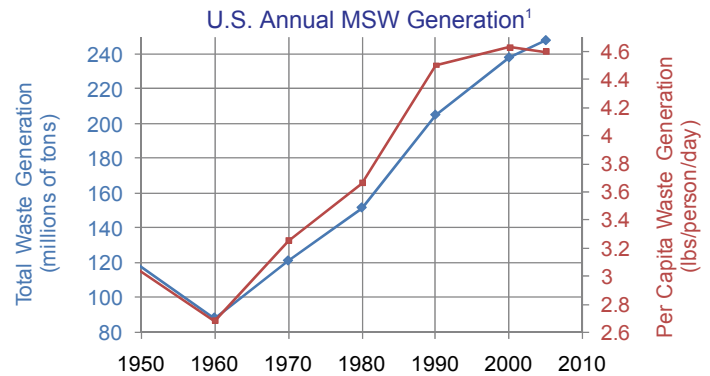
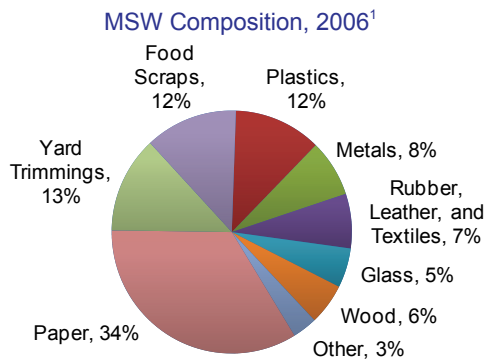




Municipal Solid Waste

factsheets

Municipal Solid Waste (MSW), commonly called “trash” or “garbage”, includes wastes such as durable goods, e.g., tires, furniture; nondurable goods, e.g., newspapers, plastic plates/cups; containers and packaging, e.g., milk cartons, plastic wrap; and other wastes, e.g., yard waste, food. This category of waste generally refers to common household waste, as well as office and retail wastes, but excludes industrial, hazardous, and construction wastes. The handling and disposal of MSW is a growing concern as the volume of waste generated in the U.S. continues to increase.



Generation Statistics¹

- Total annual MSW generation in the U.S. has increased more than 60% since 1980 to the current level of 251 million tons per year.
- Packaging and containers were 31.7% of MSW generation in 2006, followed by nondurable goods (including papers and plastics which last under 3 years) at 25.5%, with the remainder nearly evenly divided between durable goods, yard trimmings, and food scraps.
- Between 1960 and 1990, per capita MSW generation in the U.S. increased 68% including an increase of more than 20% in the 1980's, but per capita generation has been relatively constant for the past 15 years.²
- At the 2006 per capita rate (4.60 lbs/person/day) the average American generates their own weight (~160 lbs) in MSW every 35 days. For comparison, MSW generation rates (in lbs/person/day) are 2.8 in Sweden, 3.9 in Germany, and 3.7 in the UK.³
- The generation of MSW per dollar of private consumption in the U.S. is approximately 62 lbs per thousand dollars. Comparable generation rates (in lbs/thousand dollars) are 75 in Sweden, 88 in Germany, and 67 in the UK.³

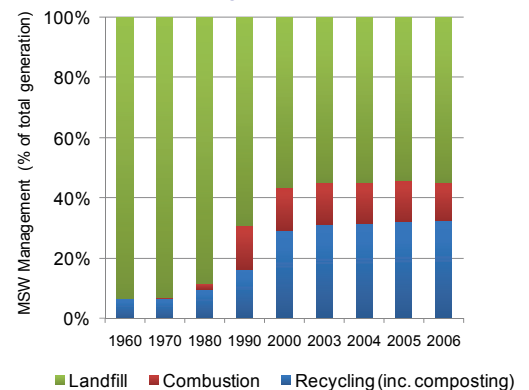
— Total MSW Generation — Per Capita Generation

Management Methods

Landfill

- In 2005, 54% of MSW generated in the U.S. was disposed of in 1,654 landfills.²
- While the total number of landfills in the U.S. has been declining steadily, total capacity has increased. The combined capacity of the three largest landfill corporations is 6.8 million tons, with an additional 1.3 billion tons acquired for “probable expansion.”⁴
- Disposal (tipping) fees for landfills in the U.S. currently average \$41 per ton with a high of \$98 per ton in Vermont.⁵
- Environmental implications of landfill disposal include the loss of land area resources, potential leaching of hazardous materials to ground water (proper design limits this possibility), and emissions of methane (CH₄, a greenhouse gas) to the atmosphere.
- Landfills are the second largest source of anthropogenic CH₄ emissions in the U.S., accounting for 125.7 million metric tons CO₂-equivalent in 2006, about 2% of total GHG emissions.⁶ However, only half of the total landfill CH₄ produced is emitted into the atmosphere, the remainder is recovered and combusted into CO₂ through flaring or electricity generation.⁷

MSW Management in the U.S.¹



¹ U.S. Environmental Protection Agency (2007) *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures 2006*.

² U.S. Environmental Protection Agency (2006) *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures 2005*

³ Organisation for Economic Co-operation and Development (2007) *OECD Key Environmental Indicators 2007*.

⁴ U.S. Securities and Exchange Commission (2006) *Annual Reports*.

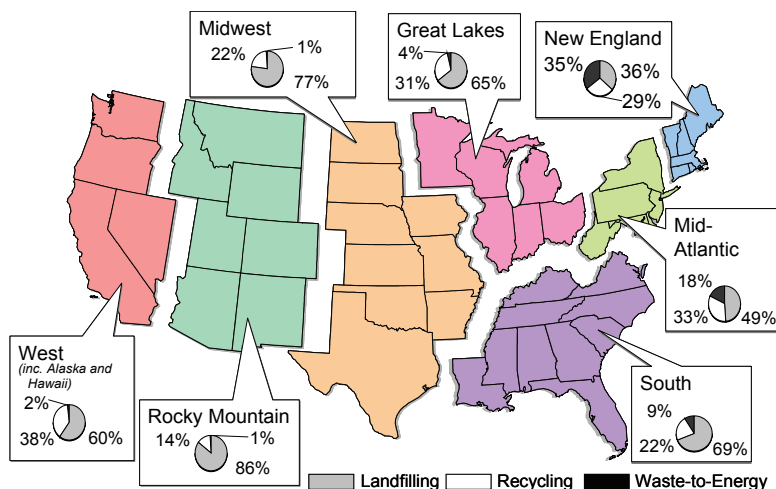
⁵ Biocycle and the Earth Engineering Center of Columbia University (2006) *The State of Garbage, 15th Nationwide Survey of Municipal Solid Waste Management in the United States*.

⁶ U.S. Environmental Protection Agency (2008) *Inventories of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006*.

Combustion

- In 2006, 12.5% of MSW generated in the U.S. was disposed of through waste incineration with energy recovery.¹
- Combustion reduces waste to ash (a 75% reduction in weight) for disposal in a landfill.²
- Waste-to-energy programs that convert MSW into useable energy supplied 171 trillion BTU in 2006 – less than 0.2% of total U.S. demand.⁸
- In 2004, 101 waste-to-energy facilities were in operation in the U.S. with average disposal fees of \$63 per ton.⁵
- The incineration of MSW generates a variety of pollutants (such as CO₂, heavy metals, dioxins and particulates) that contribute to environmental and human health impacts such as climate change, smog, acidification, asthma, and heart and nervous system damage.

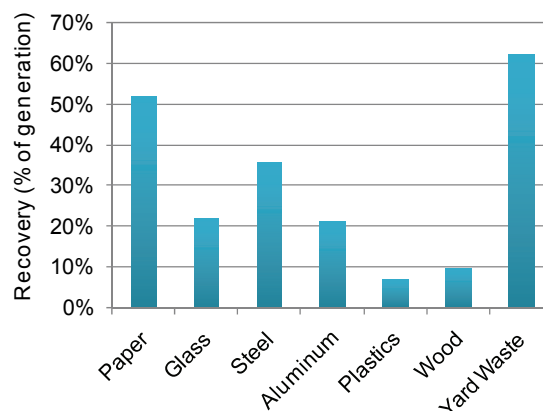
Regional MSW Management Breakdown, 2004⁴



Recycling and Composting¹

- In 2006, 32.5% of MSW generated in the U.S. was recovered for recycling or composting, diverting 82 million tons of material from landfills and incinerators - more than double the value from 15 years earlier.
- Recovered composting materials represent 25% of all recovered materials.
- Currently 8,660 curbside recycling programs serve 144 million people in the U.S. (48% of the U.S. population). The number of curbside programs in the U.S. has increased threefold since 1990.⁴
- Over 72% of corrugated boxes are recovered for recycling; other commonly recycled products include newspapers (88%), major appliances (67%), office papers (66%), and aluminum beverage cans (45%).
- Some common products with poor recycling rates include: carpet (8%), plastic bags (8%), and small appliances (1%).

Recovery of Materials in MSW, 2006¹



Opportunities for Improvement

Source Reduction

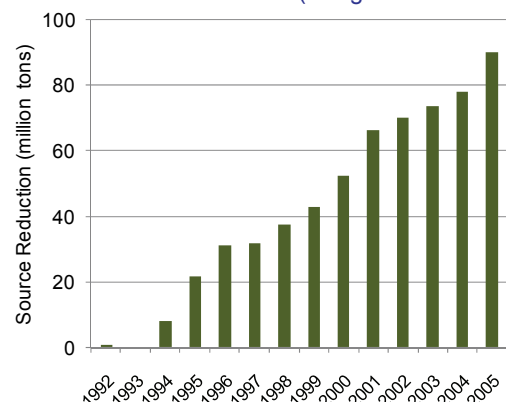
Source reduction activities reduce the amount of wastes before they enter the MSW management system. Source reduction activities for consumers include:

- Minimize the volume of packaging material required to deliver products by selecting products packaged efficiently or buying in bulk.
- Identify opportunities to reuse products and packaging in the home or community rather than disposing or recycling them.
- Encourage companies to implement source reduction programs and purchase products with post-consumer recycled content.
- Reduce consumption of disposable goods and purchase products from reuse centers.
- Reduce food waste (26% of edible food is wasted at the consumer level) through efficient meal planning and composting of scraps.⁹

Encourage Supportive Public Policy

- Many municipalities have implemented programs, e.g., reuse centers, food rescue; and incentives, e.g., Pay-As-You-Throw programs designed to limit the volume of waste collection per household.
- Less than half of the population has access to curbside recycling programs. Implementation of curbside recycling and composting programs where they are currently unavailable can help reduce the burden of waste disposal.⁵
- Many states do not restrict landfill disposal of some potentially hazardous items, e.g., oil, batteries, scrap tires and electronics.⁵ Many of these products and materials are hard to recycle and have limited management options.
- 11 states (CA, CT, DE, HI, IA, ME, MA, MI, NY, OR, and VT) have deposit laws that encourage the return of empty containers for refunds.²

U.S. Source Reduction (using 1990 baseline)²



¹ U.S. Department of Energy, Energy Information Administration (2006) *Emissions of Greenhouse Gases in the United States 2005*.

² U.S. Department of Energy, Energy Information Administration (2008) *Renewable Energy Annual 2006*.

³ Heller, M.C. and G.A. Keoleian (2000) *Life Cycle-Based Sustainability Indicators for Assessment of the U.S. Food System* (CSS00-04).

