

THE STATE OF GARBAGE IN AMERICA

A joint study by BioCycle and the Earth Engineering Center of Columbia University

THE STATE of Garbage In America Report was launched by *BioCycle* in 1989. State of Garbage In America provides a picture of how municipal solid waste (MSW) is handled throughout the United States. This is the 16th nationwide survey. Starting with the 2004 State of Garbage In America survey, *BioCycle* began collaborating with Columbia University's Earth Engineering Center (EEC), which developed a new methodology for data collection.

The 2008 State of Garbage in America survey, conducted over the winter and spring of 2008, collected and reports on calendar year 2006 data provided by individual states (where available). For this report, *BioCycle* and EEC engaged the services of Emerge Knowledge Design, Inc. to create an on-line

Latest national data on municipal solid waste management — 29 percent recycled and composted, 7 percent combusted via waste-to-energy and 64 percent landfilled.

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form used by states to enter their data.

The information in this article is the culmination of the third *BioCycle*/EEC collaboration, conducted by the authors of this report using 2006 data. The national picture of the State of Garbage in America is: Of an estimated total of 413 million tons of MSW generated, 28.6 percent is recycled and composted, 6.9 percent is combusted in waste-to-energy plants and 64.5 percent is landfilled. The invaluable contributions of the state solid waste and recycling officials providing data are most appreciated.

Table 1. State of Garbage in America survey data 1989–2006: Reported and estimated MSW generation and rates of MSW recycling, waste-to-energy and landfilling¹

Year Of Data	Reported MSW Generation ² (tons/yr)	Estimated MSW Generated ³ (tons/yr)	MSW Recycled ⁴ (%)	MSW Waste-To-Energy (%)	MSW Landfilled (%)
1989	269,000,000		8.0	8.0	84.0
1990	293,613,000		11.5	11.5	77.0
1991	280,675,000		14.0	10.0	76.0
1992	291,472,000		17.0	11.0	72.0
1993	306,866,000		19.0	10.0	71.0
1994	322,879,000		23.0	10.0	67.0
1995	326,709,000		27.0	10.0	63.0
1996	327,460,000		28.0	10.0	62.0
1997	340,466,000		30.0	9.0	61.0
1998	374,631,000		31.5	7.5	61.0
1999	382,594,000		33.0	7.0	60.0
2000	409,029,000		32.0	7.0	61.0
2002	–	369,381,411	26.7	7.7	65.6
2004	–	387,855,461	28.5	7.4	64.1
2006	–	413,014,732	28.6	6.9	64.5

¹2002, 2004 and 2006 estimated MSW Generated, MSW Recycled, WTE and Landfilled have been adjusted to exclude non-MSW. ²Reported MSW Generation is reported values calculated by *BioCycle* prior to collaboration with Columbia University and use of current methodology. ³Estimated MSW Generated is sum of MSW Recycled, WTE and Landfilled. ⁴MSW Recycled includes composting and recycling.

STATE OF GARBAGE METHODOLOGY

Prior to *BioCycle*'s collaboration with EEC, the State of Garbage questionnaire asked states to provide the annual tons of MSW generated and a percent breakdown of tons recycled, composted, combusted and landfilled. The tonnages of MSW recycled, combusted and landfilled were calculated using the percentage breakdowns and MSW generation tons for each state. Those tonnages (based on weighted averages) were used to calculate the national rates for recycling, combustion and landfilling (see years 1988-2000 in Table 1).

The EEC methodology is a more objective, numbers-based analysis of solid waste management in the U.S. In the 2004 State of Garbage in America survey (the first using the new methodology), therefore, all data were requested in actual tonnages. For instance, instead of asking states what percent of the total MSW generated was landfilled, the survey questionnaire asked for the tons landfilled in each category listed (e.g., resi-

Estimated tonnage of MSW generated in a state consists of the sum of tons recycled and composted, combusted in WTE facilities and landfilled.

dential, commercial, industrial, C&D, organics, tires). If such a breakdown was not available, we asked for total tons landfilled. The same was done with recycling data: specific tonnages recycled were requested, broken down by categories (e.g., glass, metal, paper).

To maximize the opportunity for direct comparisons (state by state and nationally), the next step is to calculate the MSW-only portion of total solid waste generated, recycled, combusted and landfilled. This is accomplished by including only MSW stream tonnages, i.e., the residential and commercial waste streams, organics and tires. It does not include C&D, industrial and agricultural waste.

MSW that crosses state lines is attributed to the state of origin; imported waste is excluded from state MSW totals while exported waste is included. Recyclables include

tons reported for glass, steel, aluminum, other metals, paper, plastic, tires, organics, wood and "other." C&D materials and industrial wastes (e.g., automobile scrap) are not included. The estimated tonnage of MSW generated in a state consists of the sum of tons recycled and composted, combusted in WTE facilities, and landfilled.

DATA CHALLENGES

While many recycling and composting programs were initiated with funds from state government, their management has always been at the local level. In some states, reporting of tonnages diverted from disposal was required in order to receive additional grant funds and calculate how a state was progressing to meet its recycling goal. In other states, this type of reporting was not required. Furthermore, states differed on what

Table 2. Tons of MSW (nonhazardous) generated by state and waste stream categories included (2006 data unless noted)^{1,2}

State	Reported MSW Generated (tons/yr)	Reported						Imported	
		Residential	Industrial	Tires	Commercial	Ag.	C&D	Waste	Other
Alaska	733,708	x	-	x	x	x	x	-	-
Arizona	4,853,738	x	-	-	x	-	-	-	-
Arkansas	2,900,689	x	-	-	x	-	-	-	-
Connecticut ³	3,429,624	x	x	-	x	x	-	-	-
Delaware	1,106,586	x	x	x	x	x	x	-	-
Dist. of Columbia	997,150	x	x	x	x	-	-	x	-
Florida ⁴	36,846,586	x	x	x	x	-	x	-	x
Illinois	25,521,113	x	-	-	x	-	x	-	-
Iowa	3,222,019	x	x	-	x	x	x	x	x
Kansas	3,466,041	x	-	x	x	-	-	-	-
Kentucky	5,317,765	x	-	-	x	-	-	-	x
Louisiana	5,551,158	x	-	-	x	-	x	-	-
Maine	1,989,266	x	-	-	x	-	x	-	-
Maryland	7,009,905	x	-	x	x	-	-	-	-
Massachusetts	9,160,000	x	-	-	x	-	-	-	-
Minnesota	6,100,748	x	-	-	x	-	-	-	x
Missouri	12,512,808	x	x	x	x	-	x	x	x
Montana	1,189,539	x	x	x	x	x	x	x	-
Nebraska	2,100,347	x	x	-	x	x	-	x	-
New Hampshire	1,724,380	x	-	-	x	-	x	-	-
New Jersey ⁴	2,155,5981	x	x	x	x	x	x	-	-
New Mexico	1,966,566	x	-	x	x	-	-	-	x
New York	22,652,168	x	x	x	x	x	x	x	-
North Carolina	11,865,829	x	x	x	x	-	x	-	-
North Dakota	660,552	x	-	-	x	-	-	-	-
Ohio	28,237,571	x	x	x	x	x	x	-	x
Oklahoma	4,590,985	x	-	-	-	-	x	-	-
Oregon	5,753,962	x	-	x	x	-	x	-	-
Pennsylvania	14,895,285	x	-	-	x	-	-	-	-
Rhode Island	1,681,486	x	x	x	x	x	x	-	-
South Carolina	497,4678	x	-	x	x	-	-	-	x
South Dakota	981,476	x	x	-	x	-	x	x	-
Tennessee	13,333,323	x	x	-	x	x	x	-	-
Texas	40,000,000	x	-	x	x	-	x	x	-
Utah	2,706,246	x	-	-	x	-	-	x	-
Vermont	610,655	x	x	-	x	-	-	-	-
Virginia	9,706,554	x	x	x	x	-	x	-	-
Washington	6,647,369	x	-	-	-	-	-	-	-
West Virginia	1,824,188	x	x	-	x	x	x	x	-
Wisconsin	5,879,304	x	-	x	x	-	x	-	-

¹Alabama, California, Colorado, Georgia, Hawaii, Idaho, Indiana, Michigan, Mississippi, Nevada and Wyoming did not include information on categories in their reported generation. ²An 'x' means that this waste stream is included in the reported number. A '-' means that it is not included. ³2003 data. ⁴2005 data.

Table 3. Estimated tonnage of MSW generated, recycled, combusted via waste-to-energy (WTE) and landfilled (2006 data unless noted)¹

State	Population (2006)	Estimated MSW Generation (tons/yr)	MSW Recycled (tons/yr) ²	MSW to WTE (tons/yr) ³	MSW Landfilled (tons/yr) ³	Per Capita Estimated Generation (tons/person/yr)
Alabama ⁴	4,590,240	6,996,343	591,608	194,039	6,210,696	1.52
Alaska	677,450	765,354	28,646	3,000	733,708	1.13
Arizona ⁵	6,165,689	8,197,591	1,025,591	0	7,172,000	1.33
Arkansas	2,809,111	3,468,842	532,689	35,464	2,900,689	1.23
California ⁶	36,249,872	49,926,000	19,409,000	591,000	29,926,000	1.38
Colorado	4,766,248	8,690,005	481,598	0	8,208,407	1.82
Connecticut ⁷	3,495,753	3,360,933	830,264	2,158,292	372,377	0.96
Delaware	852,747	988,433	103,150	0	885,283	1.16
District of Columbia	585,459	1,031,083	21,142	12,791	997,150	1.76
Florida ⁶	18,057,508	23,631,947	6,775,329	5,796,339	11,060,279	1.31
Georgia ⁸	9,342,080	11,549,889	n/a	81,535	7,195,075	1.24
Hawaii ⁶	1,278,635	1,649,000	410,000	756,000	483,000	1.29
Idaho ⁵	1,463,878	1,238,394	99,590	0	1,138,804	0.85
Illinois	12,777,042	26,420,364	9,773,194	0	16,647,170	2.07
Indiana ⁹	6,302,646	13,570,231	4,531,056	569,263	8,469,912	2.15
Iowa ⁹	2,972,566	4,341,454	1,464,395	54,496	2,822,563	1.46
Kansas	2,755,817	4,089,591	817,818	0	3,271,773	1.48
Kentucky	4,204,444	7,887,748	2,996,565	63,700	4,827,483	1.88
Louisiana	4,243,288	6,051,158	500,000	0	5,551,158	1.43
Maine	1,314,910	2,178,339	695,580	701,811	780,948	1.66
Maryland	5,602,017	7,009,905	2,536,633	1,371,970	3,101,302	1.25
Massachusetts	6,434,389	9,160,000	3,410,000	3,100,000	2,650,000	1.42
Michigan ^{9,10}	10,102,322	12,768,089	2,594,940	1,039,389	9,133,760	1.26
Minnesota	5,154,586	5,894,933	2,523,635	1,170,841	2,200,457	1.14
Mississippi	2,899,112	3,194,368	145,000	0	3,049,368	1.10
Missouri ⁹	5,837,639	9,939,008	3,183,864	23,300	6,731,844	1.70
Montana	946,795	1,430,049	240,510	0	1,189,539	1.51
Nebraska	1,763,765	2,360,861	260,514	0	2,100,347	1.34
Nevada	2,492,427	3,007,000	619,000	0	2,388,000	1.21
New Hampshire	1,311,821	1,269,774	406,693	206,873	656,208	0.97
New Jersey ⁶	8,666,075	12,756,058	4,400,000	1,397,094	6,958,964	1.47
New Mexico	1,942,302	2,125,052	191,601	0	1,933,451	1.09
New York	19,281,988	21,686,509	7,694,160	3,491,700	10,500,649	1.12
North Carolina	8,869,442	8,205,475	1,877,277	107,837	6,220,361	0.93
North Dakota	637,460	660,552	83,404	0	577,148	1.04
Ohio	11,463,513	16,885,677	3,530,328	0	13,355,349	1.47
Oklahoma ⁵	3,577,536	4,394,393	170,000	0	4,224,393	1.23
Oregon	3,691,084	4,426,431	1,820,063	203,103	2,403,265	1.20
Pennsylvania ⁶	12,402,817	16,486,254	4,868,115	1,951,447	9,666,692	1.33
Rhode Island	1,061,641	1,351,454	166,962	1,995	1,182,497	1.27
South Carolina	4,330,108	4,974,679	1,510,409	224,506	3,239,764	1.15
South Dakota	788,467	861,576	83,476	0	778,100	1.09
Tennessee ⁹	6,074,913	12,211,686	4,798,402	0	7,413,284	2.01
Texas ⁹	23,407,629	31,212,927	5,900,000	0	25,312,927	1.33
Utah	2,579,535	2,864,492	438,873	123,912	2,301,707	1.11
Vermont	620,778	644,226	229,953	47,286	366,987	1.04
Virginia	7,640,249	12,210,991	4,140,457	2,135,407	5,935,127	1.60
Washington	6,374,910	8,313,340	2,725,310	325,398	5,262,632	1.30
West Virginia	1,808,699	2,110,381	337,661	0	1,772,720	1.17
Wisconsin	5,617,744	5,881,023	1,886,545	454,321	3,540,157	1.05
Wyoming	512,757	684,690	73,200	0	611,490	1.34
Total U.S. (pop., tons)	298,799,903	413,014,732	118,207,659	28,394,109	266,412,964	1.38
Total U.S. %		100%	28.6%	6.9%	64.5%	

¹Estimated MSW Generation, MSW Recycled, WTE and Landfilled have been adjusted to exclude C&D and other non-MSW materials. ²includes recycled and composted tons. ³WTE and Landfilled figures are adjusted for import/export; imported waste is excluded, exported waste is included. ⁴Alabama did not have information on these waste streams and has therefore been assigned values based on average per capita recycling and landfilling of the reporting states. ⁵2004 data. ⁶2005 data. ⁷2003 data. ⁸Adjusted per 2005 Georgia Statewide Waste Characterization Study MSW Weighted Averages. ⁹2004 State of Garbage In America recycling data (from 2006 report) were used for lack of 2006 data by the state. ¹⁰2004 WTE data were used for lack of 2006 data by the state.

The in-state landfilled and combusted tonnages are reported with near certainty.

they counted toward their recycling goals, e.g., some included C&D debris while others did not (which is still the case today).

Over time, the private sector invested in collection and materials processing. This presented challenges in collecting information on final tonnages recycled due to the competitive nature of the industry. In some states, reporting mechanisms were established to track these recycled tons.

This lack of consistent reporting methods (from state to state and nationally) of recycled and composted tons was factored into the EEC's development of the State of Garbage methodology by asking states to break out all the waste streams included in their reported tons recycled/composted, combusted and landfilled. As has been found each year the State of Garbage survey has been conducted, the in-state landfilled and combusted tonnages are reported with near

Per capita MSW generation is 1.38 tons/person/year, higher than the 1.3 tons/person reported in 2006.

certainty, owing to the fact that landfills and WTE facilities are generally permitted with regulatory reporting requirements.

Recycling and yard trimmings composting facilities, on the other hand, are not necessarily required to report throughput. Therefore, some states reported estimates of their recycled or composted tons based on historical data or waste composition studies, while some did not report these categories at all.

In this year's survey, as was the case in previous years, the State of Garbage team corresponded with state solid waste and re-

Table 4. Waste imports and exports by state for 2006 (unless noted)¹

State	Imported (tons/yr)	Exported (tons/yr)
Alaska	-	23,700
Arizona	438,000	85,000
Arkansas	-	160,937
Connecticut	70,009	268,823
Delaware	650	12,617
District of Columbia	-	1,009,941
Georgia	1,738,964	-
Illinois	-	2,400,000
Indiana	2,165,429	-
Iowa	-	92,156
Kansas	770,650	140,939
Kentucky	681,414	191,132
Louisiana	-	168,341
Maine	560,931	75,980
Maryland	302,167	2,861,849
Massachusetts	230,000	1,000,000
Michigan	6,345,177	-
Minnesota	-	740,269
Mississippi	740,876	-
Missouri	228,858	2,520,071
New Hampshire	616,772	28,400
New Jersey	705,389	2,563,818
New Mexico	625,247	-
New York	2,083,705	4,499,089
North Carolina	129,906	1,329,202
North Dakota	109,756	15,000
Ohio	3,755,647	1,064,226
Oregon	1,942,698	51,965
Pennsylvania	7,252,828	600,000
Rhode Island	-	1,995
South Carolina	1,676,789	133,606
Tennessee	741,560	647,804
Texas	255,000	518,700
Utah	23,434	-
Vermont	-	87,940
Washington	167,819	1,361,802
West Virginia	-	413,688
Wisconsin	1,518,598	315,000
Wyoming	-	590
Total	35,878,273	25,384,580

¹Imported and Exported MSW includes material reported as delivered to landfill and WTE facilities; "-" indicates information not reported by the state.

Table 5. Number of municipal solid waste landfills and waste-to-energy plants, average tip fees, and landfill capacity by state for 2006¹

State	Number of MSW Landfills	Average Landfill Tip Fee (\$/ton)	Total Landfill Capacity Remaining (cubic yards (cy) or tons as noted)	Landfill Capacity Being Added? (y=yes n=no)	Number Of WTE Plants	Average WTE Tip Fee (\$/ton)
Alaska	300	-	-	yes	1	-
Arizona	40	-	-	yes	0	-
Arkansas	62	-	-	yes	3	-
Connecticut	2	-	3 years	no	6	-
Delaware	3	58.9	5,000,000 cy	yes	0	-
Florida	50	40.36	-	yes	11	52.95
Georgia	56	-	429,202,431 cy	yes	1	-
Illinois	49	-	1,024,452,000 cy	yes	0	-
Indiana	35	29.57	245,570,987 cy	yes	1	-
Iowa	59	39	96,753,114 tons	yes	1	64
Kansas	52	-	-	no	0	-
Kentucky	34	29.21	212,043,842 tons	yes	2	-
Louisiana	27	32.35	71,721,948 tons	no	0	-
Maine	12	35-85	16,800,000 cy	no	4	-
Maryland	22	52	84,838,536 cy	no	9	-
Massachusetts	18	79	2,506,455 cy	no	7	71
Michigan	50	-	461,824,259 cy	yes	3	-
Minnesota	21	40	27,000,000 cy	yes	9	36
Mississippi	17	28	817 years	yes	0	-
Missouri	21	-	201,892,185 cy	yes	7	-
Montana	79	25	92,025,335 cy	yes	0	-
Nebraska	23	-	-	yes	0	-
New Hampshire	9	-	33,506,593 tons	no	2	-
New Jersey	12	72	-	yes	5	80
New Mexico	33	28	162,033,429 cy	no	0	-
New York	27	56	152,693,697 tons	yes	10	71
North Carolina	40	35	157,920,815 tons	yes	1	52
North Dakota	14	31.3	-	yes	0	-
Ohio	42	32	667,843,591 cy	yes	0	-
Oklahoma	38	15-22	-	-	0	-
Oregon	33	35	-	no	1	-
Pennsylvania	48	-	265,000,000 tons	yes	6	-
Rhode Island	2	45.31	3 tons	yes	0	-
South Carolina	18	36	102,506,233 tons	yes	1	-
South Dakota	15	35	-	yes	0	-
Tennessee	34	28	293,235,231 cy	yes	0	-
Texas	215	25.7	-	yes	1	-
Utah	34	-	200 years	yes	1	-
Vermont	4	96	-	no	0	-
Virginia	60	-	249,070,298 tons	yes	5	-
Washington	16	45.3	-	-	3	98
West Virginia	19	45.18	-	yes	0	-
Wisconsin	35	37	-	yes	2	59
Wyoming	51	30-80	-	yes	0	-
Total	1,831	42.08			103	64.88

¹Alabama, California, Colorado, Hawaii, Idaho and Nevada did not provide information on these fields. "-" = 'no reported value.'

Table 6. Quantity of materials recycled per state, per category (tons/year) (2006 data unless noted) ^{1,2}

State	Glass	Paper	C&D	Steel	Plastic	Aluminum	Other Metals	Wood	Tires	Organics	Total Other
Arkansas	2,646	148,851	—	72,264	33,876	76,293	—	55,878	34,508	79,068	5,622
Colorado	2,557	308,209	4,227	—	1,076	—	7,457	12	32,022	—	14,339
Connecticut ³	32,182	460,056	—	11,959	13,067	733	75,507	—	—	233,029	236,754
District of Columbia	5,538	14,066	—	404	876	258	—	—	—	—	—
Florida ⁴	164,965	1,780,993	2,668,057	312,730	69,425	44,247	2,066,703	1,525,048	607,000	1,440,745	—
Kansas	27,854	267,852	—	39,435	5,633	5,194	118,749	62,343	12,787	76,592	20,712
Kentucky	4,688	231,326	—	1,437,226	4,617	12,295	102,751	—	942,361	258,752	2,546
Maine	52,172	286,055	24,830	81,853	15,646	2,185	92,219	94,518	30,678	30,371	9,883
Maryland	58,992	938,992	155,967	532,583	34,815	—	619,247	209,140	29,925	898,777	42,549
Massachusetts	420,000	1,240,000	3,060,000	—	60,000	—	920,000	6,000	—	734,000	30,000
Minnesota	122,274	932,501	—	24,778	47,845	24,778	406,604	103,837	18,646	179,043	825,937
Montana	1,024	56,698	28,971	135,172	260	1,733	—	—	—	31,135	4,963
Nebraska ⁴	8,457	231,058	—	1,935	6,895	8,549	—	—	—	—	3,620
New Hampshire	9,251	50,870	304,657	24,909	2,086	823	1,232	—	—	30,387	287,135
New Jersey ⁴	300,521	1,364,156	—	593,276	75,160	79,474	—	159,433	37,327	1,723,466	—
New Mexico	541	88,162	—	21,528	1,760	3,672	—	—	866	65,137	3,935
New York ⁴	333,181	2,603,911	6,319,191	1,381,104	205,107	60,680	—	70,179	39,124	856,642	522,679
North Carolina	51,883	305,615	40,352	7,516	19,373	5,808	28,382	60,399	187,273	570,994	69,041
Ohio	40,112	1,029,617	—	409,862	43,739	124,485	4,834	193,783	106,772	1,311,497	265,627
Oregon	96,619	790,363	14,332	339,360	42,412	21,521	8,398	87,645	16,557	391,213	52,959
Pennsylvania ⁴	57,447	557,578	404,745	19,074	56,625	47,603	1,062,090	191,032	49,730	557,691	2,269,246
Rhode Island	14,980	57,847	—	5,696	4,909	1,027	—	—	—	76,242	403
South Carolina	11,090	822,026	1,093,459	4,415	20,379	6,606	190,220	44,127	62,765	604,699	348,779
Tennessee ⁵	5,196	85,387	65,020	10,643	4,274	—	25,727	369,962	72,902	148,330	5,113
Virginia	39,278	922,024	123,998	—	30,159	—	704,127	296,165	70,210	860,133	237,769
Washington	90,992	570,802	2,295,278	1,048,885	38,262	14,951	135,976	289,612	23,528	1,000,040	—
West Virginia	777	22,165	—	3,217	688	623	105	—	—	—	—
Wisconsin	103,527	921,125	46,000	25,973	29,424	7,959	17,231	—	31,500	537,600	212,206

¹States have been assigned “—” if they did not report on that field. ²Only includes states providing information on recycling categories. ³2003 data. ⁴2005 data. ⁵Does not include tonnages recycled by private sector.

cycling staff to clarify the data submitted, primarily to distinguish MSW tons from non-MSW tons reported. When necessary, data gaps were also filled in, or “back calculated,” through the use of historic State of Garbage recycling rates applied to the known tonnage disposed from 2006.

The majority of states in the 2008 State of Garbage In America survey provided 2006 data, as requested. Footnotes in the tables indicate the year of the data if other than 2006. Alabama is the only state not providing any data for this year’s report. Therefore, the state was assigned values based on average per capita recycling and landfilling of the reporting states.

There are some notable changes in how data is reported in 2008. First, *BioCycle/EEC* decided to eliminate the calculation of a national “Reported MSW Generation” tonnage (Table 1) as that data was not provided by all 50 states. Table 2 includes the reported tonnages that were provided.

Second, the State of Garbage team chose not to calculate the percent of MSW recycled/composted, combusted via WTE and landfilled for individual states. Instead, only the national percents were calculated. Third, insufficient data was provided to include total number of curbside recycling programs and yard trimmings composting facilities in the U.S. Additional data collection is needed in order to present national totals.

THE NATIONAL PICTURE

The 2008 State of Garbage in America survey estimates that a total of 413,014,732 tons of municipal solid waste were generated in the United States (all 50 states and the District of Columbia) in 2006. Estimated MSW generated includes MSW recycled/composted, combusted at WTE facilities and landfilled. Reported tonnages were adjusted to exclude non-MSW such as construction and demolition debris and industrial waste.

The 413 million tons reflects a 25 million ton increase in MSW generation between the 2006 and 2008 State of Garbage surveys. The per capita estimated generation is 1.38 tons/person/year, higher than the 1.3 tons/person reported in 2006. At the same time, the percent breakout between tons recycled/composted, combusted and landfills is almost identical — 28.6 percent (2008) versus 28.5 percent (2006) recycled; 6.9 percent (2008) versus 7.4 percent (2006) combusted; and 64.5 percent (2008) versus 64.1 percent (2006) landfilled.

Table 3 provides the “raw” tonnages for each state used to calculate the national percentages. The per capita MSW generation rate is also provided for each state, along with their 2006 population. According to our State of Garbage calculations, Idaho has the lowest per capita MSW generation (.85), followed by North Carolina (.93), Connecticut (.96) and New Hampshire (.97). At the other end of the spectrum, the highest per capita

A total of 35.9 million tons were imported, and 25.4 million tons were exported.

Around 118 million tons of MSW were estimated to be recycled in 2006.

tonnages were found in Indiana (2.5), Illinois, (2.07) and Tennessee (2.01).

Table 4 reports the tons of MSW imported and exported for landfilling and combustion in the United States in 2006. Tonnages were reported by 38 states. A total of 35.9 million tons were imported, and 25.4 million tons were exported. Pennsylvania receives the largest amount of MSW from other states (7.3 million tons), followed by Michigan (6.3 million tons), Ohio (3.8 million tons), Indiana (2.2 million tons) and New York (2.1 million tons). States exporting the greatest ton-

nages are New York (4.5 million tons), Maryland (2.9 million tons), New Jersey (2.6 million tons), Missouri (2.5 million tons) and Illinois (2.4 million tons).

LANDFILLS AND WASTE-TO-ENERGY

Table 5 provides state-by-state information on landfills and WTE facilities. According to this year's State of Garbage In America report, the number of MSW landfills in the U.S. actually increased between 2004 and 2006. This year's total is 1,831 landfills (44 states reporting), compared to 1,654

Table 7. MSW landfill disposal bans for selected materials

State	Yard Trimmings	Whole Tires	Used Oil	Lead-Acid Batteries	White Goods	Electronics	Others
Alaska			X	X			
Arizona		X			X		
Arkansas	X	X		X		X ¹	
California		X	X		X	X	X ²
Connecticut	X ³			X			
Delaware	X ⁴	X					
Florida		X	X	X	X		
Georgia	X ⁵	X	X	X			
Idaho		X		X			
Illinois	X	X	X	X	X		X ⁶
Indiana	X ⁷	X		X			
Iowa	X	X	X	X	X		
Kansas		X					
Kentucky		X		X			
Louisiana		X	X	X	X		
Maine		X		X	X	X	X ⁸
Maryland	X ⁹	X	X		X		
Massachusetts	X	X		X	X	X	X ¹⁰
Michigan	X	X	X	X			X ¹¹
Minnesota	X	X	X	X	X	X	
Mississippi		X		X			
Missouri	X	X	X	X	X		
Nebraska	X ¹²	X	X	X	X		
New Hampshire		X		X		X	
New Jersey	X ¹³						X ¹⁴
New Mexico			X	X			
New York		X	X	X			
North Carolina	X	X	X	X	X		X ¹⁵
North Dakota			X	X	X		
Ohio	X ⁹	X					
Oregon		X	X	X	X		
Pennsylvania	X ¹⁶	X		X			
Rhode Island ¹⁷	X	X	X		X		X ¹⁸
S. Carolina	X	X	X	X	X		
S. Dakota	X	X	X	X	X		
Tennessee		X	X	X			
Texas		X	X	X	X ¹⁹		
Utah		X	X	X			
Vermont		X	X	X	X		X ²⁰
Virginia		X		X			
West Virginia ²¹	X ²²	X	X	X			
Wisconsin	X	X	X	X	X	X ²³	X ¹⁸
Wyoming				X			

¹Regulations banning disposal of all computer and electronic equipment in landfills began January 1, 2008; ²Fluorescent bulbs; ³Grass clippings; ⁴Yard waste ban at Cherry Island Landfill began in January 2008; ⁵Yard trimmings are banned from MSW landfills designed and built to Subtitle D standards; Primary method of dealing with yard trimmings is disposal in inert and C&D landfills in state; ⁶Potentially Infectious Medical Waste; ⁷Leaves; also, woody vegetative matter greater than 3 feet in length is banned by statute; woody vegetative matter less than 3 ft in length is banned if it is not bagged, bundled, or otherwise contained; ⁸Mercury containing products; ⁹Separately collected yard waste is banned; ¹⁰Glass, metal and plastic containers and recycled paper; Asphalt paving, brick, concrete, metal and wood were banned from disposal in July 2006; ¹¹Beverage containers; ¹²Leaves and grass are banned April 1 through November 30; ¹³Leaves only; ¹⁴All other recyclable materials that any local government designates as a recyclable material; ¹⁵Aluminum cans banned since 1994; beginning in 2009, wood pallets, plastic bottles and oil filters will be banned; Beginning in 2012, computers will no longer be accepted for disposal; ¹⁶Truckloads comprised primarily of leaves; ¹⁷All materials specified as mandatory recyclables are technically banned from landfill disposal; ¹⁸Recyclable paper and containers; ¹⁹With CFCs; ²⁰Oil based paint, mercury added products, ni-cad batteries; ²¹Items checked are banned by state but individual landfills may have own rules; ²²West Virginia has a ban on yard waste; If no composting facility is available, landfills can usually get a waiver on the rule; ²³Generated by non-households.

landfills two years ago (45 states reporting). The average landfill tip fee nationally was calculated to be \$42.08/ton, with average tip fees in the states ranging from \$15/ton in Oklahoma to \$96/ton in Vermont.

States estimated total remaining landfill capacity, reporting in either cubic yards or tons. Pennsylvania reported that it has 265 million tons of remaining capacity, followed closely by Virginia (249 million tons) and Kentucky (212 million tons). Each of those states noted that landfill capacity is still being added. Several states reported landfill capacity remaining by the number of years. Mississippi has 817 years of capacity left, while Utah has 200 years.

On the combustion side, there are 103 WTE plants in the U.S., with a national average tipping fee of \$64.88/ton. Florida and New York report the most plants (11 and 10, respectively); Maryland and Minnesota each have 9 plants. Reported tipping fees range from \$52/ton at North Carolina's one WTE facility, to \$98/ton in Washington State.

THE RECYCLING SCENE

The amount of MSW recycled in 2006 is an estimated 118 million tons. Only 33 of the 50 states, and the District of Columbia, were able to provide recycled tonnage data for calendar year 2006. Six states reported 2005 tonnages; 3 states provided 2004 data, 1 had 2003 data, and the State of Garbage team used calculated recycled tonnages from the last survey (2004 data) for 6 states. Alabama did not report.

Table 6 lists the quantities of specific materials recycled by 27 states. Fairly high tonnages of paper were reported recycled, along with organics that include yard trimmings, wood and food waste.

DISPOSAL BANS

States are asked to list all MSW materials banned from landfill disposal. Information was gathered for 43 states (Table 7). Lead-acid batteries and whole tires are the most commonly banned materials. There are 23 states that ban all, or a portion of, yard trimmings from disposal. Pennsylvania, for example, bans "truckloads comprised primarily of leaves;" Connecticut only bans grass clippings.

West Virginia, at the state level, bans yard trimmings from disposal, but notes that if a composting facility isn't available, the local landfill can usually get a waiver. In some situations, states do not have a ban on yard trimmings, but one may be adopted by a local government. For example, Santa Cruz County in California has a landfill ban on recyclable materials at two of its landfills. The same materials, which include yard trimmings, can be recycled at those landfills.

A follow-up article will provide a more detailed analysis of the information reported by states for the 2008 State of Garbage In America survey. A summary of the data that was provided to *BioCycle* and EEC, but not reported in this article, will be included. ■

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