

# Municipal Solid Waste Generation, Recycling, and Disposal in the United States:

## Facts and Figures for 2005

The Environmental Protection Agency has collected and reported data on the generation and disposal of waste in the United States for more than 40 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 2005. Both 2004 and 2005 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 things we commonly throw away. This household type of waste ranges from our package wrappings, 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 60 percent to its 2005 level of nearly 246 million tons per year. Excluding composting, MSW recovered through recycling rose to more than 58 million tons, 5.7 tons more than in 2004.

Composting recovered nearly 21 million tons of waste. The total MSW recovery rate, which includes both

#### Recycling and Composting Programs for MSW

The latest recycling and composting figures we have are for 2005. In that year,

- **Recycling and composting programs recovered 32.1 percent of MSW in 2005—that was 79 million tons!**
- **Around 8,550 curbside recycling programs existed nationwide, slightly down from 8,875 in 2002.**
- **About 3,470 community composting programs were operational, an increase from 3,227 in 2002.**



recycling and composting, was just over 32 percent in 2005.

Our individual MSW generation rate has remained relatively constant since the 1990s at 4.5 pounds per person per day. Our recycling

### Disposing of MSW

Figure 5 on page 9 shows that the number of MSW 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. Since 1990, MSW sent to landfills has decreased by 9 million tons, from 142.3 million tons in 1990 (See Table 1) to 133.3 million tons in 2005.
- In 2005, the net per capita discard rate (after recycling, composting, and combustion with energy recovery) was 2.46 pounds per person per day, similar to 2.49 pounds per person in 2003 (see Table 3 on page 4).

### Recovering Energy from Burning MSW

- In 2005, approximately 33.4 million tons or 13.6 percent of MSW was combusted with energy recovery.
- Combustion with energy recovery increased nearly tenfold from 1980 to 1990; since then MSW combustion with energy recovery has increased slightly

rate was close to 1.5 pounds per person per day. After accounting for what we recycled, we combusted with energy recovery or discarded about 3 pounds per person per day in 2005.

In 2005, recycling and composting diverted 79 million tons of waste. Paper and paperboard recovery rose to 42 million tons. Metals were recycled at a rate of nearly 37 percent, and 62 percent of yard trimmings were recovered. 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. In 2005, more than 33 million tons (14 percent) were combusted with energy recovery, and about 133 million tons (54 percent) went to landfills or were otherwise disposed of.

**Table 1**  
**Generation, Materials Recovery, Composting, Combustion with Energy Recovery, and Discards of Municipal Solid Waste, 1960 - 2005**  
(in millions of tons)

Activity	1960	1970	1980	1990	2000	2003	2004	2005
<b>Generation</b>	88.1	121.1	151.6	205.2	237.6	240.4	247.3	245.7
Recovery for recycling	5.6	8.0	14.5	29.0	52.7	55.8	52.7	58.4
Recovery for composting*	Neg.	Neg.	Neg.	4.2	16.5	19.1	20.5	20.6
<b>Total Materials Recovery</b>	5.6	8.0	14.5	33.2	69.1	74.9	77.7	79.0
<b>Combustion with Energy Recovery†</b>	0.0	0.4	2.7	29.7	33.7	33.7	34.1	33.4
<b>Discards to Landfill, Other Disposal‡</b>	82.5	112.7	134.4	142.3	134.8	131.9	135.5	133.3

\* 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.

† 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 with energy recovery.

Details may not add to totals due to rounding.

**Table 2**  
**Generation, Materials Recovery, Composting, Combustion with Energy Recovery, and Discards of Municipal Solid Waste, 1960 - 2005**  
(in percent of total generation)

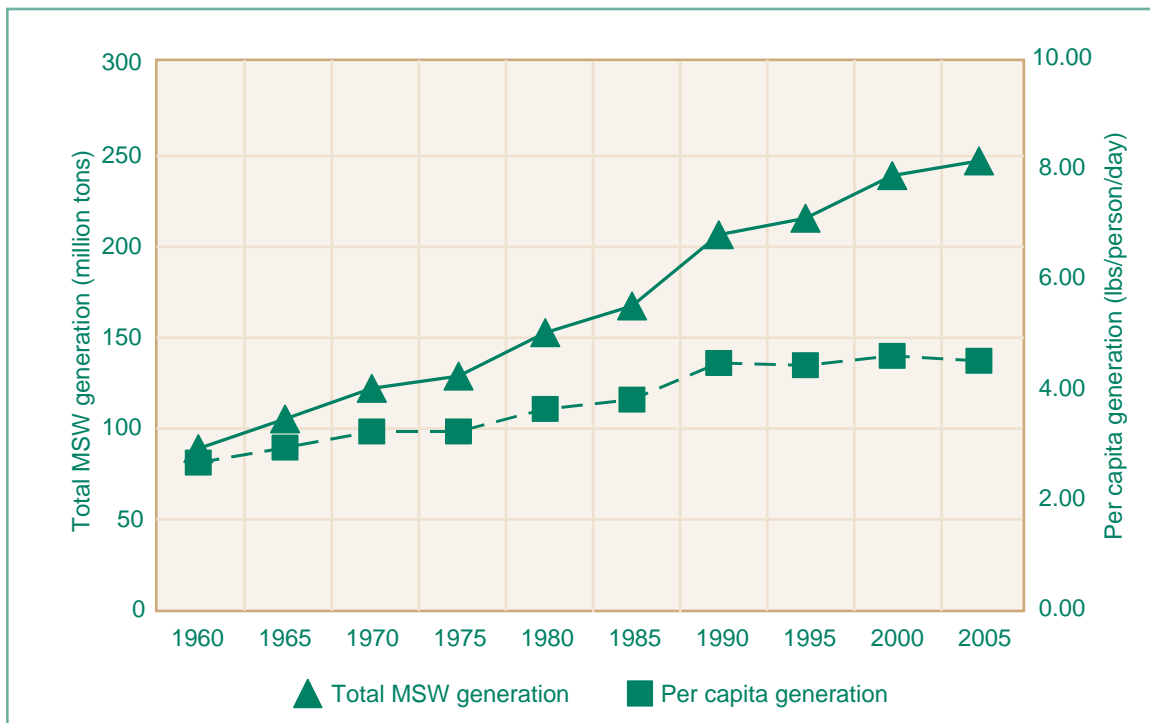
Activity	1960	1970	1980	1990	2000	2003	2004	2005
<b>Generation</b>	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Recovery for recycling	6.4%	6.6%	9.6%	14.2%	22.2%	23.2%	23.1%	23.8%
Recovery for composting*	Neg.	Neg.	Neg.	2.0%	6.9%	7.9%	8.3%	8.4%
<b>Total Materials Recovery</b>	6.4%	6.6%	9.6%	16.2%	29.1%	31.1%	31.4%	32.1%
<b>Combustion with Energy Recovery†</b>	0.0%	0.3%	1.8%	14.5%	14.2%	14.0%	13.8%	13.6%
<b>Discards to Landfill, Other Disposal‡</b>	93.6%	93.1%	88.6%	69.3%	56.7%	54.9%	54.8%	54.3%

\* 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.

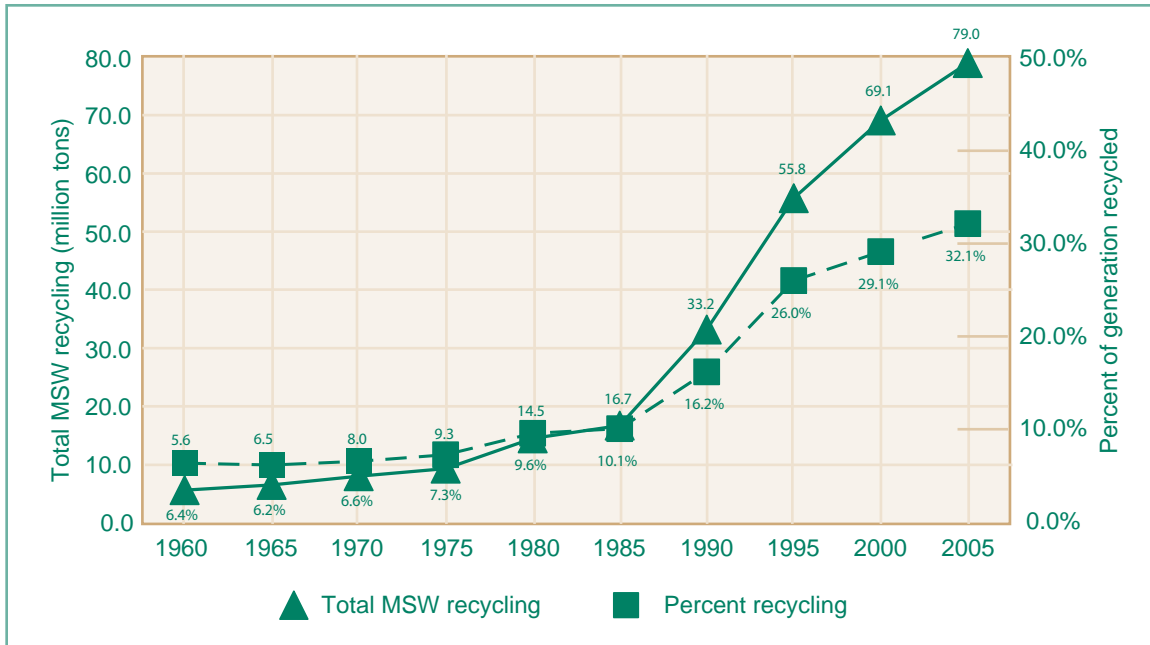
† Includes combustion of MSW in mass burn or refuse-derived fuel form, and combustion with energy recovery of source separated materials in MSW (e.g., wood pallets and tire-derived fuel).

‡ Discards after recovery minus combustion with energy recovery.  
Details may not add to totals due to rounding.

**Figure 1**  
**MSW Generation Rates from 1960 - 2005**



**Figure 2**  
**MSW Recycling Rates from 1960 - 2005**



**Table 3**  
**Generation, Materials Recovery, Composting, Combustion with Energy Recovery, and Discards of Municipal Solid Waste, 1960 - 2005**  
**(in pounds per person per day)**

Activity	1960	1970	1980	1990	2000	2003	2004	2005
<b>Generation</b>	2.68	3.25	3.66	4.50	4.63	4.53	4.61	4.54
Recovery for recycling	0.17	0.22	0.35	0.64	1.03	1.05	1.07	1.08
Recovery for composting*	Neg.	Neg.	Neg.	0.09	0.32	0.36	0.38	0.38
<b>Total Materials Recovery</b>	0.17	0.22	0.35	0.73	1.35	1.41	1.45	1.46
<b>Combustion with Energy Recovery†</b>	0.00	0.01	0.07	0.65	0.66	0.63	0.64	0.62
<b>Discards to Landfill, Other Disposal‡</b>	2.51	3.02	3.24	3.12	2.62	2.49	2.52	2.46
Population (millions)	179.979	203.984	227.255	249.907	281.422	290.850	293.660	296.410

\* 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.

† 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 with energy recovery.

Details may not add to totals due to rounding.

## MUNICIPAL SOLID WASTE IN 2005

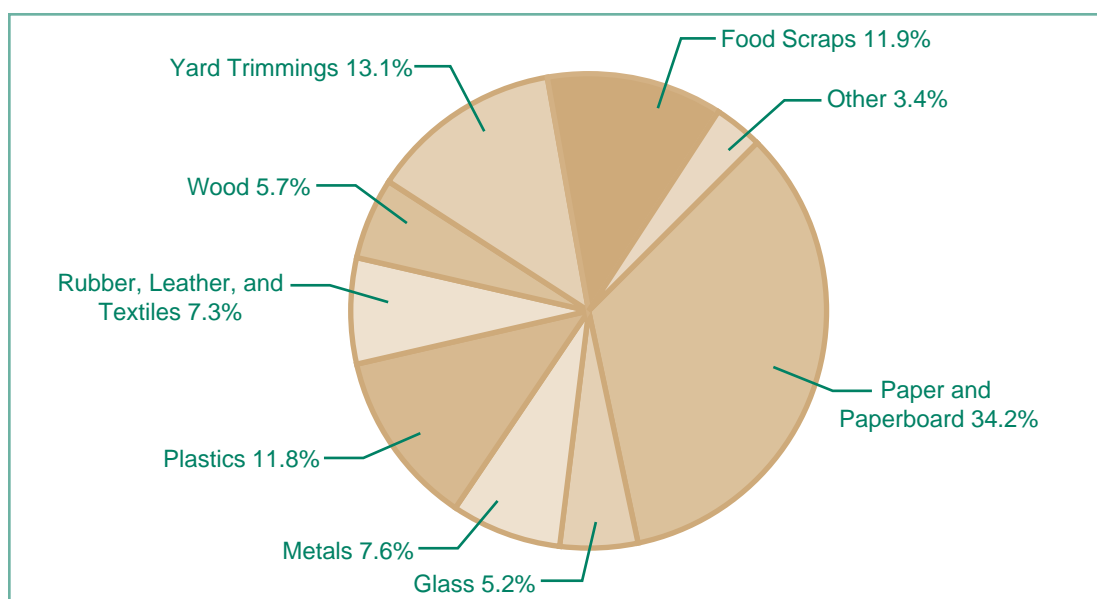
Sources of MSW include both residential and commercial locations. We estimated residential waste (including waste from apartment houses) to be 55 to 65 percent of total MSW generation. Waste from schools and commercial locations, such as hospitals and businesses, constitutes 35 to 45 percent of MSW.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

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

### Materials in MSW

Organic materials continue to be the largest components of MSW. Rounding to the nearest whole number, paper and paperboard products account for 34 percent of the waste stream, with yard trimmings and food scraps accounting for about 25 percent. Plastics comprise 12 percent; metals make up 8 percent; rubber, leather, and textiles account for 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 2005. A breakdown, by weight, of the MSW materials generated in 2005 is provided in Figure 3.

**Figure 3**  
**Total MSW Generation - 2005 (Before Recycling = 246 million tons)**



Some material from each MSW category was recycled or composted in 2005. The highest recovery rates were achieved in yard trimmings, paper and paperboard products, and metal products. Almost 21 million tons of yard trimmings were composted, representing a five-fold increase since 1990. Half the paper and paperboard generated in 2005 was recycled. Recycling these organic materials alone kept 25 percent of municipal solid waste out of landfills and combustion facilities. Nearly 7 million tons, or about 37 percent, of metals were recycled too. Recycling rates (recovery as a percent of generation) for all materials in 2005 are listed in Table 4.

**Table 4**  
**Generation and Recovery of Materials in MSW, 2005**  
(in millions of tons and percent of generation of each material)

Material	Weight Generated	Weight Recovered	Recovery as a Percent of Generation
Paper and paperboard	84.0	42.0	50.0%
Glass	12.8	2.76	21.6%
Metals			
Steel	13.8	4.93	35.8%
Aluminum	3.21	0.69	21.5%
Other nonferrous metals*	1.74	1.26	72.4%
<b>Total Metals</b>	<b>18.7</b>	<b>6.88</b>	<b>36.8%</b>
Plastics	28.9	1.65	5.7%
Rubber and leather	6.70	0.96	14.3%
Textiles	11.1	1.70	15.3%
Wood	13.9	1.31	9.4%
Other materials	4.57	1.17	25.6%
<b>Total Materials in Products</b>	<b>180.7</b>	<b>58.4</b>	<b>32.3%</b>
Other Wastes			
Food, other**	29.2	0.69	2.4%
Yard trimmings	32.1	19.9	61.9%
Miscellaneous inorganic wastes	3.69	Neg.	Neg.
<b>Total Other Wastes</b>	<b>65.0</b>	<b>20.6</b>	<b>31.6%</b>
<b>TOTAL MUNICIPAL SOLID WASTE</b>	<b>245.7</b>	<b>79.0</b>	<b>32.1%</b>

Includes waste from residential, commercial, and institutional sources.

\*Includes lead from lead-acid batteries.

\*\*Includes recovery of other MSW organics for composting.

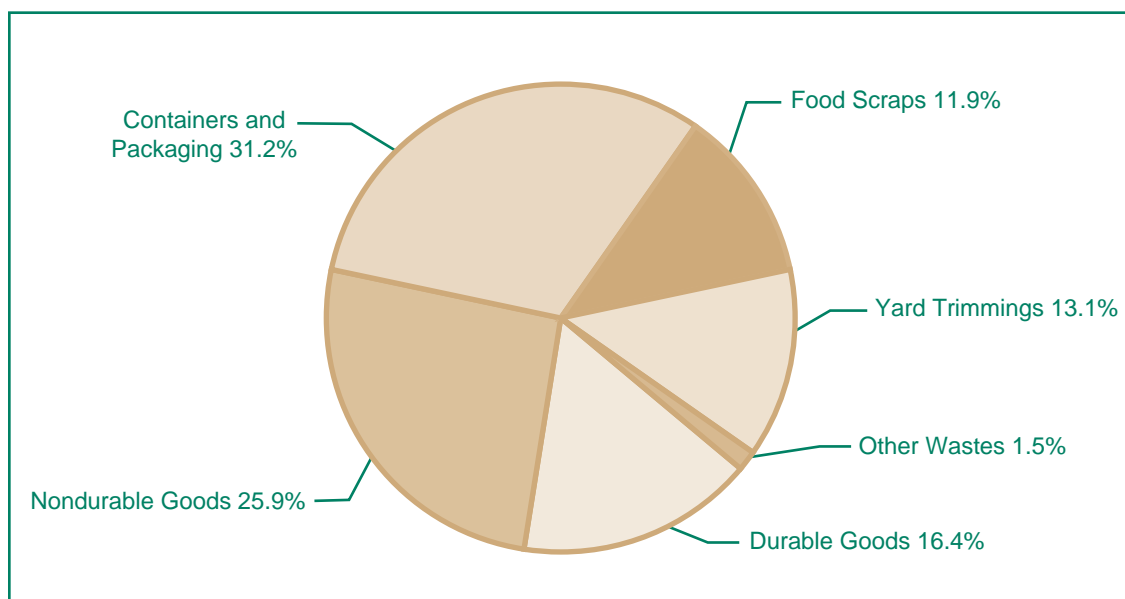
Details may not add to totals due to rounding.

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

## Products in MSW

The breakdown, by weight, of product categories generated in 2005 is shown in Figure 4. Containers and packaging made up the largest portion of waste generated, about 77 million tons. The second-largest portion of MSW was nondurable goods, comprising nearly 64 million tons. Durable goods make up the third largest segment, accounting for 40 million tons.

**Figure 4**  
**Products Generated in MSW - 2005 (Total Weight = 246 million tons)**



The generation and recovery of product categories in MSW in 2005 are shown in Table 5. This table shows that recovery of containers and packaging was the highest of the four product categories, recycling almost 40 percent of containers and packaging. Aluminum, steel, and paper products were the most recycled materials by percentage in this category. About 36 percent of aluminum was recycled (about 45 percent of all aluminum beverage cans were recycled), while more than 63 percent of steel packaging (mostly cans) was recycled. About 50 percent of paper and paperboard was recycled; corrugated cardboard boxes accounted for most of that amount.

Around 25 percent of glass containers were recycled, while about 15 percent of wood packaging—mostly wood pallets—was recovered for recycling. More than 9 percent of plastic containers and packaging were recycled, mostly from soft drink, milk, and water bottles.

Overall recovery of nondurable goods was 32 percent in 2005. Paper products, such as newspapers and high-grade office papers, were the most recycled materials. Newspapers alone were recycled at a rate of 89 percent. Approximately 63 percent of high-grade office papers and 39 percent of magazines were recovered. About 36 percent of unwanted mail was recovered, as well as 18 percent of telephone directories.

Clothing and other textile products are included in the nondurable goods category. These products were recovered for recycling or export at a rate of 18 percent.



**Table 5**  
**Generation and Recovery of Products in MSW by Material, 2005**  
(in millions of tons and percent of generation of each product)

	Weight Generated	Weight Recovered	Recovery as a Percent of Generation
<b>Durable Goods</b>			
Steel	11.4	3.43	30.1%
Aluminum	1.08	Neg.	Neg.
Other non-ferrous metals*	1.74	1.26	72.4%
Total metals	14.2	4.69	33.0%
Glass	1.83	Neg.	Neg.
Plastics	8.71	0.37	4.2%
Rubber and leather	5.68	0.96	16.9%
Wood	5.37	Neg.	Neg.
Textiles	3.02	0.28	9.3%
Other materials	1.45	1.17	80.7%
Total durable goods	40.3	7.47	18.5%
<b>Nondurable Goods</b>			
Paper and paperboard	44.9	19.0	42.4%
Plastics	6.55	Neg.	Neg.
Rubber and leather	0.99	Neg.	Neg.
Textiles	7.91	1.42	18.0%
Other materials	3.36	Neg.	Neg.
Total nondurable goods	63.7	20.5	32.1%
<b>Containers and Packaging</b>			
Steel	2.37	1.50	63.3%
Aluminum	1.90	0.69	36.3%
Total metals	4.27	2.19	51.3%
Glass	10.9	2.76	25.3%
Paper and paperboard	39.0	22.9	58.8%
Plastics	13.7	1.28	9.4%
Wood	8.56	1.31	15.3%
Other materials	0.24	Neg.	Neg.
Total containers and packaging	76.7	30.5	39.8%
<b>Other Wastes</b>			
Food, other**	29.2	0.69	2.4%
Yard trimmings	32.1	19.9	61.9%
Miscellaneous inorganic wastes	3.69	Neg	Neg
Total other wastes	65.0	20.6	31.6%
<b>TOTAL MUNICIPAL SOLID WASTE</b>	<b>245.7</b>	<b>79.0</b>	<b>32.1%</b>

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.

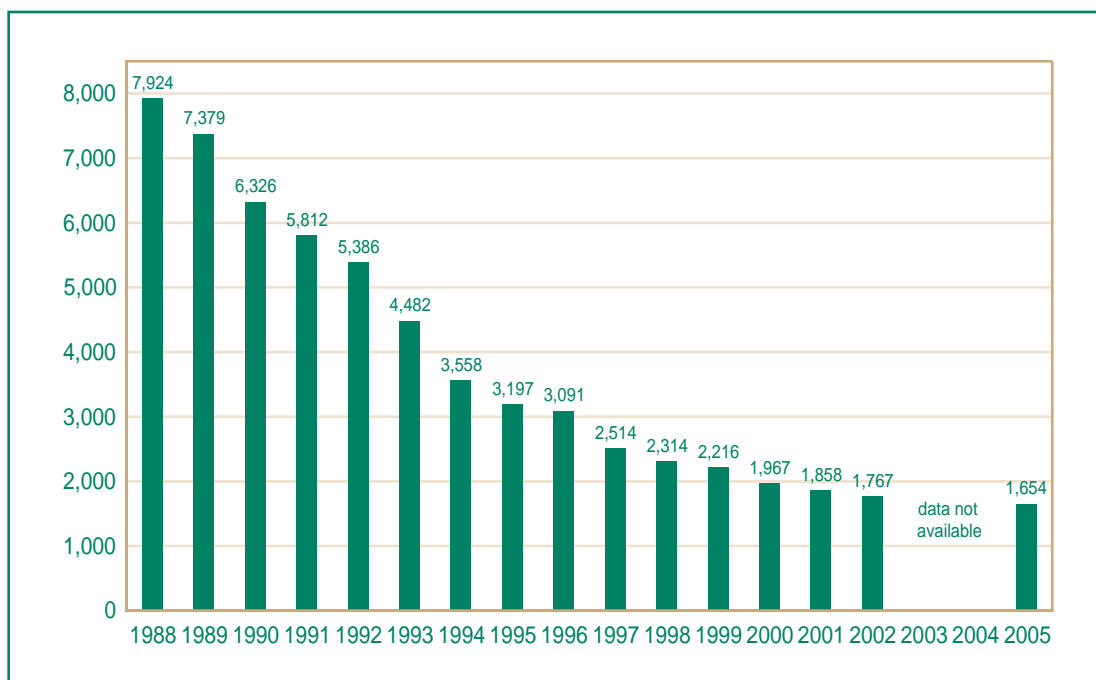


Overall, more than 18 percent of durable goods were recovered in 2005. Nonferrous metals other than aluminum had one of the highest recovery rates, at about 72 percent, due to the high rate of lead recovery from lead-acid batteries. Recovery of steel in all durable goods was 30 percent, with high rates of recovery from appliances and other miscellaneous durable goods.

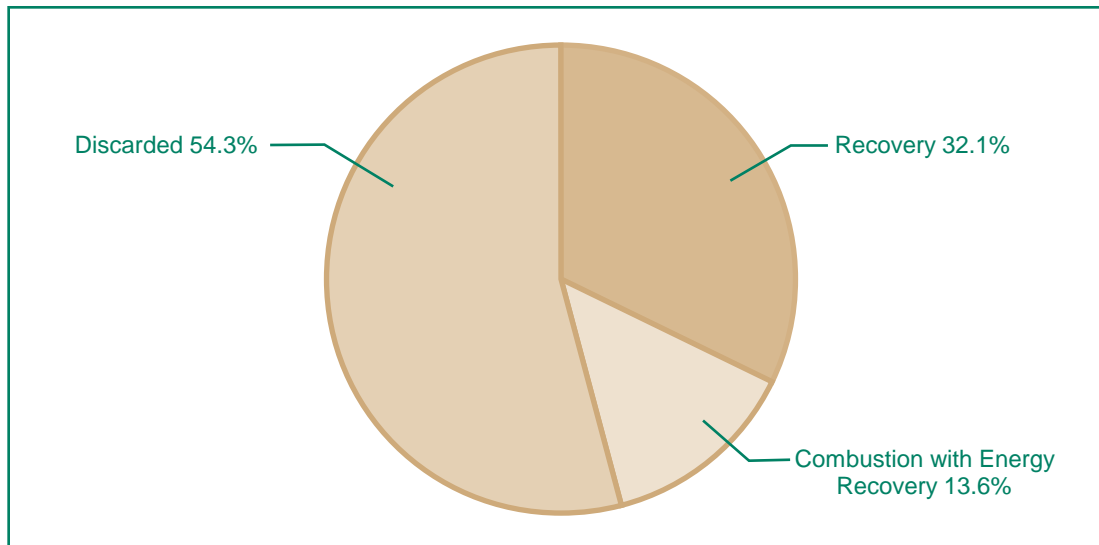
Lead-acid batteries were one of the most recovered products in 2005, with an impressive recycling rate of about 99 percent. Other products with particularly high recovery rates were newspapers (about 89 percent), corrugated boxes (about 72 percent), major appliances (67 percent), steel cans (about 63 percent), and aluminum beverage cans (about 45 percent).

Additionally, around 35 percent of rubber tires were recycled, while other tires were retreaded and shredded rubber tires were converted to fuel.

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



**Figure 6**  
**Management of MSW in the United States, 2005**



## FOR MORE INFORMATION

This report and previous reports in the same series are available on the Internet at [www.epa.gov/epaoswer/non-hw/muncpl/msw99.htm](http://www.epa.gov/epaoswer/non-hw/muncpl/msw99.htm). Detailed data tables for 2005 and previous years may be found at the same location. General information on municipal solid waste is available on the Internet at [www.epa.gov/osw](http://www.epa.gov/osw).





United States  
Environmental Protection Agency  
Solid Waste and Emergency Response (5306P)  
Washington, DC 20460

Official Business  
Penalty for Private Use \$300

EPA-530-F-06-039  
October 2006  
[www.epa.gov/osw](http://www.epa.gov/osw)