

Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2003

The Environmental Protection Agency has collected and reported data on the generation and disposal of waste in the United States for more than 30 years. We use the information to measure the success of municipal solid waste (MSW) reduction and recycling programs across the country. The data also shows us where we, as a nation, need to make environmental improvements. Because we only report this information every two years, these facts and figures are current through calendar year 2003. Both 2002 and 2003 data are reported here for the first time.

TRENDS IN MUNICIPAL SOLID WASTE

Municipal solid waste (MSW), usually known as trash or garbage, is made up of the things we commonly throw away. This household type of waste ranges from our package wrapping, food scraps, and grass clippings to our old sofas, computers, and refrigerators. It does not contain industrial, hazardous, or construction waste. Despite sustained improvements in waste reduction, household waste remains a constant concern because trends indicate that the overall tonnage we create continues to increase.

Since 1980, the total annual generation of MSW has increased more than 50 percent to its 2003 level of just over 236 million tons per year—topping 2002 by more than a half-million tons. Excluding

Recycling and Composting Programs for MSW

The latest recycling and composting figures we have are for 2002. In that year,

- Around 8,875 curbside recycling programs existed nationwide, down somewhat from 9,700 in 2001.
- About 3,227 community composting programs were operational, a slight decrease from 2001 figures.

The decreases in recycling and composting programs may be the result of some consolidation of curbside recycling programs and fewer states reporting composting data.

WHAT CAN YOU
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Disposing of MSW

Figure 5 on page 9 shows that the number of municipal solid waste landfills has steadily declined over the years. On the other hand, average landfill size has increased. At the national level, landfill capacity appears to be sufficient, although it may not be in some regional areas.

- The percentage of MSW going to landfills continues to decrease (see Tables 6,7). Since 1990, MSW being sent to landfills has decreased by 9 million tons, from 140 million tons to 131 million tons in 2003. The tonnage landfilled results from an interaction among generation, recycling, and combustion, which do not necessarily rise and fall at the same time.
- In 2003, the net per capita discard rate (after recycling and composting) was 3.09 pounds per person per day, down from 3.14 pounds per person per day in 2002 (see Table 3).

composting, MSW recovered for recycling rose to more than 55 million tons, about a 3-percent increase over 2002. Composting recovered almost 17 million tons. The total MSW recovery rate, which includes both recycling and composting, was just over 30 percent in 2003 (see Tables 1, 2; Figures 1, 2).

Our 2003 individual MSW generation rate has remained relatively constant since the 1990s at 4.5 pounds per person per day. Our recycling rate was just over 1 pound per person per day. After accounting for what we recycled, we discarded about 3 pounds per person per day in 2003 (Table 3).

In 2003, recycling and composting diverted more than 72 million tons from disposal. Paper and paperboard recovery rose to 40 million tons. Metals were recycled at 36 percent, and electronic products had about a 10 percent recycling rate. Consider the significance of these figures today compared to 1980 when we only recycled 10 percent of all our MSW and disposed of the rest. Clearly, we're recycling more and discarding less.

After accounting for the MSW that was recovered by recycling and composting, we measure waste disposed of in combustors and landfills (see Figures 5, 6). In 2003, around 33 million tons (14 percent) were combusted, and about 131 million tons (55 percent) went to landfills or were otherwise disposed of.

Table 1
Generation, Materials Recovery, Composting, and Discards of Municipal Solid Waste, 1960 - 2003
 (in millions of tons)

Millions of Tons									
	1960	1970	1980	1990	1995	2000	2001	2002	2003
Generation	88.1	121.1	151.6	205.2	213.7	234.0	231.2	235.5	236.2
Recovery for recycling	5.6	8.0	14.5	29.0	46.2	52.4	52.8	53.8	55.4
Recovery for composting*	Neg.	Neg.	Neg.	4.2	9.6	16.5	16.6	16.7	16.9
Total Materials Recovery	5.6	8.0	14.5	33.2	55.8	68.9	69.3	70.5	72.3
Discards after Recovery	82.5	113.0	137.1	172.0	158.0	165.1	161.9	165.0	163.9

*Composting of yard trimmings, food scraps, and other MSW organic material.

Does not include backyard composting.

Details may not add to totals due to rounding.

Table 2
Generation, Materials Recovery, Composting, and Discards of Municipal Solid Waste, 1960 - 2003
 (in percent of total generation)

Percent of total generation									
	1960	1970	1980	1990	1995	2000	2001	2002	2003
Generation	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Recovery for recycling	6.4%	6.6%	9.6%	14.2%	21.6%	22.4%	22.8%	22.8%	23.5%
Recovery for composting*	Neg.	Neg.	Neg.	2.0%	4.5%	7.0%	7.2%	7.1%	7.1%
Total Materials Recovery	6.4%	6.6%	9.6%	16.2%	26.1%	29.4%	30.0%	29.9%	30.6%
Discards after Recovery	93.6%	93.4%	90.4%	83.8%	73.9%	70.6%	70.0%	70.1%	69.4%

*Composting of yard trimmings, food scraps, and other MSW organic material.
 Does not include backyard composting.
 Details may not add to totals due to rounding.

Figure 1
MSW Generation Rates from 1960 to 2003

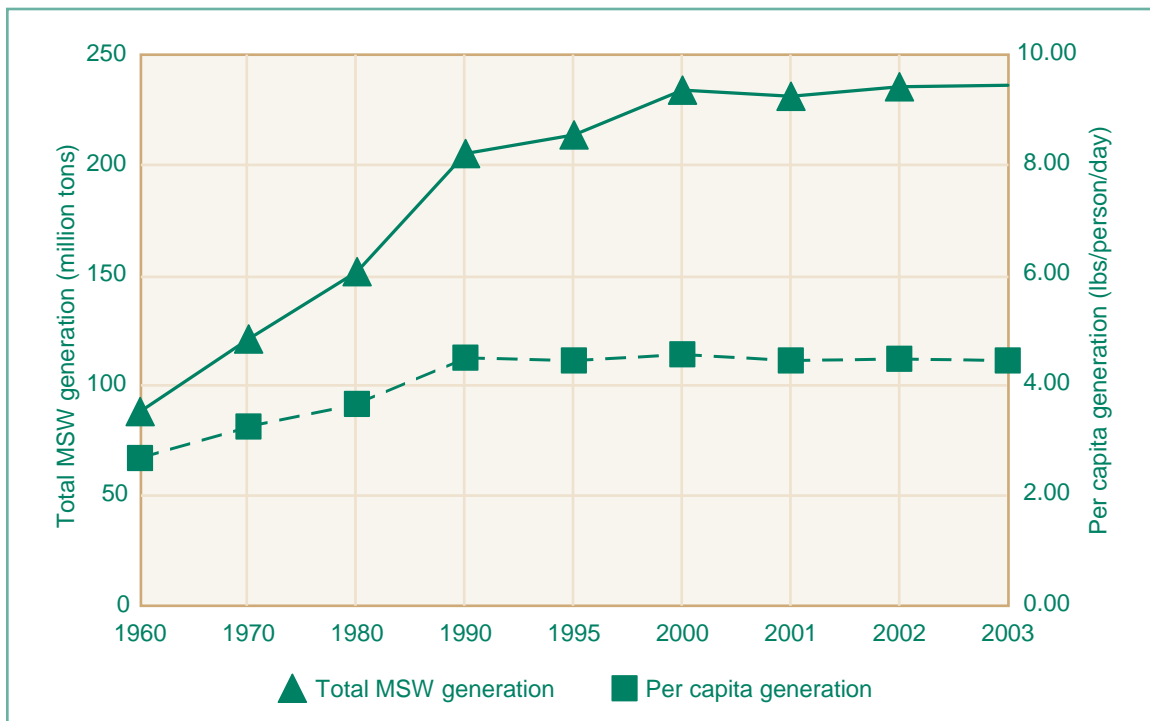


Figure 2
MSW Recycling Rates from 1960 to 2003

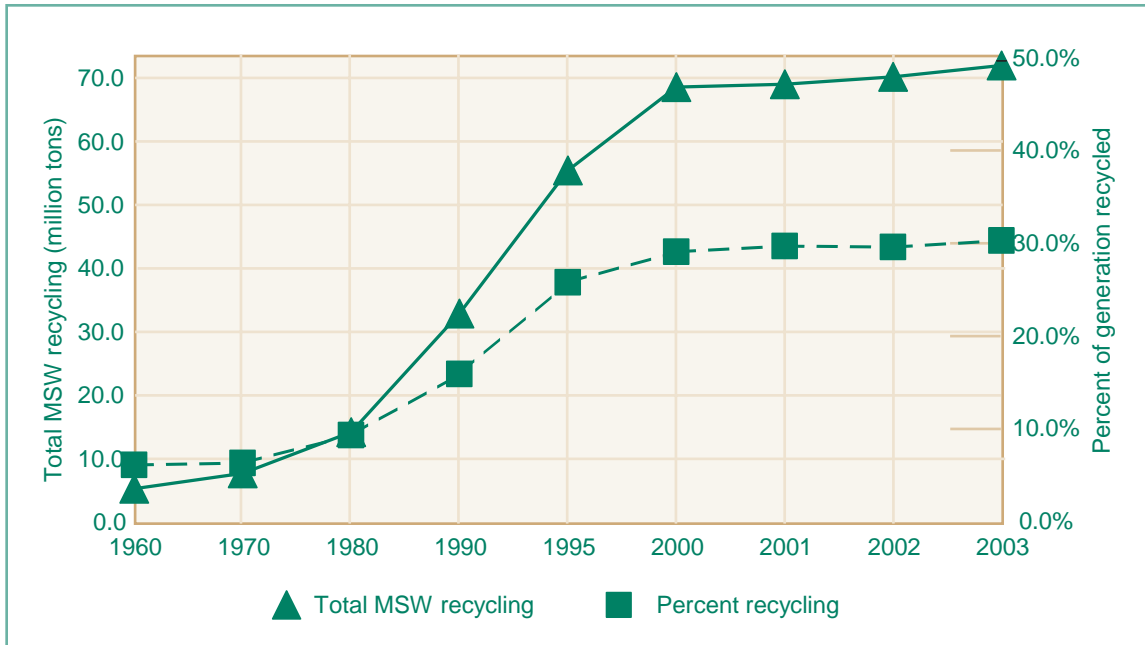


Table 3
Generation, Materials Recovery, Composting, and Discards of Municipal Solid Waste, 1960 - 2003
(in pounds per person per day)

Pounds per person per day									
	1960	1970	1980	1990	1995	2000	2001	2002	2003
Generation	2.68	3.25	3.66	4.50	4.45	4.56	4.45	4.48	4.45
Recovery for recycling	0.17	0.22	0.35	0.64	0.96	1.02	1.02	1.02	1.04
Recovery for composting*	Neg.	Neg.	Neg.	0.09	0.20	0.32	0.32	0.32	0.32
Total Materials Recovery	0.17	0.22	0.35	0.73	1.16	1.34	1.34	1.34	1.36
Discards after Recovery	2.51	3.03	3.31	3.77	3.29	3.22	3.11	3.14	3.09
Population (millions)	179.979	203.984	227.255	249.907	263.168	281.422	284.797	287.974	290.810

*Composting of yard trimmings, food scraps, and other MSW organic material.
Does not include backyard composting.
Details may not add to totals due to rounding.

MUNICIPAL SOLID WASTE IN 2003

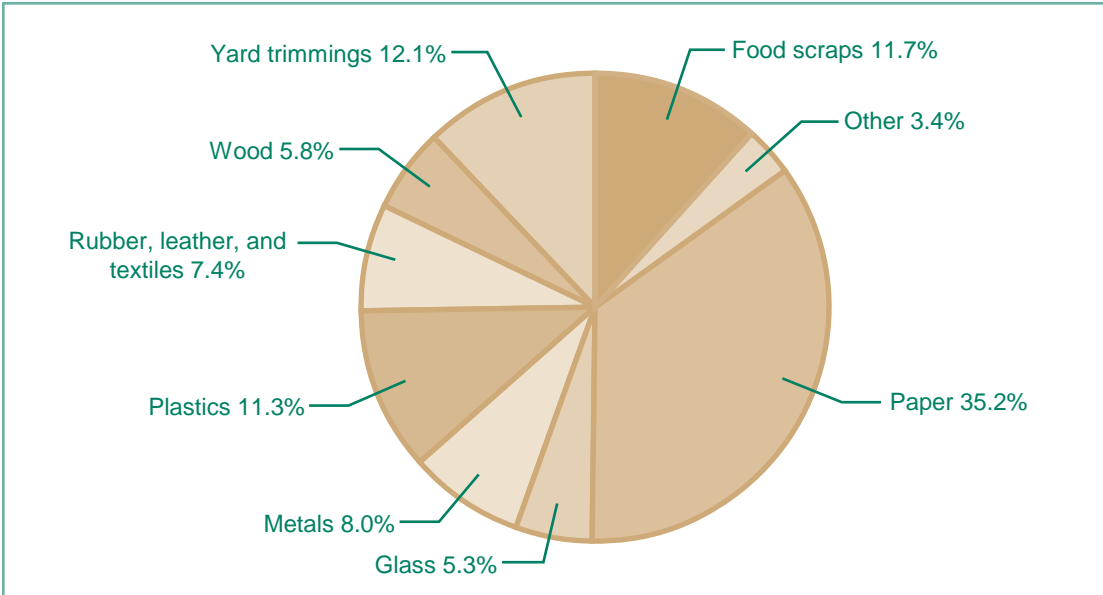
Sources of MSW include both residential and commercial locations. We estimated residential waste (including waste from apartment houses) to be 55 to 65 percent of total MSW generation. Waste from schools and commercial locations, such as hospitals and businesses, constitutes 35 to 45 percent of MSW. Local and regional factors, such as climate and level of commercial activity, contribute to the variations.

We analyze MSW two ways. The first is by material (paper and paperboard, yard trimmings, food scraps, plastics, metals, glass, wood, rubber, leather and textiles, and other); the second is by major product categories. Product categories include durable goods (like furniture and appliances), nondurable goods (products meant for disposal), containers and packaging (like milk cartons, cardboard boxes, plastic wrap) and other wastes (like food scraps and yard trimmings).

Materials in MSW

Organic materials continue to be the largest components of MSW: Paper and paperboard products account for 35 percent of the waste stream, with yard trimmings and food scraps together accounting for about 24 percent. Plastics comprise 11 percent; metals make up 8 percent; and rubber, leather and textiles account for about 7 percent. Wood follows at 6 percent, and glass at 5 percent. Finally, other miscellaneous wastes made up approximately 3 percent of the MSW generated in 2003. A breakdown, by weight, of the MSW materials generated in 2003 is provided in Figure 3.

Figure 3
2003 Total MSW Generation - 236 Million Tons (Before Recycling)



Some material from each MSW category was recycled or composted in 2003. The highest recovery rates were achieved in yard trimmings, paper products, and metal products. About 56 percent—or about 16 million tons—of yard trimmings were composted, representing almost a four-fold increase over 1990. About 48 percent of paper and paperboard were recycled. Nearly 7 million tons, or about 36 percent, of metals were recycled. Recycling rates (recovery as a percent of generation) for all material categories in 2003 are listed in Table 4.

Table 4
Generation and Recovery of Materials in MSW, 2003
(in millions of tons and percent of generation of each material)

	Weight Generated	Weight Recovered	Recovery as a Percent of Generation
Paper and paperboard	83.1	40.0	48.1%
Glass	12.5	2.35	18.8%
Metals			
Steel	14.0	5.09	36.4%
Aluminum	3.23	0.69	21.4%
Other nonferrous metals*	1.59	1.06	66.7%
Total metals	18.8	6.84	36.3%
Plastics	26.7	1.39	5.2%
Rubber and leather	6.82	1.10	16.1%
Textiles	10.6	1.52	14.4%
Wood	13.6	1.28	9.4%
Other materials	4.32	0.98	22.7%
Total Materials in Products	176.4	55.4	31.4%
Other wastes			
Food, other**	27.6	0.75	2.7%
Yard trimmings	28.6	16.1	56.3%
Miscellaneous inorganic wastes	3.62	Neg.	Neg.
Total Other Wastes	59.8	16.9	28.2%
TOTAL MUNICIPAL SOLID WASTE	236.2	72.3	30.6%

Includes waste from residential, commercial, and institutional sources.

*Includes lead from lead-acid batteries.

**Includes recovery of other MSW organics for composting.

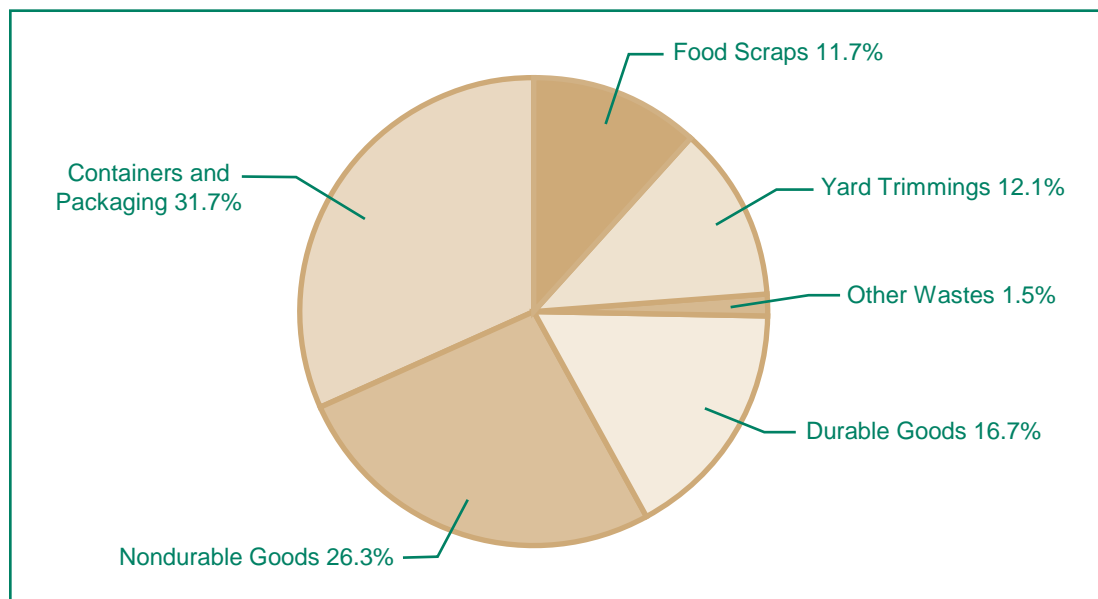
Details may not add to totals due to rounding.

Neg. = Less than 5,000 tons or 0.05 percent.

Products in MSW

The breakdown, by weight, of product categories generated in 2003 is shown in Figure 4. Containers and packaging made up the largest portion of waste generated, about 75 million tons. The second-largest portion of MSW was nondurable goods, comprising just over 26 percent. Durable goods make up the third largest segment, accounting for almost 40 million tons.

Figure 4
Products Generated in MSW - 2003 (Total Weight = 236 million tons)



The generation and recovery of the product categories in MSW in 2003 are shown in Table 5. This table shows that recovery of containers and packaging was the highest of the three product categories, recycling almost 39 percent of containers and packaging. Aluminum, steel, and paper products were the most recycled materials by percentage in this category. Nearly 44 percent of all aluminum beverage cans were recycled, while almost 61 percent of steel packaging (mostly cans) was recovered. About 48 percent of paper and paperboard was recycled. This figure includes corrugated containers that had a 71 percent recycling rate.

Around 22 percent of glass containers were recycled, while about 15 percent of wood packaging—mostly wood pallets—was recovered for recycling. Nearly 9 percent of plastic containers and packaging were recycled, which were mostly soft drink, milk, and water bottles. Plastic milk bottles were the most recycled materials, accounting for roughly 32 percent. Plastic soft drink bottles were recovered at a 25 percent rate.

Overall recovery of nondurable goods was 31 percent in 2003. Paper products, such as newspapers and high-grade office papers were the most recycled materials. Newspapers alone were recycled at a rate of about 82 percent. Around 56 percent of high-grade office papers and 33 percent of magazines were recovered. About 32 percent of junk mail was recovered. Slightly more than 18 percent of books, almost 16 percent of telephone directories, and nearly 13 percent of other commercial printing products accounted for additional recycled paper materials in 2003.

Table 5
Generation and Recovery of Products in MSW by Material, 2003
(in millions of tons and percent of generation of each product)

	Weight Generated	Weight Recovered	Recovery as a Percent of Generation
Durable Goods			
Steel	11.2	3.37	30.2%
Aluminum	1.06	Neg.	Neg.
Other non-ferrous metals*	1.59	1.06	66.7%
Total metals	13.8	4.43	32.1%
Glass	1.78	Neg.	Neg.
Plastics	8.39	0.33	3.9%
Rubber and leather	5.91	1.10	18.6%
Wood	5.27	Neg.	Neg.
Textiles	3.03	0.32	10.6%
Other materials	1.30	0.98	75.4%
Total durable goods	39.5	7.16	18.1%
Nondurable Goods			
Paper and paperboard	44.3	18.1	40.8%
Plastics	6.35	Neg.	Neg.
Rubber and leather	0.88	Neg.	Neg.
Textiles	7.37	1.20	16.3%
Other materials	3.26	Neg.	Neg.
Total nondurable goods	62.1	19.3	31.0%
Containers and Packaging			
Steel	2.84	1.72	60.6%
Aluminum	1.94	0.69	35.6%
Total metals	4.78	2.41	50.4%
Glass	10.7	2.35	22.0%
Paper and paperboard	38.8	21.9	56.4%
Plastics	11.9	1.06	8.9%
Wood	8.36	1.28	15.3%
Other materials	0.22	Neg.	Neg.
Total containers and packaging	74.8	29.0	38.8%
Other wastes			
Food, other**	27.6	0.75	2.7%
Yard trimmings	28.6	16.1	56.3%
Miscellaneous inorganic wastes	3.62	Neg.	Neg.
Total Other Wastes	59.8	16.9	28.2%
TOTAL MUNICIPAL SOLID WASTE	236.2	72.3	30.6%

Includes waste from residential, commercial, and institutional sources.

*Includes lead from lead-acid batteries.

**Includes recovery of other MSW organics for composting.

Details may not add to totals due to rounding.

Neg. = Less than 5,000 tons or 0.05 percent.

Clothing and other textile products are included in the nondurable goods category. These products were recovered for recycling or export at a rate of 16 percent.

Overall, approximately 18 percent of durable goods were recovered in 2003. Nonferrous metals other than aluminum had one of the highest recovery rates, at nearly 67 percent, due to the high rate of lead recovery from lead-acid batteries. Recovery of steel in all durable goods was 30 percent, with high rates of recovery from appliances and other miscellaneous durable goods.

Lead-acid batteries were one of the most recovered products in 2003, with a recycling rate of 93 percent. Other products with particularly high recovery rates were steel from major appliances (about 90 percent), corrugated boxes (about 71 percent), newspapers (about 82 percent), steel cans (60 percent), and aluminum beverage cans (about 44 percent). Around 10 percent of selected consumer electronics, including computers, TVs, stereos, cell phones and similar equipment, were recycled.

The percent of rubber in tires that was recovered for recycling was almost 36 percent. Other tires were retreaded and shredded rubber tires were also used as fuel, or burned for energy recovery.

Figure 5
Number of Landfills in the United States by Year.

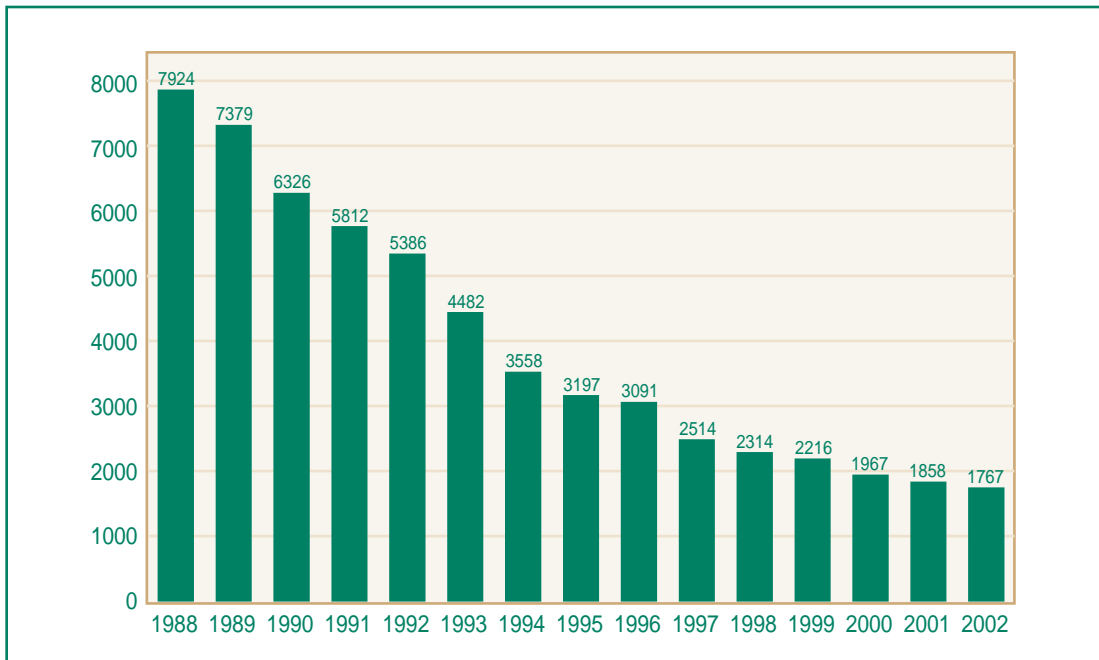


Figure 6
Management of MSW in the United States - 2003

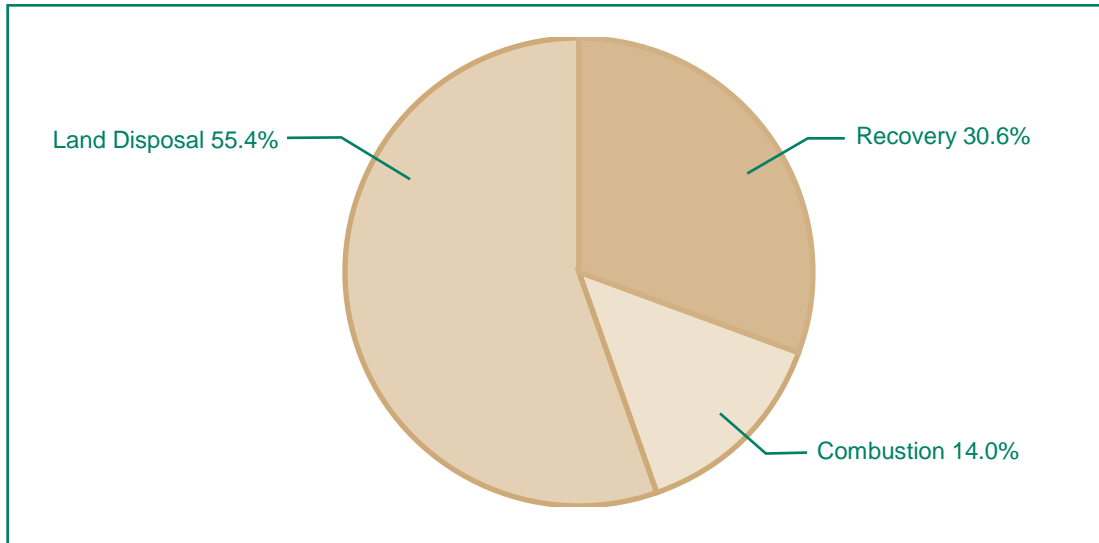


Table 6
Generation, Materials Recovery, Combustion, and Discards of Municipal Solid Waste, 1960 - 2003
(in millions of tons)

Millions of Tons									
	1960	1970	1980	1990	1995	2000	2001	2002	2003
Total Generation	88.1	121.1	151.6	205.2	213.7	234.0	231.2	235.5	236.2
Total Materials Recovery	5.6	8.0	14.5	33.2	55.8	68.9	69.3	70.5	72.3
Combustion*	27.0	25.1	13.7	31.9	35.5	33.7	33.6	33.4	33.1
Discards to landfill, other disposal**	55.5	87.9	123.4	140.1	122.4	131.4	128.3	131.7	130.8
Total Discards after Recovery	82.5	113.0	137.1	172.0	158.0	165.1	161.9	165.0	163.9

*Includes combustion of MSW in mass burn or refuse-derived fuel form, and combustion with energy recovery of source separated materials in MSW (e.g., wood pallets and tire-derived fuel).

**Discards after recovery minus combustion.

Details may not add to totals due to rounding.

Table 7
Generation, Materials Recovery, Combustion, and Discards of Municipal Solid Waste, 1960 - 2003
(in percent of total generation)

Millions of Tons									
	1960	1970	1980	1990	1995	2000	2001	2002	2003
Total Generation	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Materials Recovery	6.4%	6.6%	9.6%	16.2%	26.1%	29.4%	30.0%	29.9%	30.6%
Combustion*	30.6%	20.7%	9.0%	15.5%	16.6%	14.4%	14.5%	14.2%	14.0%
Discards to landfill, other disposal**	63.0%	72.6%	81.4%	68.3%	57.3%	56.2%	55.5%	55.9%	55.4%
Total Discards after Recovery	93.6%	93.4%	90.4%	83.8%	73.9%	70.6%	70.0%	70.1%	69.4%

*Includes combustion of MSW in mass burn or refuse-derived fuel form, and combustion with energy recovery of source separated materials in MSW (e.g., wood pallets and tire-derived fuel).

**Discards after recovery minus combustion.

Details may not add to totals due to rounding.

FOR MORE INFORMATION

This report and previous reports in the same series are available on the Internet at <<http://www.epa.gov/msw/msw99.htm>>. Detailed data tables for 2003 and previous years may be found at the same location. General information on municipal solid waste is available on the Internet at <<http://www.epa.gov/msw>>.



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