



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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2012 Solid Waste Data Update

December 2015

Introduction

In the *2010-2020 Solid Waste Master Plan (Master Plan)* the Executive Office of Energy and Environmental Affairs (EEA) and the Massachusetts Department of Environmental Protection (MassDEP) established a plan and vision for how Massachusetts will manage its solid waste for the 2011-2020 timeframe. To assist in implementing the *Master Plan*, MassDEP annually collects and analyzes solid waste management system data. The data are used to track progress in meeting waste reduction milestones and to evaluate solid waste management capacity needs. MassDEP has updated the solid waste data for calendar year 2012 and revised waste management capacity projections through 2020 based on the 2012 data.

MassDEP continues to implement a wide range of program initiatives to reduce waste and increase recycling and composting, while also ensuring that remaining waste is managed and disposed of safely. These initiatives are described in the *Master Plan*.

Goals and Methodology Summary

In the *Master Plan*, the primary quantitative goal is to reduce the amount of annual waste disposal by 30 percent from 2008 – 2020, from 6,550,000 tons of disposal in 2008 to 4,550,000 tons of disposal in 2020. MassDEP also will continue to calculate recycling rates as a point of information, although Massachusetts does not have a recycling rate goal. The methodology for the disposal reduction calculation and recycling rates is summarized in the table below.

Table 1 Methodology Summary		
Waste Reduction Rates		Equation
Disposal Tonnage	=	In State Disposal (Landfill & Municipal Waste Combustor) + Export for Disposal – Import for Disposal
Disposal Tonnage Reduction	=	2008 Disposal – Current Year [2012] Disposal
% Disposal Reduction	=	$\frac{2008 \text{ Disposal} - \text{Current Year [2012] Disposal}}{2008 \text{ Disposal}}$
MSW Recycling Rate	=	$\frac{\text{MSW Recycling} + \text{Composting}}{\text{MSW Generation}}$ (MSW Recycling + Composting + MSW Disposal)
C&D Recycling Rate	=	$\frac{\text{C\&D Recycling}}{\text{C\&D Generation}}$ (C&D Recycling + C&D Other Diversion + C&D Disposal)

Progress in Meeting Disposal Reduction Milestone

In the *Master Plan*, MassDEP established a vision to maximize the diversion of materials from disposal by 2020. The *Master Plan* establishes a specific goal to reduce annual disposal by 2 million tons, or 30 percent, from 2008 to 2020. This is a change from the previous Master Plan, which expressed our waste reduction goals in terms of a waste reduction rate. MassDEP now believes that disposal reduction is a simpler, more direct, and more effective metric for evaluating waste reduction and diversion progress, including source reduction, recycling, composting, and other forms of diversion. Therefore, the *2010-2020 Plan* has shifted from a waste reduction rate to a disposal reduction target as our primary goal for measuring progress. MassDEP will measure disposal reduction by comparing the total disposal in a future year against disposal in 2008 as a baseline year.

Total disposal in 2012 was 5,400,000 tons, a decrease of 1.15 million tons, or 18 percent, from 2008.

Solid Waste Management Overview

Table 2 presents a comprehensive picture of solid waste management in Massachusetts for calendar years 2005-2012. Table 3 highlights how solid waste management changed from 2011 to 2012, including the tonnage and percent change.

Table 2 Integrated Solid Waste Management System 2005-2012 (all data in tons)										
			2005	2006	2007	2008	2009	2010	2011	2012
Total Generation			14,490,000	13,260,000	12,690,000	12,600,000	10,710,000	10,550,000	10,760,000	10,960,000
MSW			9,310,000	8,710,000	8,370,000	8,360,000	7,630,000	7,520,000	7,750,000	7,470,000
Non-MSW			5,190,000	4,550,000	4,320,000	4,240,000	3,080,000	3,040,000	3,000,000	3,490,000
		C&D	5,100,000	4,460,000	3,940,000	3,800,000	2,870,000	2,700,000	2,690,000	3,030,000
		Other	90,000	90,000	380,000	440,000	210,000	340,000	310,000	460,000
Diversification			7,750,000	6,710,000	6,010,000	6,050,000	4,900,000	5,120,000	5,150,000	5,560,000
MSW			3,300,000	2,970,000	2,740,000	2,980,000	2,640,000	2,810,000	2,880,000	2,790,000
		Recycling	2,540,000	2,220,000	1,990,000	2,300,000	1,990,000	2,150,000	2,130,000	2,090,000
		Composting	760,000	740,000	740,000	680,000	650,000	660,000	750,000	700,000
Non-MSW			4,450,000	3,740,000	3,270,000	3,070,000	2,270,000	2,310,000	2,270,000	2,770,000
		C&D Recycling	3,530,000	3,070,000	2,750,000	2,520,000	1,850,000	1,830,000	1,870,000	2,220,000
		Other C&D Diversification	930,000	670,000	510,000	520,000	380,000	440,000	380,000	530,000
Other Non-MSW Diversification						30,000	30,000	30,000	30,000	20,000
Disposal			6,750,000	6,550,000	6,680,000	6,550,000	5,800,000	5,430,000	5,610,000	5,400,000
		Landfill	2,070,000	2,080,000	1,900,000	1,740,000	1,500,000	1,560,000	1,650,000	1,700,000
		MSW	1,760,000	1,880,000	1,760,000	1,560,000	1,330,000	1,280,000	1,390,000	1,380,000
		C&D	240,000	130,000	60,000	130,000	120,000	120,000	70,000	100,000
		Other	70,000	70,000	70,000	50,000	60,000	170,000	190,000	220,000
		Combustion	3,090,000	3,100,000	2,970,000	3,230,000	3,180,000	3,180,000	3,260,000	3,210,000
		MSW	3,080,000	3,090,000	2,960,000	3,210,000	3,180,000	3,170,000	3,250,000	3,210,000
		Non-MSW	10,000	10,000	10,000	10,000	10,000	10,000	10,000	-
		Net Exports	1,580,000	1,370,000	1,820,000	1,580,000	1,120,000	690,000	700,000	490,000
		Export	1,820,000	1,620,000	2,060,000	1,850,000	1,590,000	1,270,000	1,340,000	1,050,000
		MSW	1,360,000	1,000,000	1,090,000	840,000	900,000	690,000	630,000	510,000
		Non-MSW	460,000	620,000	970,000	1,010,000	680,000	580,000	710,000	540,000
		Import	250,000	250,000	240,000	270,000	470,000	580,000	640,000	560,000
		MSW	200,000	230,000	180,000	240,000	420,000	440,000	390,000	420,000
		Non-MSW	50,000	30,000	60,000	30,000	50,000	140,000	240,000	150,000
Amounts may not add exactly due to rounding.										
*Non-MSW combustion was less than 5,000 tons										

Table 3 Solid Waste Tonnage and Percent Change Summary: 2011 - 2012

	2011	2012	Tons Change	% Change
Generation	10,760,000	10,960,000	200,000	1.9%
MSW	7,750,000	7,470,000	(280,000)	-3.6%
Non-MSW	3,000,000	3,490,000	490,000	16.3%
C&D	2,690,000	3,030,000	340,000	12.6%
Other	310,000	460,000	150,000	48.4%
Diversion	5,150,000	5,560,000	410,000	8.0%
MSW	2,880,000	2,790,000	(90,000)	-3.1%
Recycling	2,130,000	2,090,000	(40,000)	-1.9%
Composting	750,000	700,000	(50,000)	-6.7%
Non-MSW	2,270,000	2,770,000	500,000	22.0%
C&D Recycling	1,870,000	2,220,000	350,000	18.7%
Other C&D Diversion	380,000	530,000	150,000	39.5%
Other Non-MSW Diversion	30,000	20,000	(10,000)	-33.3%
Disposal (Incl. Net Exports)	5,610,000	5,400,000	(210,000)	-3.7%
In-State Disposal	4,910,000	4,910,000	0	0.0%
Landfill	1,650,000	1,700,000	50,000	3.0%
MSW	1,390,000	1,380,000	(10,000)	-0.7%
C&D	70,000	100,000	30,000	42.9%
Other	190,000	220,000	30,000	15.8%
Combustion	3,260,000	3,210,000	(50,000)	-1.5%
MSW	3,250,000	3,210,000	(40,000)	-1.2%
Non-MSW	10,000	0	(10,000)	-100.0%
Net Exports	700,000	490,000	(210,000)	-30.0%
Exports	1,340,000	1,050,000	(290,000)	-21.6%
MSW	630,000	510,000	(120,000)	-19.0%
Non-MSW	710,000	540,000	(170,000)	-23.9%
Imports	640,000	560,000	(80,000)	-12.5%
MSW	390,000	420,000	30,000	7.7%
Non-MSW	240,000	150,000	(90,000)	-37.5%

Note: % Change is calculated based on the rounded amounts in this table.
Percentages may not add exactly to 100% due to rounding.

In 2012, 11 million tons of solid waste was generated in Massachusetts, up 1.9% from 10.8 million tons in 2011. Of this amount, 7.5 million tons were municipal solid waste (MSW) (68%) and 3.5 million tons were non-MSW (32%). Of the 11 million tons generated, 5.6 million tons (51%) were diverted (includes recycling, composting, and other diversion) and 5.4 million tons (49%) were disposed.

Figure 1: Total Solid Waste Generation 2012

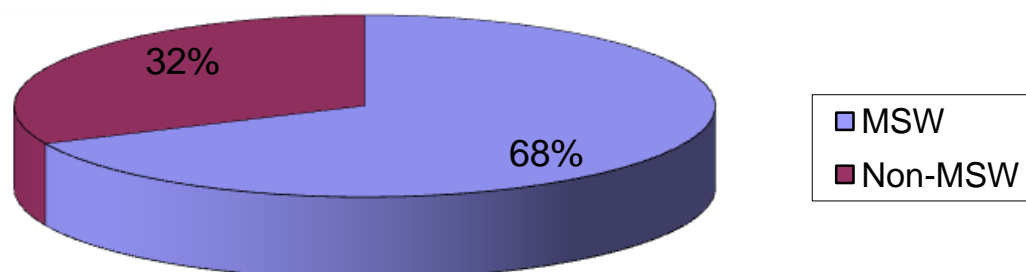


Table 4 shows recycling rates for overall waste (MSW and non-MSW combined), MSW only, and construction and demolition (C&D) materials only. Of the total waste that was generated in 2012, 46% was recycled, up from 44% in 2011. The MSW recycling rate remained at 37% in 2012 after reaching 37% in 2011. The C&D recycling rate increased from 69% in 2011 to 73% in 2012.

Table 4				
Recycling Rates Based on Actual Generation				
	2009	2010	2011	2012
Overall Recycling	42%	44%	44%	46%
MSW Recycling	35%	37%	37%	37%
C&D Recycling	65%	68%	69%	73%

From 2011 to 2012 total disposal decreased by 3.7%. Of the total waste that required disposal, 4.9 million tons (91%) were disposed in-state, of which 1.7 million tons were land filled and 3.2 million tons were combusted. Massachusetts exported 1.1 million tons for disposal and imported 0.56 million tons, and

thus was a net exporter of about 0.49 million tons (9%) of waste requiring disposal. See Table 9 for a more detailed picture of disposal import and export data by state.

Municipal Solid Waste Management

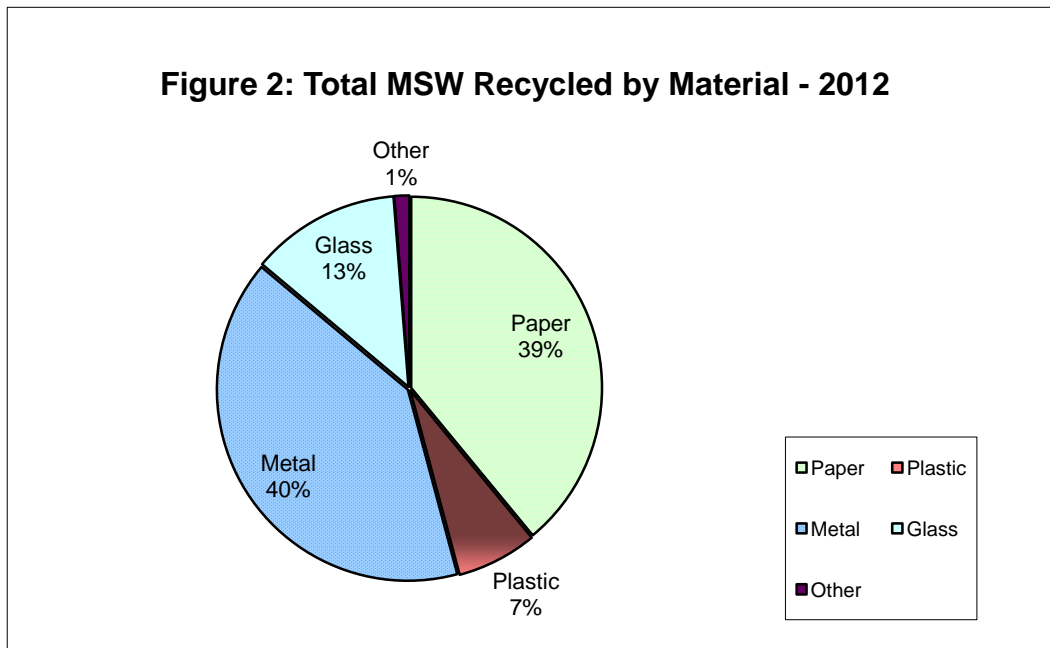
In 2012, 7.5 million tons of MSW were generated in Massachusetts. Of this amount, 37% was recycled or composted, remaining essentially level compared with the two prior years. From 2011 to 2012:

- MSW generation decreased 4% from 7.8 million tons to 7.5 million tons.
- MSW recycling and composting tonnage decreased 3%, from 2.9 million tons to 2.8 million tons.
- MSW disposal (disposal in-state and net export out of state for disposal) remained the same, at 4.9 million tons.
- MSW net exports for disposal decreased from 240,000 tons to 90,000 tons.

Table 5			
How MSW was Managed from 2010 – 2012*			
	2010	2011	2012
Recycled and Composted	37%	38%	37%
Combusted (in state)	42%	41%	43%
Landfilled (in state)	17%	18%	18%
Net Exported for Disposal	3%	3%	1%

*Percentages in this chart are rounded, so that they do not always add up to 100%.

Figure 2 shows the breakdown of MSW recycling by material category, excluding composting.



Non-MSW Waste Management

In 2012, 3.5 million tons of non-MSW were generated in Massachusetts, 3 million tons of which were C&D materials. C&D generation was higher than the 2.7 million tons in 2011. Of the amount generated, 73% was recycled in 2012, up from the 70% recycling rate in 2011. The bulk of the C&D recycling tonnage was asphalt, brick and concrete (ABC), which increased slightly from 2011 to 2012. Excluding ABC materials, the C&D recycling rate was 33% in 2012, up from 22% in 2011. Table 6 shows how C&D was managed from 2009-2012.

Table 6: C&D Materials Management			
	2010	2011	2012
Generated	2,700,000	2,690,000	3,030,000
Recycled	1,830,000	1,870,000	2,220,000
ABC	1,610,000	1,630,000	1,830,000
Metal	100,000	70,000	100,000
Wood Non-Fuel	50,000	10,000	90,000
Wood Waste	10,000	10,000	110,000
Other	50,000	50,000	70,000
Other Diverted (not recycling)	440,000	380,000	530,000
Grading and Shaping/LF Cover Material/LF Roads	320,000	210,000	350,000
C&D Wood for Fuel	120,000	170,000	180,000
Disposed	420,000	450,000	280,000
<i>In-state</i>	120,000	70,000	100,000
<i>Out-of-state</i>	310,000	380,000	180,000

*Other materials include ceiling tiles, carpet, gypsum wallboard, and asphalt roofing shingles. Amounts may not add exactly due to rounding.

Other Non-MSW Management

Some non-MSW materials other than C&D are disposed in Massachusetts landfills and combustion facilities or sent out of state for disposal each year. In 2012, 230,000 tons of these materials were disposed in-state, including industrial waste, medical waste, wood waste, ash and sludge. Approximately 210,000 tons were disposed of out-of-state on a net basis; 320,000 tons were sent out of state for disposal and 110,000 were sent from other states to be disposed in Massachusetts. These materials include asbestos-containing materials, sludge, and contaminated soils.

In addition, a significant amount of other non-MSW materials are managed each year in management systems that are tracked separately from the primary MSW/C&D waste management system. These include MSW combustion ash disposal, use of materials as alternative daily cover at landfills (both active and inactive), and other beneficial uses of materials in non-landfill applications. Table 7 shows materials used as daily cover at active landfills in Massachusetts.

Table 7 Reported Daily Cover Material at Active Landfills (in tons)			
	2010	2011	2012
Auto Shredder Residue	110,000	170,000	180,000
Bottom Ash	150,000	150,000	160,000
Soil/Sand	180,000	140,000	170,000
Contaminated Soils	300,000	330,000	400,000
C&D Fines and Residuals	140,000	90,000	90,000
Other Materials¹	80,000	120,000	110,000
TOTAL	980,000	1,000,000	1,110,000

Municipal Waste Combustor Ash

Seven waste-to-energy combustors operated in Massachusetts in 2012. In 2012, these combustors generated approximately 816,000 tons of combustion ash (excluding recovered post-burn metals), 195,000 tons of which was beneficially reused and 621,000 tons of which was disposed. Recent regulatory changes have eliminated the requirement to manage ash in a mono-fill facility, so that ash disposal locations may shift over time. The status of existing ash landfills is summarized in Table 8. MSW combustion ash also was disposed of in several other landfills in addition to those listed here in 2012.

Table 8 Active MSW Combustion Ash Landfills in Massachusetts²		
Municipality	Site Name	Current Permit Expires
Agawam	Bondi's Island Ash Landfill	2022
Carver	CMW Ash Landfill	2016
Haverhill	Ward Hill Neck Ash Landfill	2018
Peabody	Peabody Ash Monofill	2019
Saugus	Wheelabrator Ash Landfill	2015
Shrewsbury	Shrewsbury Ash Landfill	2031

Disposal Import/Export Data for 2010-2012

Table 9 shows MSW and C&D data exported and imported for disposal by state. The export and import data for Massachusetts was collected from annual facility reports (AFR) submitted to MassDEP and from direct correspondence with other states. In some instances, the export data provided in the AFR differed from that reported from other states. In order to make the most inclusive estimate of export, the higher number from the two sources was used. For example, if

¹ "Other Materials" includes approximately 20 various materials.

² Although these landfills generally accept MSW combustion ash only, they may at times accept other materials for disposal.

an AFR reported that Massachusetts sent Connecticut 10,000 tons of MSW, and Connecticut reported receiving 29,000 tons of MSW from Massachusetts, 29,000 tons of export was used.

Table 9: Disposal Import/Export Data by State (tons): 2009-2012								
MSW Exported				C&D Exported				
	2010	2011	2012			2010	2011	2012
CT	26,620	14,872	6,544		ME	47,012	97,405	7,449
ME	248,794	233,625	182,530		NH	27,417	42,361	9,028
NH	225,671	199,523	148,889		NY	2,803	112	41,779
NY	189,131	181,507	49,699		OH	197,757	244,022	160,417
OH	1,502	0	120,549		RI	38,170	1,096	27
RI	45	0	0		VT	6,495	1,802	0
SC	0	0	0		TOTAL	319,654	386,798	218,700
VA	21	0	0					
TOTAL	903,004	629,527	508,211					
MSW Imported				C&D Imported				
	2010	2011	2012			2010	2011	2012
					CT	563	102	20,045
CT	121,170	79,431	93,471		ME	12	3	0
ME	2,126	1,927	0		NH	9,683	10,034	6,255
NH	95,463	82,971	63,292		NY	0	0	0
NY	18,579	19,612	22,854		RI	2,130	155	8,309
RI	184,777	191,625	224,482		VT	0	42	5
VT	17,318	17,832	12,326		TOTAL	12,388	10,336	34,614
CANADA	0	30	12					
TOTAL	439,433	393,428	416,437					

Waste Management Capacity Projections

Table 11 projects waste management capacity through 2020. These projections are based in part on the disposal capacity projections shown in Table 10. These projections assume generation increases slightly from 2012-2020 (1 percent/year). These projections also assume that 76% of potential landfill disposal capacity is utilized (based on recent historical capacity utilization rates). The waste management capacity projections estimate two different scenarios:

- 1) baseline recycling remains level with generation (i.e., the recycling rate remains the same), and
- 2) recycling tonnage increases 4.0% per year from 2012-2020, meeting the goal of reducing disposal tonnage by 30% by 2020.

The projections show projected management capacity and net export through 2020. Under scenario 1, net export for disposal in 2020 is projected to be 2.2 million tons. Under scenario 2, net export for disposal in 2020 is projected to be 0.6 million tons.

The disposal capacity projections in Table 10 reflect either actual permitted capacity or approved capacity contingent on receiving permits. However, in some cases, landfills may take in less than their permitted tonnage in a particular year. In these cases, capacity for a particular landfill may last beyond the date shown in these projections. MassDEP attempts to take this factor into account by projecting only 76% of potential landfill capacity in showing waste management capacity projections in future years. The combustion capacity is shown as level based on actual 2011 tons burned, although this actual amount managed will vary slightly from year to year.

Table 10: Projected Disposal Capacity 2014-2020 (Tons Per Year)											
Municipality	2011 Actual Disposal	2011 Permitted Capacity	End of current permitted capacity	Lifetime of LF	2014	2015	2016	2017	2018	2019	2020
Active Landfills											
Barre	56,240	93,600	2015	2015	93,600	93,600	0	0	0	0	0
Bourne	178,415	219,000	2016	2025	219,000	219,000	219,000	219,000	219,000	219,000	219,000
Carver	96,347	175,000	2016	2016	175,000	175,000	175,000	175,000	175,000	175,000	175,000
Chicopee	192,822	365,000	2017	2017	365,000	365,000	365,000	365,000	0	0	0
Dartmouth	78,658	115,000	2014	2021	115,000	115,000	115,000	115,000	115,000	115,000	115,000
Fall River	276,758	468,000	2014	2014	468,000	0	0	0	0	0	0
Middleborough	28,316	39,676	2017	2031	39,676	39,676	39,676	39,676	39,676	39,676	39,676
Nantucket	2,101	26,000	2020	2020	26,000	26,000	26,000	26,000	26,000	26,000	26,000
Southbridge	173,353	305,000	2019	2019	405,600	405,600	405,600	405,600	405,600	405,600	0
Sturbridge	563	410	2016	2016	410	410	410	0	0	0	0
Taunton	76,321	120,120	2015	2015	120,120	120,120	0	0	0	0	0
Westminster	231,666	390,000	2015	2022	390,000	390,000	390,000	390,000	390,000	390,000	390,000
Municipal Waste Combustors											
Agaw am	125,622	130,000			130,000	130,000	130,000	130,000	130,000	130,000	130,000
Haverhill	584,558	570,000			570,000	570,000	570,000	570,000	570,000	570,000	570,000
Millbury	489,165	480,000			480,000	480,000	480,000	480,000	480,000	480,000	480,000
North Andover	459,922	450,000			450,000	450,000	450,000	450,000	450,000	450,000	450,000
Pittsfield	79,788	80,000			80,000	80,000	80,000	80,000	80,000	80,000	80,000
Rochester	1,116,419	1,100,000			1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
Saugus	400,234	410,000			410,000	410,000	410,000	410,000	410,000	410,000	410,000
	4869008	5929806									
TOTAL PERMITTED CAPACITY					5,637,406	5,054,406	4,450,686	4,056,276	3,625,600	3,625,600	3,220,000
TOTAL POTENTIAL CAPACITY					5,637,406	5,169,406	4,955,686	4,955,276	4,590,276	4,590,276	4,184,676
KEY:											
Permitted Capacity	Number without shading										
Potential Additional Capacity	Number with shading										
ESTIMATED TOTAL POTENTIAL AVAILABLE CAPACITY					5,057,229	4,701,549	4,539,121	4,538,810	4,261,410	4,261,410	3,953,154
76% of potential for LFs and 100 % of combustion capacity											
based on 2010 tons burned, rounded up to the next 10,000 tons											
actual combustion amount will vary slightly year to year											
	Total Potential LF Capacity				1,837,229	1,481,549	1,319,121	1,318,810	1,041,410	1,041,410	733,154
Actual 2010 disposal for MVCs is actual tonnage burned minus post combustion metal recovery.											
MVC disposal capacity is not a fixed tonnage amount, but rather a function of the facility's air permit and may vary slightly.											

Table 11: Waste Management Capacity Projections: 2014-2020

	2014	2015	2016	2017	2018	2019	2020
Generation	11,184,840	11,296,689	11,409,656	11,523,752	11,638,990	11,755,380	11,872,933
Baseline Recycling	4,993,867	5,043,805	5,094,243	5,145,186	5,196,638	5,248,604	5,301,090
Increased Recycling	5,452,213	5,670,302	5,897,114	6,132,998	6,378,318	6,633,451	6,898,789
Non-M SW Other Diversion	414,593	418,739	422,926	427,156	431,427	435,742	440,099
Combustion Capacity	3,240,000	3,240,000	3,240,000	3,240,000	3,240,000	3,240,000	3,240,000
Potential LF Capacity	1,837,229	1,481,549	1,319,121	1,318,810	1,041,410	1,041,410	733,154
In-state Capacity (baseline recycling)	10,485,688	10,184,093	10,076,291	10,131,151	9,909,475	9,965,755	9,714,343
In-state Capacity (increased recycling)	10,944,035	10,810,589	10,879,162	11,118,964	11,091,155	11,350,602	11,312,042
Net Disposal Export (baseline recycling)	699,152	1,112,596	1,333,364	1,392,601	1,729,515	1,789,624	2,158,591
Net Disposal Export (increased recycling)	240,805	486,099	530,494	404,788	547,834	404,777	560,891
Assumptions for Annual Percent Change:	2014-2020						
Generation	10%						
Baseline Recycling Tonnage	10%						
Increased Recycling Tonnage	4.0%						
Non-M SW Other Diversion	10%						
Baseline recycling assumes recycling changes at the same rate as generation.							
Non-M SW Other Diversion includes fines and residuals for landfill uses and non-M SW for fuel.							
Combustion Capacity is projected to remain level from 2011 through 2020 based on 2010 tonnage accepted.							
Future landfill capacity is calculated to be 76% of total potential based on historical disposal patterns.							
Net export is calculated by subtracting In-State Management Capacity from Generation.							
In-State Management Capacity is the sum of Recycling, other Non-M SW Diversion, Combustion Capacity and Potential Landfill Capacity.							
disposal total - increased recycling	5,318,034	5,207,648	5,089,615	4,963,598	4,829,244	4,686,187	4,534,045
disposal total - baseline recycling	5,776,380	5,834,144	5,892,486	5,951,411	6,010,925	6,071,034	6,131,744

