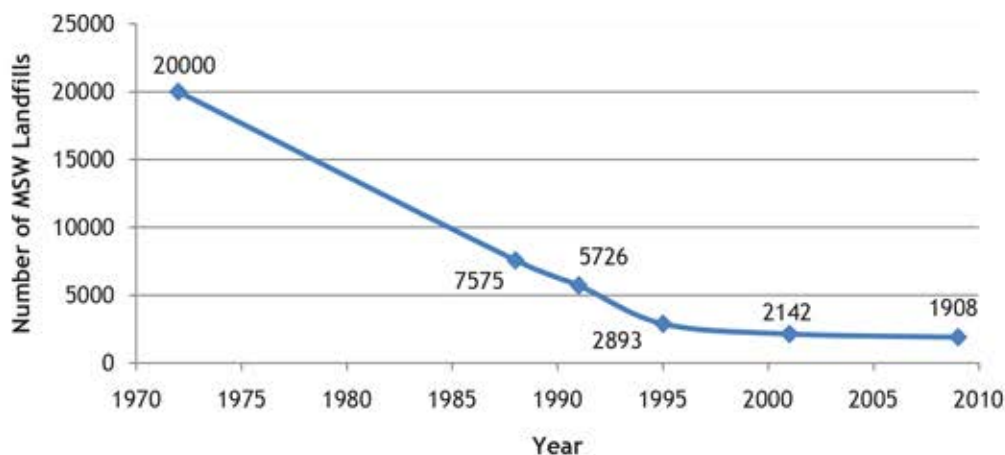


MUNICIPAL SOLID WASTE LANDFILL FACTS

Landfilling remained the most common way to dispose of municipal solid waste (MSW) in the United States (U.S.). According to the U.S. Environmental Protection Agency (EPA), of the 243.0 million tons of MSW generated in 2009, 135.9 million tons (54.3%) were landfilled. Landfills received approximately the same amount of MSW since 1980 despite a steady decline in landfill numbers. In the 1970s, some 20,000 landfills existed and most were unlined "dumps." Today, as a result of stringent federal and state regulations, there are slightly more than 1,900 MSW landfills. Figure 1 shows the decline in MSW landfills over time.

Figure 1. Number of MSW Landfills



Although the number of MSW landfills has declined with time, national capacity has not changed significantly because older MSW landfills tended to be smaller and more numerous. These landfills may have closed to avoid the cost of new federal and state regulations. Older landfills were replaced by newer, larger landfills supported by greater intra- and inter-state wastesheds. Table 1 lists the largest landfill by state in 2010. Slightly less than half the states (22) had a landfill that received in excess of one million tons per year. Generally, these very large landfills are located in highly populated states or near major population centers.

LANDFILL TIPPING FEES

The cost of waste disposal at an MSW facility is referred to as the "tipping fee." Many tipping fees exist at a facility, but the most commonly referenced tipping fee is the "spot market" tip fee (i.e., the drive-up cost to dispose of a single ton of MSW). The following figure shows the average national tip fees at landfills from 1985 to 2010. A regression analysis of the data showed a statistically significant correlation between tipping fees and time. Figure 1 shows that tipping fees have increased on average by \$1.24 per year.

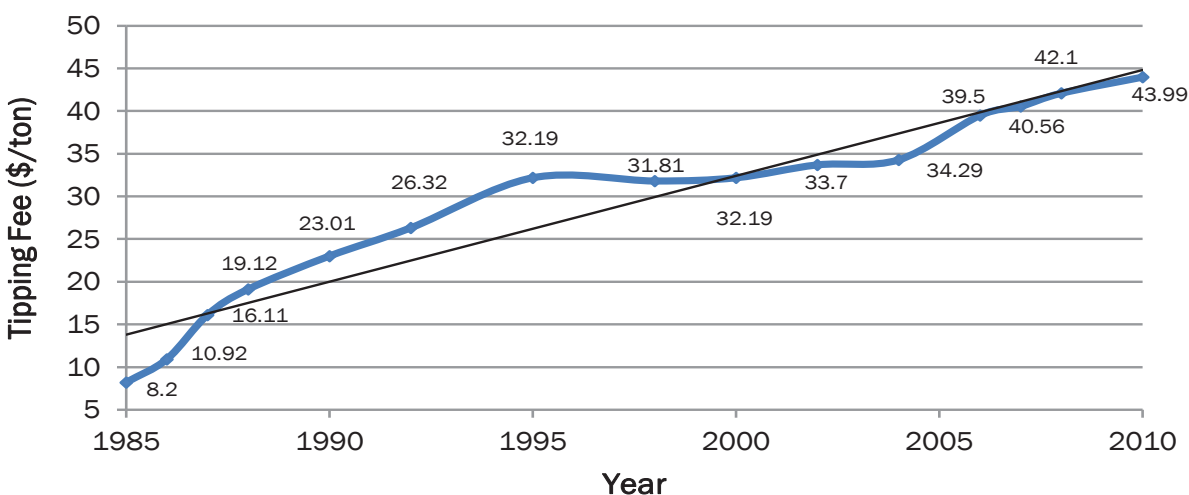


For more information on NWRA's Municipal Solid Waste Landfill Facts, contact Anne Germain Director, Waste & Recycling, at 202-364-3724 or agermain@wasterecycling.org.

TABLE 1. LARGEST LANDFILLS BY STATE
(Waste & Recycling News, 2010)

STATE	LANDFILL	LOCATION	2009 TONNAGE
Alabama	Sand Valley	Collinsville	454,470
Alaska	Anchorage Regional	Anchorage	320,000
Arizona	Butterfield Station	Phoenix	1,570,789
Arkansas	Eco-Vista	Springdale	365,166
California	Puente Hills	Whittier	2,638,241
Colorado	Denver Arapahoe	Aurora	1,672,312
Connecticut	Manchester	City of Manchester	86,338
Delaware	Cherry Island North	Wilmington	432,445
Florida	Central Disposal	Pompano Beach	1,056,000
Georgia	Pine Bluff	Canton	1,435,455
Hawaii	PVT	Nanakuli	254,513
Idaho	Hidden Hollow	Boise	680,413
Illinois	Orchard Hills	Davis Junction	1,707,828
Indiana	Newton County	Brook	2,249,110
Iowa	Metro Park East	Mitchellville	527,781
Kansas	Johnson County	Shawnee	1,044,495
Kentucky	Outer Loop	Louisville	1,000,000
Louisiana	River Birch	Avondale	1,296,000
Maine	Crossroads	Norridgewock	133,551
Maryland	Brown Station Road	Upper Marlboro	435,848
Massachusetts	Fitchburg/Westminster	Westminster	260,509
Michigan	Pine Tree Acres	Lenox	1,645,402
Minnesota	Elk River	Elk River	363,359
Mississippi	Pecan Grove	Pass Christian	409,156
Missouri	Fred Weber	Maryland Heights	830,605
Montana	Missoula	Missoula	263,000
Nebraska	Pheasant Point	Omaha	473,489
Nevada	Apex Regional	Las Vegas	2,111,078
New Hampshire	Turnkey	Rochester	1,090,000
New Jersey	Gloucester County	South Harrison	543,542
New Mexico	Cerro Colorado	Albuquerque	610,438
New York	Seneca Meadows	Waterloo	1,911,316
North Carolina	Charlotte Motor Speedway	Concord	1,076,806
North Dakota	Fargo	Fargo	212,431
Ohio	Rumpke Sanitary	Colerain Township	1,862,431
Oklahoma	Quarry	Tulsa	585,485
Oregon	Columbia Ridge	Arlington	1,564,148
Pennsylvania	Tullytown	Tullytown	1,557,386
Rhode Island	Central	Johnston	906,380
South Carolina	Lee County	Bishopville	1,141,707
South Dakota	Sioux Falls	Sioux Falls	250,000
Tennessee	Middlepoint	Murfreesboro	958,639
Texas	McCommas Bluff	Dallas	1,567,811
Utah	Wasatch Regional	Tooele County	618,039
Vermont	Waste USA	Coventry	339,226
Virginia	Atlantic Waste	Waverly	1,674,842
Washington	Roosevelt Regional	Roosevelt	2,088,177
West Virginia	Meadowfill	Clarksburg	293,766
Wisconsin	Orchard Ridge	Menomonee Falls	987,803
Wyoming	Casper	City of Casper	109,223

Figure 2. MSW Landfill Tipping Fees



Between 1985 and 1995, tipping fees increased steadily at \$2.40 per year. This increase was likely caused by states implementing the federal Resource Conservation and Recovery Act (RCRA) Subtitle D regulations or their state equivalents. Tipping fees remained relatively constant between 1995 and 2004. From 2004 to 2010 tipping fees rose at a rate similar to the 1985 to 1995 period at \$1.62 per year. This increase was probably caused in part to rising fuel costs.

GAS-TO-ENERGY PROJECTS

MSW is comprised of more than 60 percent biomass, including paper and paperboard (28.2%), food scraps (14.1%), yard trimmings (13.7%), and wood (6.5%). When this biomass is safely managed in an MSW landfill, it has the ability to produce landfill gas that is comprised approximately of equal parts of methane and carbon dioxide with a trace amount of non-methane organics. Because methane is a combustible gas, MSW landfills have been installing gas collection and destruction systems (e.g., flares, internal combustion engines, turbines, or boilers). These destruction devices can be linked to systems that capture the energy commonly referred to as landfill gas-to-energy (LFGTE) projects. These LFGTE projects have been around since the late 1970s, providing renewable energy in the form of electricity and direct use of the gas as an alternative fuel. Table 2 shows the number of operational and candidate LFGTE projects in each state.

Landfill gas-to-energy (GTE) projects have been around since the late 1970s, providing renewable energy in the form of electricity and direct use of the gas as an alternative fuel. On July 2011, 558 operational landfill GTE projects existed in 46 states according to EPA's Landfill Methane Outreach Program (LMOP), i.e., only Alaska, Hawaii, Nevada, and Wyoming did not have projects. These landfills produced 1,727 megawatts (MW) of electricity and 312 million standard cubic feet per day (mmscfd) of gas for direct use.

LMOP believes that there is an additional 510 candidate landfills that could be utilizing collected landfill gas. If projects were developed at these landfills, an additional 1,170 MW or 590 mmscfd could be converted to alternative energy sources. Table 2 provides the states with operational landfill GTE projects and the number of candidate projects.

According to EPA, the estimated environmental benefits of LFGTE projects in 2010 were equivalent to:

- The amount of GHG emissions from 18,903,428 passenger vehicles; or
- The carbon sequestered annually by 21,084,403 acres of pine or fir forests or,
- The carbon dioxide emissions from consuming more 11,123,267,382 gallons of gasoline.

The energy benefits derived by landfill GTE projects are capable of powering more than 1,019,685 homes plus directly heating another 736,361 with landfill gas.

TABLE 2. OPERATIONAL AND CANDIDATE LANDFILL GAS-TO-ENERGY PROJECTS

STATE/TERRITORY	OPERATIONAL PROJECTS	CANDIDATE LANDFILLS
Alabama	4	18
Alaska	0	2
Arizona	3	14
Arkansas	4	7
California	77	37
Colorado	1	12
Connecticut	3	3
Delaware	3	*
Florida	17	16
Georgia	13	24
Hawaii	0	8
Idaho	2	3
Illinois	32	22
Indiana	22	12
Iowa	4	14
Kansas	6	8
Kentucky	7	18
Louisiana	6	7
Maine	2	2
Maryland	10	11
Massachusetts	20	2
Michigan	36	4
Minnesota	7	6
Mississippi	2	13
Missouri	11	15
Montana	2	3
Nebraska	2	5
Nevada	0	3
New Hampshire	8	3
New Jersey	17	3
New Mexico	2	3
New York	28	6
North Carolina	18	34
North Dakota	2	1
Ohio	20	20
Oklahoma	3	12
Oregon	7	2
Pennsylvania	38	12
Puerto Rico	0	12
Rhode Island	2	*
South Carolina	14	8
South Dakota	1	1
Tennessee	6	11
Texas	27	52
Utah	4	5
Vermont	5	*
Virginia	26	11
Virgin Islands	0	2
Washington	6	8
West Virginia	2	9
Wisconsin	25	6
Wyoming	0	2
Totals	558	~510

* Data not available.