United States
Environmental Protection
Agency

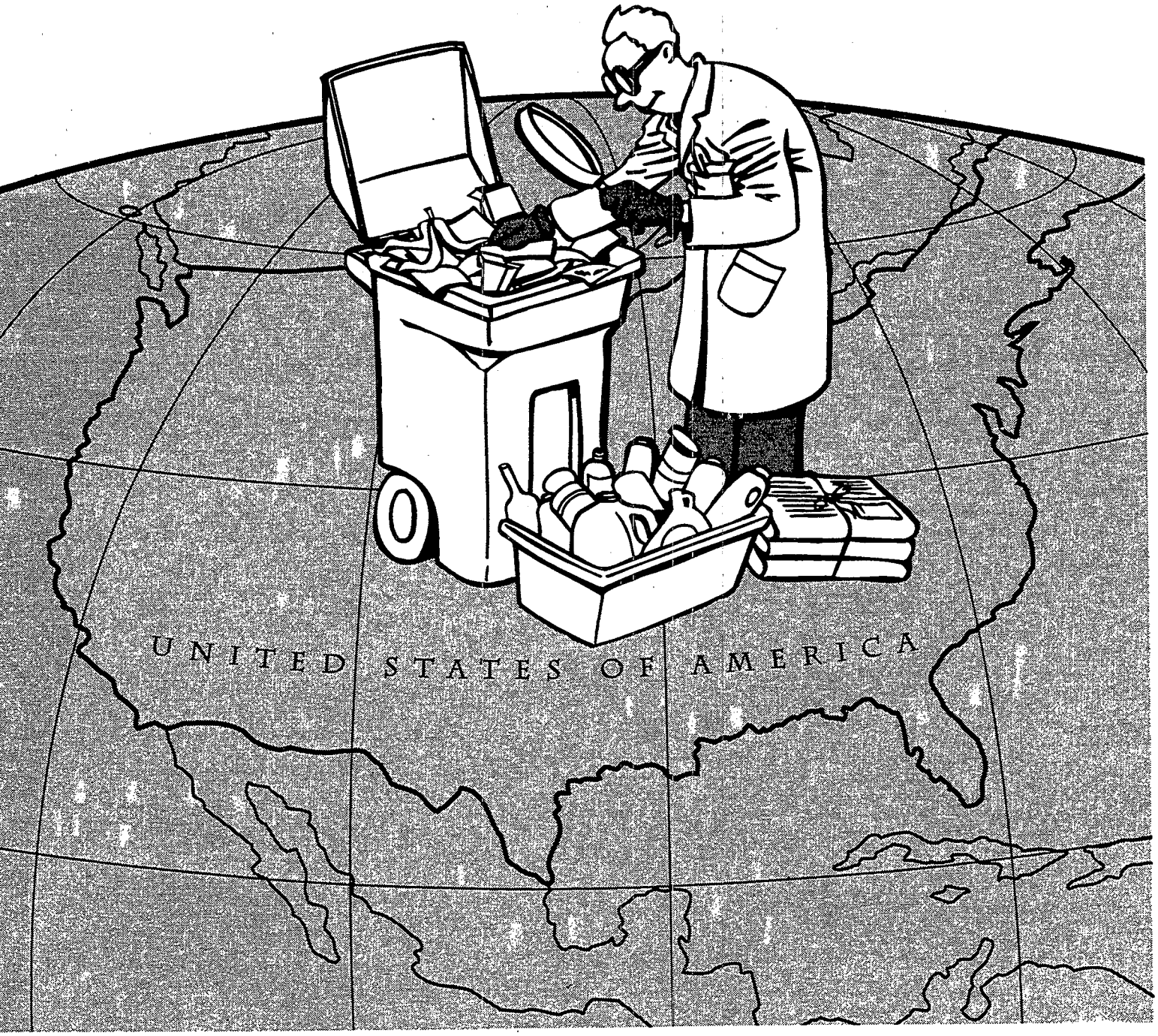
Solid Waste and
Emergency Response
(5305W)

EPA530-S-99-021
September 1999
www.epa.gov/osw

EPA

Characterization of Municipal Solid Waste in The United States: 1998 Update

Executive Summary



Characterization of Municipal Solid Waste in the United States: 1998 Update

Executive Summary

Prepared for

U.S. Environmental Protection Agency
Municipal and Industrial Solid Waste Division
Office of Solid Waste

by

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July 1999

CHARACTERIZATION OF MUNICIPAL SOLID WASTE IN THE UNITED STATES: 1998 UPDATE

Executive Summary

FEATURES OF THIS REPORT

This report is the latest in a series of reports published by the U.S. Environmental Protection Agency (EPA) describing the national municipal solid waste (MSW) stream. The report characterizes the national solid waste stream for 1997. It also discusses trends and highlights changes that have occurred over the years, both in the types of wastes generated and in the ways they are managed. Although the report does not specifically address local and regional variations in the waste stream, the data in the report can be used to develop approximate estimates of MSW generation and composition in defined areas.

This report includes information on:

- Total MSW generation, recovery, and discards from 1960 to 1997.
- Per capita generation and discard rates.
- Materials (e.g., paper, glass, metals, plastic) that comprise MSW, as well as products (e.g., durable and nondurable goods, containers, packaging) found in the waste stream.
- Aggregate data on the infrastructure for MSW management, including estimates of the number of curbside recycling programs, drop-off centers, materials recovery facilities, and composting programs in the United States.
- Trends in MSW management from 1960 to 1997, including source reduction, recovery for recycling (including composting), and disposal via combustion and landfilling.
- Projections of MSW generation to the year 2005.

REPORT HIGHLIGHTS

In 1997, 217 million tons of MSW were generated in the U.S., or 4.4 pounds per person per day. Paper and yard trimmings account for over 51 percent of total generation. Of the total of 217 million tons of MSW generated, 28 percent was recycled, up from 10 percent in 1980 and 16 percent in 1990.

The 217 million tons of municipal solid waste (MSW) generated in 1997 was nearly 8 million tons more than in 1996, when MSW generation was 209 million tons. Historically, the increase in waste generation has been correlated with increased economic activity, and moderated by decreases in waste generation caused by source reduction activities such as backyard composting and leaving grass trimmings on the lawn. On a per capita basis, half of the increase in total MSW generation was offset by increased recycling.

- Between 1996 and 1997, almost all product categories increased in tonnage. This correlates with increased per capita consumer expenditures. The exceptions were glass and yard trimmings.

- Paper and paperboard products made up the largest percentage of all the materials in MSW, increasing by 4.2 million tons to 83.8 million tons, or 38.6 percent of total generation, in 1997. This increase was due to a rebound in newsprint production, and more production of printing and writing papers, containerboard (corrugated boxes), boxboard, and tissue paper.

- Yard trimmings comprised the second largest material category, estimated at 27.7 million tons, or 12.8 percent of total generation, in 1997. This compared to 35.0 million tons (17.1 percent of total generation) in 1990. This decline is largely due to state legislation affecting yard trimmings disposal in landfills, and due to source reduction measures such as backyard composting and leaving grass trimmings on the yard. From 1996 to 1997, the per capita generation of yard trimmings decreased by only 0.2 million tons.

- Recycling (including composting) recovered 28 percent (61 million tons) of MSW in 1997, up from 27 percent (57 million tons) in 1996.*

* Data shown for years prior to 1997 have been adjusted to reflect the latest revisions to the data and methodology, and therefore may differ slightly from the same measure reported in previous updates.

- There were nearly 9,000 curbside recycling programs in the United States in 1997, as well as more than 12,000 drop-off centers for recyclables. About 380 materials recovery facilities helped process the recyclables collected. About 3,500 yard trimmings composting programs were reported, up from about 2,300 reported in 1996.

- Recovery of paper and paperboard reached 42 percent (35 million tons) in 1997, accounting for more than half of the total MSW recovered. With greater generation of paper, more was available for recycling.

- In addition, 11.5 million tons of yard trimmings were recovered for composting in 1997, accounting for the second largest fraction of total recovery. The percentage of yard trimmings composted (41 percent) has more than doubled since 1992. This is due to increased numbers of yard trimmings facilities, more material being handled at facilities, and bans of yard trimmings from landfills by 22 states. From 1996 to 1997, however, composting increased by just one million tons, suggesting that much of the impact of the states' bans of yard trimmings from landfills had already taken place.

- The per capita discard rate (after recovery for recycling, including composting) was 3.2 pounds per person per day in 1997, up from 3.1 pounds per person per day in 1996.

- Landfills managed 55 percent of MSW generated (120 million tons), about the same percentage as in 1996. Combustion facilities managed 17 percent (37 million tons) of total MSW generated, about the same as in 1996.

TRENDS IN MSW MANAGEMENT

Table ES-1 and Figure ES-1 show the trends in MSW generation, materials recovery, and disposal over time.

Waste Generation

- The waste generation figure of 217 million tons per year in 1997 is an increase of nearly 8 million tons from 1996, when MSW generation was 209 million tons. Looking at the longer term trend, generation increased steadily from 88 million tons in 1960 to 214 million tons in 1994. Generation decreased slightly in 1995 and 1996, then increased again in 1997. Increases in waste generation since 1960 have been correlated with increased economic activity as measured by gross domestic product and personal consumption expenditures. The waste generation has been limited by source reduction activities such as an increase in yard

trimmings being composted on-site, and more grass trimmings being left on lawns.

- The decrease in waste generation in 1995 was due in large part to decreases in yard trimmings. This continued in 1996, and was supported by paper and paperboard generation decreases in 1996 as well. In 1997, generation of paper and paperboard increased by 4.2 million tons, compared to 1996, accounting for about half of the increase in waste generation over the last year.

- The per capita MSW generation rate for 1997 was 4.4 pounds per person per day, compared to 4.3 pounds per person per day in 1996. The longer term trend shows that the per capita waste generation rate increased from 2.7 pounds per person per day in 1960 to 4.5 pounds per person per day in 1990—decreasing to 4.4 in 1995, 4.3 in 1996, then rising again to 4.4 in 1997. Again, these changes are correlated with economic activity, but limited by source reduction. The per capita waste generation increase from 1996 to 1997 would have been even higher had no source reduction activities taken place.

Recycling, Including Composting

- From 1996 to 1997 the recycling rate increased from 27 percent to 28 percent. This compares to a 10 percent recycling rate in 1980 and a 16 percent rate in 1990 (Figure ES-2).

- Although the rate of growth of recycling, including composting, is not as high as it was in the early 1990s, the tonnage of material recycled and composted has continued to grow, as has the per capita recycling rate.

- From 1996 to 1997 the per capita MSW generation rate, which is strongly correlated with economic activity, increased by 0.12 pounds per person per day. Half of this (0.06 pounds per person per day) went to increased recycling and half of this (0.06 pounds per person per day) went to increased disposal.

Disposal

- In the 1960s and early 1970s, a large percentage of MSW was burned. Through the mid-1980s, incineration declined considerably and landfills became more difficult to site. MSW generation continued to rise, however, while materials recovery rates increased slowly. As a result, the burden on the nation's landfills grew dramatically. Although there are now fewer municipal solid waste landfills, their average size has increased and capacity at the national level does not appear to be a problem. Regional dislocations do, however, sometimes occur. As recovery rates have increased, while combustion remained relatively constant, the percentage of MSW discarded to landfills has steadily decreased.

Table ES-1

GENERATION, MATERIALS RECOVERY, COMPOSTING, COMBUSTION, AND DISCARDS OF MUNICIPAL SOLID WASTE, 1960 TO 1997
(In millions of tons and percent of total generation)

	1960	1970	1980	1990	1994	1995	1996	1997
Thousands of Tons								
Generation	88.1	121.1	151.6	205.2	214.2	211.4	209.2	217.0
Recovery for recycling	5.6	8.0	14.5	29.0	42.2	45.3	46.4	48.6
Recovery for composting*	Neg.	Neg.	Neg.	4.2	8.5	9.6	10.9	12.1
Total Materials Recovery	5.6	8.0	14.5	33.2	50.6	54.9	57.3	60.7
Discards after recovery	82.5	113.0	137.1	172.0	163.6	156.5	151.9	156.3
Combustion**	27.0	25.1	13.7	31.9	32.5	35.5	36.1	36.7
Discards to landfill, other disposal†	55.5	87.9	123.4	140.1	131.1	120.9	115.8	119.6
Pounds per Person per Day								
Generation	2.68	3.25	3.66	4.50	4.50	4.40	4.32	4.44
Recovery for recycling	0.17	0.22	0.35	0.64	0.89	0.94	0.96	1.00
Recovery for composting*	Neg.	Neg.	Neg.	0.09	0.18	0.20	0.23	0.25
Total Materials Recovery	0.17	0.22	0.35	0.73	1.06	1.14	1.18	1.24
Discards after recovery	2.51	3.04	3.31	3.77	3.44	3.26	3.14	3.20
Combustion**	0.82	0.67	0.33	0.70	0.68	0.74	0.75	0.75
Discards to landfill, other disposal†	1.69	2.36	2.98	3.07	2.75	2.52	2.39	2.45
Population (thousands)	179,979	203,984	227,255	249,907	260,682	263,168	265,253	267,645
Percent of Total Generation								
Generation	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%	19.7%	21.5%	22.2%	22.4%
Recovery for composting*	Neg.	Neg.	Neg.	2.0%	4.0%	4.5%	5.2%	5.6%
Total Materials Recovery	6.4%	6.6%	9.6%	16.2%	23.6%	26.0%	27.4%	28.0%
Discards after recovery	93.6%	93.4%	90.4%	83.8%	76.4%	74.0%	72.6%	72.0%
Combustion**	30.6%	20.7%	9.0%	15.5%	15.2%	16.8%	17.3%	16.9%
Discards to landfill, other disposal†	63.0%	72.6%	81.4%	68.3%	61.2%	57.2%	55.4%	55.1%

* Composting of yard trimmings and food wastes. Does not include mixed MSW composting or backyard composting.
** Includes combustion of MSW in mass burn or refuse-derived fuel form, incineration without energy recovery, 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.

Source: Franklin Associates

Figure ES-1. Total municipal solid waste generation and management, 1960 to 1997

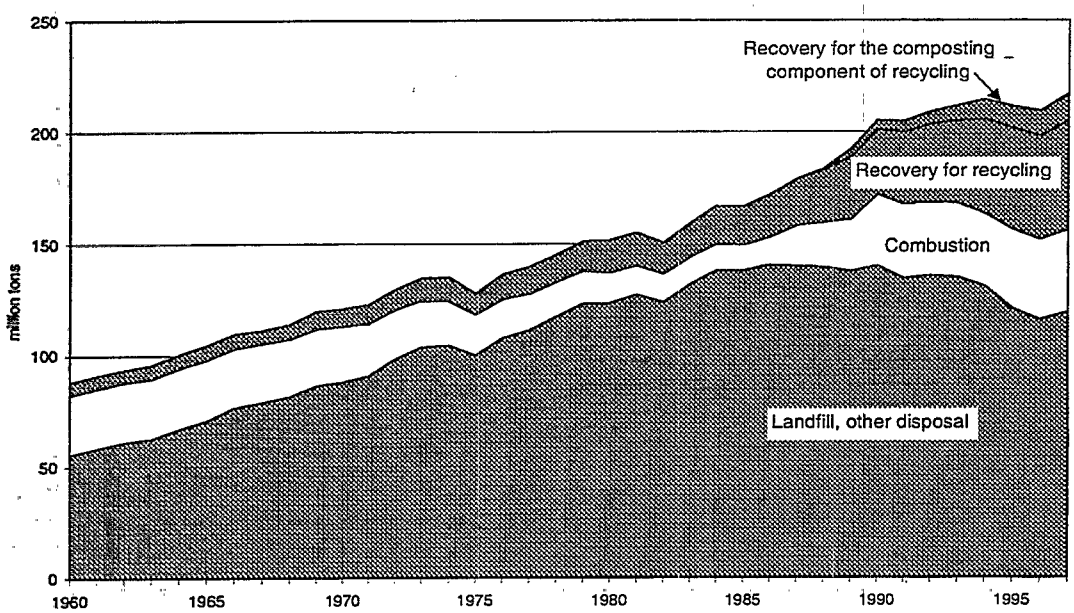
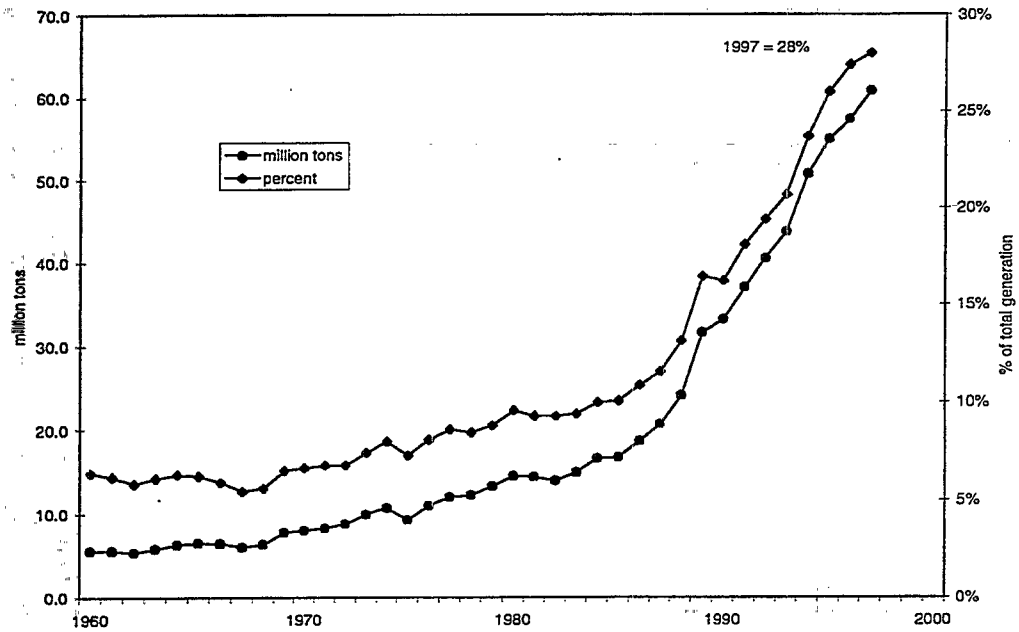


Figure ES-2. MSW recovery tonnages and rates, 1960 to 1997



DEFINITIONS AND METHODOLOGY

Municipal solid waste (MSW) includes wastes such as durable goods, nondurable goods, containers and packaging, food scraps, yard trimmings, and miscellaneous inorganic wastes from residential, commercial, institutional, and industrial sources. Examples of waste from these categories include appliances, automobile tires, newspapers, clothing, boxes, disposable tableware, office and classroom paper, wood pallets, and cafeteria wastes. MSW does not include wastes from other sources, such as construction and demolition debris, automobile bodies, municipal sludges, combustion ash, and industrial process wastes that might also be disposed in municipal waste landfills or incinerators.

Source reduction activities reduce the amount or toxicity of wastes before they enter the municipal solid waste management system (see **Generation**). Reuse is a source reduction activity involving the recovery or reapplication of a package, used product, or material in a manner that retains its original form or identity. Reuse of products such as refillable glass bottles, reusable plastic food storage containers, or refurbished wood pallets are examples of source reduction.

Generation refers to the amount (weight or volume) of materials and products that enter the waste stream before recycling (including composting), landfilling, or combustion takes place.

Recovery of materials means removing MSW from the waste stream for the purpose of recycling (including composting). Recovery for recycling as defined for this report includes purchases of postconsumer recovered materials plus net exports of the materials. Recovery of yard trimmings includes diverting yard trimmings from disposal to a composting facility. For some materials, recovery for uses such as highway construction or insulation is considered recovery along with materials used in remanufacturing processes.

Combustion includes combustion of mixed MSW, fuel prepared from MSW, or a separated component of MSW (such as rubber tires), with or without energy recovery.

Discards include the municipal solid waste remaining after recycling (including composting). These discards are usually combusted or disposed of in landfills, although some MSW is littered, stored, or disposed on site, particularly in rural areas.

♦ ♦ ♦

Methodology. There are two primary methods for conducting a waste characterization study. The first is a source-specific approach in which the individual components of the waste stream are sampled, sorted, and weighed. Although this method is useful for defining a local waste stream, extrapolating from a limited number of studies can produce a skewed or misleading picture if used for a nationwide characterization of waste. Atypical circumstances encountered during sampling or errors in the sample would be greatly magnified when expanded to represent the nation's entire waste stream. The second method, which is used in this report, is called the "material flows methodology." EPA's Office of Solid Waste and its predecessors in the Public Health Service sponsored work in the 1960s and early 1970s to develop the material flows methodology. This methodology is based on production data (by weight) for the materials and products in the waste stream, with adjustments for imports, exports, and product lifetimes.

MUNICIPAL SOLID WASTE IN 1997

EPA has established a target recycling goal of 35 percent by the year 2005, while maintaining the per capita generation of solid waste at 4.3 pounds per person per day. The nation appears to be on-track to meet that goal, but it will take continued commitment from business, industry, government and the public to do so. As economic growth results in more products and materials being generated, there will be an increased need to utilize existing recycling and composting facilities, further develop this infrastructure, buy recycled products, and invest in source reduction activities such as grasscycling and composting.

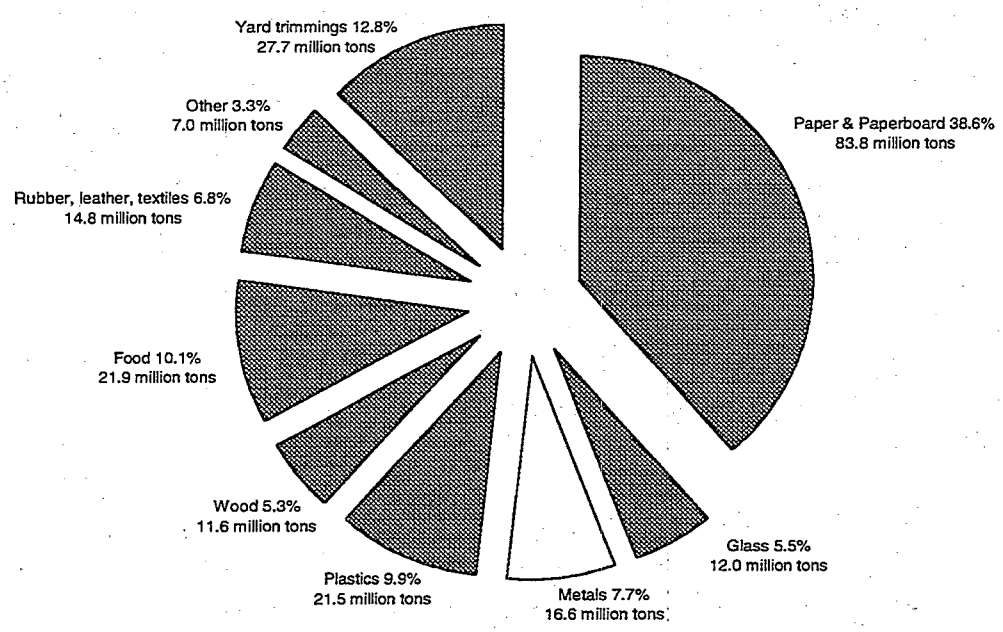
EPA has two ways of analyzing the 217 million tons of MSW generated each year. The first is by major material categories, such as paper, glass, metals, plastics, wood, food, and yard trimmings. The second is by several major product categories. Each material category (except for food wastes and yard trimmings) is made up of many different products. Products in MSW are grouped into three main categories: (1) durable goods (e.g., appliances), (2) nondurable goods (e.g., newspapers), and (3) containers and packaging. These product categories generally contain each type of MSW material, with some exceptions. The durable goods category contains no paper and paperboard. The nondurable goods category includes only small amounts of metals and essentially no glass or wood. The containers and packaging category includes only very small amounts of rubber, leather, and textiles.

Materials in MSW

In 1997, MSW generation totaled 217 million tons. Figure ES-3 provides a breakdown, by weight, of the MSW materials generated in 1997. Paper and paperboard products made up the largest component of MSW generated (39 percent), and yard trimmings comprised the second largest material component (13 percent). Glass, metals, plastics, wood, and food wastes each constituted between 5 and 10 percent of the total MSW generated. Rubber, leather, and textiles combined made up about 7 percent of MSW, while other miscellaneous wastes made up approximately 3 percent of the MSW generated in 1997.

A portion of each material category in MSW was recycled or composted in 1997, as illustrated in Table ES-2. It should be noted, however, that recovery rates for some products within a material category are higher than the overall recovery rate for the material category, because some products are not recovered at all. For example, aluminum cans were recovered at a rate of 60 percent, but the overall recovery rate for aluminum was 31 percent. Likewise,

Figure ES-3. Materials generated in MSW by weight, 1997
(Total weight = 217 million tons)



even though corrugated containers were recovered at a rate of 67 percent, the overall recovery rate for paper and paperboard was 42 percent.

Products in MSW

Figure ES-4 shows the breakdown, by weight, of MSW products generated in 1997. Containers and packaging comprised the largest portion of products generated, at 33 percent (72 million tons) of total MSW generation. Nondurable goods were the second largest fraction, comprising about 27 percent (59 million tons). The third main category of products is durable goods, which comprised 15 percent (33 million tons) of total MSW generation.

Table ES-3 shows the generation and recovery of the product categories in MSW. Recovery of **containers and packaging** was the highest of the three product categories—39 percent of containers and packaging generated in 1997 were recovered for recycling. About 49 percent of aluminum packaging was recovered (mostly aluminum beverage cans), while 61 percent of steel packaging (mostly cans) was recovered. Paper and paperboard packaging recovery was estimated at 54 percent; corrugated containers accounted for most of that figure.

Table ES-2

GENERATION AND RECOVERY OF MATERIALS IN MSW, 1997
(In millions of tons and percent of generation of each material)

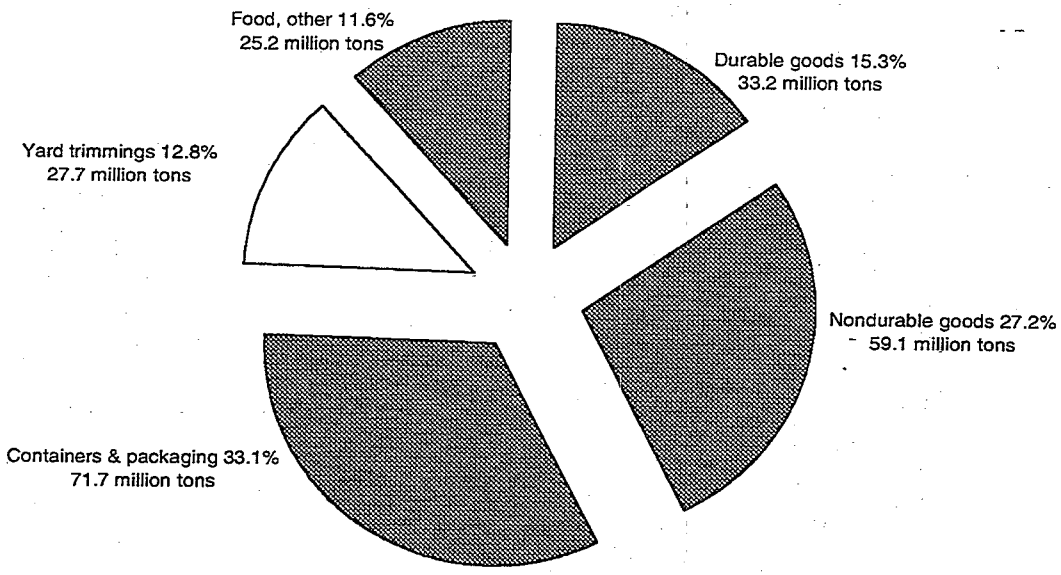
	Weight Generated	Weight Recovered	Recovery as a Percent of Generation
Paper and paperboard	83.8	34.9	41.7%
Glass	12.0	2.9	24.3%
Metals			
Steel	12.3	4.7	38.4%
Aluminum	3.0	0.9	31.2%
Other nonferrous metals*	1.3	0.8	65.4%
Total metals	16.6	6.5	39.1%
Plastics	21.5	1.1	5.2%
Rubber and leather	6.6	0.8	11.7%
Textiles	8.2	1.1	12.9%
Wood	11.6	0.6	5.1%
Other materials	3.8	0.8	20.2%
Total Materials in Products	164.1	48.6	29.6%
Other wastes			
Food, other**	21.9	0.6	2.6%
Yard trimmings	27.7	11.5	41.4%
Miscellaneous inorganic wastes	3.3	Neg.	Neg.
Total Other Wastes	52.9	12.1	22.8%
TOTAL MUNICIPAL SOLID WASTE	217.0	60.7	28.0%

Includes wastes from residential, commercial, and institutional sources.
* Includes lead from lead-acid batteries.
** Includes recovery of paper for composting.
Neg. = Less than 50,000 tons or 0.05 percent.

Approximately 28 percent of glass containers were recovered overall, while about 8 percent of wood packaging (mostly pallets removed from service) was recovered for recycling. About 9 percent of plastic containers and packaging was recovered in 1997, mostly soft drink, milk, and water bottles.

Overall recovery of **nondurable goods** was 25 percent in 1997. Newspapers constituted the largest portion of this recovery, with 55 percent of newspapers generated

Figure ES-4. Products generated in MSW by weight, 1997
(Total weight = 217 million tons)



being recovered for recycling. High-grade office papers and magazines were also recovered in significant quantities in 1997, at an estimated 51 percent and 23 percent, respectively.

About 16 percent of clothing and other textile nondurable products also were recovered for recycling.

Overall, **durable goods** were recovered at a rate of 17 percent in 1997. Nonferrous metals had one of the highest recovery rates, at 65 percent, due to the high rate of lead recovery from lead-acid batteries. Nearly 31 percent of ferrous metals were recovered from appliances and miscellaneous durable goods. Excluding retreads and tire-derived fuel use, over 22 percent of tires also were recovered for recycling.

Residential and Commercial Sources of MSW

Sources of MSW, as characterized in this report, include both residential and commercial locations. Residential waste (including waste from multi-family dwellings) is estimated to be 55 to 65 percent of total MSW generation. Commercial waste (including waste from schools, some industrial sites where packaging is generated, and businesses)

Table ES-3

GENERATION AND RECOVERY OF PRODUCTS IN MSW BY MATERIAL, 1997
(In millions of tons and percent of generation of each product)

	Weight Generated	Weight Recovered	Recovery as a Percent of Generation
Durable goods			
Ferrous metals	9.2	2.8	30.8%
Aluminum	0.9	Neg.	Neg.
Other non-ferrous metals	1.3	0.8	64.8%
Total metals	11.4	3.7	32.2%
Glass	1.4	Neg.	Neg.
Plastics	6.7	0.3	4.4%
Rubber and leather	5.8	0.8	13.4%
Wood	4.5	Neg.	Neg.
Textiles	2.5	0.2	6.7%
Other materials	1.0	0.8	76.4%
Total durable goods	33.2	5.7	17.0%
Nondurable goods			
Paper and paperboard	44.4	13.8	31.0%
Plastics	5.4	Neg.	<1%
Rubber and leather	0.8	Neg.	Neg.
Textiles	5.6	0.9	15.9%
Other materials	2.9	Neg.	Neg.
Total nondurable goods	59.1	14.7	24.8%
Containers and packaging			
Steel	3.1	1.9	61.0%
Aluminum	1.9	0.9	48.5%
Total metals	5.0	2.8	56.2%
Glass	10.6	2.9	27.6%
Paper and paperboard	39.5	21.1	53.5%
Plastics	9.4	0.8	8.7%
Wood	7.1	0.6	8.3%
Other materials	0.1	Neg.	Neg.
Total containers and packaging	71.7	28.3	39.4%
Other wastes			
Food wastes	21.9	0.6 *	2.6%
Yard trimmings	27.7	11.5	41.4%
Miscellaneous inorganic wastes	3.3	Neg.	Neg.
Total other wastes	52.9	12.1	22.8%
TOTAL MUNICIPAL SOLID WASTE	217.0	60.7	28.0%

Includes wastes from residential, commercial, and institutional sources.
* Includes recovery of paper for composting.
Neg. = less than 50,000 tons or 0.05 percent.

constitutes between 35 and 45 percent. Local and regional factors, such as climate and level of commercial activity, contribute to these variations.

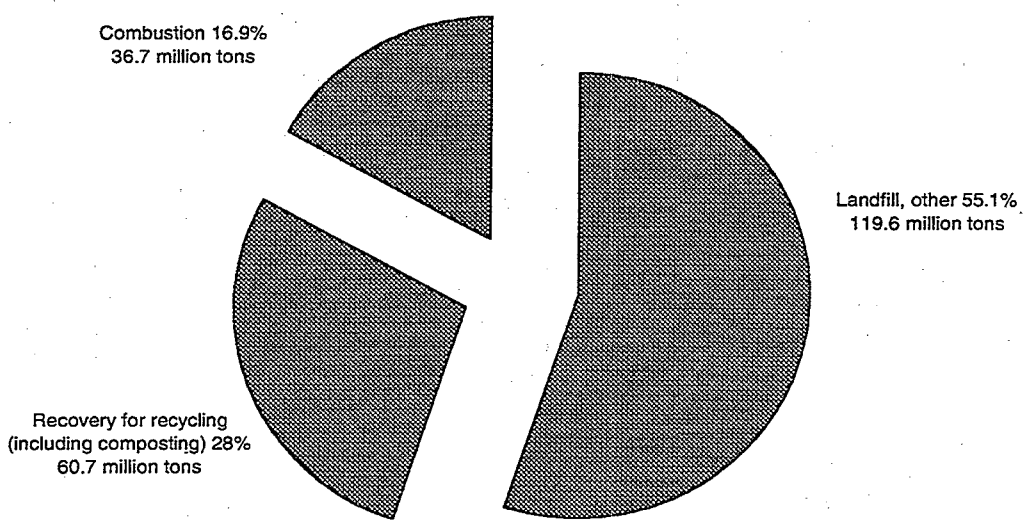
MANAGEMENT OF MSW

EPA's integrated waste management hierarchy includes the following components:

- Source reduction (or waste prevention) (including reuse of products and backyard composting of yard trimmings)
- Recycling (including composting)
- Waste combustion (preferably with energy recovery) and landfilling.

Figure ES-5 shows how much MSW was recovered for recycling (including composting) and how much was disposed of by combustion and landfilling in 1997. Twenty-eight percent (61 million tons) of MSW was recycled and composted; an estimated 17 percent (37 million tons) was combusted (nearly all with energy recovery); and the remainder, 55 percent (119 million tons), was landfilled. (Relatively small amounts of this total undoubtedly were littered or self-disposed rather than landfilled.)

Figure ES-5. Management of MSW in the U.S., 1997
(Total weight = 217 million tons)



Source Reduction

Source reduction includes the design, manufacture, purchase, or use of materials, such as products and packaging, to reduce their amount or toxicity before they enter the MSW management system. Some examples of source reduction activities are:

- Designing products or packaging to reduce the quantity or the toxicity of the materials used, or to make them easy to reuse.
- Reusing existing products or packaging, for example, refillable bottles, reusable pallets, and reconditioned barrels and drums.
- Lengthening the lives of products to postpone disposal.
- Using packaging that reduces the amount of damage or spoilage to the product.
- Managing nonproduct organic wastes (e.g., food scraps and yard trimmings) through on-site composting or other alternatives to disposal (e.g., leaving grass clippings on the lawn).

Product source reduction activities are not quantified at the national level in this report.

Recovery

Recovery for recycling (including composting) continues to be one of the most effective waste management techniques. Approximately 51 percent of the U.S. population (136 million people) had access to the nation's nearly 9,000 curbside recycling programs in 1997. Seventy-five percent of the programs were in the Northeast and Midwest. In addition, over 12,000 drop-off centers for recyclables were reported in 1997. About 380 materials recovery facilities helped process the recyclables collected in 1997. An estimated 3,500 yard trimmings composting programs (not backyard composting) existed in 1997; the majority of these programs were in the Northeast and Midwest.

Combustion

Most MSW combustion in the United States involves the recovery of an energy product (generally steam or electricity). Total MSW combustion with energy recovery, referred to as waste-to-energy combustion, had a design capacity of 101,000 tons per day in 1997. There were 112 waste-to-energy combustion facilities in the United States in 1997;

about 38 percent of these were located in the Northeast, accounting for about 48 percent of total design capacity. There is a small amount of capacity (2,400 tons per day) for incineration without energy recovery.

Landfilling

Although the number of landfills in the United States is decreasing, landfill capacity has remained relatively constant. In 1997, approximately 2,200 municipal solid waste landfills were reported in the contiguous United States, with the Southeast and West having the greatest number of landfills. Forty-two states had landfills reporting more than 10 years of capacity remaining. Only six states reported having less than 10 years of capacity left.

PROJECTIONS OF MSW GENERATION AND MANAGEMENT

MSW Generation

Projections of municipal solid waste generation were made for the years 2000 and 2005. The projections for most materials and products were based on linear trends, that is, it was assumed that generation would continue to grow (or decline) based on past experience. It was assumed that there will be no dramatic changes in the next eight years.

Projected generation by material is shown in Table ES-4. Generation of waste from products made of paper and paperboard, metals, plastics, wood, and other materials such as rubber and textiles is projected to continue to increase. Only glass is projected to decline.

Food waste is projected to increase at the same rate as population. Generation of yard trimmings has been decreasing due to state legislation regulating their disposal (e.g., landfill bans on disposal of yard trimmings). While no new legislation of this type was identified, an increasing number of communities have been instituting variable rate collection programs (pay-as-you-throw). Since these programs tend to decrease the amount of yard trimmings disposed, it was assumed that generation of yard trimmings will remain constant from 2000 to 2005.

The long term historical trend has been for generation of manufactured products to increase (Figure ES-6). Diversion of yard trimmings from disposal has served to hold down the overall growth of MSW; however, the overall trend is still up.

Table ES-4

PROJECTIONS OF MATERIALS GENERATED*
IN THE MUNICIPAL WASTE STREAM: 2000 AND 2005
(In thousands of tons and percent of total generation)

	Million tons		% of total	
Materials	**2000**	**2005**	**2000**	**2005**
Paper and Paperboard	87.7	94.8	39.3%	39.6%
Glass	11.9	11.2	5.3%	4.7%
Metals	17.6	18.7	7.9%	7.8%
Plastics	23.4	26.7	10.5%	11.2%
Wood	14.0	15.8	6.3%	6.6%
Others	19.7	22.2	8.8%	9.3%
Total Materials in Products	174.3	189.4	78.1%	79.1%
Other Wastes				
Food Wastes	22.5	23.5	10.1%	9.8%
Yard Trimmings	23.0	23.0	10.3%	9.6%
Miscellaneous Inorganic Wastes	3.4	3.6	1.5%	1.5%
Total Other Wastes	48.9	50.1	21.9%	20.9%
Total MSW Generated	223.2	239.5	100.0%	100.0%

* Generation before materials recovery or combustion.
Details may not add to totals due to rounding.
Source: Franklin Associates

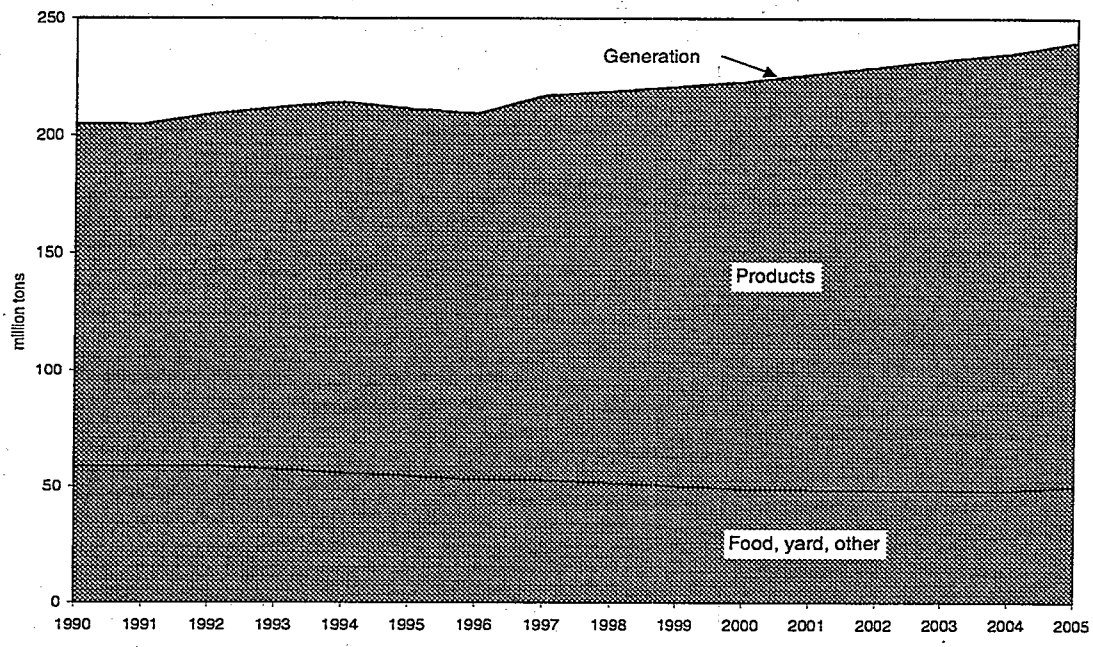
MSW Management

Projections of recycling (including composting) were made in scenarios of 30 percent and 32 percent recovery in 2000 and 32 percent and 35 percent in 2005. These projections were made in the context of an extensive recovery and processing infrastructure already in place, on the one hand, and very poor markets for most recovered materials for the past two years, on the other hand. The poor markets are not just domestic in origin, but also reflect worldwide economic conditions.

The more conservative scenario—30 percent recovery in 2000 and 32 percent in 2005—assumes continued modest growth in recovery. The more optimistic scenario—32 percent recovery in 2000 and 35 percent in 2005—assumes that market difficulties will be corrected in time to stimulate additional recovery.

Under the conservative scenario for recovery, discards of MSW to combustion or landfill would be virtually the same in 2000 as in 1997, and would be 4 percent higher in 2005 than in 1997. If a modest increase in MSW combustion is projected, MSW landfilled will decline slightly in 2000 and increase by 4 percent in 2000 compared to 1997. If recovery for recycling (including composting) could be increased to 35 percent of generation in 2005, MSW landfilled would decrease to 117.6 million tons, compared to 119.5 million tons in 1997.

Figure ES-6. Historical and projected MSW, by category



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