorable environmental and economic impacts, but Minnesota businesses are making significant progress in reducing their use of toxic chemicals. The OEA submits a biennial report to the Legislature evaluating progress and opportunities in pollution prevention. The *2002 Pollution Prevention Evaluation Report* strongly indicates progress in many manufacturing sectors. Since 1993, the amount of reported toxic chemicals released in Minnesota has decreased by 34 percent, from 24 million to 16 million pounds.

Waste management

The OEA is committed to advancing a policy that treats waste as a resource. A multi-discipline technical work group mapped the complexities of Minnesota's solid waste system and identified possible strategies that could be adopted to accomplish this goal. A Governor's Select Committee, which included the environmental leadership from the House and Senate and other elected or appointed officials, is in the second phase of meetings to develop and rec-

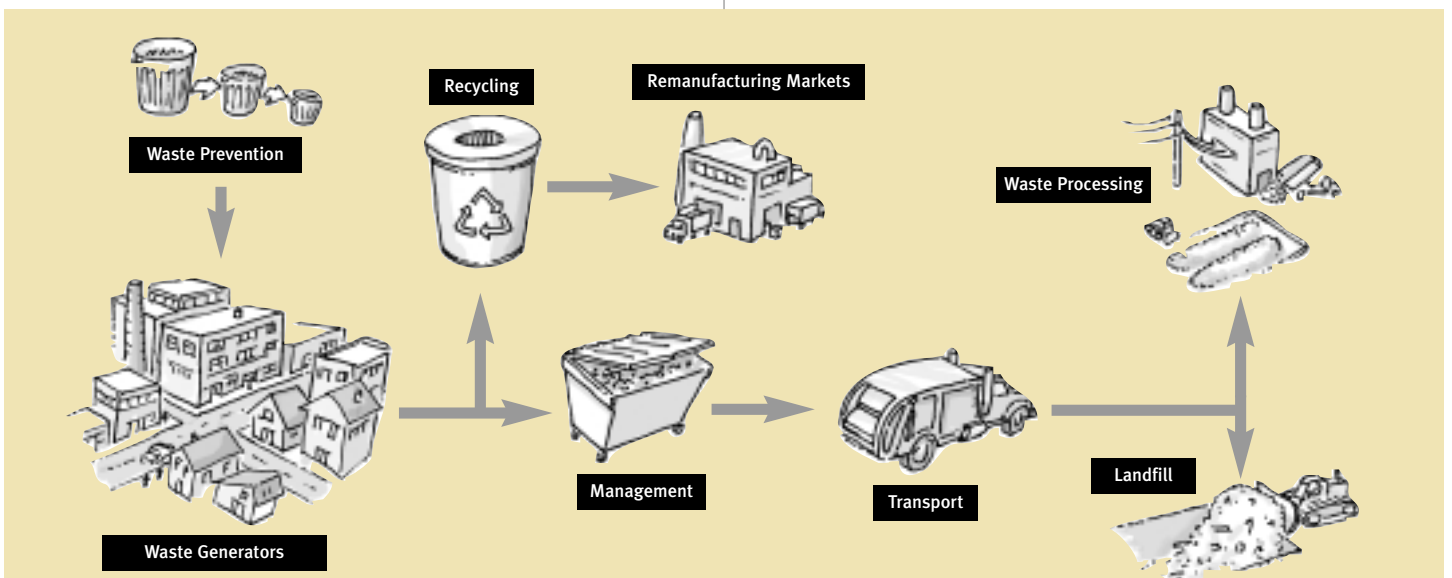


OEA funded a source-separated composting program in the city of Hutchinson, helping to divert an estimated 31 to 39 percent of the waste stream that would otherwise have been landfilled.

ommend strategies to improve Minnesota's waste management system while reducing the environmental impacts of manufacturing products through life cycle management.

Over the past 15 years, county waste management plans have changed solid waste management practices throughout the state. OEA's partnerships with local units of government, manufacturers and businesses, educators, and individual citizens have implemented an integrated system of solid waste management. OEA works directly with local government to prepare solid waste plans that guide the implementation of local and regional programs for solid waste reduction, recycling, processing, and management of yard waste, problem materials, and construction and demolition wastes. Local governments, the waste industry, commercial and industrial enterprises, and the public all actively participate in formulating and implementing these plans.

The plans serve as the foundation for the technical assistance offered by many OEA staff and emphasize building strong regional waste management systems. OEA's technical assistance priorities for counties include implementing methods to reduce waste generation; improving the cost-effectiveness of recycling, composting, and recovery systems; expanding the public's understanding of resource conservation and environmental protection; and building stronger regional waste management systems.





Environmental education

OEA's education efforts are key to assuring that Minnesotans have accurate and up-to-date information to understand and minimize the environmental impacts of their actions. Through its educational activities, the OEA can advance pollution prevention activities, modify the current waste management system, and encourage Minnesotans to practice resource conservation behaviors, as well as help them see the environmental, economic, and social connections of their activities.

A junk mail reduction campaign in 2001, for example, resulted in a 40 percent increase in Minnesotans signing up to reduce unwanted mail, which eliminated approximately 965,000 pounds of paper and plastic junk mail. During the height of the campaign, there was a fourfold increase in hits to the OEA's web site, with over 10,725 people downloading our junk mail reduction postcard.

The OEA facilitates various education-based programming and partnerships statewide. The OEA conducts monthly environmental education workshops that provide fundamental educational skills for scientists, technical specialists, and researchers, and up-to-date education tools for the trained

educators seeking assistance in honing their skills. More than 800 people representing state, local, and federal government, nonprofits, business, consultants, and educators have participated in these workshops. Regional staff in Greater Minnesota pro-



OEA's SEEK website: www.seek.state.mn.us

vides local access to OEA's resources and workshops. One-on-one assistance is a critical component in improving Minnesotans' skills, especially in working on innovative sustainability issues.

In partnership with the Department of Children, Families and Learning and the National State Education and Environment Roundtable, the OEA is working with approximately 24 Minnesota schools in a program that uses each school's natural and socio-cultural settings to teach students about issues that they perceive as relevant to their daily lives. The objective of this approach is to increase students' motivation for learning and academic achievement. This EIC program (Environment as an Integrating Context For Learning) combines best practices into a comprehensive education framework that simultaneously addresses content standards from multiple disciplines. The number of EIC schools has doubled in four years.

The OEA partners with various levels of local, state, and federal government, nonprofit organizations, national and local businesses, environmental organizations, and citizens to accomplish its objectives. OEA's environmental education web site, SEEK, currently has 120 partners, including environmental and educational organizations and agencies that post their resources on this interactive web site.

Three primary advisory bodies offer input and advice on OEA's policies and programs: the Prevention, Reduction and Recycling Advisory Council (PRRAC), Environmental Educational Advisory Board (EEAB), and the Solid Waste Management Advisory Council (SWMAC). OEA also works closely with the Department of Children, Families and Learning, the National State Education and Environment Roundtable, and 24 Minnesota schools who will combine best practices into a comprehensive educational framework that address content standards from multiple disciplines.

Market development

Recycling creates jobs, saves energy, and reduces pollution. OEA works to develop new markets for recycled materials through financial and technical assistance.

Minnesota's recycling programs save 53 trillion BTUs (enough to power all the homes in Ramsey County for one year), creating over 8,700 jobs and providing approximately \$93 million in tax revenues to the state's economy. Of the 2.3 million tons of solid waste recycled, 1.9 million tons were processed for secondary manufacturing.

Recognizing state government's tremendous purchasing power and the influence it can have on what products are produced, the OEA and the Department of Administration have teamed up to promote the purchase of goods and services that have a reduced effect on human health and the environment. OEA is now routinely involved in adding environmental products to state purchasing contracts and educating agencies about new products.



OEA worked with Administration to include mercury component disclosure or phase-out requirements in the 2002 motor vehicle request for bids. In the summer of 2000, the OEA helped establish state contracts for flooring and recycled-content latex paint. Further, Minnesota is the only state in the country to specify that all waste electronic materials generated by state agencies and managed under the state contract shall be processed, used, reused, reclaimed, or disposed of only in Canada, Mexico, or the United States, not overseas.

Sustainable development

OEA is working with the Departments of Administration and Commerce and other state agencies to implement the sustainable guidelines/energy

benchmarking law passed in 2001 (Minn. Stat. §16B.325). This project will develop and implement sustainable building design guidelines and maximize energy efficiency in public buildings. The project is an extension of OEA's ongoing efforts in this area.

The OEA's NextStep web site and sustainable communities



The OEA's NextStep web site: www.nextstep.state.mn.us

e-mail newsletter also disseminate important information and help to build skills for those interested in sustainability. OEA partners with over 2,000 members of the Minnesota Sustainable Communities Network to promote and share resources on sustainable issues such as energy and resource conservation, as well as sponsoring an annual conference.

- ▶ **City of St. Peter.** In January of 2001, the OEA began working with the city of St. Peter, local businesses, local economic development groups, and a private utility to plan a long-term industrial development strategy in which businesses cooperate with each other and with the local community in areas such as common facilities, infrastructure, energy and water use management, and sustainable design features. Through these kinds of sustainable development practices, businesses achieve superior economic and environmental performance. The completed feasibility study targeted development opportunities in two areas: a bio-based chemical production system with emerging business recruitment options, and a community food production system including local suppliers and processors, institutions, waste water treatment plant and marketing cooperative.
- ▶ **Eureka Township Project.** In 2001, OEA awarded a grant to work with two rural townships on the edge of the Twin Cities metropolitan area that are beginning to experience development pressure. The goal of the grant is to help the local communities visualize different development alternatives so that these townships can effectively shape the development process. OEA's contractor is working with community representatives to construct several potential development scenarios. A new software product helps the communities visualize the scenarios and measure the influence of each scenario on environmental, economic, and quality of life indicators, including water quality, infrastructure costs, land use, traffic, open space, and tax base. This project was recognized in Newsweek (8/5/2002) as an innovative way of examining potential growth scenarios.

Financial assistance

Since 1985, the OEA has awarded more than \$10 million in grants to businesses, public entities, nonprofit organizations, schools, and others throughout

Minnesota. From October 1999 to July 2000, OEA provided \$1.35 million to 28 projects, leveraging nearly \$1.5 million in matching funds. The program emphasizes environmental education, pollution prevention, waste reduction and reuse, source separation, recycling and market development of recyclables, and resource conservation. The OEA reviews and approves grants for integrated waste management facilities under the Solid Waste Processing Facilities Capital Assistance Grant Program. The state has funded 89 grants totaling \$46.6 million and has leveraged \$108 million in local contributions for the development of Minnesota's waste management infrastructure. The OEA also provides financial assistance to counties through SCORE (Select Committee on Recycling and the Environment) grants and through the Metropolitan Landfill Abatement Account's Local Recycling Development Grant program to support and expand services to prevent waste generation, foster reuse of materials, and expand recycling. These programs contribute significantly to Minnesota's high recycling rate.

Eliminating Hazardous Cleaning Products and their Disposable Bottles. With the help of an OEA grant, Restore Products



Company (Shoreview) developed and tested the Restore Refill Station in six Minnesota grocery stores. The Refill Station allows shoppers to conveniently refill reusable containers with non-

toxic, plant-based cleaning products. The Refill Station is now being manufactured in Minnesota to be placed in any grocery store. During the test phase alone, use of the Refill Station eliminated:

- ▶ 6,066 pounds of single-use plastic.
- ▶ 7,000 gallons of conventional cleaning products, replaced with a renewable, plant-based product containing no hazardous ingredients.

Minnesota Office of Environmental Assistance

520 Lafayette Rd. N.
St. Paul, MN 55155-4100

651-296-3417 or 800-657-3843

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Introduction

The environmental issues facing Minnesotans are diverse and complex. Pollutants in our air, water, and land come from many sources and many human activities, and existing regulatory programs alone are not adequate to protect our health and natural resources. Acting not as a regulator but as a catalyst, the Office of Environmental Assistance (OEA) has responded by adapting its programs and developing new approaches to address today's environmental challenges.

Established on July 1, 1994, OEA is responsible for waste planning and management for the entire state of Minnesota as well as for developing long-term, integrated waste prevention and management programs in areas such as pollution prevention, toxicity reduction, and environmental education. The OEA has moved well beyond waste management activities.

Working in partnership with Minnesota's citizens, businesses, and other governmental entities, the OEA is creating new models that integrate environmental, economic, and social concerns, as demonstrated by its national leadership in several innovative product stewardship initiatives as well as the office's programs for pollution prevention and waste reduction that conserve energy and resources. We also emphasize the use of renewable resources for energy and manufacturing to reduce the amount of toxic materials released to our air, water, and land. We use technical and financial assistance to achieve our goals.

Examples of OEA's innovative programs include:

- ▶ A partnership with the Department of Agriculture and the Legislative Committee on Minnesota's Resources that resulted in the removal of more than 1,100 pounds of mercury from manometers on dairy farms.
- ▶ Over the last three years, OEA's waste reduction campaign to reduce junk mail has helped Minnesota citizens eliminate approximately 965,000 pounds of paper and plastic junk mail.
- ▶ Supported by an OEA grant, Haubenschield Farm (Princeton, Minnesota) pioneered the use of an anaerobic manure digester to produce methane, generating enough electricity to run the farm plus 78 nearby homes, thereby saving 50 tons of coal each year, reducing greenhouse gas emissions by approximately 1,200 tons per year.
- ▶ In a joint project, the OEA worked with Medtronic, Inc. to integrate "design for the environment" concepts into one of its medical products. The design change saves the company \$2.1 million each year while reducing chemical use and wastewater loading by 75 to 85 percent in the coating process, reducing use of materials by 30 to 35 percent, and eliminating 1,000 pounds of solid waste per year in the battery manufacturing process.
- ▶ The "hydrogen economy" promises to have significant economic and environmental benefits. The OEA is actively working with fuels such as hydrogen because of their pollution prevention benefits, by developing technical expertise and promoting pilot projects. For example, OEA has awarded a grant to help fund a fuel cell to provide electricity for a Hennepin County library. This high-profile demonstration project will serve to measure environmental benefits and educate the public on residential fuel cells.

In the waste management area, OEA continues to work closely with counties to manage Minnesota's solid waste. Our efforts keep Minnesota's recycling rate one of the highest in the nation and foster a recycling industry that contributed over \$3.48 billion to the state's economy in 2000, while saving more than enough energy to power all the homes in Hennepin County. Through these and other efforts described in this report, the OEA helps strengthen Minnesota's environment, our health, and our economy.



OEA's mission and goals

OEA's mission is to help Minnesotans make informed decisions and take actions that conserve resources and prevent pollution and waste to benefit the environment, economy, and society. We strive to support healthy, vital communities—to assure that Minnesota remains a world competitor. To further this mission, the OEA is working to achieve four strategic goals:

Goal 1: Minnesotans reduce and prevent pollution and toxicity.

Goal 2: Minnesotans use materials, products, and services in a manner that conserves resources and minimizes waste generation.

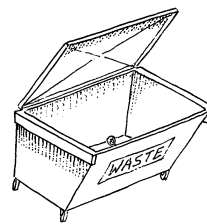
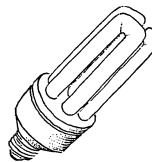
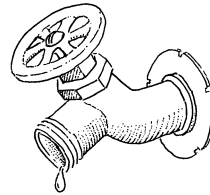
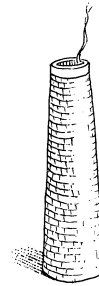
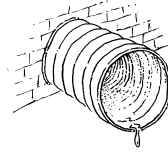
Goal 3: Our society recognizes and strengthens the interconnections between the environment, the economy, and social structures.

Goal 4: Minnesotans understand and minimize the adverse environmental impacts of their actions.

OEA activities

Throughout Minnesota, OEA works in partnership with businesses, other government agencies, schools, community organizations, and individuals to apply innovative approaches to Minnesota's environmental issues. To provide convenient and easy access to information and to the financial and technical assistance we offer, the OEA is organized into four major work areas: Policy Evaluation Research and Grants, Business Assistance/Pollution Prevention, Local Government Assistance, and Environmental Education. This structure allows the OEA to:

- ▶ Work with local governments, businesses, community organizations, and individual citizens to further the state's economic and social priorities in an environmentally sustainable manner.
- ▶ Provide financial incentives through grants and loans to advance implementation of innovative environmental programs and prototypes.
- ▶ Educate Minnesotans about pollution prevention and resource conservation through the media, outreach programs, and the OEA web site.
- ▶ Work with educators and environmental organizations to improve the nature and delivery of environmental education.



Strengthening the interconnections between the environment, the economy, and society

The environmental issues of the 21st century are complex and require new, innovative approaches. OEA is addressing today's challenges by developing systemic solutions rather than limited programs. By changing society's economic and community models to incorporate environmental concerns throughout the process, we develop long-range strategies that are economically viable and environmentally sustainable.

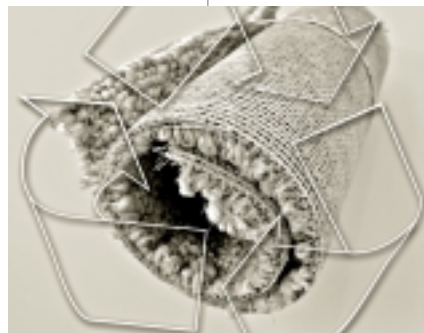


OEA's product stewardship initiatives

OEA's product stewardship program, which has received national recognition, provides just such a new innovative approach to conserving resources, reducing waste, and increasing recycling. In 1999, Minnesota was the first state to develop and implement a product stewardship policy. While this is often characterized as a solid waste management strategy, product stewardship is in reality designed to implement broad sustainability goals such as product redesign, pollution reduction, and energy and resource conservation through a life-cycle approach to product management.

Product stewardship encourages people to think differently about the products they make, buy, and use, so that manufacturers, retailers, and consumers think about and treat products as resources rather than waste. Product stewardship means that everyone involved in designing, manufacturing, selling, and using a product takes responsibility for the environmental impacts of that product throughout every stage of its life. In particular, product stewardship asks manufacturers to share in the financial and physical responsibility for recovering and reprocessing products when people are done using them.

The OEA's product stewardship policy creates partnerships between government and industry to reduce the environmental impacts of manufactured products in an economically efficient and environmentally beneficial manner. When manufacturers share the costs of reprocessing products,



they have an incentive to use recycled materials in new products and to design products that are less toxic and easier to recycle, incorporating environmental concerns into the earliest phases of product design. As a result of OEA's product stewardship policy initiative, some manufacturers have entered into agreements of national scope, accepting responsibility for collecting and recycling their products when consumers are done using them.

Initially, the OEA chose three products to be addressed within a product stewardship

framework: paint, carpet, and electronic products that contain cathode ray tubes. These products were chosen based on factors such as toxicity, volume being discarded, and potential for increased recovery and processing.

The OEA's product stewardship information is online at www.moea.state.mn.us/stewardship.

Carpet

In February 2000, OEA convened the Midwestern Workgroup on Carpet Recycling to explore product stewardship for discarded carpet, which currently accounts for at least 77,000 tons, or 2.4 percent of the waste stream in Minnesota.

Originally, the states of Minnesota, Iowa, and Wisconsin, and the U.S. EPA spearheaded the work group. Ultimately, the work group grew to include 40 representatives from the carpet industry (manufacturers, carpet retailers, and recyclers), federal, state, and local governments, and non-governmental environmental groups.

Their work culminated in an agreement in January 2001 in which industry com-

mitted to create a third-party, industry-funded organization to recover used carpet and to negotiate a memorandum of understanding (MOU) to implement this agreement. The final agreement had the support of more than 15 state governments.

In 2001, Minnesota helped lead the negotiation of a groundbreaking nationally recognized MOU that among other things established a 10-year schedule of recovery and recycling goals for carpet, which will be implemented by the third-party industry organization. The MOU was signed in January 2002 that formalizes this schedule, with support of the carpet industry, government, and environmental organizations. The agreement also states that goals for the following 10-year period will be developed using a similar multi-stakeholder process. The states, with input from the carpet industry, also developed model procurement guidelines so that carpet purchasers can specify environmentally preferable carpeting. The OEA serves on the Executive Committee of the CARE organization created to reach the recycling and reuse goals.

Electronics

Waste electronics are a growing waste challenge for Minnesota. A 1999 study by the National Safety Council estimated that nearly 500 million computers will become obsolete between 1997 and 2006. Few old household electronic products are recycled; most are either in storage or are thrown into 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.

Electronics with CRTs Task Force

The OEA convened a task force for electronic products containing CRTs in September 1999. Members included electronics manufacturers, retailers, recyclers, and representatives from local and state government. The task force met seven times from September 1999 to October 2000 to examine management and financing options, and assess various markets for materials from recovered electronic products.

The relationships, knowledge and experience gained through Minnesota's CRT Task Force led to a variety of collection and recycling projects with manufacturers, retailers, recyclers, and local governments in 2000 and 2001. These projects have provided nationally recognized data and experience toward achieving the state's goal of establishing a national program for electronics collection and recycling in partnership with the electronics industry.

Demonstration project: Plug into Recycling

In conjunction with the task force, OEA formed a partnership with Sony Electronics, Panasonic, Waste Management's Asset Recovery Group, and the American Plastics Council to design and conduct a three-month statewide collection and recycling project for used residential elec-



tronics. This project explored the economics and feasibility of collecting and recycling electronic equipment using a shared responsibility and financing model in order to identify how best to capture and recycle used electronics from municipal waste in Minnesota.

National Electronics Product Stewardship Initiative (NEPSI)

The OEA's partnerships and projects with electronics manufacturers over the last three years helped lay the groundwork for the National Electronics Product Stewardship Initiative, which began in 2001. NEPSI is a multi-stakeholder dialogue involving 12 electronics manufacturers, 10 states (including Minnesota), the federal 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 financing that system. Negotiations are expected to continue through early 2003.

Sony take-back program

Building on the success of the demonstration project, in October 2000, Sony Electronics announced a landmark effort

with its vendor, Waste Management (WM), to recycle all Sony electronics from Minnesota consumers. Through this program, the first of its kind in the United States, Minnesota residents can recycle Sony products at no charge by dropping them at designated WM sites. More information about this program is available on OEA's web site:

www.moea.state.mn.us/plugin/sonyevents.cfm.

Paint

Paint is the largest-volume item collected by city and county household hazardous waste (HHW) programs. In 2001, more than 200,000 gallons of leftover latex paint and more than 150,000 gallons of leftover oil paint were collected. Volumes continue to increase. According to 2001 SCORE report, Minnesota counties reported an 86% increase in latex paint collected at HHW facilities. The large quantity of waste latex and oil-based paint generated each year poses a costly disposal challenge that local governments now fund. Latex paint is banned from disposal from a landfill in its liquid form and cannot be disposed of in a sewer or sink. However, leftover paint is typically still a usable material and can produce cost savings if managed as a recyclable material rather than a hazardous waste.

The OEA has initiated discussions with paint manufacturers and retailers to explore options to collect and recycle waste paint without relying solely on government-funded programs. The OEA will continue to work to establish partnerships that advance these objectives.

Grant projects

The OEA awarded grants in FY2000 to two paint manufacturers in Minnesota to increase paint recycling and create recycled-content latex paints. Amazon Environmental Inc. (Roseville) produces rebled paint, Amazon Select™, which contains a minimum of 80 percent post-consumer recycled content material.

Hirshfield's Paint Manufacturing (Minneapolis) makes a high quality reprocessed paint, RenewWall™, containing a minimum of 20 percent post-consumer recycled material. Both companies are on the state contract for recycled latex paint. Their products are less expensive than competing non-recycled brands, and meet rigorous specifications for performance and quality.

National Paint Stewardship Initiative

The OEA is working with the paint industry, other state and local governments, U.S. EPA, and non-governmental organizations to negotiate a voluntary national paint stewardship agreement (similar to the national Carpet Stewardship Agreement) to properly manage waste paint, increase the value recovered



Amazon Environmental Inc. (Roseville) produces rebled paint, Amazon Select™, which contains a minimum of 80 percent post-consumer recycled content material.

from post-consumer paint, and reduce the environmental impacts of paint throughout its lifecycle. The National Paint Stewardship Initiative is expected to begin in the spring of 2003. For more information regarding the OEA's paint stewardship efforts, visit www.moea.state.mn.us/stewardship/paint.cfm.

New products

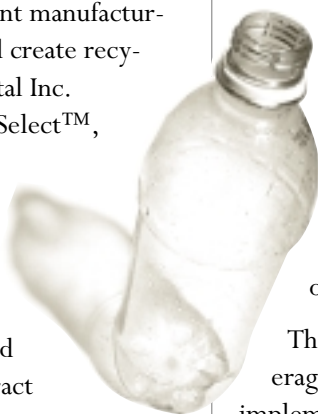
The OEA recently initiated work on two new product stewardship products: beverage containers and automobiles.

Beverage containers

Beverage containers are perhaps the most ubiquitous form of waste in the United States. In 1999, over 132 billion beverage containers were discarded—approximately 40 percent of which were recycled. While plastic, glass, and aluminum beverage containers are staples of municipal recycling programs, they are also a highly visible form of roadside litter.

Recycling all types of beverage containers saves significant amounts of energy, and reduces water and other air pollutant emissions.

The OEA proposes to initiate a national dialog with beverage container manufacturers that will result in a signed implementation agreement to achieve significant, measurable improvement in beverage container recycling nationwide. The U.S. EPA has awarded a grant to the OEA to begin the first phase of this process. OEA's project team will develop a charter defining the objectives, work plan, participants, facilitator, and other aspects of a national dialogue on beverage container recycling. OEA will also attempt to secure commitments from the necessary groups to participate in the effort. The second phase of the project would result in the implementation agreement.



Automobiles

Over 10 million vehicles are sent to salvage yards and scrap facilities each year. Approximately 75 percent (by weight) of a vehicle is composed of metals that are recycled. The other 25 percent contains plastics, rubber, wood, paper, glass, and other materials. Nearly 5 million tons of this “fluff” material are disposed of in landfills each year. A greater emphasis on the use of recycled/recovered materials in vehicles will decrease the amount of toxic and hazardous constituents in automobiles and decrease the amount of waste material going to landfills.

With the support of a grant from U.S. EPA, the OEA is examining opportunities for product stewardship within the automobile industry. We are now evaluating the materials currently used to manufacture and assemble automobiles and identifying the environmental goals of manufacturers and their progress in meeting those goals. The research will identify specific applications for parts containing recycled-content materials and assess any barriers restricting their use. We are exploring the possibility of including air issues in the next phase of this project.



Sustainable buildings

A significant amount of the pollution and waste produced and energy and natural resources consumed in the United States and worldwide come from the “built environment.” Depending on how they are designed, constructed, and operated, buildings also can have positive or negative impacts on the health, safety, and productivity of their inhabitants. According to the WorldWatch Institute, “Sick Building Syndrome” occurs in at least 30 percent of new or renovated buildings constructed around the globe.

The OEA supports policies, programs, and technologies that encourage the development of sustainable buildings. A sustainable building 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. The design of a sustainable building also considers historic preservation and access to public infrastructure systems, as well as the entire life cycle of the building and its components.

Sustainable building continues to gain momentum and support in Minnesota and nationally as a more economically efficient, healthy, and environmentally friendly approach to building design and construction. The OEA has been actively working to advance sustainable building practices and policies, particularly within Minnesota state agencies and local governments.

Grants for sustainable building

Through its environmental assistance grant program, the OEA has funded and supported a number of innovative projects that will make it easier for organizations and individuals to incorporate sustainable building principles into their construction projects. These include:

- ▶ Training architects and government professionals to use the Minnesota Sustainable Design Guide, a web-based design tool that educates and assists architects, building owners, occupants, educators, students, and the general public concerning sustainable building design. The guide can be used to overlay environmental issues on the design, construction, and operation of both new and renovated facilities. It was developed with OEA technical assistance four years ago for Hennepin County buildings and funded in part by an OEA grant (www.develop.csbr.umn.edu/msdg2/).



Deconstruction Services in Minneapolis

- ▶ Expansion of DeConstruction Services, a program of the Green Institute, that dismantles and salvages building materials for reuse.
- ▶ Creation of Sustainable Schools Minnesota, a pre-design guide for school officials to help design “sustainable schools.”
- ▶ Development of the ReUse Center’s reclaimed wood redressing facility.
- ▶ Construction of two affordable homes by the Rondo Land Trust, using reclaimed and redressed wood from the ReUse Center.
- ▶ 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 life-cycle information about components of building systems (e.g., wall systems), as well as information about how changing a particular building component interrelates with other material choices. The database will evaluate and disseminate sustainable design practices and support a sustainable campus initiative.

Projects that incorporate sustainable concepts into affordable housing and those that assist schools to address indoor air quality and “sick building” issues through sustainable building techniques, including energy efficiency upgrades, are priority targets for the 2002-2003 OEA grant round.

With the creation of an OEA Green Building web site at www.moea.state.mn.us/greenbuilding, the wealth of Minnesota-specific sustainable building information, developed with OEA funding and technical assistance, is now accessible to other state agencies and local governments. The web site includes extensive information and links on building design, products and materials, recycling of construction and demolition materials, and financing. The web site also provides local case studies and resources specifically targeted at schools and local-governments.

Technical assistance for state construction and leasing

The OEA Sustainable Building Program has devoted considerable effort to improving the design, construction, and leasing

practices for public sector buildings. The OEA has encouraged the Department of Administration to use the Minnesota Sustainable Design Guide as a roadmap to incorporate sustainable building design and construction practices into state building projects.

In partnership with several state agencies, the OEA helped to incorporate high performance building guidelines into the capital budget process for 2002. For construction of the Departments of Agriculture and Health new laboratory facility and parking ramp, proposers were required to use the Sustainable Design Guide, including a list of required strategies developed with OEA’s assistance.

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. Compliance with these guidelines is mandatory for all new buildings receiving funding from the bond proceeds fund after January 1, 2004. The OEA helped develop the Request for Proposals (RFP) for the Buildings, Benchmarks & Beyond (B3) project awarded in July 2002, and is on the core team working with the consultants chosen to develop the guidelines.

OEA has begun using the informational materials (RFPs, specifications, case studies, etc.) to provide enhanced technical assistance to other public entities to implement sustainable building throughout Minnesota. OEA also is examining the need for legislative initiatives to facilitate sustainable building efforts by public entities.

Request for lease proposal

One of the OEA’s goals is to incorporate sustainable building design in important state and local projects. In fall 2001, the Department of Administration, MPCA, DNR, University of Minnesota Center for Sustainable Building Research, and OEA began creating the structure for a “green” lease RFP for a combined DNR, PCA, and OEA facility. The interagency team developed sustainable building specifications for the lease RFP, fine tuned technical assistance information available to applicants, and evaluated proposals. The RFP was issued in summer 2002, and we hope that it will develop into a model document for use by other state and other public entities in Minnesota.

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 sustainable building and maintenance practices.



Minnesota Sustainable Communities Program

Helping communities and businesses efficiently share resources and cooperate leads to economic gains, environmental gains, and enhancement of human resources. Through its sustainable communities programs, the OEA is working to help our communities thrive and to keep our businesses globally competitive by minimizing resource use and creating effective communities and industrial sectors.

NextStep

In early 2001, the OEA introduced NextStep (www.nextstep.state.mn.us), a comprehensive web site for people who want to find and share resources on sustainability in Minnesota. This active site, which is organized into 12 key topic areas, contains summaries of hundreds of tools and resources related to sustainable communities. NextStep also contains many case studies, a calendar and job listings, a member directory, a regional search, and other educational features. The web site has been well received by its users, and in 2001 won a special award from the Minnesota Chapter of the American Planning Association in the public education category. It is also featured as one of the top web sites on sustainable community development by the U.S. Department of Energy's Smart Communities Network, and was selected for a Wally

Award by the nonprofit organization 1,000 Friends of Minnesota.

NextStep is a key educational component of the OEA's 2,000+ member Minnesota Sustainable Communities Network (MnSCN). The network is also served by a popular biweekly e-mail newsletter now in its sixth year (the MnSCN Update), an annual conference (with the 2001 conference attracting more than 600 attendees), a short video, and occasional printed materials. MnSCN encourages networking, information exchange, and better access to assistance on the topic of sustainability, and helps to build the capacity of local governments and communities to implement sustainable practices.

Industrial ecology projects

Industrial ecology uses the model of natural ecosystems, in which organisms depend upon each other for nutrients and absorb each other's waste. Eco-industrial communities exchange byproducts for use as feedstocks rather than continually using virgin materials and discarding waste. This sharing of resources leads to economic gains, gains in environmental quality and equitable enhancement of human resources for the businesses and community. By collaborating in areas such as energy, water, and material use and sharing of services, business communities can achieve superior economic and environmental performance.

Eco-industrial parks inherently reflect the community characteristics such as:

- ▶ The industrial input resource base, energy resources and material flows.
- ▶ Compatibility with existing industrial, local business and community activities.
- ▶ Priorities for economic opportunities, environmental quality and growth.
- ▶ Quality of life, natural resource, cultural and other community amenities.
- ▶ Benefits resulting from eco-industrial development include:



- ▶ Businesses realize greater resource efficiency, lower costs, improved employee health and productivity, and stronger connections with suppliers, customers, and the community.
- ▶ The community enjoys high quality job creation and retention, compatibility with community development vision, enhanced business recruiting and value added to the local economy.
- ▶ Environmental benefits include less waste and pollution, more efficient use of energy and resources, and improved performance to reduce clean-up and other regulatory costs.

The OEA is working with Minnesota's businesses and communities to implement industrial ecology principles in development projects. A recent example of our effort to implement more sustainable development practices is a multi-agency initiative involving the city of St. Peter, Minnesota. In January 2001, the city initiated a planning project that included a redevelopment and diversification strategy, prompted in part by recent natural disasters, economic distress and projected future community growth. The project was funded by the city, local economic development groups, the OEA, and a private utility. The approach emphasized local and regional assets, including the region's agricultural base, local institutions, and the existing small industrial base. The result was a completed feasibility study that targeted development opportunities in two areas: a bio-based chemical production system with emerging business recruitment options and a community food production system including local suppliers and processors, institutions, wastewater treatment plant and marketing cooperative.



Haubenschild Farm is a pioneer in using anaerobic manure digestion to produce methane for generating electricity in Minnesota. The 800-cow family farm produces enough power to run the entire farm, plus 78 homes in the Princeton area.

Sustainable development grants

OEA's grant program has been successful in helping Minnesota communities become more sustainable, and to meet their environmental, social, and economic goals.

Haubenschild Farm. An excellent example of a successful sustainable development project is the Haubenschild Farm Anaerobic Digester Project in Princeton. Haubenschild Farm is a pioneer in using anaerobic manure digestion to produce methane for generating electricity in Minnesota. The 800-cow family farm produces enough power to run the entire farm, plus 78 homes in the Princeton area. The farm has made about \$130,000 worth of electricity, and saves between \$60,000 and \$80,000 in fertilizer each year. In almost two years of operation, the digester has performed exceedingly well, producing double the amount of methane predicted by engineers. Because of the extraordinary partnership of a diverse set of interests, the project has had tremendous support and received much favorable publicity, including a front-page article in the Star Tribune. The project also won a Governor's Award for Excellence in Waste and Pollution Prevention in 2001 (www.moea.state.mn.us/p2/govaward.cfm.) Several other farms are now considering similar projects.

Old Sears Distribution Center Site, Minneapolis. The former Sears Center on Lake Street in Minneapolis consists of more than 18 acres and buildings with over 1.9 million square feet of space. Parties involved in efforts to redevelop this site include the OEA, the City of Minneapolis, Department of Transportation, Department of Commerce, Hennepin County, private design and construction firms, and the U.S. Department of Housing and Urban Development (HUD awarded Minneapolis one of 15 national Empowerment Zone designations. This site is one of three demonstration projects in HUD's Empowerment Zone Strategic Plan.)

The OEA awarded a grant to assist in the development and application of viable, cost-effective sustainable design and construction options for the project. Specific priority areas for the OEA grant included optimizing energy efficiency and evaluating the use of renewable energy sources to conserve resources and prevent air pollution; and designing a materials handling system that maximizes reduction, reuse and recycling of waste generated in the buildings.

Bridal Veil Industrial Redevelopment. The Bridal Veil area is a 380-acre brownfield site in southeast Minneapolis. This sustainable industrial redevelopment project funded through an OEA grant, sought to demonstrate to real estate developers the benefits of developing land in a sustainable manner. This project produced a guide that provides information on sustainable high performance building design and serves as a resource for com-

community representatives seeking to champion sustainable development approaches in their communities.

Minnesota Project/Minnesota Design Team grant. The Minnesota Project, funded through an OEA grant, supports the Minnesota Design Team (MDT) in its efforts to increase community sustainability through sound design work. The project intends to increase implementation of Design Team recommendations by providing assistance to communities following MDT visits. One of the key objectives of OEA's grant project is for each community to develop and implement at least one priority initiative that results in: resource conservation, pollution prevention, source reduction, and prevention of waste, hazardous substances and toxic pollutants.

The OEA also awarded a grant to document 200 case studies of successful rural business and community projects in Minnesota that feature environmentally sustainable innovations.



New software helps local communities like Eureka visualize different development alternatives and their impacts.

Eureka Township Project. In 2001, OEA awarded a grant to work with two rural townships on the edge of the Twin Cities metropolitan area that are beginning to experience development pressure. The goal of the grant is to help the local communities visualize different development alternatives so that these townships can effectively shape the development process.

Working with representatives from each township, OEA's contractor is constructing several potential development scenarios. A new software product helps the communities visualize the scenarios and measure the influence of each scenario on environmental, economic, and quality of life indicators, including water quality, infrastructure costs, land use, traffic, open space, and tax base. After work with the townships is completed, the grantee will hold meetings in several communities around the state to share the results of the project and explain the process.

This project was recognized in Newsweek (8/5/2002) as an innovative way of examining potential growth scenarios.

Preventing pollution and reducing toxicity



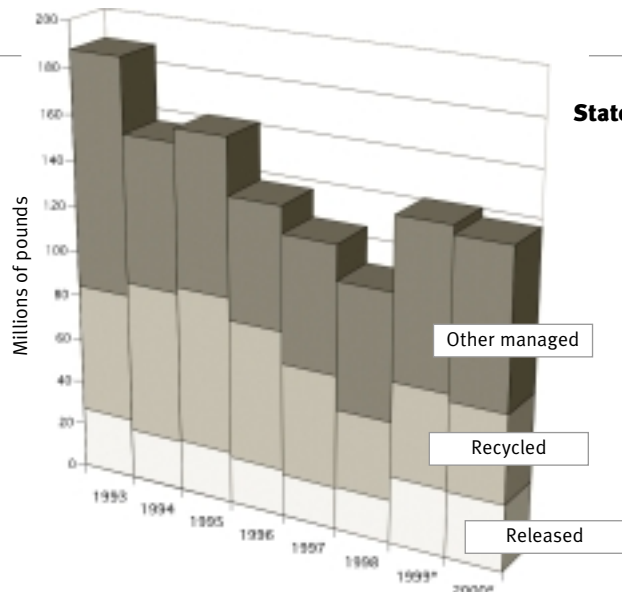
Preventing pollution and reducing toxic chemicals create significant economic benefits as well as environmental benefits. Pollution prevention (P2) is a front-end approach to addressing environmental concerns, rather than a pollution control, or end-of-pipe method. By avoiding the expense of managing toxic wastes and decreasing the potential for harm from an accidental release, Minnesota industries that implement pollution prevention measures have saved millions of dollars in the last two years alone, while benefiting public health and safety by reducing the quantity and toxicity of waste.

The OEA provides incentives and assistance to facilities for pollution prevention to improve their environmental and economic performance. This has proven to be a very effective strategy for keeping Minnesota businesses competitive with those in other states and nations. OEA's P2 program is completely voluntary, using positive incentives such as technical assistance, recognition awards, education, grants, and loans to motivate organizations to implement pollution prevention.

Evaluating P2 progress

The OEA evaluates the state's progress in pollution prevention every two years and reports its findings to the Legislature. In the *Pollution Prevention Evaluation Report, 2002*, the OEA examines the quantity of Toxic Release Inventory (TRI) chemicals that were generated and released into the environment by Minnesota's reporting facilities. OEA staff then evaluates this and other data to determine industry trends, evaluate

progress, and recommend future program and policy changes. The 2002 report shows that while additional pollution prevention opportunities remain, a decrease in the number of reporters and an approximate one-third reduction in both releases and generation strongly indicate that noteworthy progress in P2 has occurred in many manufacturing sectors. The full report is available on the OEA web site at www.moea.state.mn.us/p2/p2evaluation2002.cfm.



Statewide trend for reported TRI chemicals (excluding recyclers) from 1993 to 2000
in millions of pounds

Year	1993	1994	1995	1996	1997	1998	1999*	2000*
Number of reporters	549	532	465	432	406	428	399	404
Amount of TRI chemicals (in millions of pounds)								
Released	26.9	22.4	22.9	20.8	18.7	19.0	29.8	29.3
Recycled	57.2	67.5	69.6	61.9	49.7	34.6	41.4	38.7
Other managed	103.3	65.0	68.4	53.5	55.9	55.3	69.3	68.7
New reporters*	0	0	0	0	0	18.5	0	0
Total generated	187.4	154.9	160.9	136.2	124.3	127.4	140.5	136.7

Technical assistance for pollution prevention efforts

The OEA recognizes that strong partnerships are needed to turn assistance into results. OEA prioritizes its P2 technical assistance by evaluating:

- ▶ **Opportunity** – Manufacturing sectors that have market-ready pollution prevention technology.
- ▶ **Risk** – Manufacturing sectors that use large quantities of the chemicals that pose the largest potential risk to public health and the environment.

Minnesota Technical Assistance Program

The Minnesota Technical Assistance Program (MnTAP), which is funded by the OEA, helps Minnesota businesses maximize resource efficiency, prevent pollution, and reduce waste by providing on-site and telephone assistance, interns, a clearing-house, and materials exchange services. Over the past two years, MnTAP received 2,537 requests for assistance, conducted 304 site visits, and placed 14 interns in companies. These activities resulted in significant economic and environmental benefits: reducing 11.2 million pounds of waste and emissions, conserving 90 million gallons of water, and saving companies \$5.2 million. Overall, MnTAP saves businesses at least \$2 for every \$1 spent on the program.

Minnesota manufacturers rank on-site P2 technical assistance as one of their highest needs. In fact, a 2002 survey showed that of the facilities that received MnTAP assistance 92 percent indicated they would use MnTAP services again, 70 percent succeeded in preventing or reusing waste, and 31 percent saved money as a result of that assistance. The survey results also state that assistance requests for reducing hazardous air emissions, water use, and energy conservation made up over half of all requests. As a result of the relationships MnTAP has built with the business community, pollution prevention practices are improving the way Minnesota companies operate, saving money and helping to protect the environment.

Wastewater load reduction program for industrial users

MnTAP is helping wastewater treatment plants and publicly owned treatment works (POTWs) meet discharge limits by working with their industrial users to reduce phosphorus, biochemical oxygen demand (BOD), total suspended solids, and water use through the application of pollution prevention measures. MnTAP contacted 600 wastewater treatment plants and provided technical assistance to 128 industrial users to raise their awareness of the benefits of pollution prevention and help the industrial users implement pollution prevention practices. MnTAP has already helped companies reduce 30,796 pounds of phosphorus, 3 million pounds of organic

and solids loading, and 66.5 million gallons of water, resulting in a cost savings of \$2.8 million to the companies. In addition, many POTWs were able to reduce phosphorus or other pollutants by partnering with these industries and avoiding installation of additional treatment capacity at a significant cost savings to the taxpayer.

Pollution prevention assistance for the fiberglass reinforced plastics industry

The OEA, through MnTAP's technical assistance program, and the MPCA recently completed an EPA-supported study to assist fiberglass reinforced plastics (FRP) shops in implementing pollution prevention strategies that will help them meet or exceed compliance with federal laws. During the course of the project, five technologies were put into place in three companies resulting in reductions of 108,400 pounds of styrene and a saving of \$119,000.

OEA's MnTAP staff contacted over 100 shops in Minnesota and made 22 site visits. The highlight of the initiative was a FRP Demo Days' event in 2001 which combined seminars,



MnTAP technical assistance has resulted in significant economic and environmental benefits: reducing 11.2 million pounds of waste and emissions, conserving 90 million gallons of water, and saving companies \$5.2 million.

resource booths, and technology demonstrations with a focus on techniques and technologies to use resin more efficiently and reduce styrene emissions. Over 170 people attended the event, and 50 percent of attendees were fiberglass fabricators. MnTAP developed a number of fact sheets and case studies that document the environmental and economic benefit of these more efficient technologies. These are now being distributed to FRP shops.

Industrial painter training

The Twin Cities chapter of the Chemical Coaters Association International (CCAI) has teamed with MnTAP to train students in the proper techniques of powder coating at Dunwoody Institute. Students learn the best techniques to prepare and coat with the latest, most efficient technologies. The industry benefits through resource and labor efficiency and productivity, reduced waste, and environmental protection. Additional topics to be covered as part of the series include paint pretreatment, liquid organic coating, liquid application equipment, and environmental issues.

Hydrogen economy

The development of cleaner fuels will result in significant pollution prevention. OEA's 2002 *Pollution Prevention Evaluation Report* recommended that OEA work with Minnesota Planning to prepare a study on alternative fuels, including hydrogen. Minnesota Planning will complete the white paper "Freedom Fuel: Minnesota and the Hydrogen Economy" in fall of 2002. The OEA also provides pollution prevention technical assistance through research initiatives such as use of biomass fuels for hydrogen production.

The OEA provides financial assistance through its grant program for a project that will use a hydrogen fuel cell to provide electricity for a new Hennepin County library. This high-profile demonstration project will serve to measure environmental benefits and educate the public on residential fuel cells.

As a member of the Minnesota Hydrogen Infrastructure Initiative, the OEA works with the Department of Commerce, Minnesota Planning, and industry and public interest groups. The primary objective of the Initiative is to assure that Minnesota is in the best position to benefit from the approaching hydrogen economy. The group meets quarterly to coordinate technical, economic and policy research and planning. Finally, through its relationship with the U.S. Department of Energy's National Renewable Energy Laboratory, the OEA co-sponsored a Midwest Regional Hydrogen Infrastructure Forum in Chicago in October 2002.

Design for the Environment

The OEA's Design for the Environment efforts help manufac-

turers incorporate pollution prevention concerns into a product at the design stage. For a typical product, 70 percent of the cost of development, manufacture, and use is determined in its design phase. Design for the Environment (DfE) considers the potential environmental impacts of a product throughout its entire life cycle, from the extraction of resources needed to make the product to its disposal. These environmental impacts can range from the release of toxic chemicals into the environment to the consumption of nonrenewable resources and excessive energy use.

By integrating environmental considerations up-front at the time the product is designed, a company can increase efficiency and improve environmental performance, while reducing waste of materials and energy, regulatory concerns and liabilities, and costs. For example, in a joint project with the OEA, Medtronic, Inc. integrated DfE concepts into the design of a medical product. As a result of the redesigned manufacturing process for the product, the company realizes the following benefits:

- ▶ Saves an estimated \$2.1 million each year.
- ▶ Reduces chemical usage and wastewater loading by 75 to 85 percent in the coating process.
- ▶ Reduces materials use by 30 to 35 percent while also eliminating 1,000 pounds of solid waste per year in the battery manufacturing process.

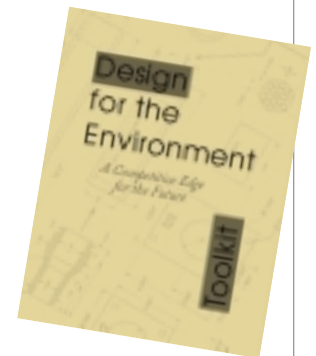
In addition to providing on-site DfE assistance, the OEA has developed a *DfE Tool Kit*, a guide to help businesses develop less polluting and more efficient products. In 2001, the Tool Kit was downloaded more than 9,000 times from the OEA web site. The OEA web site (www.moea.state.mn.us/p2/dfe.cfm) features case studies and guide sheets that discuss aspects of DfE.

Procurement

State agencies can significantly influence the marketplace through their purchasing policies. The Department of Administration's Materials Management Division spends more than \$1 billion annually to purchase commodities (supplies,



By using *Design for Environment* concepts during product development, companies can increase efficiency and reduce waste, costs and regulatory concerns.



etc.) for state agencies. In order to maximize the effectiveness of the state government's tremendous purchasing power, the OEA is working with the Department of Administration to promote the purchase of environmentally preferable products—goods and services that have a reduced effect on human health and the environment.

By buying products that are less toxic, have the least amount of packaging, made from renewable resources, conserve energy and water, or that have some other more preferable characteristic, state agencies and local units of government can reduce the state's regulatory liability, improve worker safety, and lower disposal costs. Using energy- and water-conserving products can save the state money. Products that are reusable, more durable, or repairable create less waste and are typically more cost-effective over the life of the product.

The OEA is now routinely involved not only in promoting environmentally preferable products, but also in adding these products to state purchasing contracts and in improving the tracking of such purchasing. Here are a few examples of the progress the OEA is making:

- ▶ Established the first state contract for recycled-content latex paint in July 2000.
- ▶ Established a state contract for flooring in June 2000, which included several environmental specifications. The solicitation set air quality standards for carpet, required vendors to recycle old carpet, and encouraged vendors to bid carpet, tile, and rubber flooring made with recycled materials.
- ▶ Added chlorine-free paper and a less-toxic cleaner to the Central Stores catalog.
- ▶ Initiated discussions with the Department of Administration on mercury component disclosure and phase-out requirements in the 2002 motor vehicle request for bids (RFB), in partnership with the Pollution Control Agency and INFORM, Inc. The RFB, issued in October 2001, included a disclosure requirement and statement of intent to purchase only mercury-free vehicles starting in the next two to three years.
- ▶ The OEA tracks purchases of Blue Planet and E-85 fuel used in its two flexible fuel vehicles.

Environmentally preferable purchasing (EPP) positively impacts the state, both environmentally and economically. For example, choosing to purchase products containing post-consumer recycled content material creates a demand for recyclable materials, which in turn fosters new recycling manufacturing. Using state and local government purchasing power can help develop markets for these environmentally preferable products and help support publicly funded programs, such as consumer recycling. Buying recycled products is necessary to close the loop on recycling and ensure that it

remains a competitive process.

Environmentally preferable purchasing can be challenging because it creates a paradigm shift from traditional "lowest up-front price" purchasing to "best-value" purchasing. It is true that some environmentally preferable products are cheaper in the short term, but EPP takes into account the total costs associated with the entire life cycle of the product, including end-of-life and final disposal. Procurement information is available on the OEA web site and links to the Department of Administration's site.

PBT reduction

The OEA has targeted two top-priority persistent, bioaccumulative, toxic chemicals (PBTs)—dioxin and mercury—because of their toxicity and persistence in the environment. PBTs are substances that do not break down readily in the environment. Instead, they build up in the food chain by accumulating in plant and animal tissue.



Mercury reduction efforts

The OEA has targeted mercury-containing consumer products for reduction efforts. Mercury is a PBT that affects the nervous system and is toxic to both humans and wildlife. Children who are exposed to mercury through their mothers' consumption of fish are particularly at risk.

Legislative ban on mercury thermometers. Under a new law effective January 1, 2002, it is now illegal to sell mercury thermometers in the state of Minnesota, except under certain conditions where a non-mercury thermometer is not available. OEA staff developed the legislative proposal and provided technical advice throughout the legislative process.

Mercury and Family Health in Minnesota. This very successful OEA grant project educated citizens about the health and environmental dangers of mercury, instructing them on how to safely clean up a broken mercury thermometer, how to properly dispose of a mercury thermometer, and how to choose a mercury-free alternative. Several mercury thermometer exchange events were held under this grant, with a focus on serving minority communities. More than 1,300 mercury fever thermometers were collected during the course of the project and replaced with non-mercury thermometers.

National Mercury Stewardship Initiative. The Quicksilver Caucus (QSC) was formed in 2001 in order to coordinate state activities related to mercury control and reduction and to provide a unified state voice on national and international mercury programs, policies, and regulations. In February 2002, QSC representatives

met with U.S. EPA officials to discuss mercury issues and identify areas for possible collaboration, including eliminating mercury in products and assuring proper disposal. Federal/state teams were formed to address these initiatives. The MPCA commissioner is the state co-chair of the Stewardship Initiative, and OEA is providing staff support to this initiative because of OEA's expertise in mercury stockpile, storage, and recovery issues. The EPA is currently developing a National Action Plan for mercury. Minnesota will comment on the plan so that it reflects state interests and concerns.

Recovery and elimination of mercury from vehicles. The OEA is working with Ramsey County, North Star Steel, and 12 automobile salvage yards in Ramsey County to improve the recovery rate of mercury switches in salvage vehicles. This program is intended to serve as a pilot for improved switch removal programs statewide. The OEA is also involved in other state and national efforts to eliminate the use of mercury in automobiles. In cooperation with INFORM, Inc. and MPCA, OEA developed a mercury component disclosure requirement for the state's 2002 motor vehicle bid specifications and helped the Department of Administration to establish a program to remove mercury switches from state vehicles before they are retired from state service.

Mercury-free schools. The OEA is providing financial grants and technical support to the Mercury-free Zone program, which is designed to eliminate mercury use in K-12 schools in Minnesota and educate students and teachers about mercury. Clancy, the nation's first mercury-detecting dog, is an integral and highly effective component of this program and is funded with an OEA grant.

Dioxin reduction efforts

Dioxins are regarded as some of the most toxic substances known. They are not intentionally manufactured, but are created as a by-product of some manufacturing processes and through the incomplete burning of chlorine-containing materials. Burn barrels are currently the largest source of dioxin in the United States. U.S. EPA research estimates that just one burn barrel (from an average family of four) can produce at least as much dioxin as a full-scale municipal waste incinerator burning 200 tons per day.

Burn barrels. The OEA is working with local, state, national, and international partners to reduce people's reliance on burn barrels as a waste disposal method. In Minnesota, the OEA's burn barrel reduction efforts rely upon education, improving local infrastructure, and enforce-



ment. For example, through an OEA grant, Chisago County implemented a Burn Barrel Buy-Back program designed to educate residents about the health and environmental concerns associated with residential garbage burning. The program offered half-price garbage service for six months for residents who agreed to give up their burn barrels and sign up for waste service. The waste hauler also provided free disposal of the old burn barrel and contaminated ash. The program was well received by both the hauling community and citizens alike. As a result, Chisago County saw a 40 percent reduction in the number of people who used burn barrels, reducing the amount of waste burned and dumped on-site by nearly 700 tons a year. The OEA also worked with Western Lake Superior Sanitary District to conduct a campaign to educate local elected officials through an educational workshop late in 2002.

In an international effort, the OEA continues to work with the Great Lakes Bi-National Toxics Strategy and Minnesota Pollution Control Agency (MPCA) on burn barrel reduction strategies for the Great Lakes Basin Area in the United States and Canada. The burn barrel subgroup (of the larger dioxin work group) recently completed a comprehensive web site featuring educational materials, resources, and legislative strategies designed to reduce the use of burn barrels (www.open-burning.org).

Chlorine-free products. The OEA continues to partner with the Department of Administration to increase the purchase of functionally equivalent, non-chlorinated products and papers in order to reduce dioxin precursors and is also working to educate health care professionals about the availability of chlorine-free supplies and equipment.



Pollution prevention activities in health care

Minnesota Healthcare Environmental Awareness and Resource Reduction Team (HEARRT) is a group coordinated by OEA, with representation from healthcare facilities, county and state environmental staff, and citizen groups. HEARRT meets quarterly at the OEA to share information about environmental management within healthcare facilities and to implement the goals of the Hospitals for a Healthy Environment (H2E) project of the American Hospital Association and U.S. EPA.

Hospitals for a Healthy Environment (H2E)

In the H2E initiative, OEA is working with the U.S. EPA, the American Hospital Association, the American Nurses

Association, and Health Care Without Harm to improve environmental performance in the health care industry. The goals of the H2E effort are to eliminate mercury-containing waste by the year 2005, to reduce the total volume of all wastes by 33 percent in 2005 and 50 percent in 2010, and to minimize the production of PBT pollutants. After three years of work, the OEA through its MnTAP program helped H2E produce three key resource documents to eliminate waste from healthcare settings: Mercury Waste Elimination Plan, Chemical Waste Minimization Plan, and Total Waste Elimination Plan. These plans serve as important resources for hospitals as they implement measures to reduce and eliminate wastes.

In June 2001, MnTAP and OEA staff held three all-day training sessions promoting the use of these resources to reduce waste around the state, help hospital staff implement the H2E goals, and develop a strategy for sharing technology throughout the state. Five more workshops are planned for spring 2003. In addition, an outreach effort offering technical assistance will help hospitals and other facilities use these resources in their waste reduction efforts. MnTAP was given the “Champions for Change Award” in April 2002 by the H2E program in recognition of its leadership in promoting pollution prevention programs within the health care field.

Reducing Toxics in the Home Campaign

Reducing Toxics in Your Home campaign provides information about making simple changes in everyday routines to reduce our long-term exposure to low levels of potentially harmful substances. The changes include making informed decisions about which products to purchase, how our homes are cleaned, and how we care for our yards. The public response to this outreach is enthusiastic, with over 30,000 OEA brochures being requested to date. OEA continues to disseminate this information at state and county fairs, and offers presentations to organizations, expositions, city programs, and conferences.

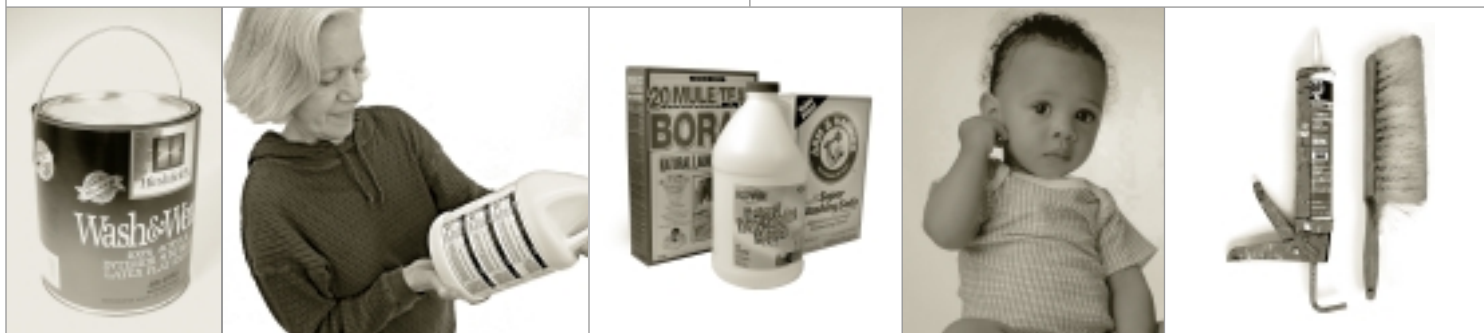
Financial assistance for pollution prevention efforts

The cost of demonstrating and implementing P2 technologies must compete against other needs and opportunities a business or community has for investment. OEA grants and loans, which are matched dollar-for-dollar by the recipient, have resulted in new P2 products and improved efficiencies that would otherwise not have been possible. P2 financial assistance accelerates the development and adoption of technologies that make Minnesota a more competitive and environmentally attractive state.

Grants

Each year, the OEA awards grants for projects that focus on pollution prevention. In particular, we support innovative projects that demonstrate “real world” use of an emerging technology, that leverage local efforts, and that develop educational resources. Examples of current pollution prevention grant projects include:

- ▶ Developing a curriculum that integrates Design for the Environment into University of Minnesota engineering coursework.
- ▶ With financial support of a U.S. Department of Energy grant, OEA partnered with an industrial leader to develop a new technology to cure metal castings that uses 80 percent less energy and produces no toxic chemical releases.
- ▶ Piloting the use of a reusable bottle automatic refill system with Restore Products, Inc., for nonhazardous cleaning products for retail customers.
- ▶ A grant to assist a consumer education campaign intended to encourage consumers to purchase E85 alternative motor fuel and flexible-fuel vehicles that use E85.



Reducing toxics in your home can include using low-VOC paints, reading labels carefully, choosing non- or low-toxicity cleaning products and minimizing the need for pesticides by caulking and careful cleaning.

Conserving resources by reducing waste and increasing reuse

Minnesota has one of the best integrated solid waste management systems in the country because of its emphasis on waste reduction, recycling, and resource recovery (i.e., composting and waste-to-energy production).

One measure of Minnesota's success has been the tremendous strides made in recycling, organics recovery and composting, and solid waste landfill abatement, which is reflected in the tremendous growth in Minnesota's recycling industry and the progress made in resource recovery. The state's recycling rate of 47 percent is the second highest in the country, according to *Biocycle* magazine. In addition, our recycling industry added over 29,000 direct and indirect jobs and over \$3.4 billion to Minnesota's economy in 2000. Over 20 percent of Minnesota's waste is sent to resource recovery facilities, one of the highest rates in the nation; and high levels of yard waste are composted. In addition, last year OEA's materials exchange program resulted in 630 tons of material reused and total monetary savings of over \$372,000.

All of this activity supports state solid waste policy. The goal of the Waste Management Act, as stated in Minn. Stat. § 115A.02(a), 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.
- ▶ provide for the orderly and deliberate development and financial security of waste management facilities, including disposal facilities.

OEA's waste management objective 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. Minnesota's efforts are not restricted to managing waste. The state's steady increase in



waste generation has environmental impacts and is a burden on Minnesota's integrated waste system. As a result, OEA's program activities are also directed at maximizing resource conservation and recycling, while also promoting a transition to viewing our waste as a resource. 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 has three main principles:

Treating waste as a resource reduces pollution. Shifting waste management practices toward those that better manage waste as a resource, such as waste reduction, reuse, recycling, or composting, leads to reductions in the amount of pollution released to the environment, including greenhouse gases.

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.

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, and as seen in Hutchinson, bring money back to the local community.

While Minnesota has considerable success in implementing this policy, challenges remain. The *2002 Solid Waste Policy Report* discusses four areas in which progress toward implementing state solid waste policy remains to be made:

Growth in waste generation. Minnesota's waste generation has grown at an average rate of over 4 percent per year over the last decade.

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 Minnesota's 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. In 2001, 35 percent of the municipal solid waste generated in Minnesota was sent to landfills.

Waste exports to other states. These exports have tripled since 1993, increasing potential liability to Minnesotans as well as bypassing state solid waste policy.

The OEA has a number of programs specifically designed to implement an integrated waste management system that views waste as a resource. These programs are divided into sections on planning, waste reduction, and programs that increase recycling, composting, and resource recovery.

Planning

The OEA works with solid waste planners in each of the state's 87 counties and the Western Lake Superior Sanitary District. Local governments, the waste industry, commercial and industrial enterprises, and the public all actively participate in formulating and implementing these plans.

Solid waste plans guide the overall operation of local solid waste systems, including waste reduction and recycling programs, yard waste composting, household hazardous waste collection, problem materials management, and resource recovery facilities. The plans serve as the foundation for the technical assistance offered by OEA staff and emphasize building strong regional waste management systems.

During 2001 and 2002, the OEA approved 17 solid waste management plans and helped many counties implement waste assurance strategies to continue to move mixed municipal waste to processing facilities in Minnesota and Wisconsin. The OEA also assisted counties in developing food waste composting facilities, managing electronics such as televisions and computers, and negotiating contracts with waste haulers and solid waste facilities.

In November 2001, the OEA and county solid waste administrators formed a work group to recommend changes to solid waste planning. Suggested changes will be presented for consideration by the Legislature in the 2003 session. The changes will include creation of a Minnesota Blueprint and Strategies document and will streamline the solid waste planning process.

State Solid Waste Advisory Committee (Governor's Blue Ribbon Panel)

In 2001, the OEA appointed a State Solid Waste Advisory Committee to make recommendations on how to better meet state waste policy goals. This committee was made up of waste generators, haulers, processors, recyclers, landfill operators, local government staff, and legislators. They met from October 2001 to January 2002 to outline how the state might develop a fully integrated waste management system that would be able to handle the state's growing waste stream.

The recommendations of the committee were presented to the chairs of the House and Senate Environment and Natural Resource Policy Committees in February 2002. The recommendations were 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 full text of the Advisory Committee's recommendations is available in the OEA's *2002 Solid Waste Policy*

Report, and on the OEA's web site.

The Advisory Committee reconvened in July 2002 and is currently in the process of creating more specific recommendations for the Legislature. This committee is expected to complete its work by December 2002.

Upper Midwest Solid Waste Group

Solid waste management officials from Illinois, Indiana, Iowa, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and U.S. EPA Region 5, gathered in Iowa in December 2000 for the first Upper Midwest Solid Waste Summit to advance a multi-state regional approach for managing solid waste issues.

The Midwestern states face significant common challenges, including growing solid waste streams, increased landfilling, unstable recycling markets, consolidation of private waste management companies, and increased quantities of solid waste being transported across state boundaries for disposal in other states. Because each state operates under different laws and policies and takes a different approach to solid waste management, the states as a group are challenged to develop environmentally sound policies.

At the first meeting, the 10 states agreed on seven key issues:

- ▶ Developing a common vision and policies among the states on issues such as disposal bans, waste toxicity and "bioreactor" landfills.
- ▶ Addressing the growing amount of waste transported for dis-

posal across state lines.

- ▶ Improving the sharing of data and information between the states, such as developing methods for standardizing information and for tracking waste.
- ▶ Developing recycling markets and implementing procurement practices at a regional level.
- ▶ Improving regional awareness of solid waste issues by educating the public and decision-makers.
- ▶ Developing an approach to address the impact of consolidation by waste management businesses.
- ▶ Working with major manufacturers on product stewardship issues, such as instituting take-back programs.

Two more states, Kansas and Missouri, joined the group at the second summit held in Madison, Wisconsin, in December 2001. At that meeting, the Upper Midwest Solid Waste Group further refined the list of key issues into three main areas:

- ▶ Developing a common group vision.
- ▶ Improving data sharing between states.
- ▶ Increasing regional awareness of solid waste issues.

Three subgroups were formed around these topic areas, meeting to prepare for the third summit, to be held in Minnesota in December 2002. At this third meeting, the Upper Midwest Solid Waste Group discussed the latest trends, problems, and potential solutions to solid waste issues and work towards a more regional approach to solid waste management.

Waste reduction

Waste reduction—preventing waste from being generated in the first place—is at the top of the waste management hierarchy because it is the most beneficial waste management strategy, both economically and environmentally. Waste that is not generated does not need to be managed or recycled, which means fewer costs, no risk of contamination from improper management, and no pollution from transporting, recycling, processing, or landfilling wastes. Preventing waste at its source helps sustain the longevity and economic viability of the state's waste management systems.

Waste reduction campaign

Over the last three years, the OEA has worked with local governments, businesses, and consumers to promote waste reduction through the statewide campaign—*ReduceWaste: If not you, who?* The ongoing messages of this campaign focus on the opportunities that people have to reduce their everyday production of waste and recyclables. The underlying goal of *If not you, who?* is to make the ideas of reducing and reusing social "norms," changing individual behaviors and attitudes about producing and disposing of waste.

The initial campaign started in January 2000 and increased public awareness of the need to reduce and prevent waste by over 14 percent through advertising, public relations, and



grassroots education. According to a survey conducted after the end of the initial education 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. Responding to these public concerns, in 2001 the OEA conducted a focused residential campaign to reduce the amount of unwanted mail residents receive. The OEA worked with statewide media outlets, newspapers, and radio, as well as several electric utility companies to distribute postcards explaining how to stop unwanted mail. Minnesotans could then mail the postcards to the Direct Marketing Association (DMA), directing the Mail Preference Service to add their names to its database. The DMA is a trade association whose members include the largest marketers of mailing list names in the country.



As a result of the OEA's campaign, 40,000 Minnesotans registered with the Direct Marketing Association's Mail Preference Service which will eliminate approximately a million pounds of paper and plastic junk mail.

Over the duration of the campaign, the OEA fielded over 2,000 phone calls on unwanted mail and sent out more than 4,000 junk mail cards. An additional 10,000 cards were collected at the Minnesota State Fair. There was also 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. As a result of the OEA's campaign, Minnesota citizens filled out more than 40,000 junk mail cards, which will eliminate approximately 965,000 pounds of paper and plastic junk mail. The number of Minnesotans who signed up for the DMA's Mail Preference Service increased by 40 percent, from 115,000 in 2001 to 164,000 in 2002.

More importantly, the campaign succeeded in changing attitudes. Post-campaign interviews revealed that over half (52

percent) of the 400 statewide survey respondents claimed they had heard of the campaign and that 62 percent of 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 Waste Reduction Campaign will continue in 2002 and 2003, and under its Environmental Assistance Grant Program, the OEA will continue to solicit waste reduction projects. These funds encourage applicants statewide to find innovative ways to minimize or eliminate waste and toxicity and encourage reuse of materials as *resources* rather than waste. The RFP for FY 2001 sought projects that reduce the amount and/or toxicity of waste generated by consumers, businesses, or a specific community; or which increase the level of knowledge or awareness of waste reduction throughout the state. Our current RFP focuses on reducing office paper and continuing earlier reduction efforts. Further information about the OEA's waste reduction campaign is available on www.reduce.org.

Waste reduction in businesses

Minnesota businesses can gain significant economic benefits through waste reduction. They can reduce costs, increase efficiency, and reduce environmental impact. To stay competitive, companies are trying to reduce costs to boost their bottom line, but very few have looked to reduce or eliminate the expense incurred in producing and managing their waste materials.

OEA is targeting two areas that have significant potential for economic and environmental savings: office paper and reusable transport packaging. The reduction of office paper is a priority for OEA's business waste reduction efforts. In Minnesota alone, OEA estimates that nearly 550,000 tons of high-grade office paper are discarded each year. This year, the OEA has made grant funds available for Minnesota organizations that want to reduce their paper waste.

Transport packaging includes containers used to store, ship, protect, and identify goods. A growing number of suppliers are developing new containers that are reusable or use less packaging. In addition, companies that use the containers are finding ways to recycle them. The OEA recently updated its online *Reusable Transport Packaging Directory: A List of Manufacturers and Shipping Container Products*, which helps businesses identify the types of reusable transport packaging containers available and where to get them.

www.moea.state.mn.us/transport/

Retired Engineers Technical Assistance Pilot Program

In 2001, with the support of OEA and EPA grants, the Minnesota Retired Engineers Technical Assistance Program (Minnesota RETAP) began recruiting and training retired engineers and other professionals to conduct environmental and waste reduction assessments. RETAP engineers provide free, confidential and non-regulatory solid waste prevention assistance to Minnesota's fast-growing commercial/service sector. Data shows that the commercial/service sector is a major contributor to the ever-increasing amount of garbage generated in the state.

In addition, many opportunities exist for water and energy conservation in this sector. Yet historically, this sector has not been the focus of environmental outreach and assistance. Further, the businesses that make up the commercial/service sector have not been subjected to the permit and rule requirements faced by industries such as manufacturers and power plants. Through RETAP, Minnesota businesses have been able to tap the wealth of experience and knowledge of local retired engineers to find cost-saving solutions to their environmental challenges. RETAP engineers expect to complete 50 assessments by the end of 2002.

Materials exchange

Materials exchanges are networks that help businesses and organizations find uses for items that would otherwise be thrown away. Exchanges keep usable materials from going to waste, and help businesses save money, both by avoiding the cost of disposal and by getting materials at little or no cost.

Minnesota Materials Exchange Alliance

With funding from the OEA, MnTAP went online in 1999 with a statewide Minnesota Materials Exchange Alliance, a database and interactive web site, www.mnexchange.org, used to conduct exchanges, track and measure results, and print a statewide catalog.

In order to help extend the statewide reach of the Minnesota Materials Exchange Alliance, the OEA also funded five local materials exchange projects in 1999:

- ▶ Becker, Clay, and Wilkin Counties
- ▶ Cass, Crow Wing and Hubbard Counties
- ▶ Chisago County
- ▶ Otter Tail County
- ▶ Southwest Regional Solid Waste Commission



MnTAP is working to integrate these independent regional programs into the statewide network.

In 2001, MnTAP reported that 248 exchanges occurred in the metro area, resulting in 630 tons of material reused with total monetary savings of over \$372,000. Materials exchanged in 2001 ranged from office supplies and equipment to construction materials and furnishings, as well as transport packaging (pallets and barrels) and industrial chemicals.

Corporate reuse project

With the support of a 16-month EPA grant, MnTAP worked in partnership with several businesses to establish internal materials exchange programs/systems. Several different types of organizations were selected for the project: a commercial, multi-tenant building; a metal fabricating shop with five Minnesota facilities; an international medical device manufacturer; a large national retailer with stores, distribution centers, and corporate headquarters; and an international designer and manufacturer of mainframe computers that develops and provides software and supports for its systems.

The objective of the project was to help medium to large corporations design and build internal reuse programs that could be sustained over the long term and to develop an understanding of the variables that would affect outcomes. A number of critical elements impacted the degree of success for implementing corporate reuse:

- ▶ All five organizations had completed previous activities that signaled their desire to go beyond environmental compliance in addressing their environmental impact.
- ▶ Upper management support was vital. Ongoing involvement from upper management in the medical device company helped ensure that reuse activities were implemented and quantified.
- ▶ Three corporations used volunteer employee teams to harness the experience and knowledge representing the spectrum from purchasing to distribution.
- ▶ Working with these five organizations has helped establish long-term relationships that will be maintained to continue the internal reuse programs and other waste reduction initiatives.

Recycling

The recycling efforts of Minnesota residents and businesses are improving our environment every day. The results are clear—cleaner air and water, avoided material consumption, avoided energy consumption, more forested land and open space, and reduced greenhouse gases. Minnesota continues to be a national recycling leader, posting the second highest recycling rate in the country at 47 percent.

While the tons of material recycled continue to rise each year (nearly 2.3 million tons in 2001), the overall recycling rate has been fairly stagnant over the past several years. This is due to the ever-increasing volumes of waste Minnesotans generate. Our waste generation continues to outpace our gains in recycling.

Recycling market development

Minnesota's recycling programs do an excellent job of keeping waste out of the solid waste disposal system. However, recycling is more than an alternative to waste disposal. It also conserves and reuses resources, creating new jobs and businesses in the process.

Economic impact of Minnesota's recycling industry

Minnesota's recycling industry is a major positive economic force in Minnesota. More than two-thirds of the economic activity related to recycling in Minnesota is related to re-manufacturing secondary materials (materials such as paper, plastic, metals, and glass collected for recycling) into new products.

In 2000, Minnesota's value-added manufacturers (businesses that re-manufacture recyclables into new products) generated an estimated \$93 million dollars in state tax revenue and employed an estimated 8700 people in direct jobs. These jobs in turn support another estimated 19,900 people downstream in indirect and induced jobs. Altogether, Minnesota's recycling industry supports over 28,000 jobs that pay an estimated \$1.19 billion in wages, represent a major force in the

Minnesota economy. The estimated gross economic activity for Minnesota's value-added recycling manufacturing industry is \$3.48 billion.

OEA's market development activities

OEA's staff maintains recycling industry expertise and a network of contacts serving the public and private sectors in Minnesota. The OEA strives to encourage the location of sources of recyclables near re-manufacturing capacity. This enhances the prices paid for recyclables and allows re-manufacturers to expand with more confidence. Local sourcing of material also supports the local manufacturing and collection jobs. Specifically, OEA staff offers the following assistance:

- ▶ Information about recyclable materials and state, regional, and national market development issues.
- ▶ Research into recycling market conditions, manufacturing technology, and product testing.
- ▶ Data about products made from recycled materials.
- ▶ Referrals for financing, business plan development, and facility siting.
- ▶ Legislation and policy information regarding recycling in Minnesota.



OEA staff developed the *Minnesota Recycled Products Directory*, which lists Minnesota-based

companies that make products with recycled materials and includes a description of their products and contact information. This searchable database is available on OEA's web site at www.moea.state.mn.us/rpdir/. The *Minnesota Recycling Markets Directory*, which contains more than 300 businesses that collect, buy, or sell recyclable materials, is located at www.moea.state.mn.us/markets/

The largest segment of this value-added recycling industry is

Environmental benefits of recycling in Minnesota

- ▶ **Recycling in Minnesota conserves energy and reduces greenhouse gas emissions.** The 2.4 million tons of paper, glass, metals and plastic and other material recycled in 2000 saved a total of about 53 trillion BTUs of energy—more than enough energy to power all the homes in Hennepin County for one year. In addition, recycling also resulted in reduction of net greenhouse gas emissions of nearly 1.4 million tons.
- ▶ **Recycling in Minnesota conserves natural resources.** 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 486,585 tons as a result of recycling efforts.
- ▶ **Recycling in Minnesota reduces air and water pollution.** Last year, recycling reduced overall emissions, excluding carbon dioxide and methane, by 35,589 tons. In addition waterborne waste were reduced by 5,895 tons.



OEA awarded a grant to Bituminous Roadways to advance the techniques and procedures to process consumer tear-off shingles so that they can be effectively and economically incorporated into hot mix asphalt.

made up of manufacturers who use recycled paper, post-consumer paper, and old corrugated cardboard as a raw material source. Rock-Tenn (St. Paul) and Liberty Paper (Becker) are major companies using this feedstock. Much of their raw material—recycled paper—comes from Minnesota recyclers. OEA has provided technical assistance and advice to address specific issues that have arisen and to match suppliers and materials for these activities.

In 2001, recycling markets in the state experienced some additional successes for glass, carpet, and roofing shingles. Through a grant from the OEA, Raguse Manufacturing established a commercial glass pulverization facility in Wheaton, Minnesota and has expanded to produce about 20 tons per week of sandblast media for the construction industry. This facility accepts all types of glass. At full capacity, Raguse will be producing 100 tons per week of sandblast media from post-consumer glass.

Nylon Board Manufacturing (Medford) is manufacturing a new nylon and plastic composite sheeting for use in the construction industry that is made from post-consumer and post-industrial carpet and waste plastic. OEA is assisting Nylon Board Manufacturing by providing financial support for research and development.

In the metro area, OEA has been working with MnDOT and a road contractor, Bituminous Roadways, to explore the use of shingle byproducts in roadways. OEA awarded a grant to Bituminous Roadways to advance the techniques and procedures to process consumer tear-off shingles so that they can be effectively and economically incorporated into hot mix asphalt. The company already uses shingle-manufacturing by-product in their mix. This next phase will develop a national engineering and environmental specification for the approximately 500,000 tons of post-consumer shingles generated in Minnesota each year.

SCORE grants and other waste reduction grant projects

Under the SCORE grant program, the OEA has distributed approximately \$14 million annually in funding appropriated by

the Legislature for block grants to Minnesota counties. The counties matched this with over \$28 million in county funding. SCORE grant funds are used to expand waste education and waste prevention services, improve reuse of materials, and expand recycling, yard waste, and problem materials programs. Until 2002, state funding for SCORE has remained the same since the early years of the program, while volumes of waste and recyclables have significantly increased. During the 2002 legislative session, SCORE funding was cut by 10 percent. As programs have changed, counties have shouldered the additional costs.

This state and local SCORE funding is vital to supporting county source reduction, recycling, and household hazardous waste programs, as evidenced by the state's high recycling rate and ever-increasing investment in local and regional household hazardous waste infrastructure. Any additional reductions to county SCORE funding could negatively affect Minnesotans' ability to recycle and properly manage their household hazardous waste and solid waste.

For more information on state and county waste and recycling data or to download a copy of the most recent *Report on SCORE Programs*, see OEA's web site at www.moea.state.mn.us/lc/score.cfm. New data from calendar year 2002 should indicate what impact the booming economy and eventual recession of the mid- to late-1990s have had on waste generation.

OEA also awards grants for projects that support our waste management goals and strategies through projects. Examples of these grants include the following:

- ▶ An OEA grant to the Northwest Minnesota Household Hazardous Waste Management organization to establish a mobile solid waste education unit to educate the public in waste reduction, recycling, and other issues in a ten-county area.
- ▶ OEA has issued several market development grants to support recycled plastic; recycled roofing materials such as asphalt shingles; the resale of salvaged materials from construction/demolition projects; building products made

from recycled carpet materials; and the production of wood products made from reused wood pallets and scrap wood.

Composting

The OEA works with businesses and counties to establish organics recycling programs throughout the state, including food rescue programs, source-separated organics programs, and MSW composting programs. According to an OEA waste composition study in 2000, approximately 32 percent of the waste being delivered to resource recovery or land disposal facilities consisted of compostable materials, primarily non-recyclable paper and food waste. The amount of waste land-filled or sent for resource recovery could be significantly reduced if this waste were composted.



Hutchinson's source-separated organics composting program is fast becoming a nationwide model.

Following a recent trend toward source-separated composting both nationally and in Minnesota, the OEA has funded source-separated composting programs in the city of Hutchinson, the Western Lake Superior Sanitary District, and Swift County. The OEA is also working with other local units of government, including Burnsville, Wayzata, and Washington, Hennepin, and Winona Counties to support the development of local composting programs.

Early in 2001, Hutchinson rolled out its source-separated organics program. Similar in concept to how most cities conduct recycling collection, residents and businesses sort food and yard waste, recyclables, and MSW into separate containers for curbside pickup. After only a few months of operation, the program is operating at a lower cost to residents and business than the previous recycling/land disposal system and is diverting an estimated 31 to 39 percent of the waste stream that would otherwise have been landfilled.

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.

The OEA is a member with the United States Composting Council, which actively engages in discussion and problem solving for the organics recovery industry. The OEA has assisted in bringing United States Composting Council sponsored compost operator training to Minnesota and the Midwest.

Solid Waste Processing Capital Assistance Program

The Solid Waste Processing Facilities Capital Assistance Program (CAP) is an important tool in helping the state reach the goals identified in the Solid Waste Management Act. CAP is a bond-funded program created to help finance the capital costs (the actual buildings and fixtures) of solid waste processing facilities that conserve and recover resources and energy and reduce the need for land disposal.



The program has helped to fund publicly owned recycling facilities, waste-to-energy projects (refuse-derived fuel facilities and incinerators with resource recovery), household hazardous waste centers, composting projects (yard waste and organics) and special waste recovery projects. These facilities are often set up to serve a number of counties.

CAP recipients are chosen through a competitive, two-stage application process that allows the OEA to identify and assist projects that best meet Minnesota's solid waste management goals. The maximum grant per project is \$2 million for a single-county applicant. Multi-county applicants are eligible for \$2 million times the number of participating counties or 50 percent of the total eligible capital costs, whichever is less.

Since 1985, CAP has made 90 awards totaling \$47.7 million. The local governments have matched this amount with more than \$107.8 million in local contributions for the development of Minnesota's waste management infrastructure. During the 2001-2002 biennium, six projects received state financial assistance totaling \$2,272,000.

Applicant	Type of project	Total cost	Awarded	CAP grant
NOBLES COUNTY	HHW	\$475,500	7/00	\$150,000
MURRAY COUNTY RECYCLING	HHW	\$420,000	9/00	\$180,000
WILKIN COUNTY RECYCLING	HHW	\$558,800	12/00	\$277,000
DODGE COUNTY	COMPOST	\$372,000	2/01	\$186,000
WESTERN LAKE SUPERIOR SANITARY DIST.	COMPOST	\$658,000	1/01	\$329,000
CITY OF FERGUS FALLS W-TO-E	RETROFIT	\$3,798,131	6/02	\$1,150,000
TOTALS		\$6,282,431		\$2,272,000

Helping Minnesotans understand and minimize the adverse environmental impacts of their actions



One of OEA's most important strategic goals is to assure that Minnesotans have the right information to understand and minimize the environmental impacts of their actions. OEA's environmental education efforts are the key to reaching this goal. OEA's focus is on capacity building—developing effective organizations and individual leaders who can implement comprehensive environmental education programs at the state and local level.

Minnesota is fortunate to have a wealth of individuals, organizations, schools, businesses, and agencies working to inform and educate citizens on the environment. Those providing environmental education (EE) and information are varied in number, age, expertise, location, and audiences served, but all believe that with a greater knowledge base, Minnesotans will be prepared to make informed decisions about the environment. Just as everything in the environment is interdependent, so are the educational efforts in this state.

The OEA is a non-regulatory government agency, which is vital in the education field. We support rather than compete with other environmental education efforts. In fact, the OEA provides a conduit for connecting Minnesota's EE efforts to national standards and guidelines, while also bringing national EE initiatives to local and state attention. Educators continue to rely upon OEA's *GreenPrint for Minnesota, Second Edition: State Plan for Environmental Education*, which provides key strategies for state agency environmental education efforts and acts as a guide for organizations and educators in delivering environmental education to all Minnesota audiences (available online at www.moea.state.mn.us/ee/greenprint.cfm.)

OEA's successful capacity-building program fosters coordination and partnerships, provides resources to educators, furthers communication among EE providers, and develops education skills.

Resources for educators

Providing resources and access to resources is vital to delivering fair, current, and accurate environmental education. The OEA offers extensive resources through a variety of venues:

- ▶ **Environmental Literacy Scope and Sequence** is a sequence of EE concepts that lead to the environmental literacy scope. It is a framework of teaching the interrelations of the natural and social systems and is a great tool for formal and non-formal educators. The OEA worked with the Department of Children, Families and Learning and the GreenPrint Council to develop the Scope and Sequence and offered workshops to familiarize environmental educators with the document and how to use it.
- ▶ **Environment as an Integrating Context for Learning (EIC)**. In partnership with the Department of Children, Families and Learning and the National State Education and Environment Roundtable (SEER), the OEA has worked with approximately 24 Minnesota schools that will focus on combining best practices into a comprehensive education framework that simultaneously addresses content standards from multiple disciplines. Assisted by OEA's EE efforts, the number of EIC schools has doubled in four years. EIC uses the school's natural and socio-cultural settings to engage students in schoolwork that they perceive as relevant to their daily lives, thus increasing their motivation for learning and academic achievement.
- ▶ **The Minnesota Report Card on Environmental Literacy** documents the results of the first statewide survey concerning environmental literacy of adults in Minnesota. A random sample of 1,000 Minnesota adults was surveyed in 2001 for knowledge about, attitudes toward, and behaviors related to the environment. This report not only describes the environmental literacy of Minnesotans, but also compares Minnesotans' literacy on related survey questions to that of Pennsylvania residents and United States citizens.

The survey demonstrates a clear connection between Minnesotans' general environmental knowledge and their self-reported attitudes and behaviors. Respondents who scored higher in general environmental knowledge were significantly

more likely to engage in more positive environmental behaviors. However, the data also suggest that in addition to environmental knowledge, other factors such as income and location may also come into play in the creation of environmentally sensitive behaviors.

The survey will help shape OEA's strategies and priorities. For example, the survey indicates that Minnesotans consider water pollution to be extremely important and an area not safeguarded enough. More protection of wild areas and wetlands is seen as important, 43 percent and 40 percent respectively, although almost 40 percent of those surveyed believe that the correct balance of regulation is met for these environmental areas.

Air pollution is seen as also requiring more regulation, but the difference between not enough laws and the correct balance of regulation is less than 4 percentage points. A majority of Minnesotans frequently conserve energy (89%); service their vehicles regularly (87%); recycle glass, paper, and cans (80%); conserve water (58%); and cut down on creating garbage (55%). Seventy-three percent of Minnesota adults reported a willingness to pay extra for gas if they knew that the additional money would significantly improve the environment.

► **A GreenPrint for Minnesota: State Plan for Environmental Education** offers

guidance to individuals, organizations, and agencies that deliver or support environmental education in Minnesota. The *GreenPrint* is designed to foster and expand partnerships to produce and provide EE programs and materials to Minnesota citizens. The 2001 revised GreenPrint reflects the input of over 900 stakeholders. Implementation of the GreenPrint will provide Minnesotans with the knowledge and skills to become active and engaged citizens to help keep our communities healthy and vital.



► **SEEK: Sharing Environmental Education Knowledge** is Minnesota's interactive directory of EE resources. At present, SEEK has 120 partners (environmental and education organizations and agencies) that post their resources, from activity guides to job opportunities, on this well-traveled web site. It began with 1995 funding recommended by the LCMR and after the two-year funding period the OEA offered to host SEEK and further its growth. It is a site that is emulated by many states throughout the United States. SEEK is a gathering place for environmental educators (www.seek.state.mn.us)

► **OEA's web sites.** OEA's home web site (www.moea.state.mn.us) offers visitors resources for learning more about pollution prevention, reuse, recycling, responsible waste management, and sustainable practices. In addition to its home web site, the OEA

also maintains several other web sites. The waste reduction campaign's www.reduce.org web site is an online source for Minnesotans who want to know more about preventing garbage and reducing what they throw away. NextStep (www.nextstep.state.mn.us) offers resources for finding and sharing information on sustainability. MnTAP's web site (www.mntap.umn.edu) features resources for technical assistance to businesses, including information about its intern programs and materials exchange program.

► **OEA Clearinghouse** is a wealth of hands-on resources. From videos to fact sheets to curricula to CD-ROMs, the Clearinghouse and its staff offer incredible amounts of information and guidance. In 2000, Clearinghouse staff provided information and resources to over 1,500 people in Minnesota, the entire U.S., and internationally, who represent business, citizen and youth groups, families, government and nonprofits, higher education students, preK-12 students, teachers and nonformal educators, and religious groups.



► **Grants** are another tool the OEA uses to support EE. Many projects, programs, and resources would not have been developed without grant assistance. From waste minimization programs on college campuses to environmental literacy research, these grants have made a difference. Recent EE grants include the following:

- A grant to develop a web site to provide the public with objective scientific information on pesticides.
- A grant to help fund a series of extensive educational workshops on pollution prevention techniques and activities and waste toxicity/reduction at the Fond du Lac reservation.
- A grant to assist production of an environmental resource guide, including educational content and incentives (in the form of discount coupons) to reduce household environmental impacts.

Building education skills

The ability to effectively educate others on environmental issue takes more than technical environmental knowledge. It requires education skills and the ability to communicate. The OEA offers a variety of skill-building programs.

► **Capacity building workshops** are given monthly by the OEA because of the expressed need of our customers. More than

800 people representing state, local, and federal government, nonprofits, business, consultants, and educators have participated in these workshops, with many return participants.



These workshops provide fundamental educational

skills for those individuals that are trained as scientists, technical specialists, and researchers as well as up-to-date education tools for the trained educators seeking assistance in honing their skills. The workshops have included *Guidelines for the Initial Preparation of Environmental Educators*, *Environmental Education Materials: Guidelines for Excellence*, *Volunteer Programs*, *Public Participation*, *Multiple Intelligences*, *Sustainability*, and *Communication Skills*.

- ▶ **Regional EE workshops.** The regional OEA environmental education staff in greater Minnesota provides regional EE workshops, developed in partnership with other local organizations, according to the needs of the particular audiences. Workshops have included *Tools for Educating about the Environment*, *Guidelines for Excellence*, and *Share Fairs*, which connect local educators to EE resources. Having access to these opportunities, without the time and costs associated with traveling to the Twin Cities, is highly valued by EE professionals in Greater Minnesota.
- ▶ **One-on-one skill building assistance** is offered as the situation warrants. The OEA environmental education team is very adept in the environmental education field and their expertise is often sought out.

