

Report to the Legislature On the Solid Waste Management Program - 2006 Information Update

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State of Oregon
Department of
Environmental
Quality



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Executive Summary

Oregon Solid Waste Management Program 2006 Update

The purpose of this report is to provide current data and information about solid waste generation and management in Oregon and to satisfy legislative reporting requirements (ORS 459A.015 and 459A.020, the state solid waste management plan update).

This is a summary of the information contained on the DEQ Solid Waste Program's webpage at www.deq.state.or.us/lq/sw/index.htm. In order to conserve natural resources, only this executive summary is being distributed in hard copy. Other documents available on the webpage are a disposal status update and 2005 Oregon Material Recovery Survey Report.

This report includes data for 2004 and 2005 (the most recent data available), as well as historical trend information. The preliminary waste composition data are for 2005 (the data are still being analyzed; the final report is expected to be completed in spring 2007), and the recovery data are for 2005.

General Trends

As reported in 2004, the total amount of solid waste generated each year continues to increase steadily after leveling off in 2000 and 2001, with corresponding increases in recovery softening the environmental impact of the increases in waste produced.

- In both 2004 and 2005, Oregon's recovery rate was above the state's interim goal of 45% for the year 2005, and the 2005 recovery rate of 49.1% is the highest rate the state has achieved since it started measuring recovery rates in 1992. The recovery rate includes materials recycled by households and businesses or sent offsite for composting. It also includes some materials burned for energy recovery.
- The total amount of materials collected for recycling, composting, and energy recovery in 2005 is almost 24% greater than the amount collected in 2002. The energy and greenhouse gas savings attributable to the state's successful recovery programs are significant (see Waste Generation and Prevention section).
- The total amount of municipal solid waste disposed of each year also continues to grow, but at a slower pace than the amount recovered. In 2005, about 11% more waste was disposed of than in 2002.

- Annual waste generation per person has increased from 5.7 pounds-per-day in 1992 to 8.4 pounds-per-day in 2005, up from 8.0 in 2004. Consequently, Oregon failed to meet its first waste prevention goal of no increase in the **per capita** generation rate in 2005 and will not likely meet its more stringent 2009 goal of no increase in **total** waste generation unless Oregonians rapidly develop effective waste prevention programs.
- Solid waste disposed of at Oregon municipal waste (i.e., non-hazardous) facilities, including waste from out-of-state, contaminated soil, and other special wastes, has increased from 3.6 million tons in 1994 to 6.1 million tons in 2005, an increase of 2.5 million tons or almost 70%.
- Solid waste is increasingly managed by fewer and larger facilities. Of the 94 landfills open at the end of 1991, 62 are now closed. Only one new municipal landfill has opened since 1993, leaving a total of 30 open landfills and two facilities that burn waste. About half of the closed landfills were very small, accepting less than a ton of waste per day on average.
- Oregon continues to receive a significant amount of waste for landfilling that is generated out-of-state. In 2005, 35% of the waste disposed at municipal facilities in Oregon was from out-of-state.
- Oregon exports only a tiny fraction of its waste for disposal in other states. In 2005, only 1.3% of municipal solid waste generated in Oregon was landfilled out-of-state.

Disposal

Oregon has 30 operating municipal solid waste landfills, one mixed solid waste energy recovery facility, and one mixed solid waste incinerator. With so many landfills that have closed in the past two decades, Oregon has the potential for some of them to leak contamination. Thus, the need for regulatory oversight continues well beyond the date at which a facility stops accepting waste for disposal. Continued monitoring of groundwater and methane gas levels may be necessary for decades after a facility closes.

Many of the landfills that remain open or that have opened in the past decade are larger facilities that

accept waste on a regional rather than a local basis. Some of these landfills are among the nation's largest, providing Oregon with sufficient disposal capacity for many years to come.

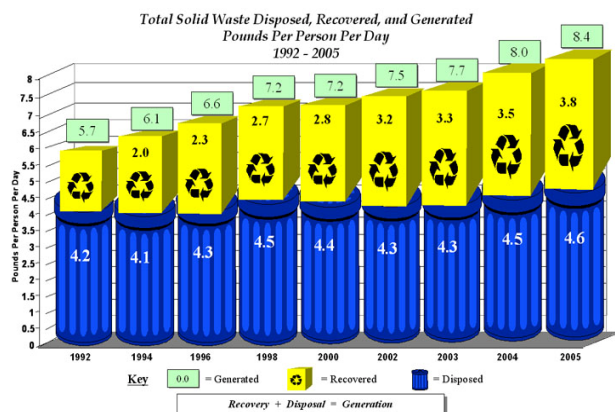
For more detailed information about disposal, see the 2005/2006 Disposal Status document on the DEQ webpage (www.deq.state.or.us/lq/sw/index.htm), where you can also look up the locations of disposal facilities in Oregon on the Facility Profiler.

Waste Generation and Prevention

Waste generation is defined as the sum of materials disposed and recovered. It is a rough measure of the total amount of materials discarded by households, businesses, and government. It includes garbage as well as materials separated for recycling and off-site composting by businesses, institutions, and households.

Methods to reduce waste generation include waste prevention (using and wasting less by acquiring fewer items as raw materials, packaging, or consumables or by purchasing more durable goods, for example), reuse (using something in its original form, as opposed to recycling's reformulation of materials into new products), and on-site composting.

The amount of residential, commercial, and construction solid waste generated in Oregon and measured by DEQ has increased from 3.3 million tons in 1993 to 5.5 million tons in 2005. Since 1993, total measured solid waste generation has grown 70%. On a per-capita basis, measured solid waste generation in Oregon grew 43% between 1993 and 2005 (from 5.8 pounds per day in 1993 to 8.4 pounds per day in 2005). The chart below illustrates the growth in Oregon's per-capita waste generation.



Rising waste generation is a trend that implies increasing use of natural resources and raw materials. In a finite world with growing population, increasing per-capita use of resources is not sustainable. Oregon's most recent Solid Waste Management Plan changed the state's focus from managing wastes in order to conserve landfill space

to viewing waste and recyclables as valuable resources. The ultimate goal of the plan is to conserve natural resources and reduce the environmental impacts associated with resource consumption.

The 2001 Legislature incorporated this shift in thinking into Oregon law. HB 3744 amended ORS 459.015 to recognize explicitly that "there are limits to Oregon's natural resources and the capacity of the state's environment to absorb the impacts of increasing consumption of resources, including waste generation and increasing solid waste disposal." It noted that "it is in the best interests of the people of Oregon to conserve resources and energy by developing an economy that encourages waste prevention and recycling." HB 3744 also amended ORS 459A.010 to create waste generation goals that parallel the state's existing waste recovery goals. The waste generation goals are:

- For the calendar year 2005 and subsequent years, no annual increase in per capita municipal solid waste generation; and
- For the calendar year 2009 and subsequent years, no annual increase in total municipal solid waste generation.

Unfortunately, the goal was not met for calendar year 2005, as per-capita municipal solid waste generation grew 4.6% from the previous year. If these goals are to be achieved, significant changes will be needed in how households and businesses use (and discard of) materials.

DEQ is currently evaluating the trend of increasing waste generation in an attempt to determine its causes. We have determined that approximately 11-20% of the increase in per-capita generation (between 1993 and 2002) can be explained by improvements in reporting and minor changes in monitoring methodologies, particularly involving estimations of recycling. Another 5-20% of the increase (again, between 1993 and 2002), possibly more, is readily attributable to shifts in how households and businesses manage their wastes, for example, from on-site burning and composting (which aren't counted) to off-site disposal or composting (which are counted).

Thus, not all of the increase in waste generation shown in the chart and discussed above is associated with increases in the use of resources. However, DEQ's estimates of changes in reporting and shifts in waste management do not explain at least half (and perhaps as much as 86%) of the increase in per-capita generation. It appears that the use and waste of certain materials is in fact increasing. Materials where waste generation has grown most rapidly include:

- construction;
- remodeling and demolition wastes;
- plastics;
- durable goods such as home furnishings, electronics, and clothing.

DEQ Actions to Prevent Waste

DEQ has implemented several programs aimed at helping achieve the statutory waste generation goals.

Waste Prevention Strategy — Throughout 2006, DEQ has been developing a Waste Prevention Strategy, which will set priorities and define the direction of DEQ's work to help the state achieve its waste generation goals. Background research has been commissioned and conducted in the following areas:

- Causes of increasing waste generation in Oregon;
- Relationship between waste generation, prevention, and broader environmental concerns;
- Recent and existing waste prevention activities by state government in Oregon;
- Recent and existing waste prevention activities by local governments in Oregon;
- Existing waste prevention (and reuse) infrastructure in Oregon, including the roles of nongovernmental organizations;
- Private business experience with waste prevention;
- Waste prevention efforts outside of Oregon; and
- The role of product stewardship in preventing waste.

Research reports will be published in early 2007, and DEQ expects to discuss a draft of the waste prevention strategy with stakeholders in 2007. Then DEQ will revise and begin implementing it. In the interim, DEQ has implemented a number of other activities to reduce waste generation:

Solid Waste Grants "Focus Areas" — Since 1991, DEQ has awarded 246 solid waste grants to local governments. Beginning in 2000, DEQ has made it easier for projects that reduce waste generation to receive funding by designating waste prevention projects eligible for additional scoring points. As a result, communities across the state have implemented an impressive array of projects, including building infrastructure for the salvage of reusable building materials, computer and furniture reuse, edible food donation, a website that makes it easier for businesses to donate obsolete but still useful materials to schools, and several home composting and business waste prevention outreach projects.

Business Waste Prevention Projects — In 2006, DEQ completed a pilot project in which we worked with several Oregon businesses on a voluntary basis to reduce packaging-related waste. This project was co-funded by Metro. Businesses participating in the project made several changes to their packaging, reducing material use by almost 500 tons and saving an

estimated \$994,000 per year. The project successfully demonstrated a variety of voluntary methods businesses can use to reduce costs while reducing environmental impacts. Case studies, descriptions of "best practices," and other information resources were developed and promoted to Oregon businesses. The project also featured the use of innovative, science-based analysis tools to help Oregon businesses better understand environmental trade-offs and reduce fossil fuel use, waste generation, and atmospheric and waterborne pollution associated with packaging waste. This project may be expanded, pending completion of the Waste Prevention Strategy.

Technical Assistance and Information Sharing — DEQ has increased its outreach to businesses, trade associations, local governments, and the public about cost-effective methods to prevent waste. Outreach includes presentations at business meetings and conferences and customized technical assistance to local governments and businesses.

2% Credit Programs — DEQ administers the "2% recovery credit program," an incentive created by the Legislature in 1997 and amended in 2001 to encourage local governments to implement waste prevention, reuse, and home composting programs in their communities. Wastesheds (usually counties) that implement approved programs are eligible for credits toward their annual recovery rates.

Product Stewardship — DEQ has been involved in product stewardship discussions for electronics waste, mercury thermostats, carpet, pharmaceuticals, and paint at the regional and national levels (see Product Stewardship below). While most discussions focus on recovery, product stewardship also creates incentives for waste prevention and reuse.

Chipper Tax Credit — DEQ administers a tax credit for the purchase of yard debris chippers. By chipping woody prunings on-site, households and businesses can reduce waste generation. This program also contributes to better air quality by giving rural residents an incentive not to burn yard debris.

Cross-Media Environmental Analysis — DEQ is applying more sophisticated analytical and evaluation tools to assure that our waste prevention activities (and other waste management activities) are achieving positive environmental results. Life cycle inventory analysis, a comprehensive accounting of resources and emissions over the life of a product, is an analytical tool that has proven useful in our business waste prevention work as well as evaluating the global warming potential of various waste prevention and management options. Using this type of analysis, DEQ is better able to evaluate options for their environmental impact, giving consideration to multiple environmental criteria.

Product Stewardship

Product stewardship is an approach in which all parties involved in the manufacturing and marketing of a product share responsibility for the environmental impacts of it over its life cycle, from design to end-of-life management. The greater the ability of the party to influence the life cycle impacts, the greater the degree of responsibility. Product stewardship, both voluntary and regulatory, is a growing trend in many industries and countries. A primary aim of product stewardship is to internalize the costs of end-of-life management into the costs of producing and selling products so that government and the tax-paying public do not pay those costs.

Electronics: In 2006, DEQ commissioned a study of the electronic scrap (e-scrap) industry throughout Oregon. The survey of 74 e-scrap handlers and collectors (65 responded) provides a detailed look at their companies, collections, and environmental management practices. DEQ commissioned the study to examine gaps in e-scrap services and to learn what current environmental management practices are, in anticipation of future service needs and establishment of statewide guidelines or best management practices for dealing with e-scrap. The 60-page report is available on DEQ's webpage. Some of the findings include:

- Nearly half of all e-scrap handled in Oregon is processed by just three entities (one private business, one nonprofit organization, one thrift store/charitable organization).
- Eleven rural counties in southern and eastern Oregon have no reasonable collection points available, but about 95 percent of the state's population has reasonable access to electronic recycling services.
- During 2005, businesses and organizations collected and/or processed about 16.7 million pounds of e-scrap material (annual per capita amount is 1.8 pounds). More than half of the material is managed by private businesses and about 40 percent by nonprofit organizations. Just over two-thirds of the materials collected were recycled, 25% was reused, 2% was landfilled or incinerated, and the remaining 6% was "unknown" in terms of handling.
- A large percentage of e-scrap collected and/or processed appears to be ultimately exported out of state for final use or disposition.
- The e-scrap industry in Oregon is in flux about environmental practices, with a wide range of practices used by handlers and collector/handlers.

Mercury Thermostats: During 2006, DEQ, in partnership with the Product Stewardship Institute, collaborated with thermostat manufacturers, contractors, and wholesalers, along with other state and local governments, to conduct a pilot program to expand mercury thermostat recovery efforts through the Thermostat Recycling Corporation. In conjunction with PGE, who paid for rebates, DEQ set up a program to offer \$4 rebates to contractors who turn in mercury-containing thermostats for recycling and purchase Energy Star®-qualified thermostats. The goal of the program is to increase collection from the current approximately 850 per year at wholesaler locations to 4,000 per year. Program evaluation is not complete yet, but the number of wholesalers participating in the TRC program more than doubled, and more than 4,200 thermostats had been collected for recycling by the end of September 2006.

Recycling

After Oregon did not meet its goal of 50% recovery by the year 2000, the 2001 Legislature extended the 50% goal to 2009 and set an interim goal of 45% for 2005. In order to help the state meet its recovery goals, all the wastesheds (usually counties) set new recovery goals for 2005 and 2009. The 2001 recovery legislation (HB 3744) also required wastesheds to prepare plans to meet their goals and make them available to DEQ by December 31, 2001. Recovery plans must be updated and made available again by December 31, 2006 and by December 31, 2010. The Metro wasteshed (Multnomah, Clackamas, and Washington counties) is not required to prepare a wasteshed plan; its current waste reduction plan meets this requirement.

Oregon met its statewide recovery goal in 2005 with a recovery rate of 45.3% of the actual total "counting" (municipal) waste stream in 2005. More than 2.5 million tons were recovered. This is an 8.9% increase in recovery tonnage from 2004, when 2.3 million tons (44.1% of the total waste stream) were recovered. In 1992, the first year the recovery rate was measured, only 840,000 tons were recovered. The 2005 recovered tonnage translates to 1,383 pounds per person per year compared to 1,287 pounds per person per year in 2004. The state of Oregon total rate including 2% credits (for wasteshed reuse and backyard composting programs) was 49.1%. This is 4.1% above the statutory mandated 2005 goal of 45% recovery statewide.

Roughly one third of the wastesheds did not meet their 2005 recovery goal; but 20 others have already exceeded their 2009 goals. In addition to updating their recovery plans, wastesheds that do not meet their goals must prepare a technical review to determine why they aren't meeting them and find ways to achieve their goals. DEQ will provide assistance in this process if requested by wasteshed representatives. Wastesheds may petition DEQ for a change in their goals.

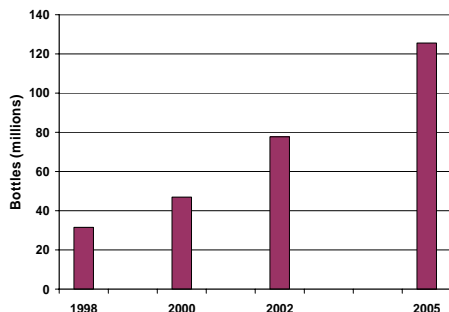
Statewide, the increase in recovery rates between 1992 and 2005 can largely be attributed to a very significant increase in recovery of organics - particularly wood waste and yard debris - and to an increase in paper recovery. Tire recovery, on the other hand, has dropped steeply. More detailed information on waste generation, material recovery, and specific watershed programs can be found in the 2005 Oregon Material Recovery Survey Report on the DEQ webpage.

Waste Characterization

Oregon regularly conducts solid waste composition studies as required by state law (Oregon Revised Statutes 459A.035). A study was conducted in 2005/06, and the final report for that study should be available in early 2007. Data for a recycling composition study were also gathered in 2004/05. Previous disposal studies were done in 2002, 2000, 1998, 1994/95, and 1992/93. The Metro regional government also conducted studies in 1993/94 and earlier. Metro, the cities of Portland and Eugene, and Marion County have all contributed to some or all of the composition studies conducted since 1998. The information gained by these studies allows local governments and recycling businesses to target recycling efforts toward materials that are still being thrown away.

The recent statewide waste composition studies show some positive trends. The percentage of recyclable paper, glass, and scrap metal being disposed was less in 2002 than in earlier studies. This decrease appears to be caused by increases in recovery of these materials. Paper (recyclable and non-recyclable) remains the largest group of materials disposed by weight, and food waste remains the largest single material disposed.

Preliminary results for 2005 have been analyzed for some materials, including rigid plastic containers or RPCs (DEQ must project an RPC recycling rate for 2007 by the end of the year). One interesting result is the continuing increase in the number of plastic water bottles that are disposed, as illustrated below.



Estimated number of water bottles disposed in Oregon solid waste, based on DEQ waste composition studies for each year. Estimates for 2005 are preliminary.

Complete results of the 2002 and earlier waste composition studies can be viewed or downloaded from DEQ's webpage.

Commercial Composting

When DEQ began permitting compost facilities in 1999, there were 24 facilities composting nearly 314,000 tons of organic materials. Much has changed since that time: the industry is growing quickly, there is a greater variety of materials collected for composting (feedstocks), and new technologies are under consideration or in use. Now, 41 facilities are permitted, and 366,578 tons of materials were composted in 2005.

In order to protect human health, water quality, and the environment while continuing to support Oregon's composting industry, the Solid Waste Program began a compost facility rulemaking process. A Compost Facility Work Group composed of compost operators, local and regional governments, Compost Council of Oregon representatives, farm composters, and other interested parties is looking at updating administrative rules to reflect the changing compost environment and provide clarity on water quality protection. The draft rules should be available for public review in 2007.

In 2006, DEQ conducted a water sampling study of nine representative composting facilities. Participating composters took water samples at three areas on-site that were analyzed for contaminants at DEQ's laboratory. The results demonstrate that water that runs through piles of composting material (leachate) cannot be handled in the same manner as stormwater. The findings of the study are important for the rule-making and best management practices for permitting compost facilities.

Household Hazardous Waste (HHW)

In 2005, DEQ sponsored seven household hazardous waste collection events which attracted 2,367 participants. The average amount of waste collected per participant was 125 pounds and included pesticides, mercury, paint products, automotive products, and cleaning products. In addition, six HHW collection events were held in three counties under the purchaser program. Through this program, local governments have access to DEQ's HHW contractor but pay for collection costs themselves. Participation at the 2005 purchaser events was impressive, with more waste collected at these six events than was collected at DEQ's seven HHW events in the same year.

For the ninth year in a row, DEQ offered collection of conditionally exempt generator (CEG) and agricultural pesticide waste in conjunction with each of DEQ's household hazardous waste events. The participants pre-registered with DEQ's contractor, MSE, and made payments for waste management directly to the contractor. DEQ's only involvement was that these collections took place at the same site and usually on

the same day as the DEQ-sponsored HHW collection events.

In response to the governor's directive to reduce persistent bio-accumulative toxins (PBTs) in the environment, DEQ continues to offer a mercury thermometer exchange program, with goals of reducing the amount of mercury in homes, providing for proper disposal of mercury, and educating Oregonians about the dangers associated with PBTs. At locally sponsored HHW collection events in Bend, Medford, and Tillamook and at all DEQ-sponsored events, DEQ provided digital thermometers to participants who brought in mercury thermometers for disposal. A total of 1,455 mercury-containing thermometers were collected, and 1,009 digital thermometers were distributed.

DEQ continued a pilot program to collect mercury and mercury-containing goods free of charge. DEQ paid for collection of this waste from CEGs at both locally sponsored and DEQ sponsored collection programs.

In 2006, DEQ's household hazardous waste program shifted its focus from funding collection events to grants and education. Only two household hazardous waste collection events were held in 2006. However, \$230,280¹ was awarded in grant funding to local governments to plan and build household hazardous waste facilities. Additionally, DEQ is developing programs to educate the public about alternatives to hazardous products through social based marketing.

Governor's Advisory Group on Global Warming

In early 2004, Governor Kulongoski convened a high-level advisory group to recommend actions Oregon should take to reduce its emissions of heat-trapping greenhouse gases. In support of this effort, seven technical subcommittees were formed to inventory Oregon's emissions and evaluate a variety of policy and program measures for their greenhouse gas reduction potential. DEQ's Solid Waste Program staffed the technical subcommittee that evaluated materials and waste issues.

The Subcommittee on Materials and Waste concluded that most conventional approaches to inventory greenhouse gases significantly undercount emissions associated with the life cycle of materials. The Subcommittee also concluded that for many manufactured materials, landfill- and other disposal-

related emissions are much smaller than emissions that occur during material production and transportation. In March 2005, the Governor's Advisory Group on Global Warming transmitted to Governor Kulongoski the "Oregon Strategy for Greenhouse Gas Reductions." Included in the strategy are 10 recommendations that deal with solid waste prevention, recovery, and disposal. In terms of greenhouse gas impact, the recommendation with the largest impact calls for Oregon to achieve its statutory waste generation and recovery goals. DEQ was already working toward these goals when the strategy was completed, and continues to do so (as described above in the Waste Prevention and Generation section).

Complete report

Executive Summary (this document)

Appendices:

2005/2006 Disposal Status, State of Oregon (available on the DEQ Solid Waste Program webpage)

2005 Oregon Material Recovery Report (available on the DEQ Solid Waste Program webpage)

For questions, comments, or further information, please e-mail solwaste@deq.state.or.us or contact the DEQ Solid Waste Policy and Program Development Section, 811 SW Sixth Avenue, Portland, OR 97204, 503-229-5913 or toll-free in Oregon, 1-800-452-4011.

¹ 2006 HHW grants were awarded to Baker, Wallowa, and Union counties for a joint HHW facility, City of Gresham for an HHW education project, and Jackson-Josephine, Curry, and Crook counties for HHW planning projects. Permanent HHW facilities that have been partially funded by DEQ and are now open are located in Marion, Columbia, and Hood River-Wasco-Sherman counties.