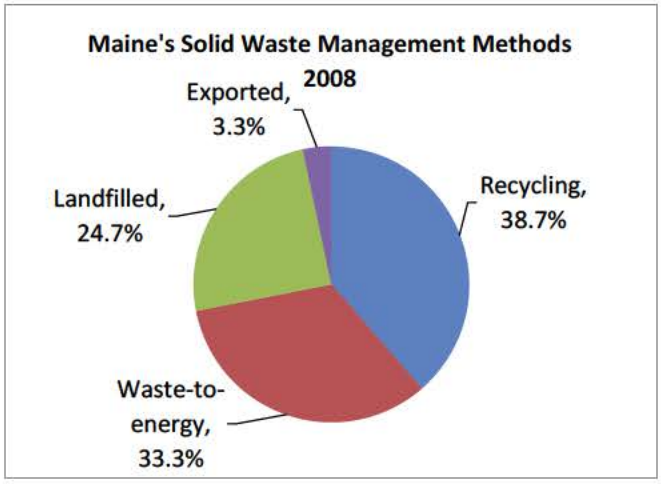
Solid Waste Generation & Disposal Capacity Report

For Calendar Year 2008



Prepared by the Maine State Planning Office

for the

Joint Standing Committee on Natural Resources of the 124th Legislature

March 2010

Acknowledgements

This report is prepared by the State Planning Office in accordance with 38 MRSA §2124-A.

Calculations are based on data provided by municipalities, commercial recycling brokers, and public and private disposal facilities. We would like to thank the hundreds of municipal officials and private sector waste management and recycling companies who helped with supplying data. Without them, the State Planning Office could not produce this report.

Data from calendar year 2008 are the most current and complete data available for this report.

Executive Office
State Planning Office
Waste Management & Recycling Program
38 State House Station
184 State Street
Augusta, Maine 04333-0038
(207) 287- 8934
www.maine.gov/spo/recycle

March 2010

Printed under Appropriation #014 07B 1655 008208

Contents

Executive Summary 4

By the Numbers 10

I. Introduction 12

ll. Municipal Solid Waste Generation 15

III. Recycling 17

IV. Existing and Planned Processing and Disposal Capacity 21

V. Projected Waste Processing and Disposal Needs and Capacity 31

Vl. Disposal Prices 36

VlI. Analysis of Consolidation within the Solid Waste Industry 37

Appendices 40
A. Waste Disposal Capacity Available, 2008-2020 40
B. Legislative Reference 41
C. Maine Recycled Materials, 1997-2008 42
D. Maine MSW Generation and Retail Sales Comparison, 1998-2038 43

Executive Summary

This report is submitted to the Joint Standing Committee on Natural Resources pursuant to 38 MRSA §2124-A. It provides an overview of Maine's municipal solid waste generation, recycling, combustion, and landfill activities for 2008, in order to:

1) determine the impact of these activities on available solid waste disposal capacity,
2) identify planned and consumed capacity at disposal facilities, and
3) project the lifespan of capacity.

The report also determines the state's recycling rate.

The State Planning Office prepares this capacity report annually, which allows policymakers to scrutinize progress and effectiveness of Maine's solid waste policies against the most current numbers and projections. The objective is to inform policy discussions with information about changes and trends in Maine's solid waste management practices.

Below is a summary of key findings for policymakers based on an the State Planning Office's analysis of data and trends.

Key Findings

Municipal solid waste generated in Maine decreased with the economic downturn.

For the first time in 15 years, residents and businesses in Maine generated signifcantly less waste than the previous year. Waste generation decreased by 8.7% from 2007 to 2008. This decrease reflects the national economic slowdown. And we expect this trend to continue for several more years before starting to reverse itself. Based on early economic indicators, we do not expect waste to reach 2007 levels again until 2015.

Waste generation is largely tied to our consumption of goods. There is a modest trend in waste reduction from decreases in the weight of consumer goods (for example, when products get smaller, are made of lighter weight materials, or use lighter weight packaging). But these trends are often overshadowed by the greater amount of waste we produce.

The amount of waste we generate impacts our need for disposal capacity, consumes resources to manage, and poses environmental concerns in its handling.

Mainers continue to recycle more.

The State has a goal to recycle 50% of its waste each year. Maine's recycling rate has remained fairly steady for the past five years, at about 35% to 36%. In 2008, it increased to 38.7%.

Maine's statewide recycling rate is calculated by dividing the total amount of municipal solid waste recycled (including composting) by the total amount generated. Thus, the rate is driven equally by the amount of waste we recycle and the amount we produce.

In the past five years, the amount of waste we generate has increased at a faster pace than we recycled. So, even though we recycled more in actual tonnages, the rate stayed the same or declined.

In 2008, that changed. Both solid waste generation and recycling decreased. But, generation decreased at a higher rate than recycling, causing the statewide recycling rate to rise.

Mainers recycle over 700,000 tons of waste per year. To achieve our recycling goal of 50%, we would need to recycle 900,000 tons per year, at today's generation levels.

A 50% recycling rate is achievable, with new resources and policy changes. In the *2009 State Waste Management and Recycling Plan*, for example, the Office estimates that a disposal ban on corrugated cardboard alone could capture 20% of the tonnage needed to reach Maine's 50% recycling goal.[1]

Maine recycles and combusts for energy its municipal solid waste to reduce reliance on landfilling.

Thirty-three percent of Maine's total municipal solid waste tonnage was delivered to the four waste-to-energy facilities while recycling managed 38.7%, and both activities reduced the volume of waste requiring landfilling.

The balance of Maine's solid waste (24.7%) was directly landfilled.[2] This percentage landfilled does not include waste produced from the combustion of municipal solid waste (MSW) or other MSW processing residues. We focus on the tonnages directly landfilled, rather than waste processed before it is landfilled, for pratical reasons –that is to keep our eye on the ball. Wastes accepted by waste-to-energy plants and processed into residues before landfilling are much reduced in volume. Wastes that are directly landfilled, which could be recycled or diverted for other uses, are the major consumer of landfill space. We recognize that this emphasis on how we present the data could change if greater processing capacity is established in Maine.

[1] For additional strategies to increase recycling, see the *2009 State Waste Management and Recycling Plan*, available on-line at http://www.maine.gov/spo/recycle/publications.htm.

[2] Exported waste accounts for the remaining 3.3% of the total.

The good news is that, overall, Maine landfills less than it combusts or recycles.

Maine imports solid waste to fuel its waste-to-energy plants.

In 2008, Maine imported over a half million tons of municipal solid waste, largely by the State's four waste-to-energy facilities. Reflecting Maine's economy and a slowdown in domestic waste being delivered to them, the four waste-to-energy facilities increased their importation of municipal solid waste in order to meet tonnage requirements for their energy contracts.

The State Planning Office expects that imports of municipal solid waste (MSW) will continue at waste-to-energy facilities, and will be gradually replaced by Maine MSW, but only as the economy recovers and generation of in-state waste increases.

While economics have increased the amount of municipal solid waste imported by waste-to-energy facilities, the amount of out-of-state waste landfilled is expected to decline, largely due to the closure of Pine Tree Landfill in Hampden in 2009. Maine's 20-year-old policy to ban the development of new commercial landfill capacity was intended to help limit waste imports and it appears it will have its intended effect.

Maine has sufficient statewide disposal capacity until 2018.

Maine will need from 22.6 to 25.7 million cubic yards of landfill capacity over the next 20 years. The State currently has 15.8 million cubic yards of licensed capacity.

As the table in Appendix A shows, Maine has capacity in our state-owned and private landfills together to manage the total wastes generated through 2017-18. Currently, Juniper Ridge, the the state-owned landfill, has licensed capacity that will last until 2016-2017, using either a projected 2.8% growth rate or a more conservative 1% growth rate in wastes delivered to the facility. The Crossroads Landfill has projected capacity for three to four additional years, to 2020-21.

Maine's nine municipally-owned landfills have on average sufficient projected capacity through 2035 for their own use.

Even given the economic slowdown, Maine will need to begin planning for new landfill capacity in the next one to two years.

Maine can reduce its reliance on landfills by increasing recycling and diverting waste to better uses.

Maine could decrease its landfill capacity needs by 25% over the next 20 years by recycling 50% of its municipal solid waste each year.

Although results at individual landfills will vary due to the kinds and amounts of

solid waste they receive, 50% recycling would decrease Maine's overall capacity needs from a range of 22.6 to 25.7 million cubic yards to a range of 16.9 to 19.3 million cubic yards, depending upon the rate of growth of municipal solid waste over the 2010-2028 timeframe. Thus achieving 50% recycling (or greater) would have a significant effect on Maine's need to develop new capacity.

Costs vary, but the State Planning Office estimates that it costs $20-30 per cubic yard to permit and develop new landfill disposal capacity depending on types of waste and size of footprints. Developing new landfill capacity to meet 20 years of Maine's disposal needs after the existing landfill space is consumed is likely to cost roughly $136 million. Reducing the amount of landfill space needed through recycling could lower the landfill development costs by as much as $30 million.

Currently, in Maine much of these costs would be borne upfront by commercial owners or operators and paid back over time by municipalities and other users through tipping fees on the disposal of solid waste. In those municipalities with their own landfills, property taxpayers bear the cost of new landfill development.

We can also estimate the cost to build Maine's recycling infrastructure to accommodate increases in materials and tonnages that would be collected at a 50% recycling rate. This would be roughly $5-6 million and likely would be borne by property taxpayers and private investors, perhaps with some state funds as incentives.

Maine can choose where it wants to invest its resources.

Maine's disposal capacity supply and demand has had no measurable effect on disposal pricing in 2008.

One of the things current law asks us to look at in this capacity report is the impact of disposal capacity on tipping fees with an eye to monitoring collusion or other forms of monopolistic, oppressive practices.

In 2008, the Office found no significant changes in disposal prices in Maine.

The operator of the Juniper Ridge Landfill is bound by a cap on tipping fees, imposed by the State in its Operating Services Agreement. Under the current agreement, the operator cannot charge more than $68 per ton for municipal solid waste and CDD wastes and $56 per ton for special wastes delivered to the Juniper Ridge Landfill. Because of this cap, Juniper Ridge is perceived by the private and public waste sectors as having an effect on disposal pricing. The cap acts as a check on pricing for the disposal of similar materials at other solid waste facilities.

Maine's solid waste industry is diverse and competitive.

The law also asks the Office to analyze the ownership of the collection, recycling, hauling, and disposal sectors of Maine's solid waste industry for

undue consolidation and the potential for unfavorable impacts on competition. The Office examines these industry sections to look for conditions that might create either a lack of service or a monopolistic situation.

Maine's solid waste industry is a mix of public and private investments and services that handles 5,000 tons of materials each day (including recyclables). We believe that Maine's interrelated system of collection, recycling, hauling, and disposal currently serves Maine's solid waste management needs fairly and effectively.

Key Questions for Policymakers

Based on the foregoing analysis, the State Planning Office identifies the following key questions that policymakers may want to consider for Maine solid waste policy going forward:

- Does Maine want to change current state policy in a way that would regulate or mandate more recycling in order to achieve a 50% recycling rate and reduce our reliance on landfilling?

- Does Maine want to invest resources in building public recycling infrastructure or in developing new landfill capacity (or both)?

- Does Maine want to continue its ban on new commercial landfill capacity to help control the importation of municipal solid waste, or remove the ban to foster new landfills that will help meet Maine's anticipated capacity need in the next eight years?

Our Methodology

The data used from this report comes from a variety of sources:

- recycling and waste disposal data submitted by local and regional recycling programs to SPO and Department of Environmental Protection;

- solid waste disposal data from the public and private disposal facilities' annual license reports to DEP; and

- commercial recycling data from survey data.

The Office combines the tonnages of waste processed and disposed, as well as that recycled, composted, and reused, to create a reliable estimate of the total municipal solid waste generation in Maine.

To estimate recycling, the Office combines municipal and private recycling tonnages and adjusts the figures to eliminate duplicate counting of recyclables. The calculation is not a precise measurement. Some data are incomplete, particularly for composting and

reuse efforts. The Office estimates that the overall rate is accurate to within two (2) percentage points.

To estimate landfill capacity, the Office accepts landfill capacity estimates from the public and private facilities, calculates the amount of waste being disposed at each facility, projects the amount of waste expected to be disposed over time (subtracting out expected recycling tonnages), and determines the life span of each facility and a statewide total.

Traditionally, the Office based projections of solid waste generation on historical data. From 1993 – 2007, solid waste generation increased 4% per year. The years 2008 and 2009 changed all that. Based on two years of economic downturn, which has reduced waste generation in Maine, we have modified our projections. In this report we project a continued decline in waste generation in 2009, zero percent growth in 2010 and 2011, and then, based on averaging into the historical data the downturn years, a more modest increase of 2.8% per year starting in 2012.

In addition, for comparison purposes, the Office also projected a very conservative increase of 1% to measure the impact of a possible slower economic recovery. Using the same estimates of zero increases in 2010-2011, and then a more modest increase of 1% starting in 2012, the Office projects a slightly more advantageous impact on landfill disposal capacity. The 1% scenario shows a possible extension of disposal capacity of up to one year.

Lastly, we have examined state economic indicators as an alternative to historical data to project future waste amounts. SPO economists found a strong correlation between Maine retail sales and waste generation. We have included an analysis of that comparison in Appendix D. As such, waste generation increases appear to closely mirror reliable projections for retail sales in Maine. The Office will track that correlation in the future as the recession eases to see if it holds.

Additional assumptions used in making these projections:

- Recycling tonnages increase as waste generation increases to maintain a 38.7% recycling rate;
- Exported waste remain at 2008 levels;
- Continued operation of and reliance on the four waste-to-energy facilities, at the existing mix of tonnages (out-of-state waste, processed residues, etc); and
- No significant change in municipally-operated landfills.

Projections and assumptions would change should we see significant closures or start-ups of waste processing or disposal facilities, major swings in market conditions for recyclables, or policy changes to increase public and private recycling.

By the Numbers

This section provides an overview of Maine's municipal solid waste (in tons) in 2008 compared to 2007.

Management of Maine's Municipal Solid Waste

Maine in-state generated solid waste	**2007**	**2008**
Total Municipal Solid Waste Generation	2,007,594	1,833,634
Recycled/Reused	718,613	709,624
Combusted	409,153	370,082[3]
Landfilled	819,337	691,490[4]
Exported	60,491	62,438
Imported	456,580	529,125

Recycling in Maine

Maine in-state recyclables	**2007**	**2008**
Municipal/Public Efforts	201,358	266,977
Commercial/Business Efforts	517,255	442,647
Total Tons Recycled	**718,613**	**709,624**
% of MSW Recycled	**34.8%**	**38.7%**

Processing for Combustion at Waste-to-Energy Facilities

Combined in-state and out-of-state	**2007**	**2008**
Combusted	503,226	515,872
By-pass	27,014	20,520
FEPR	110,016	117,069
Metal	22,032	22,138
Ash	164,003	175,261
Total MSW Delivered to WTE	**826,292**	**850,860**

Deliveries of Out-of-state Generated Municipal Solid Waste

Out-of-state wastes (MSW only)	**2007**	**2008**
MSW – Maine Energy	117,320	160,118
MSW – PERC	37,148	80,343
MSW – ecomaine	0	2,826
MSW – Mid Maine Waste Action Corp.	0	110
MSW Landfilled – commercial landfills	8,576	0
CDD Landfilled – Pine Tree	290,493	285,728
CDD Landfilled – Crossroads	3,043	0
Total Imported	**456,580**	**529,125**

[3] includes in-states wastes only

[4] includes the 24.7 percent of MSW that is directly landfilled and the processing residues and ash from the combustion of Maine MSW. It is included under "landfilled" rather than "combusted" in order to avoid double counting

Landfill Disposal

Combined in-state and processing residues	**2007**	**2008**
Juniper Ridge	309,950	426,761
9 Municipal Landfills	142,143	149,911
Municipal CDD Landfills	28,000 (est.)	Insufficient data
2 Commercial Landfills	399,638	212,539
Total Landfilled	**879,731**	**789,211**

Disposal Capacity in Maine[5]

		3 Years	5 Years	10 Years	20 Years
WTE Facility Capacity	2008 Capacity – currently available (tons/year)	2011 Capacity – projected remaining (tons/year)	2013 Capacity – projected remaining (tons/year)	2018 Capacity – projected remaining (tons/year)	2028 Capacity – projected remaining (tons/year)
MMWAC - Auburn	70,000	70,000	70,000	70,000	70,000
ecomaine - Portland	170,000	170,000	170,000	170,000	170,000
Maine Energy - Biddeford	310,000	310,000	310,000	310,000	310,000
PERC - Orrington	304,000	304,000	304,000	304,000	304,000
Total	**854,000**	**854,000**	**854,000**	**854,000**	**854,000**
Landfill, Disposal Capacity 2.8% projected growth rate	2008 Licensed Capacity – end of year (cubic yards)	2011 Licensed Capacity – end of year (cubic yards)	2013 Licensed Capacity – end of year (cubic yards)	2018 Licensed Capacity – end of year (cubic yards)	2028 Licensed Capacity – end of year (cubic yards)
State Landfills (2):					
Carpenter Ridge – T 2 R 8	Undeveloped	Undeveloped	Undeveloped	Undeveloped	Undeveloped
Juniper Ridge – Old Town	6,549,473[6]	4,180,733	2,534,630	0	0
Juniper Ridge – Old Town (expansion being sought)	Unlicensed	Unlicensed	Unlicensed	Unlicensed	Unlicensed
Municipal Landfills (9)					
7 - Municipal landfills	3,523,580	1,900,000	1,600,000	2,500,000	1,200,000
2 - Municipal - ash	1,107,000	1,000,000	880,000	580,000	0
Commercial landfills (2)					
Crossroads - Norridgewock	4,254,517[7]	3,381,517	2,774,845	1,099,141	0
Pine Tree - Hampden	395,000	0	0	0	0
Total	15,829,570	10,462,250	7,789,475	4,179,141	1,200,000

[5] This table projects the continued operation of the four waste-to-energy facilities. It does include planned expansions of the Presque Isle, Tri-Community and Juniper Ridge Landfills but the permitted capacity may vary from these projections, since that new capacity is dependent upon receiving the necessary environmental approvals.

[6] The annual landfill report indicated 7,735,357 cubic yards of capacity remaining at the end of 2008 but the operator revised their projections to reflect the loss of planned mechanically stablized berms reducing availablecapacity.

[7] The annual landfill report indicated 4,098,599 cubic yards of capacity remaining at the end of 2008 but the owner revised their projections in July of 2009 to 4,254,517 cubic yards of remaining capacity.

I. Introduction

Maine law requires the State Planning Office to report annually to the Legislature on the State's recycling rate and disposal capacity needs. The full statutory language appears in Appendix B.

This capacity report provides policymakers with the information to plan for and make decisions about future capacity investment. Maine law requires that the Legislature be notified with recommendations for developing new disposal capacity when there are six years of capacity remaining. This report provides the basis for those recommendations. The report also assists policymakers with understanding progress toward our waste reduction and recycling goals and its impact on disposal capacity.

About this Report

The report includes a projection of the solid waste disposal needs of Maine for the next 3, 5,10, and 20 years. The report also analyzes how the fill rate at each solid waste landfill could affect the expected lifespan of that landfill. In addition, the report assesses supracompetitive pricing and its possible implications as well as a review of consolidation within the solid waste industry sectors.

Data for the calculations in this report are provided by municipalities, commercial recycling brokers, and public and private disposal facilities. Data from calendar year 2008 are the most current, complete data available for this report.

This report focuses on municipal solid waste (MSW) as defined by Maine law. MSW comprises household, baggable waste, and construction demolition debris, including such items as furniture, tires, and metal.

Though this report focuses on municipal solid waste, it does include some sludge and ash tonnages considered 'special wastes.' Special wastes are generated by other than housholds or typical businesses and, due to their quantity or chemical or physical properties, require particular handling. They include primarily ashes, sludges, and some processing wastes. This report provides details on those special wastes, which are residues of managing municipal solid waste, primarily incinerator ash.

Industrial wastes are not included in this report. Industrial wastes are not part of the waste managed by municipalities. These wastes are typically managed by the generator and disposed at generator-owned facilities or out-of-state.

The Report and the State Plan

In addition to this disposal capacity report, the State Planning Office prepares the state waste management and recycling plan every five years. The state plan contains data on capacity needs. The capacity report updates the numbers annually. This "link up" allows

policymakers to annually scrutinize the progress and effectiveness of Maine's solid waste policies and programs against the most current numbers and projections supplied by the capacity report. The objective is for timelier, policy-guided reviews of any changes and trends in Maine's solid waste management practices and for translation of the information gained into appropriate action.

We believe the key to achieving Maine's statutory waste management goals is our ability to make the short-term course corrections (consistent with the state plan) when and where they are indicated by the findings in the capacity report.

In this capacity report, the Office identifies the following corrections and changes to the assumptions of the state plan that deserve monitoring.

Recycling

- Markets for recycled materials have rebounded from the late 2008 downturn and now exceed the market highs of the first quarter of 2008. Prices on some commodities are close to the record prices of 1995.
- Maine's recycling rate jumped almost 4% from 34.8% in 2007 to 38.7% in 2008, the largest single year rise since 1993.
- The 124th Legislature passed, and the Governor signed into law, product stewardship legislation that will create a process to designate certain consumer products for inclusion in a program similar in concept to Maine's E-waste recycling program and remove them from disposal.

Capacity

- The plan estimated Maine's 20-year land disposal capacity needs at 34 million cubic yards predicated on a 4% annual growth in MSW based on historical trends. This report revises both numbers downward. As a result, landfill capacity needs drop to between 22 and 25 million cubic yards based on a low growth rate of 1% and a top growth rate of 2.8%. We offer two rates for consideration: the top rate of 2.8% based on historic trends and the low rate of 1% because the intial reports from local transfer facilties and disposal sites indicate that MSW generation tonnage would drop again in 2009.
- The plan projects capacity in the event that Juniper Ridge, the state-owned landfill, is expanded. The Juniper Ridge operator and State Planning Office submitted a public benefit determination application for the expansion, the first step in the process of securing the 21.9 million cubic yards of available capacity at the facility. The Commissioner of the Maine DEP issued a draft denial and the operator and Office withdrew the application with plans to resubmit at some point in the future.
- The issue of allowing applications for the expansion of commercial landfill disposal facilities is back in front of the Legislature. The Joint Standing

Committee on Natural Resources will study this and other issues over the 2010 summer.

Waste to Energy (WTE)

- The downturn in Maine's generation of MSW caused the WTE facilties to import more tonnage from out of state than in previous years. The plan assumed a gradual but constant decline in the amount of out of state waste required by the WTEs as Maine generation grew.
- There has been no change in the status of the Maine Energy Recovery (MERC) facility in downtown Biddeford, although in 2009 Casella Waste Systems, MERC's owner, announced in trade journals it was actively seeking a buyer for the 24-year-old plant, while at the same time officials in Biddeford and Saco are attempting to find a way to close it down.
- Penobscot Energy Recovery Company (PERC) officials announced their active strategic planning for continuing processing wastes after their 2018 contracts expire, and their planning for a system that will process less waste.

II. Municipal Solid Waste Generation

A. Methodology

Municipal Solid Waste

Municipal solid waste (MSW) is waste typically generated by households and businesses and managed by municipalities. It includes household garbage and other waste including recoverable materials such as cardboard, newsprint, office and mixed papers, food waste, plastics, glass, metals, and textiles, appliances, furniture, tires, wood waste, and yard waste as well as construction and demolition debris.

Construction/Demolition Debris (CDD) are the wastes generated by building, remodeling and destruction activities and may include such wastes as wood and wood products, concrete and brick, gypsum board, shingles, and other common components of buildings. Maine includes CDD in its definition of MSW.

Waste Generation Calculation

The State Planning Office uses three pieces of data to determine the statewide generation of municipal solid waste:

1. data provided by municipalities in their annual solid waste reports to the State Planning Office;
2. data provided by public and private disposal facilities in their annual license reports to the Maine Department of Environmental Protection; and
3. data provided by commercial recyclers and end-users in a voluntary survey.

The Office combines the tonnage of waste processed and disposed, as well as that recycled, composted, and reused, to create an estimate of the total municipal solid waste generation in Maine.

B. Statewide Municipal Solid Waste Generation

Maine residents and visitors generated 1,833,634 tons of municipal solid waste in 2008. Waste generation is a function of population growth, lifestyles, economic activity, and manufacturing and production practices. The drop in solid waste generation rates reflects the economic downturn that began in 2008.

As shown in Figure 1, over the recent past, waste generation growth had leveled. From 1993 through 2001 MSW grew 42%, at an annual growth rate over 4.5%. But from 2002 through 2007, overall growth was less than 1%. In 2008 the total waste generated fell by 173,960 tons, an 8.7% decrease.

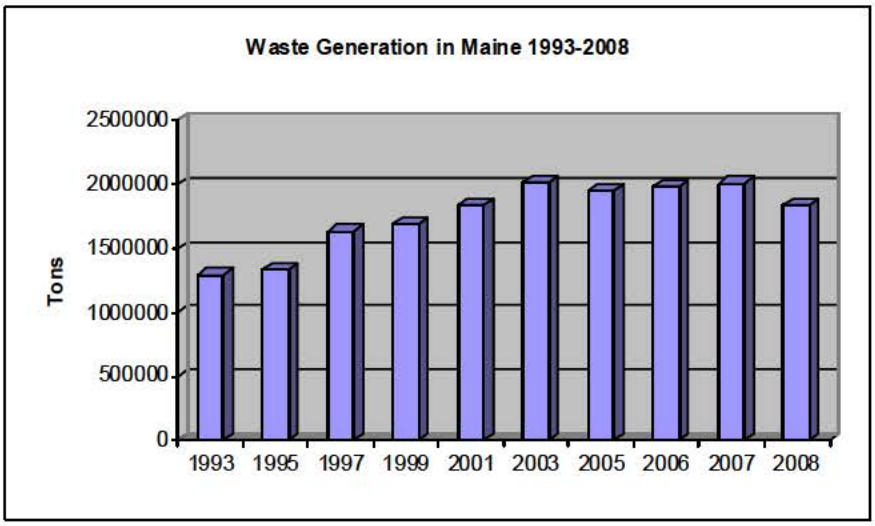


Figure 1: Maine Waste Generation, 1993-2008
Source: State Planning Office

C. Per Person Waste Generation

Each Maine resident generated approximately 2,800 pounds of MSW in 2008 or about 7.6 pounds of waste per person per day,[8] which is higher than the 2008 national average of 4.5 pounds per person reported by the U.S. Environmental Protection Agency.

Maine includes the broad category of construction and demolition debris (CDD) in its definition of MSW, which the U.S. EPA does not. Other factors for the higher weight per person are Maine's success in identifying and recording commercially generated solid waste tonnages and the impact of Maine's very high number of non-resident visitor days (total number of visitors X average length of stay) on solid waste generation.

[8] Based on an estimated 2007 Maine population of 1,316,498

III. Recycling

A. Statewide Recycling Rate

Maine recycled 38.7% of its municipal solid waste in 2008, an increase from the 2007 recycling rate of 34.8%.

Recycling Rate Calculation

The statewide recycling rate is calculated by dividing the total amount of MSW recycled (including composting and reuse) by the total amount of MSW generated.

This calculation is not a precise measurement. Some data are incomplete, particularly for composting and reuse efforts. Adjustments are made to eliminate duplicate counting of recyclables. However, the Office estimates that the overall result is accurate to within two (2) percentage points.

Recycling Trends

Figure 2 shows the tons of waste disposed compared to the tons recycled. Until 2008 the growth in waste generation had prevented the recycling rate from increasing despite greater tonnages being recycled.

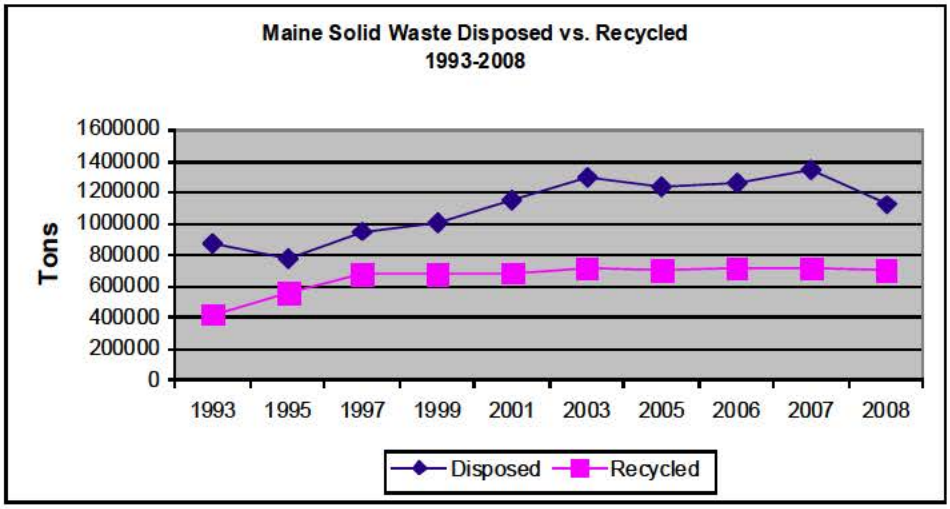


Figure 2: Maine Solid Waste Disposed vs. Recycling, 1993-2008
Source: State Planning Office

Applying the EPA Definition of Municipal Solid Waste

The state recycling rate is also calculated using the U. S. Environmental Protection Agency's definition for MSW. Table A shows the two methodologies for calculating the state's recycling rate. While Maine does not use this definition, it is useful in measuring the rate of CDD generation and recycling and their impact on the recycling rate.

Table A: Maine Statewide Recycling Rate, with and without CDD - 2008				
Maine Definition (*CDD included*)			EPA Definition (*CDD not included*)	
MSW (including CDD) generated	1,833,634		MSW w/o CDD generated	1,535,489
MSW with CDD recycled	709,624		MSW w/o CDD recycled	643,292
Recycling Rate	38.7%		Recycling Rate	41.9%

B. Type and Amount of Materials Recycled

Maine recycles a wide variety of materials with the highest tonnages in fiber products and metal. See Appendix C for a table depicting recyclable categories and tonnages from 1997 to 2008.

C. Progress Toward Achieving State Goals

Maine's Recycling and Waste Reduction Goals

Recycling

In 1989, the Maine Legislature established a goal to recycle 50% of the state's municipal solid waste annually. In 2008, Maine achieved a 38.7% recycling rate. Maine's recycling rate has been fairly steady for five years (see Figure 3). In most years, however, recycling has been outpaced by waste generation (proportionately, we throw out more than we recycle).

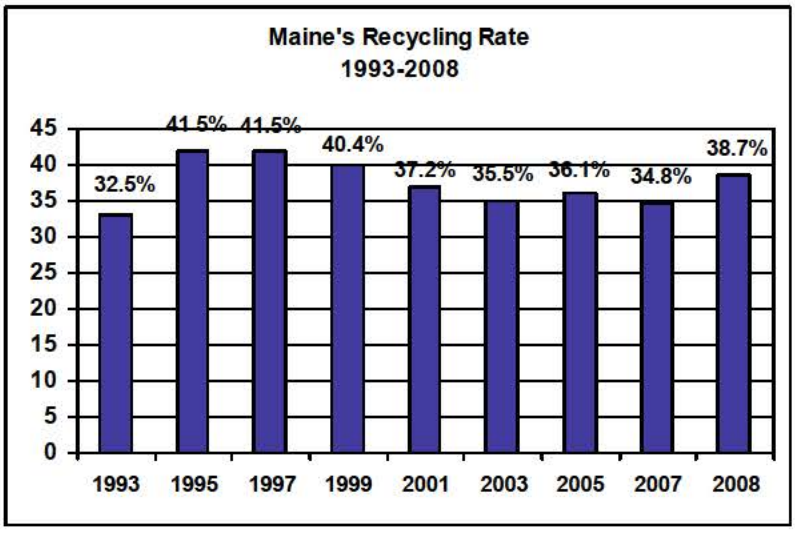


Figure 3: Maine's Recycling Rate, 1993-2008
Source: State Planning Office

While the legislated date to achieve the goal (January 1, 2009) has passed, the state remains committed to reaching the 50% goal in light of the value of reducing overall solid waste management costs, the positive impact on the environment, and a lessening of the need for additional solid waste disposal facilities.

Individual municipal and regional recycling programs are not required to achieve a 50% recycling rate; but they are required to demonstrate progress towards the goal. Recycling progress varies by community, but overall, programs recovered 15% (266,977 tons) from the state's waste stream that would otherwise need disposal.[9]

Waste Reduction

The state waste reduction goal challenges Mainers to reduce waste generation by 5% every two years. Waste generation is largely tied to our consumption of goods. There is a modest trend in waste reduction from decreases in the weight of consumer goods (for example, when products get smaller), are made of more lightweight materials, or use lighter weight packaging. But these trends are often overshadowed by the greater amount of waste we produce.

Achieving our Waste Reduction and Recycling Goals

Increasing recycling and waste reduction can extend the life of our State's landfills. State policy is to encourage municipalities to reduce and recycle solid waste through promotion, grants,[10] and technical assistance. Mainers actively recycle, but reaching the 50% goal will likely require more. To achieve a significant increase in the statewide recycling rate will require an infusion of resources for municipalities, stable markets for recyclables, or changes in state policy to achieve greater recycling and waste reduction—or all three. The *2009 Waste Management and Recycling Plan* contains a blueprint for policymakers to achieve and move beyond Maine's current goals.

Recycling Capacity

Maine has recycled over 700,000 tons per year during recent years. Approximately 38% of recyclables are handled by municipal recycling programs. The balance is the result of business recycling, handled by private sector resource management companies.

There are approximately 300 local recycling programs relying upon about 145 processing operations (a dozen of those are major municipal recycling processing centers) and over 90 composting facilities.

Assessment of Facilities

There have been significant recent (within the last five years) improvements in processing capacity in the following regional programs: Portland, Bangor,

[9] The remaining tonnages that make up the state's recycling rate are recycled by Maine businesses.
[10] as funds permit

Pittsfield, Skowhegan, Rockland, Camden, Coastal Recycling, and Lincoln County. In 2007, *ecomaine,* Maine's largest recycling region serving its 21 owner/municipalities in Cumberland County, completed a $3.8 million upgrade to its materials recovery facility in Portland and is offering processing of 'single sort' recycling collection services to programs outside their region in order to expand its recycling efforts.

Despite these improvements, municipally-managed public programs do not currently have the capacity to handle the volumes that would be generated at a 50% recycling rate, and neither the physical (buildings and equipment) or human (staffing) capacity.

To achieve a 50% recycling goal would require municipal and private sector recycling programs to handle over 200,000 tons more material based on what Maine generates today. This number will grow each year to match projected increases in waste generation.[11]

Over the next 20 years, to maintain the state's current recycling rate (38.7%) will require public and private programs to double their recycling handling abilities. As waste generation increases, the annual volume of recyclable materials will increase from 700,000 tons in 2008 to over 1.2 million tons in 2028.

In 2008, municipal recycling programs recovered almost 110,000 tons of 'traditional'[12] recycled materials. The Office estimates the programs as they exist today have additional capacity for another 20,000 to 25,000 tons annually. When combined with the available processing capacity at the *ecomaine* facility that number grows to between 40,000 to 50,000 tons.

The private sector can likely handle additional tonnages from their municipal and private customers or be in a position to respond with capital investment needs to grow their tonnages if the economics warrant it. For example, FCR Goodman (Casella) has recently opened a recycling collection and transfer facility in Hampden to handle zero sort materials recovered through their recycling contracts in the greater Bangor region. In addition, the company has recently upgraded their Charlestown, Massachusetts recycling plant to more efficiently manage zero sort materials.

It will take significant infrastructure capital investment by both the public and private waste management sectors to achieve our 50% recycling goal. To achieve this goal soon, Maine—both public and private sectors—will need to invest to build the infrastructure to manage an increase in recycling.

[11] Based on an assumed 2.8% annual growth in municipal solid waste generation

[12] Meaning paper, glass, tin cans, or other household items, not CDD

IV. Existing and Planned Processing and Disposal Capacity

In 2008, Maine's solid waste disposal facilities included: one state-owned landfill, two commercial landfills, nine municipally-operated landfills, 20 municipal construction and demolition debris (CDD) landfills, and four waste-to-energy facilities. Several processing facilities/operations were available for managing construction and demolition debris.

A. Landfills

Landfills receive a variety of wastes. That variety differs among the facilities, depending upon what their licensing approval allows. Included in that variety of wastes is: raw garbage; construction and demolition debris; residues and ash from waste to energy facilities; contaminated soils; sludges; ash from bio-mass operations; and other special wastes. This report focuses on municipal solid waste, including construction and demolition debris, as well as the residues from the processing of those wastes. However, in reviewing landfill capacity, the tonnages of the other special wastes that are accepted by the landfills do consume capacity. For that reason, those wastes and their impact on landfill capacity are included in this report.

State-owned Landfill[13]

The Legislature directs the State Planning Office to plan and provide for the long-term waste disposal needs for Maine. As part of this process, in 2003, the Legislature authorized the state acquisition of the generator-owned West Old Town Landfill, later renamed the Juniper Ridge Landfill. Pursuant to the Maine Revised Statutes, Title 38, chapter 24, the Legislature directed the State Planning Office to acquire, own, and contract for the operation of this landfill (Resolve 2003, chapter 93).

In 2008, the state-owned landfill in Old Town, known as Juniper Ridge, received a total of 617,782 tons of in-state generated waste, of which 254,299 tons were MSW and its residuals and 172,462 tons were CDD. The balance of the waste buried at the landfill, 191,021 tons, included various types of sludges, contaminated soils, and approved wastes from other in-state commercial and industrial generators (non-MSW wastes).

Assessment and Status of the State-owned Facility

Available disposal capacity remaining at Juniper Ridge at the end of 2008 was approximately 6,549,473[14] cubic yards, which translates into space for

[13] In addition to the Juniper Ridge Landfill, the State Planning Office owns 1500 acres of land in T2 R8 (near Lincoln), upon which a special waste landfill was permitted in the mid 1990s. Known as Carpenter Ridge, it has a landfill design for about two million cubic yards of waste. It was acquired by the former Maine Waste Management Agency and has been held by the State for development of disposal capacity when it is needed.

[14] The annual landfill report indicated 7,735,357 cubic yards of capacity remaining at the end of 2008 but the operator revised their projections to reflect the loss of planned mechanically stablized berms, resulting in a decrease of projected capacity.

approximately 5.63 million tons of solid waste. At projected fill rates[15], the present licensed capacity should provide 9 to 10 years of disposal capacity for the state, reaching capacity between 2017 and 2018.

In late 2006, the Juniper Ridge Landfill operator and State Planning Office began its initial investigation into expanding Juniper Ridge to provide an additional 21.9 million cubic yards of disposal capacity. It is expected to take at least 6 to 8 years to complete the development of the expansion at Juniper Ridge, based upon the following estimated timeline:

- Up to 1 year for legislative review and approval
- Up to 1 year to prepare public benefit determination and expansion applications
- Up to 2 years for DEP application review process (based on conversations with DEP staff)
- Up to 1 year for BEP approval (if given)
- Up to 1 year court appeals (if any)
- 2 years for construction

If approved as proposed, the expansion would provide an additional 18-20 years of landfill disposal capacity.

Commercial Landfills

(*Please note: because this report uses data complied through 2008, the Pine Tree Landfill is included here. Through an agreement reached among the Town of Hampden, Maine Department of Environmental Protection and the landfill's owner, the landfill ceased accepting solid waste at the end of December 2009.*)

As of 2008, Maine had two commercial landfills grandfathered under the 1989 Solid Waste Management Act that banned the development of new commercial disposal facilities. Having the commercial landfills has provided competition and disposal options for municipal solid waste, construction and demolition debris, and special wastes. The two commercial landfills are:

- Crossroads Landfill, located in Norridgewock, owned by Waste Management, Inc.

[15] The State Planning Office projected that wastes delivered to Juniper Ridge would average 550,000 tons per year, but will increase to 700,000 tons per year starting in 2010, with in-state wastes diverted from the closed Pine Tree Landfill. The Operating Services Agreement between SPO and Casella/NEWSME LLC, requires Casella to provide disposal capacity for 50,000 tons of mill waste per year from Old Town Fuel and Fiber (OTFF) and for 6,000 tons of Biomass Ash from the Lincoln Pulp and Paper Company (LLP) operation in Lincoln. Thus, of the remaining capacity at JRL, 56,000 cubic yards of space per year is to be kept in reserve for those waste streams. In 2009, the two facilities combined sent 27,599 tons to JRL.

- Pine Tree Landfill, located in Hampden, owned by Casella Waste Services, Inc.

The Crossroads Landfill is permitted to take special waste, municipal solid waste, and construction and demolition debris. It provides recycling and disposal services on a contract basis for municipalities and businesses. It currently serves 40 Maine communities in Western Maine. In 2008, the landfill accepted 307,997 tons of solid waste. Of that tonnage, 183,347 tons were Maine generated municipal solid waste and CDD. The balance of wastes included Maine generated alternative daily cover, special wastes and their processing residues (61,477 tons), and alternative daily cover and special wastes generated outside of Maine (63,173).

The Pine Tree Landfill, prior to its December 2009 closure, was permitted to take special waste, by-pass municipal solid waste, and construction and demolition debris. In 2008, the Pine Tree Landfill accepted 439,745 tons of solid waste. Of that, 49,533 tons were Maine generated municipal solid waste, CDD and their processing residues. The balance of wastes included Maine generated alternative daily cover, special wastes and their processing residues (17,193 tons) and alternative daily cover, CDD and special wastes and their residues generated outside of Maine (373,019 tons).

Table B: Capacity at Maine's Commercial Landfills – end of 2008

	2008 Fill Rate (tons)	Remaining Capacity (Cubic Yards)	Remaining Capacity (tons)	Estimate in years of life remaining based on 2008 fill rates
Crossroads Landfill	307,997	4,254,517	4,200,000	12-14 years
Pine Tree Landfill (at the end of 2009 this landfill closed)	439,745	395,000	400,000	0
Total	747,742	4,649,517	4,595,000	

Assessment of Facilities

The total disposal capacity currently licensed at these two commercial landfills is approximately 4.6 million cubic yards (although the Pine Tree Landfill is now closed). The majority of this capacity is at the Crossroads Landfill, with an estimated 4.25 million cubic yards of capacity remaining at the end of 2008. Table B shows estimated remaining disposal capacity at the commercial landfills. The 'fill rate' includes all wastes disposed of at the facility, including MSW, CDD, special wastes and other residues, whether generated within the state or delivered from outside the borders.

Municipally-operated Landfills

In 2008, 149,911 tons of solid wastes, of which 85,139 tons were MSW and 64,772 tons were ash, were disposed at nine municipally-operated landfills. Table C provides information on each individual landfill, including fill rates and estimated available remaining capacity.

Assessment of Facilities

Among the seven municipally-operated MSW landfills, there are approximately 3.5 million cubic yards of remaining available capacity that can accept approximately 2.2 million tons of municipal solid waste. This capacity is sufficient to carry the MSW for most of the communities served by these landfills for 20 years or more, based on current waste tonnages accepted.

The actual remaining life varies for each landfill, resulting in unevenness of municipal capacity across the state. This variation in when a particular community or region may exhaust their current disposal capacity is independent and possibly irrespective of any possible statewide disposal capacity concern, but would be of significant concern to those regions (see Section V.B on Regional Disposal Issues).

Bath and Brunswick are two of the state's oldest secure landfills. Brunswick serves only its own residents and a portion of its businesses. Both communities adopted programs to extend the life of their landfills, such as 'pay-as-you-throw' (PAYT) and single stream recycling collection. The Hatch Hill Landfill in Augusta serves eight communities.

The Tri-Community (Fort Fairfield) landfill serves over 40 communities in Aroostook County and recently received approval for additional capacity that will provide that facility now with over 30 years of capacity. The Presque Isle landfill is seeking a phased expansion that will eventually provide disposal capacity for up to 50 years.

The Caratunk, Forks, and West Forks landfill closed in the fall of 2008, ending that facility's use. The Greenville landfill, the Maine's last remaining unlined MSW landfill still in operation, is scheduled to close by December 31, 2014.

As part of an arrangement with the Mid Maine Waste Action Corporation, the City of Lewiston brings its waste to the MMWAC incinerator in Auburn. MMWAC, in exchange, disposes its incinerator ash at the Lewiston landfill. In addition, the Lewiston Landfill accepts a limited amount of CDD and other wastes.

Table C: Municipal Landfill Tonnages – 2008

Municipal Landfills that accept unprocessed MSW and CDD

	2008 Fill Rate (all wastes) (tons)	Remaining Capacity Cubic Yards (est.)	Remaining Capacity (tons) (est.)	Years of life remaining based on 2008 fill rates (estimated)
MSW Landfills:				
Bath	7,131	373,400	163,000	23 years
Brunswick	4,671	280,000	122,000	26 years
Greenville	3,714	96,695		Scheduled to be closed
Hatch Hill (Augusta)	25,550	1,165,000	757,000	30 years
Presque Isle	12,566	330,135	163,000	13 years
Tri-Community (Fort Fairfield)	31,507	1,278,350	995,000	36 years
CFWF (West Forks)	Closed in fall			
Total Tons:	**85,139**			
Total Remaining Capacity (est.)		**3,523,580**	**2,200,600**	

Publicly Owned Landfills that accept residues from processing of MSW

	2008 Fill Rate (all wastes) (tons)	Remaining Capacity Cubic Yards (est.)	Remaining Capacity (tons) (est.)	Years of life remaining based on 2008 fill rates (estimated)
Ash Landfills:				
ecomaine	45,522	870,000	830,000	20-25 years
Lewiston	19,250	237,400	210,000	10 years
Total Tons:	**64,772**			
Total Remaining Capacity (est.)		**1,107,000**	**1,040,000**	
Total	**149,911**	**4,630,580**	**3,240,600**	20+ years

Municipal CDD Disposal Facilities

There are approximately 20 municipal land disposal facilities that accept locally-generated construction and demolition debris, inert fill, brush, and trees. Local facilities furnish a 'short-transport' option for the management of these wastes. Data was not available to determine the level of service and tonnages of waste accepted at these

facilities for 2008. Typically, scales are not available at these facilities so a conversion factor of 400 pounds per cubic yard of delivered waste is used to estimate tonnage.

Assessment of Facilities

The remaining capacity at individual CDD facilities varies, but numbers indicate that landfill space exists for an overall capacity for another 10-12 years. A number of these facilities will be full before then, creating 'pockets' where CDD disposal options will need to be reconsidered. Four of the facilities have an estimated six years or less of capacity at current fill rates and licensed footprints.

Finding alternatives to land disposal for CDD continues to pose problems in Maine's rural areas. These materials cannot be recycled or reused without investment in equipment, labor, and sufficient land area to aggregate and process them. Markets for processed CDD do exist, but given the often small scale that most Maine towns operate on, with low volume and dispersed facilities, rural operations do not often produce the economics needed for sustainable recycling efforts.

Maine has several commercial CDD processors, including: KTI Biofuels in Lewiston; CPRC Group in Scarborough; Plan-it Recycling in Gorham; Aggregate Recycling Corp (ARC) in Eliot; and, J. Sanborn in Sanford.

KTI Biofuels is a stationary operation. It accepts only clean wood products (from in-state and out of state) for processing for use as biomass fuel. Plan-It Recycling, ARC, and Sanborn also operate from fixed locations. CPRC operates from its Scarborough facility, hauling in multiple types of materials and shipping out a variety of finished products, as well as offering mobile or 'on-site' services. Casella Waste Systems has permitted a CDD processing operation in Westbrook that could accept up to 1,000 tons of CDD per day. There are also several commercial wood chippers that move from site to site and are used to manage brush and clean CDD wood at municipal facilities.

B. Waste-To-Energy Facilities

In 2008, 33.3% of Maine's municipal solid waste was sent to a waste-to-energy (WTE) facility. Maine's WTE facilities received a total of 850,860 tons of MSW, an increase of 24,568 tons from 2007. Of this 2008 tonnage, 607,463 tons were generated in-state (a decrease from the 2007 deliveries) and 243,397 tons were imported (an increase from the 2007 deliveries). Table D shows the processing capacity of the four waste-to-energy facilities:

Table D: Maine WTE Capacity		
Waste-To-energy Facility	**Annual processing capacity (tons/year)**	**Tons received in 2008**
ecomaine	170,000	162,680
Maine Energy Recovery Company	310,000	287,943
Mid Maine Waste Action Corporation	70,000	87,872
Penobscot Energy Recovery Company	304,000	312,365
Total of WTE Facilities	**854,000**	**850,860**

The facilities provide both a product from combustion that needs to be disposed and a reduction of the MSW requiring disposal, thus reducing the need for landfill capacity. They produce a combined capacity of approximately 62 megawatts a day of electricity and reduce the volume of waste requiring landfilling by about two-thirds.

To produce the electrical generation contracted for, waste-to-energy facilities need to operate at maximum capacities. The seasonal nature of waste generation causes tonnage overage problems during the summer months and the need to "attract" additional tonnage during the winter months. Facilities bypass waste when they reach their daily operating capacity and import waste to make up for shortfalls.

WTE Residues

The waste-to-energy facilities produce several streams of materials and residues: by-pass waste, front-end process residue (FEPR), and ash. These residues, which require disposal in landfills, comprise approximately one-third of the waste processed by these facilities. The metals are recovered for recycling (See Figure 4).

> *Bypass Waste:* Bypass waste is that portion of the municipal solid waste stream intended for delivery to and incineration at a waste-to-energy facility, but diverted because the facility could not accept it. Solid waste is bypassed if there are operational interruptions or facility shutdowns or if the facility reaches its operational capacity and cannot accept waste that it is contractually obligated to receive. The bypass waste is typically delivered to a landfill for disposal. This category also includes waste that cannot be processed by the facility due to size or composition.

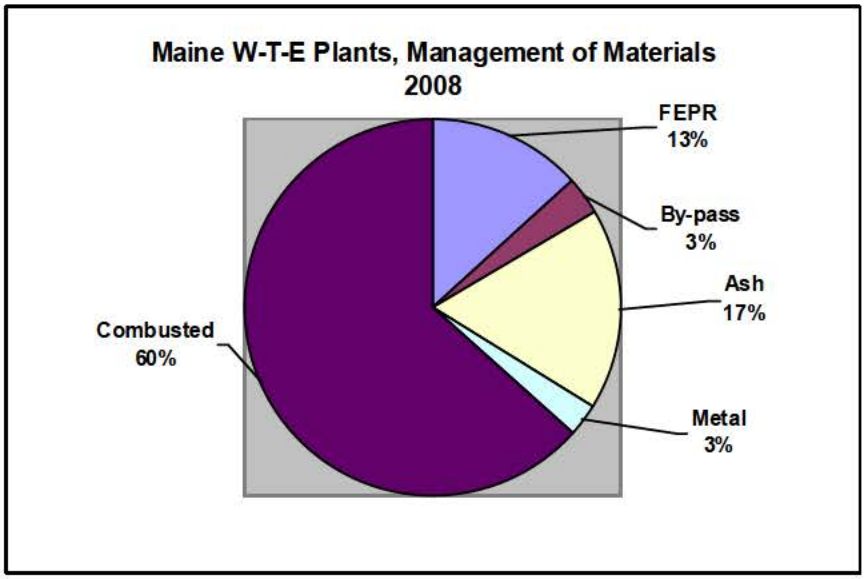


Figure 4: Maine WTE Plants, Management of Materials
Source: Facility Annual Reports, State Planning Office

- *Front-end Process Residue:* Maine Energy Recovery Company (MERC) and Penobscot Energy Recovery Company (PERC) use a refuse derived fuel technology and generate front-end process residue as a by-product of their operations.[16] These facilities dispose of the front-end process residue at landfills. Front-end process residue (FEPR) is removed prior to incineration, and may include ferrous metals, glass, grit, and fine organic matter. While metals are recycled, most FEPR is landfilled. In the past, FEPR was used in conjunction with landfill closure programs, but this is no longer a viable outlet. While some composting of FEPR has been done, the resulting product typically contains contaminants that restrict its use to limited landfill cover applications only.

- *Waste-to-energy Facility Ash:* Ash is a by-product of incineration, is classified as a special waste, and is landfilled. The ash from MERC and PERC is disposed of at the commercial landfills and Juniper Ridge. The ash from MMWAC is disposed of at the City of Lewiston's landfill and e*comaine's* ash is buried at the *ecomaine* landfill. The ash and FEPR waste streams have a continuous impact on landfill capacity, since alternatives to landfilling them do not readily exist.

Assessment of Facilities

Three of these facilities are at their 20th year of operation. The plants' maintenance programs, along with upgrades, have kept these facilities functioning well and should continue to do so for the foreseeable future. Facility upgrades occur in

[16] Mid-Maine Waste Action Corporation (MMWAC) and *ecomaine* use a 'mass burn' technology and do not produce FEPR.

response to environmental regulations, primarily aimed at air emissions reductions. All of the Maine WTE facilities perform at or better than their license requirements.

Biddeford city officials continue to work to close or move operations of Maine Energy Recovery Company, which serves 23 municipalities. In addition, contracts for the Penobscot Energy Recovery Company expire in 2018. Two hundred municipalities rely on the facility. PERC is actively planning for the extension of PERC facility operations in 2018. In the case of both MERC and PERC, their future plans need to be factored into state disposal capacity planning.

C. Imported/Exported Municipal Solid Waste

Movement of solid waste across state lines is protected under federal interstate commerce laws from state and local restriction, except in the case of a state-owned facility. Municipal solid waste is considered a commodity and is subject to fluctuations accruing to supply and demand at the regional and national level.

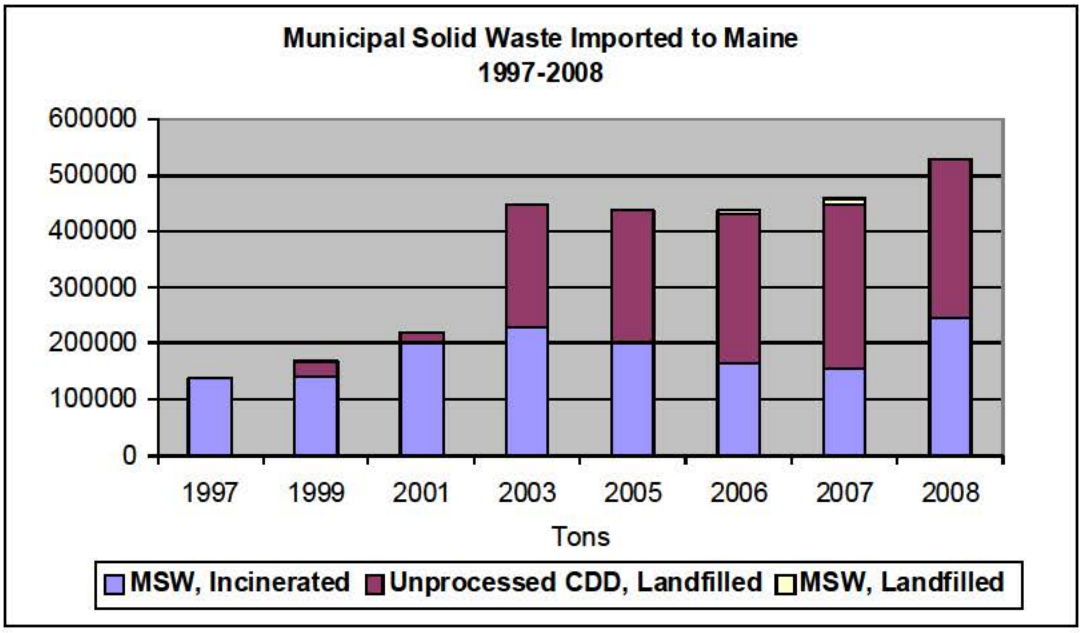


Figure 5: Municipal Solid Waste Imported to Maine, 1997-2008
Source: State Planning Office

In 2008, 529,125 tons of municipal solid wastes were imported to Maine, up from the 456,580 tons of municipal solid wastes imported to Maine in 2007. Reflecting the national economic downturn, the year saw declines in the amount of CDD (7,808 tons) and MSW imported to commercial landfills (8,576 tons). The sharp decrease in Maine-generated MSW caused the waste-to-energy facilities to increase their deliveries of imported MSW by 86,000 tons. Exports of municipal solid waste in 2008 were 62,438 tons, up slightly from the 2007 tonnage of 60,491 tons (See Figures 5 and 6).

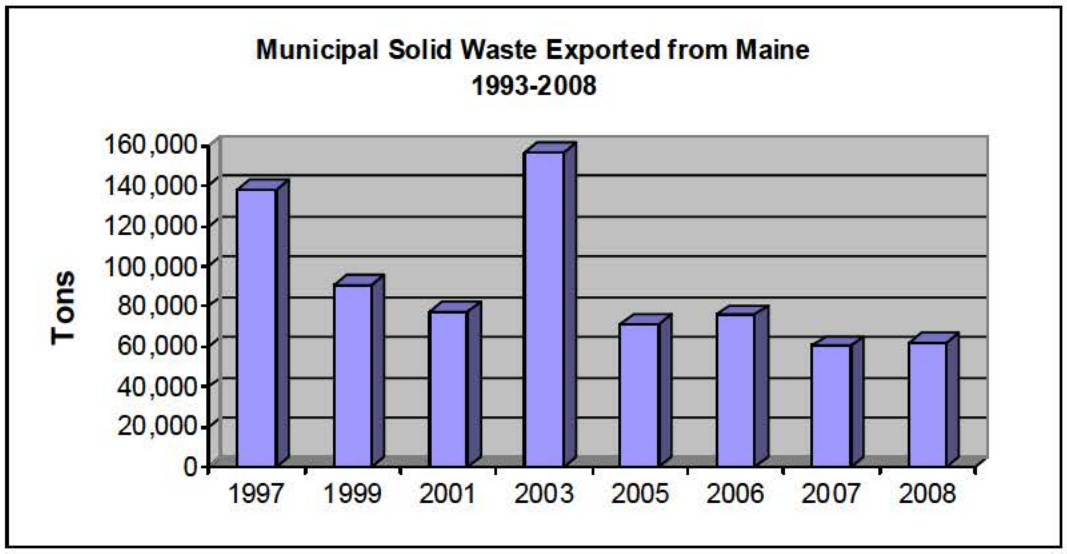


Figure 6: Municipal Solid Waste Exported from Maine
Source: State Planning Office

V. Projected Waste Processing and Disposal Needs and Capacity

Maine will require an estimated 22.6 to 25.7 million cubic yards of landfill capacity over the next 20 years to properly manage the municipal solid waste that is directly landfilled, along with the residues generated by the four waste-to-energy facilities and other processing facilities that also require landfilling of residues.

Maine currently has 15.8 million cubic yards of permitted, available disposal capacity.

Table E: Projected Disposal Capacity Available vs. Needed 2008-2028				
Landfill Capacity Available (cubic yards)			**Capacity Needed (tons)**	
Municipal Landfills	4,630,580		Total waste generated	48,848,783
Municipal CDD Landfills	Incomplete data		Imported Waste	4,000,000
Commercial	4,649,517		Recycled	18,904,479
Juniper Ridge	6,549,473[17]		Exported	1,685,349
			Combusted at WTE	10,113,000
Total Landfill Capacity Currently Permitted:	**15,829,570**		**Total Landfill Capacity Needed:**	**25,751,110**

Source: State Planning Office

By statute, this report is required to include capacity needs assessments at 3,5,10, and 20 years from the reporting year. Here is a projection of the state's capacity and disposal needs broken down according to these timeframes:

Table F: Landfill Capacity Needs in Specific Years		
Timeline	**Annual Landfill Capacity Needed (in millions of cubic yards)**	**Capacity Available at municipal, state & commercial facilities (in cubic yards)**
3 years – 2011	1.05	10,462,250
5 years – 2013	1.10	7,789,475
10 years – 2018	1.3	4,179,141
20 years - 2028	1.7	1,200,000

These consumption projections are based on the following assumptions:

- continued growth in MSW generation at 2.8% per year, starting in 2012

[17] The JRL Operating Services Agreement requires a reserve annual capacity for 56,000 tons of wastes from Old Town Fuel and Fiber and Lincoln Pulp and Paper or 1,120,000 over 20 years.

- recycling tonnages increase as waste generation increases to maintain a 38.7% recycling rate[18]
- imports continue but decrease as capacity at WTE facilities is gradually replaced by Maine MSW as generation increases
- exports remain at 2008 levels

The projection of solid waste disposal capacity is based on these parameters:

- continued operation of and reliance upon the four WTE facilities accepting approximately a total of 850,000 tons of MSW annually (610,000 tons from Maine communities and businesses)
- no significant change in municipally-operated landfills except that additional capacity is approved for the Tri-Community Landfill and the Presque Isle Landfill
- closing of the Pine Tree Landfill
- continuation of the existing state policy banning the development of new commercial landfills in which case, Crossroads Landfill would cease operations 2020-2022.[19]

Factors that can affect Capacity Projections

There are a number of factors that will influence the Office's projections, some known, some unknown.

Changes in Policy, Law or Regulation

Landfilling is the least desirable option under the Maine solid waste management hierarchy. As policy, all other solid waste management options should be considered and exercised to the greatest extent possible prior to landfilling of wastes, and thus the hierarchy can affect fill rates generally. Any changes to the hierarchy or to any of the laws and regulations governing the faciltities or the waste streams they manage, such as disposal bans and or mandatory recycling or enforcement of the hierarchy, have the potential to effect capacity projections.

Economy and Demographics

Traditionally, the Office has based its projections on historical waste generation rate trends. This year we looked at potential new ways to project waste generation. SPO economists found a strong positive correlation between waste generation and retail sales. We have included an analysis of that comparison in Appendix D. SPO will monitor this correlation to see if it holds over time.

[18] Note that even to maintain a 38% recycling rate will require that Maine increase the tons recycled from 700,000 to 1.3 million tons over the next 20 years.

[19] The Legislature will revisit this policy ban in summer 2010 which would affect this assumption.

In addition the Office will use the results of the 2010 Census to better forecast long-term trends in MSW generation and analyze effects of Maine's demographics on our future management needs.

The Office recognizes its assumptions will vary from actual generation. It is possible that actual increases will be softened or eliminated by improved recycling and waste reduction efforts, or an uncertain economy. However, given the long time frame for the development of disposal capacity, SPO strives to maintain a conservative approach in order to anticipate that time lag, and reduce the possibility of a capacity shortage crisis. In addition, SPO analyzed the lifespan of existing statewide disposal capacity based on a no-to-low growth assumption (no increase for three years, then a 1% increase thereafter). This smaller projected increase in waste generation would extend the life of Maine's existing state-owned and commercial landfills by one-to-two years.

Authority and Control

Although in its annual capacity assessment, SPO counts the available capacity at all landfills, commercial, state owned and public, *this is an assumption*, as the *actual rate at which Maine landfills accept waste is under the control of their individual owners.* Landfills receive different amounts of waste from year to year based on the varying levels of residential and business activity occuring within their wasteshed. Economic conditions, the level of competition from other facilities, management decisions, and methods can reduce or accelerate the rate of consumption.

The State does exercise control over the fill rate of its own facility at Juniper Ridge, in accordance with the terms of the Operating Services Agreement.

Contracts and Licensing

The current license agreement for the Crossroads Landfill between Waste Management, Inc. and the Maine DEP allows up to 40% of its annual intake to be out-of-state wastes, thus (in theory) only 60% of its capacity is actually available for Maine generated wastes.

The Operating Services Agreement between the State and Casella/NEWSME LLC, requires Casella to provide disposal capacity for 50,000 tons of mill waste per year from Old Town Fuel and Fiber and for 6,000 tons of Biomass Ash from the Lincoln Pulp and Paper Company operation in Lincoln. Thus, of the remaining capacity at the Juniper Ridge Landfill, 56,000 cubic yards of space per year is to be kept in reserve for those waste streams.

Compaction Rates

Landfills attempt to achieve a one-to-one ratio of compaction where one ton of

waste received consumes one cubic yard of space. Not all waste streams allow for this compaction to occur, however.

Settling Rates

All landfills settle over time due to decomposition of organic materials depending on compaction rates and the types of materials received. So over time they may gain back some space due to settling.

Improvements in Landfill Technology

There are ongoing improvements to the efficiency in operations of all landfills across the state in such areas as leachate and gas management, compaction, slope ratios and the engineering of slopes, and the application of different types and systems of daily and intermediate cover. All of these affect the ratio between the amount of wastes received and the consumption of cubic yardsof landfill space.

Current Issues Which Could Affect Capacity Needs

The amount of available landfill disposal capacity will be affected by both increases and decreases in capacity as follows:

Recycling

Recycling will continue to divert significant tonnages from disposal. The State Planning Office estimates that over 20 years, recycling will divert an estimated 19 million tons (cumulatively) from disposal, at 2008's recycling rate of 38.7%. If the recycling efforts can be increased, and the expected overall waste generation rates remain as predicted, the required disposal capacity to handle the state's solid wastes will be reduced. Indeed, an active recycling program that achieves the State's 50% recycling goal could reduce Maine's landfill capacity needs by 25% over the next 20 years.

Mainers are actively recycling and public education campaigns to promote recycling hold promise.[20] To achieve a significant increase in the statewide recycling rate will require an infusion of resources for municipalities, growth in markets for recyclables, or changes in state policy to achieve greater recycling and waste reduction—or all three. The *2009 State Waste Management and Recycling Plan* contains a blueprint for policymakers to achieve and move beyond Maine's recycling goal of 50%.[21]

[20] As evidenced by survey data which tell us these promotional initiatives are working. When asked, those who reported that they "always" recycle newspapers, for example, was 60% in 2009 compared to 54% in 2006 (before and after implementation of the Maine Recycles public awareness campaign.

[21] This document is available on-line at www.maine.gov/spo/recycle/publications.htm.

Expansions and Closures

The Joint Standing Committee on Natural Resources will conduct a study during the summer of 2010 looking at capacity issues. Specifically it wants to revisit the current state ban on the expansion of commerical landfills, which would allow the commerically-owned Crossroads Landfill to expand. Other options for expanding landfill capacity in Maine include expanding Juniper Ridge or developing Carpenter Ridge.

The question of the public benefit of expansion of the Juniper Ridge Landfill was presented to the Department of Environmental Protection by the landfill operator and State Planning Office in 2009. The public benefit determination application was withdrawn after issuance of a draft denial by DEP.

The Presque Isle landfill is awaiting final approval from the DEP to expand their disposal capacity to extend their useful life for up to another 50 years. The Tri-Community Landfill has received approval for an expansion of their landfill.

A planned construction and demolition debris processing facility in Westbrook could generate 150,000-200,000 tons per year of residue, some of which will require land disposal. The processing residues would be directed to the Juniper Ridge Landfill, if that processing facility becomes operational.

The 2009 closure of Pine Tree Landfill will have an impact on Maine's current solid waste management system, in that approximately 150,000 tons of *in-state* generated special wastes and construction and demolition debris waste that were annually disposed of at that landfill will be diverted to the Juniper Ridge Landfill.

Out-of-state Waste

The waste-to-energy facilities that currently take out of state wastes will continue to rely upon that source to fulfill their boiler needs and power contracts. However, for planning purposes, policymakers should anticipate that Maine-generated solid waste tonnages needing disposal will gradually increase, and the waste-to-energy facilities' reliance on imported municipal solid waste will decrease. The state's remaining commercial landfill may continue to accept unprocessed CDD from out-of-state.

The Office cannot at this time estimate the rate at which this decrease will occur as a review of waste imports to the WTE facilities over the last 11 years reveals fluctuations with regional waste business and the impact of the greater regional economy. Imports have varied from 138,000 tons in 1997 to 228,638 tons in 2003, dropping back to 155,068 tons in 2007, then rising to an eleven-year high of 243,397 tons in 2008, as Maine generation of municipal solid waste dropped with the economy.

VI. Disposal Prices

A. Disposal Fees

Disposal expenses comprise collecting, transporting, and tipping waste. Disposal fees or tipping fees are a key driver of municipal disposal costs. Current disposal fees range from $40 to $135[22] per ton at Maine's landfills and waste-to-energy facilities and have stabilized, allowing predictability for municipal budgeting and long-term planning.

Tipping fees at the four waste-to-energy facilities are fairly consistent and reflect the commitment of the municipalities who either own the facility or have long-term contracts for disposal services.

The State, in its operating agreement with Casella Waste Systems, established a ceiling for tipping fees that sets an upper limit on how much can be charged for wastes delivered to the Juniper Ridge Landfill. It is anticipated that this will act as a check on pricing for the disposal of similar materials at other solid waste facilities.

Energy Revenues

Tipping fees at waste-to-energy facilities are influenced by revenues received from the sale of the electricity they generate. The revenues reduce the facility's operating expenses, yielding a reduction in the tip fee charged for solid waste. Should electricity sales revenue drop, tipping fees may increase. Conversely, should the electricity sales value increase, the possibility exists that lower tipping fees, or maintaining current fees, would occur.

B. Supracompetitive Prices

Supracompetitive, as applied to '*prices,'* means prices that are higher than they would be in a normally functioning, competitive market, usually as a result of overconcentration, collusion, or some form of monopolistic, oppressive practice. State law requires the State Planning Office to determine whether changes in available landfill capacity have generated, or have the potential to generate, supracompetitive prices and make recommendations for legislative or regulatory changes as necessary.

Disposal capacity at Maine landfills is sufficient to meet current needs. At the time of this report, the disposal capacity situation does not appear to have generated supracompetitive disposal fees, because disposal prices have not experienced any significant changes for the last three years.

The operator of the Juniper Ridge Landfill is bound by a cap on tipping fees, imposed by the State in its Operating Services Agreement. Under the current agreement, Casella

[22] This does not reflect spot market prices.

cannot charge more than $68 per ton for municipal solid waste and CDD wastes and $56 per ton for special wastes delivered to the Juniper Ridge Landfill. Because of this cap, Juniper Ridge is perceived by the private and public waste sectors as having an effect on disposal pricing. The cap acts as a check on pricing for the disposal of similar materials at other solid waste facilities.

The Office maintains a firm awareness of its responsibility to stay attuned to the possibility of supracompetitive pricing, however, and to keep the Governor and Legislature informed.

VII. Analysis of Consolidation within the Solid Waste Industry

The law also asks the Office to analyze the ownership of the collection, recycling, hauling, and disposal sectors of Maine's solid waste industry for undue consolidation and the potential for unfavorable impacts on competition. The Office examines these industry sections to look for conditions that might create either a lack of service or a monopolistic situation.

Maine's solid waste industry is a mix of public and private investments and services that handles 5,000 tons of materials each day (including recyclables). We believe that Maine's interrelated system of collection, recycling, hauling, and disposal currently serves Maine's solid waste management needs fairly and effectively.

Disposal Facilities

During 2008, there was no change in ownership or operation of the disposal facilities, whether waste-to-energy facilities or landfills, except that the Caratunk-Forks-West Forks landfill was closed at the end of the year. This disposal facility was one of the last two attenuation landfills serving municipalities. The other attenuation landfill is located in Greenville and serves that region, though that landfill is scheduled to close within the next few years.

Collection Services

During 2008, the Office found no substantial change in the ownership or operation of the many collection companies servicing residents, businesses, and municipalities. In several areas of the state renewed competion for accounts and increased levels of service appeared, offering additional or new possible service options. Several companies began to offer single stream or expanded materials acceptable for recycling, for example, and to compete for municipal recyclables.

As with most industries, there was minor movement of new companies into the arena of solid waste collection services, often with a matching exodus of companies that provided similar services. CPRC Group, for one, has opened a new CDD recycling facility in Auburn and several new companies have entered the roll-off services market.

Recycling Services

During 2008, increased awareness of the 'single sort', 'single stream' recycling collection service occurred. This service permits residents to place all of their recyclables into a single container. From this single container the recyclables are collected, delivered to a processing facility, and sorted there and then marketed. *ecomaine*, located in Portland, established a single sort recycling program in 2007 and actively worked to expand municipal participation in that program during 2008. Their 21 municipal 'owner members' were either participating or modifying their current recycling programs to permit their residents to receive the single sort option. Additional

communities, either as associate members or contract communities, participate in the program as well.

Also in 2008, FCR Goodman, a division of Casella Waste Systems, expanded the number of municipalities they provide with single stream recycling opportunities. The collected recyclables are consolidated and shipped to the company's processing facilities in Auburn and Charlestown, Massachusetts.

Hauling Services

In 2008, there was no substantial change in either the number of companies providing waste hauling services nor in the number of facilities requiring these trucking services. The majority of municipally operated transfer stations use private haulers while a few continue to use their own hauling equipment and staff.

Appendices

A. Waste Disposal Capacity Available, 2008-2020

Scenario 1 - No or Low Growth Waste Generation (in cubic yards)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
		est. -3%	0 growth	0 growth	1% growth	1% growth	1% growth	1% growth	1% growth	1% growth	1% growth	1% growth	1% growth
Facility													
Juniper Ridge	6,549,473	5,759,893	4,970,313	4,180,733	3,383,258	2,577,807	1,764,302	942,662	112,805	0	0	0	0
Crossroads	4,254,517	3,963,517	3,672,517	3,381,517	3,087,607	2,790,758	2,490,940	2,188,124	1,882,281	1,573,379	1,261,388	946,277	628,015
Pine Tree	395,000	0	0	0	0	0	0	0	0	0	0	0	0
Total Statewide Capacity	11,198,990	9,723,410	8,642,830	7,562,250	6,470,865	5,368,565	4,255,242	3,130,786	1,995,086	1,573,379	1,261,388	946,277	628,015

Scenario 2 - Growth Rates projected based on correlation with economic indicators (in cubic yards)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
		est. -3%	0 growth	0 growth	2.8% growth	2.8% growth	2.8% growth	2.8% growth	2.8% growth	2.8% growth	2.8% growth	2.8% growth	2.8% growth
Facility													
Juniper Ridge	6,549,473	5,759,893	4,970,313	4,180,733	3,369,045	2,534,630	1,676,851	795,054	0	0	0	0	0
Crossroads	4,254,517	3,963,517	3,672,517	3,381,517	3,082,369	2,774,845	2,458,710	2,133,724	1,799,638	1,456,198	1,099,141	736,199	363,094
Pine Tree	395,000	0	0	0	0	0	0	0	0	0	0	0	0
Total Statewide Capacity	11,198,990	9,723,410	8,642,830	7,562,250	6,451,414	5,309,475	4,135,561	2,928,778	1,799,638	1,456,198	1,099,141	736,199	363,094

Data Notes

- 2008 capacity and annual tonnages are based on data from reports submitted to DEP by disposal facilities
- Tons have been converted to cubic yards for consistency, based on actual compaction rates at each facility
- Assumes JRL receives 550,000 tons per year plus 150,000 tons per year previously going to Pine Tree, or 700,000 tons per year, or 814,000 cubic yards per year (1 cy = 0.86 tons)
- Assumes Crossroads receives 300,000 tons per year or 300,000 cubic yards (1 cy = 1 ton)
- 2008 is the most recent complete data set available

B. Legislative Reference

Title 38: WATERS AND NAVIGATION
Chapter 24: SOLID WASTE MANAGEMENT AND RECYCLING
Subchapter 2: SOLID WASTE PLANNING

§2124-A. Solid waste generation and disposal capacity report

By January 1, 2008 and annually thereafter, the office shall submit a report to the joint standing committee of the Legislature having jurisdiction over natural resources matters, the Governor and the department setting forth information on statewide generation of solid waste, statewide recycling rates and available disposal capacity for solid waste.

The report submitted under this section must include an analysis of how changes in available disposal capacity have affected or are likely to affect disposal prices. When the office determines that a decline in available landfill capacity has generated or has the potential to generate supracompetitive prices, the office shall include this finding in its report and shall include recommendations for legislative or regulatory changes as necessary.

Beginning on January 1, 2009 and every odd-numbered year thereafter, the report submitted under this section must include an analysis of how the rate of fill at each solid waste landfill has affected the expected lifespan of that solid waste landfill. The January 2009 report must also include an analysis of the solid waste disposal needs of the State as of January 1, 2009 for the next 3, 5 and 10 years.

Beginning on January 1, 2010 and every even-numbered year thereafter, the report submitted under this section must include an analysis of consolidation of ownership in the disposal, collection, recycling and hauling of solid waste.

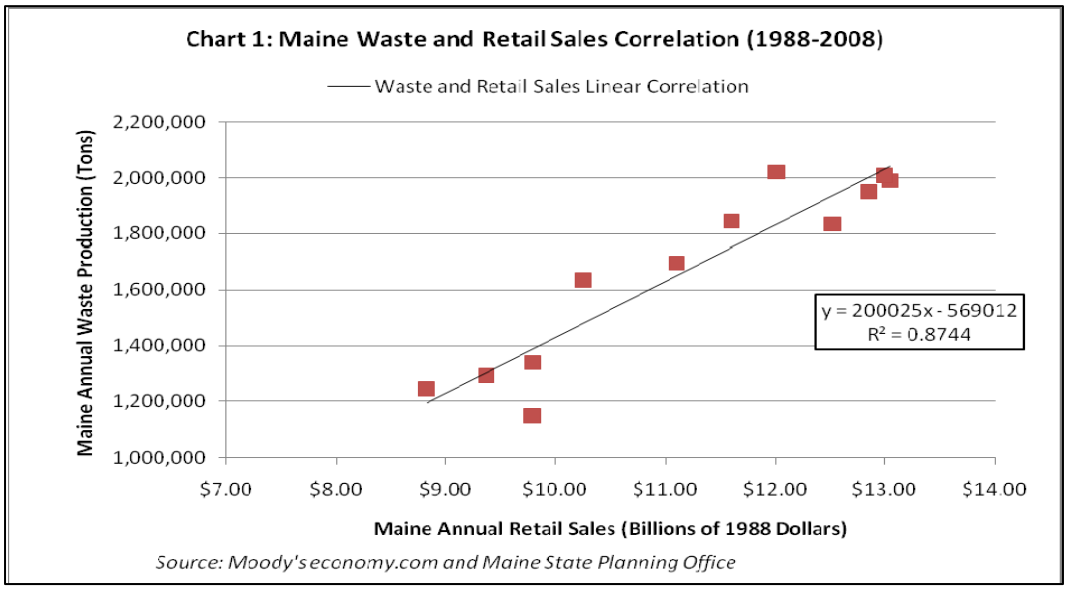
The joint standing committee of the Legislature having jurisdiction over solid waste matters may report out legislation related to the report submitted pursuant to this section.

C. Maine Recycled Materials, 1997-2008

Materials:	2008	2007	2005	2003	1999	1997
high grade paper	54,226	72,846	72,965	3,951	11,570	31,470
corrugated cardboard	103,692	117,324	117,144	88,166	198,442	214,536
newspaper	16,817	26,453	32,300	33,442	42,612	44,710
magazines	4,238	8,532	8,723	1,881	6,104	3,702
mixed paper	8,250	11,131	5,226	13,919	12,860	12,207
other paper	26,528	7,668	8,900	3,166	12,671	6,465
commingled fibers	31,543	42,210	36,805	132,475		
Total paper	**245,294**	286,164	282,063	277,000	284,259	313,090
clear glass	8,743	10,656	11,058	6,334	8,324	10,590
brown glass	16,422	23,544	24,377	11,270	12,545	7,060
green glass	7,022	11,878	12,622	3,142	26,167	11,767
commingled containers	11,215	3,442	3,598	21,672	440	1,734
Total glass	**43,402**	49,520	51,655	42,418	47,476	31,151
white goods	87,399	82,493	78,401	68,125	142,640	122,895
aluminum	2,232	2,454	2,163	2,109	1,862	1,332
tin cans	1,955	1,989	1,089	3,154	18,833	10,693
non ferrous	22,467	25,655	23,213	18,847	18,652	21,572
other (various metals)	72,119	72,434	68,432	68,984		
Total Metal	**186,172**	185,025	173,298	161,219	181,987	156,492
HDPE	8,632	8,530	9,377	3,420	4,410	4,160
PET	5,166	5,277	4,766	8,725	6,521	6,021
LDPE film	784	576	526	711		
polystyrene			8	0	6	6
Other	1,381	798	631	531	1,211	1,042
Total Plastic	**15,963**	15,181	15,308	13,387	12,148	11,229
wood waste	82,318	86,544	93,582	92,154	41,103	38,402
leaves	26,224	29,448	29,938	33,376	27,421	24,528
food waste	2,745	214	142	2,623	24,582	23,240
Total Organic	**111,287**	116,206	123,662	128,153	93,106	86,170
tires	28,473	30,545	30,374	35,467	32,530	30,559
CDD, other wastes	66,332	25,626	23,425	49,714	39,469	44,209
Mercury-added/UW	4,872	848	487	327		
Total Hard to Manage	**99,677**	57,019	54,286	85,508	71,999	74,768
Textiles/Reuse	**3,543**	2,196	1,724	2,260	6,023	1,726
Other nonbulky MSW	**4,286**	7,302	6,935	7,638	2,740	5,252
TOTAL TONS RECYCLED:	**709,624**	**718,613**	**708,931**	**717,583**	**699,738**	**679,878**

D. Maine MSW Generation and Retail Sales Comparison, 1998-2038

The amount of waste that Maine produces every year is dependent on some unknown mix of factors and also random variation. Of the standard economic and demographic variables for which forecasts are available, we expect retail sales to be one of the most highly correlated with waste production. Indeed, the scatterplot and best-fit line in Chart 1 show that, for the historical data available, retail sales are strongly correlated with waste production.



Assuming this correlation between retail sales and waste production persists into the future, and assuming the Moody's economy.com forecast for retail sales is accurate, we can roughly estimate future waste production using the economy.com retail sales forecast and a linear regression model. Chart 2, below, shows the results of our forecast using the model. Waste production is plotted on the vertical axis on the right and retail sales are plotted on the vertical axis on the left. The legend indicates which data points show historical data and which data points represent our forecast. We predict just under 1.8 million tons of waste will be produced in 2011.