APPENDIX A

SOLID WASTE GENERATION AND DISPOSAL CAPACITY REPORT JANUARY 2011

Solid Waste Generation & Disposal Capacity Report

For Calendar Year 2009

Prepared by the Maine State Planning Office

for the

Joint Standing Committee on Environment and Natural Resources
of the 125th Legislature

January 2011

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 2009 are the most current and complete data available for this report.

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Executive Summary

This report is submitted to the Joint Standing Committee on Environment and 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 2009, 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 calculates the State's recycling rate.

The State Planning Office (the 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.

Key Findings

Municipal solid waste (MSW) tonnage generated in Maine continued to decrease but at less than half the rate of decline of the previous year.

Maine residents and businesses generated less waste for a second consecutive year. Waste generation decreased by 3.1% in 2009, less than the 8.7% decrease in 2008, but still a combined decline of over 11% from 2007 levels.

MSW generation is largely tied to our consumption of goods. As the State's economy slowed, so too did Mainer's purchases and, thus, the amount we threw away. Prior to 2007, waste in Maine increased by an average 4% per year. Based on historical trends and a strong correlation with retail sales, the Office expects waste generation to pick up as the economy improves.

Maine recycling tonnage declined but the rate held steady.

The amount of waste collected for recycling declined in 2009, but, because of a corresponding decline in total MSW generated, the state recycling rate held steady at 38.7%, the same as 2008.

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

Maine continued its decades long trend of landfilling less than it combusts or recycles.

While recycling managed 38.7% of Maine's MSW in 2009, 33.3% was delivered to the four waste-to-energy facilities in 2009. Both activities significantly reduced Maine's reliance on the land disposal of waste. Wastes accepted by waste-to-energy plants and processed into residues before landfilling are reduced in weight by as much as 66%.

Maine landfilled one-quarter (25.4%) of its waste in 2009.[1] Wastes that are directly landfilled, which could be recycled or diverted for other uses, are the major consumer of landfill space. Maine's aggressive recycling goal is designed to reduce the volume of waste requiring landfilling.

Maine solid waste imports rose 8.5% to fuel its waste-to-energy plants.

During 2009, Maine imported more than a half million tons of MSW. Approximately half of that tonnage was delivered to waste-to-energy facilities to produce energy. Reflecting Maine's slow economy, the continued drop in Maine-generated waste, and their need to meet tonnage requirements for energy contracts, waste-to-energy facilities increased their importation of MSW by 41,000 tons over 2008.

The Office expects that the imports of MSW will continue at waste-to-energy facilities for the foreseeable future, to be gradually replaced by Maine MSW only as the economy recovers and generation of domestic waste increases.

The remaining out-of-state-generated MSW, including construction and demolitions debris, was received at the State's two commercial landfills — Pine Tree Landfill in Hampden and the Crossroads Landfill in Norridgewock. While economics have increased the amount of MSW imported by waste-to-energy facilities, the amount of out-of-state waste landfilled will decline sharply due to the closure of the Pine Tree Landfill at the end of 2009, which will be reflected in the Office's capacity report for 2010.

Maine has sufficient statewide disposal capacity until 2020.

Maine will need 24.4 million cubic yards of landfill capacity over the next 20 years to meet the projected disposal needs of the State. The State currently has 17.5 million cubic yards of licensed capacity.

As the table in Appendix A shows, Maine has capacity in our state-owned and commercial landfills together to manage the total wastes generated through 2019-20. The sole remaining commercial landfill, Crossroads Landfill, has projected capacity through 2021-22. Currently, Juniper Ridge, the state-owned landfill, has licensed capacity that will be exhausted at the end of 2017, using a projected 2.8% growth rate.

[1] The percentage landfilled does not include waste produced from the combustion of municipal solid waste (MSW) or other MSW processing residues in order to avoid double counting.

For comparison, if we use a projected zero growth rate in wastes delivered to the facility, the permitted capacity of Juniper Ridge will be consumed in 2018.

Maine has sufficient disposal capacity in the near-term, but will need to plan for additional capacity to come on line before 2020 to avoid service disruptions.

Maine could decrease its landfill capacity needs by 25% and substantially decrease its solid waste management costs 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, and how that waste is managed at the landfill, recycling 50% of our MSW would decrease Maine's overall capacity needs from 24.4 million cubic yards to 19.3 million cubic yards, depending upon the rate of growth of MSW over the 2010-2029 timeframe. Thus, achieving 50% recycling (or greater) would have a significant effect on Maine's need to develop new capacity.

Costs vary, but the Office estimates that it costs on average $25 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 17.5 million cubic yards of landfill space is consumed is likely to cost $175 million dollars. Reducing the amount of landfill space needed through recycling could lower the landfill development costs by as much as $125 million.

Currently, in Maine much of these development costs are 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's disposal capacity supply and demand had no measurable effect on disposal pricing in 2009.

State law directs the Office to look at the impact of available disposal capacity on tipping fees, with an eye to monitoring how a decrease in capacity may impact tipping fees charged, collusion, or other forms of monopolistic, oppressive practices.

In 2009, the Office found no significant impact to disposal prices due to a decrease in available disposal capacity. The Office consulted with the Department of the Attorney General in developing this analysis.

The operator of the Juniper Ridge Landfill is bound by a cap on tipping fees, imposed by the State in its operating services agreement. 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). The Office finds that Maine's inter-connected system of private and public sector collection, recycling, hauling, and disposal currently serves Maine's solid waste management needs fairly and effectively. The Office consulted with the Department of the Attorney General in developing this analysis.

Key Questions for Policymakers

The Governor and the Legislature may want to consider the following three policy questions:

1. Should Maine invest public dollars to increase recycling and decrease the need for development of additional disposal capacity?
2. When will Maine need to develop new state-owned landfill capacity?
3. Is owning a landfill, as part of an overall state waste management strategy, an appropriate state function?

State Investment in Recycling

In 2010, the Legislature's Natural Resources Committee examined ways to increase Maine's recycling rate including public investments to recover old corrugated cardboard, yard and leaf waste, and food wastes. The Office concluded that a $5-6 million investment in municipal recycling facilities to divert these waste streams from landfilling would increase the State's recycling rate to over 50%. At the request of the committee, the Office is preparing a report on these issues for their consideration in the 125th session.

New State-owned Landfill Capacity

In anticipation of state-owned landfill space being exhausted in 2017 or 2018, and if the Legislature wants capacity in addition to the commercially-owned Crossroads Landfill, the State needs to begin planning for new, state-owned, landfill capacity in 2011. This timeframe takes into account the current economic slowdown, and the anticipated duration of the complete development process, from the initial preparation of the application for public benefit determination, through construction of new capacity licensed and prepared to receive waste.

Maine law requires the Office to notify the Legislature when there is six years or less of remaining licensed and available statewide disposal capacity (38 MRSA §2156-A) and to recommend to the Legislature's Environment and Natural Resources Committee construction of new disposal capacity for MSW or special waste. Based on the analysis in this report, and assuming no major change in Maine's solid waste generation and management landscape, the Office expects it will reach that trigger point in 2011.

In the 2010 capacity report, we anticipate asking the Committee to consider recommendations for ensuring that Maine does not run out of statewide disposal capacity in order to avoid attempting to construct landfill capacity in a crisis situation.

State Ownership of Landfills

Given the need to start planning the development of landfill capacity in the near future, it is appropriate to examine the State's role in the solid waste disposal system.

In 1989, the Maine Legislature passed landmark waste management legislation that, among other things, banned the development of new commercial solid waste disposal facilities and set Maine state government on a course to own landfills. This was in response to concerns about out-of-state waste consuming Maine landfill capacity.

Under the commerce clause of the U.S. Constitution, states cannot restrict the flow of solid waste (considered a commodity) across state lines through use of its regulatory authority. If Maine wants to limit the importation of solid waste from other states to be disposed of here, it can only do so as the owner of the landfill. Under the 1989 law, existing commercial facilities are being phased out and the State[2] sites and owns future landfills.

Over the past 20 years, legislatures have revisited the policy of banning commercial landfills and upheld it. Most recently, the Natural Resources Committee considered a bill in spring 2010 that would have allowed an expansion of the sole remaining commercial landfill in the State. The committee voted the bill down, but continued to study this question in the summer of 2010 with the intention of re-examining it in the 125th Legislature.

In 2003, as part of an economic development strategy to preserve paper mill jobs in Old Town, the Baldacci Administration negotiated an agreement whereby the State acquired the Georgia Pacific/Fort James paper mill sludge landfill for use by Maine's municipalities and businesses to dispose MSW and residues. The Legislature gave the responsibility for overseeing the landfill to the State Planning Office. The Office contracts with a private waste management company to operate the state-owned landfill, known as Juniper Ridge.

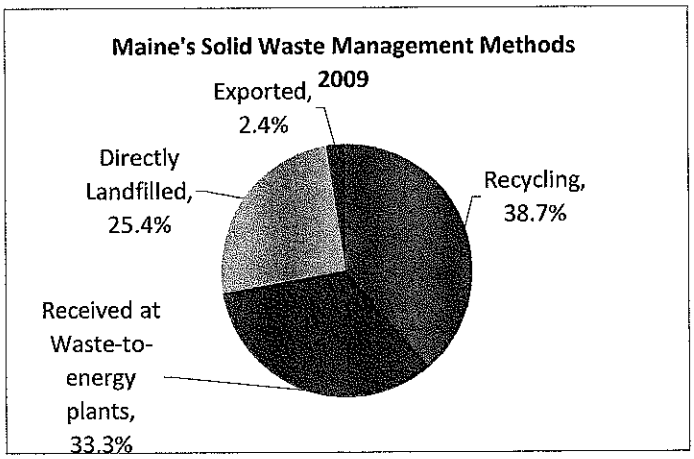
If the Legislature were to amend state law to allow new or expanded commercial landfills, the State could sell the Juniper Ridge Landfill to a commercial entity. There are

[2] In the 1989 law, the Waste Management Agency would have been the agency for state-owned landfills. When the Legislature abolished the agency in 1995, it moved that responsibility to the State Planning Office.

benefits and consequences to privatizing the landfill. On the plus side, the State would be relieved of the duties of overseeing the landfill operations, except for compliance with environmental regulations by the Department of Environmental Protection (DEP), and could realize revenues from the sale of the landfill, a valuable asset. There would be several contractual and legal issues to resolve with the current operator that, while not insurmountable, would take time and reparation to resolve. On the down side, the State would lose its ability to control the importation of solid waste and to prevent out-of-state waste from consuming landfill space that serves Maine residents and businesses.

Maine Municipal Solid Waste Management Summary

The following graph shows how Maine managed its MSW in 2009.



The following tables provide an overview of Maine's MSW (in tons) in 2009 compared to 2008. Where appropriate, clarifications between out-of-state and in-state wastes are noted.

Management of Maine's Municipal Solid Waste

Maine in-state generated solid waste	**2008**	**2009**
Total Municipal Solid Waste Generation	1,833,634	1,777,498
Recycled/Reused	709,624	687,781
Combusted	370,082[3]	352,633[3]
Landfilled	691,490[4]	693,931[4]
Exported	62,438	43,153

[3] includes in-states wastes only.

[4] This figure includes the 25.4 percent of MSW that is directly landfilled and the processing residues and ash from the combustion of Maine MSW which are ultimately landfilled thus included under "landfilled" rather than "combusted" in order to avoid double counting.

Recycling in Maine

Maine in-state recyclables	**2008**	**2009**
Municipal/Public Efforts	266,977	255,097
Commercial/Business Efforts	442,647	432,684
Total Tons Recycled	**709,624**	**687,781**
% of MSW Recycled	**38.7%**	**38.7%**

Processing for Combustion at Waste-to-Energy Facilities

Combined in-state and out-of-state	**2008**	**2009**
Combusted	515,872	522,653
By-pass	20,520	36,160
FEPR	117,069	118,864
Metal	22,138	22,285
Ash	175,261	174,900
Total MSW Delivered to WTE	**850,860**	**874,862**[5]

Disposal Facility Receipts of Out-of-state Generated MSW

facility and the type of waste received	**2008**	**2009**
Maine Energy – MSW	160,118	175,962
PERC – MSW	80,343	92,010
ecomaine – MSW	2,826	16,514
Mid Maine Waste Action Corp. – MSW	110	110
commercial landfills – MSW Landfilled	0	0
Pine Tree – CDD Landfilled	285,728	279,118
Crossroads – CDD Landfilled	0	10,631
Total MSW & CDD Imported	**529,125**	**574,345**

Landfill Disposal

Combined in-state MSW and CDD including all processing residues from the WTE facilities	**2008**	**2009**
Juniper Ridge	426,761	365,287
Municipal Landfills	149,911	149,149
Municipal CDD Landfills	Insufficient data	Insufficient data
2 Commercial Landfills	212,539	302,019
Total Landfilled	**789,211**	**816,455**

[5] 67.5% of the MSW processed at Maine's 4 WTE facilities was generated in Maine, the balance was generated outside Maine. Of the 522,563 tons combusted, 352,633 tons were generated in Maine.

Disposal Capacity in Maine[6]

		3 Years	5 Years	10 Years	20 Years
WTE Facility Capacity	2009 Capacity – currently available (tons/year)	2012 Capacity – projected remaining (tons/year)	2014 Capacity – projected remaining (tons/year)	2019 Capacity – projected remaining (tons/year)	2029 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[6]	304,000
Total	**854,000**	**854,000**	**854,000**	**854,000**	**854,000**
Landfill Disposal Capacity at a 1 % projected growth rate	2009 Licensed Capacity – end of year (cubic yards)	2012 Licensed Capacity – end of year (cubic yards)	2014 Licensed Capacity – end of year (cubic yards)	2019 Licensed Capacity – end of year (cubic yards)	2029 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	7,114,614	4,664,615	2,995,684	0	0
Juniper Ridge – Old Town (expansion being sought)	Unlicensed	Unlicensed	Unlicensed	Unlicensed	Unlicensed
Municipal Disposal Sites (10)					
8 - Municipal landfills	4,920,282	4,282,877	3,847,246	2,719,474	288,413
2 - Municipal – 'ash'	1,279,397	1,025,849	865,820	451,532	0
Commercial landfills (2)					
Crossroads - Norridgewock	4,254,517	3,351,517	2,736,397	1,143,960	0
Pine Tree - Hampden	0	0	0	0	0
Total	17,568,810	13,655,301	10,993,892	4,386,143	288,413

[6] This table projects the continued operation of the four WTE facilities. Expansions are planned at the Presque Isle and Juniper Ridge Landfills but until those expansions are permitted, no additional capacity is included in these projections.

I. Introduction

Maine law requires the State Planning Office (the 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.

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.

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.

Our Methodology

Data from calendar year 2009 are the most current, complete data available for this report. The data used from this report come from a variety of sources:

- recycling and waste disposal data submitted in annual reports by local and regional municipal recycling and waste management programs to the Office and Department of Environmental Protection (DEP);
- solid waste data from the public and private disposal and processing facilities' annual license reports to DEP; and
- commercial recycling data from surveys conducted by the Office.

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 (MSW) generation in Maine.

To estimate recycling, the Office combines municipal and commercial recycling tonnages and adjusts the figures to eliminate duplicate counting of recyclables. To estimate landfill capacity, the Office uses 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 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 zero growth scenario to measure the impact of a possible slower economic recovery. Using estimates of zero increases in 2010-2020, the Office projects 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. State 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. A preliminary analysis by state economists shows projected growth in retail sales beginning in 2010 and 2011. Based on this, the Office will monitor facility tonnages closely in 2010 and 2011 to determine whether waste generation projections need to increase and to assess any impact that would have on available disposal capacity. If the economy (as measured by retail sales) does begin to turn around in 2010 and 2011 and waste generation increases rather than holds steady at no growth, the State may have less disposal capacity than anticipated.

The Office made several assumptions in making its 10- and 20-year disposal capacity projections. It assumed:

- A constant recycling rate of 38%;
- Exported wastes continue to decline;
- 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.

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.

The report 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 MSW, 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 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. 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 modifications to the assumptions of the state plan that deserve note.

Recycling

- Markets for recycled materials have continued their rebound from the late 2008 downturn and now exceed the market highs of the first quarter of 2008. Prices on some commodities are at the record prices of 1995.
- The 124th Legislature passed, and the Governor signed into law, milestone product stewardship framework legislation. The Maine DEP has produced the legislation's first report which identifies medical sharps, paint, and pharmaceuticals for review and possible inclusion under the law.

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 maintains the downward revision of the 2008 Generation and Capacity Report. This report projects Maine's landfill capacity needs will be 24.4 million cubic yards based on a growth rate of 2.8%. The predicted continued drop in 2009 MSW generation has occurred.

Waste to Energy (WTE)

- The continued drop 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.
- As of the end of 2009, 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. If Maine Energy did close, there are several possible scenarios for the management of the Maine generated wastes currently received at the facility, but, there would not be an increase demand on in-state landfill disposal capacity. In recent years, the annual tons of Maine generated MSW accepted at Maine Energy have either approximately equalled or been less than the annual tons of residues sent to Maine landfills from the facility.

- Penobscot Energy Recovery Company (PERC) officials announced their active strategic planning for continuing processing wastes after their 2018 disposal-contracts expire, and their planning for the appropriate sized and type of system that will efficiently process less waste. A downsized WTE facility or possible new technology at PERC would translate into decreased demand for landfill capacity.

II. Municipal Solid Waste Generation

A. Definition

Municipal Solid Waste (MSW)

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, textiles, appliances, furniture, tires, wood waste, yard waste as well as construction and demolition debris.

Construction and 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.

B. Statewide Municipal Solid Waste Generation

Maine residents and visitors generated 1,777,498 tons of MSW in 2009. Waste generation is a function of population growth, lifestyles, economic activity, and manufacturing and production practices. The drop in solid waste generation rate 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 of 4%. But from 2003 through 2007, overall growth was less than 1%. In 2008 the total waste generated fell by 173,960 tons, an 8.7% decrease while 2009 numbers reflect a continued but less dramatic 3.1% decline.

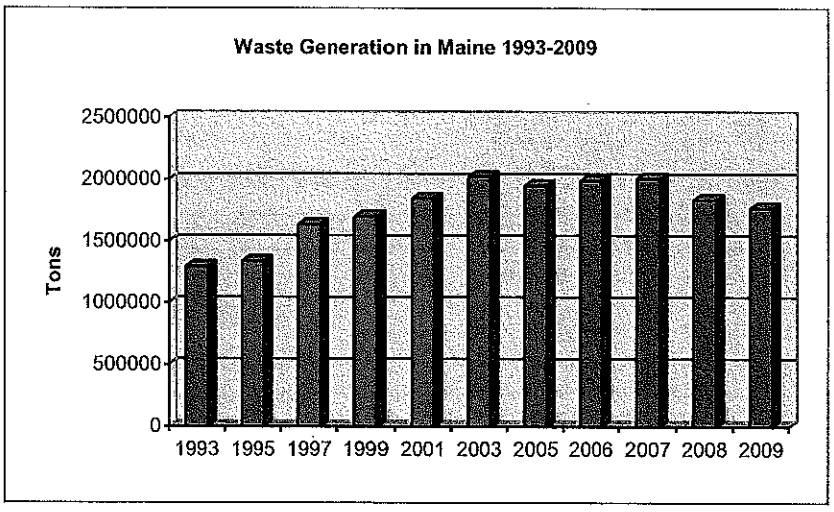


Figure 1: Maine Waste Generation, 1993-2009
Source: State Planning Office

III. Recycling

A. Statewide Recycling Rate

Maine recycled 38.7% of its MSW in 2009, the same as 2008. 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.

Recycling Trends

Figure 2 shows the tons of waste disposed compared to the tons recycled over time. Until 2008 the growth in waste generation had prevented the recycling rate from increasing despite greater tonnages being recycled. In 2008 and 2009 the recycling rates increased and held steady because overall waste generation declined.

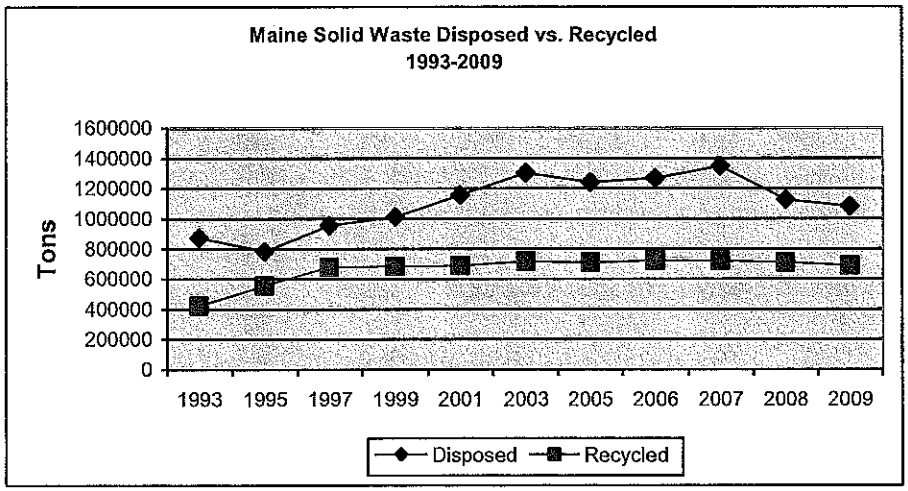


Figure 2: Maine Solid Waste Disposed vs. Recycling, 1993-2009
Source: State Planning Office

Table A shows a breakdown of MSW and CDD waste generated and recycled

Table A: Maine CDD Generation and Recycling - 2009				
MSW (including CDD) generated	1,777,498		MSW w/o CDD generated	1,392,243
MSW with CDD recycled	687,781		MSW w/o CDD recycled	620,760

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 2009.

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 MSW annually. In 2009, Maine held to a 38.7% recycling rate.

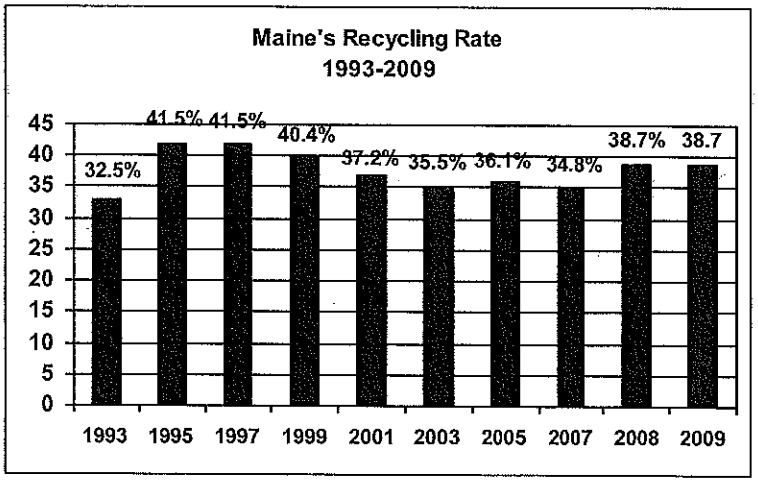


Figure 3: Maine's Recycling Rate, 1993-2009
Source: State Planning Office

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 capacity.

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, public programs recovered 15% (255,097 tons) from the State's total MSW stream that would otherwise need disposal.[7]

Achieving our Waste Reduction and Recycling Goals

To reach our statutory recycling goal of 50%, Maine would need to recycle approximately 900,000 tons per year at today's generation levels. That rate is certainly achievable, with new resources and policy changes. For example, the Office estimates that a comprehensive recovery program for the food scraps which Maine residents, institutions, and businesses throw out each year, that included new composting facilities and energized marketing of the finished product would yield two-thirds of the amount of recovered materials needed to break through the 50% threshold.[8]

[7] The remaining tonnages that make up the state's recycling rate are recycled by Maine businesses.
[8] 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.

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,[9] and technical assistance. To achieve a significant increase in the statewide recycling rate will require an infusion of resources for municipalities, private investment, stable markets for recyclables, changes in state policy to achieve greater recycling and waste reduction—or all four. 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 62% is the result of business recycling, handled by private sector resource management companies. The balance of recyclables (38%) are handled by municipal recycling programs. 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 six years) improvements in processing capacity in the following regional programs: Portland, Bangor, 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, neither the physical (buildings and equipment) nor 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 to match projected increases in waste generation. To achieve this goal soon both public and private sectors will need to invest to build the infrastructure to manage an increase in recycling.

Over the next 20 years, to maintain the State's current recycling rate (38.7%), will require public and private programs to almost 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.[10]

[9] As funds permit.

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

In 2009, municipal recycling programs recovered 101,223 tons of 'traditional'[11] recycled materials. The Office estimates the programs as they exist today have additional capacity for another 25,000 to 35,000 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 respond with capital investment to grow their tonnages if the economics warrant it. For example, FCR Goodman (Casella) has 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. Other private initiatives include developing drop points for consolidating co-mingled recycled materials based on recycling regions and direct marketing of waste and recycling services to residents in selected areas of the State.

Waste Reduction Efforts

Maine has a waste reduction goal in state law to reduce the biennial generation of MSW tonnage by 5% by January 1, 2009, and by an additional 5% every subsequent two years. The Office has ongoing public education programs and media campaigns that advance Maine's waste reduction policy. In addition, the Office assists Maine's efforts to reduce the use and the subsequent disposal of plastic shopping bags through the retail merchants "Got Your Bags, Maine?" campaign.

The State's waste reduction efforts also are promoted through the many product stewardship programs administered by the Maine DEP. Product stewardship is a policy which supports the reduction, re-use, and the recycling of materials in Maine's solid waste stream. Maine law defines "product stewardship" to mean "a producer's taking responsibility for managing and reducing the life-cycle impacts of the producer's product, from product design to end-of-life management." It provides producers with new opportunities to move toward sustainable production in which they design products so that materials can be recaptured and reused to make new products ("cradle-to-cradle" production).[12]

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

[12] For a thorough review of Maine's Product Stewardship Programs please see *Implementing Product Stewardship in Maine* available on-line at www.maine.gov/dep.

IV. Existing and Planned Disposal Capacity

In 2009, Maine's solid waste disposal facilities included: one state-owned landfill, two commercial landfills, ten municipally-operated landfills, about twenty municipal construction and demolition debris (CDD) landfills, and four waste-to-energy (WTE) 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 are: raw garbage; construction and demolition debris; residues and ash from WTE facilities; contaminated soils; sludges; ash from bio-mass operations; and other special wastes. This report focuses on MSW, including CDD, as well as the residues from the processing of those wastes. However, in reviewing landfill capacity, the tonnages of the various cover materials that are utilized and 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 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. The Legislature directed the Office to acquire, own, and contract for the operation of this landfill (Resolve 2003, chapter 93).

In 2009, the Juniper Ridge landfill, received a total of 528,622 tons of in-state generated waste, including cover materials. Of this 365,287 tons were MSW: 21,559 tons of MSW by-pass, 187,981 tons of residuals from WTE facilities, and 155,747 tons of CDD and bulky wastes. The balance of the waste buried at the landfill, 163,335 tons, included various types of sludges, residues, contaminated soils, and other approved special wastes from other in-state commercial and industrial generators.

Assessment and Status of the State-owned Facility

Available disposal capacity remaining at Juniper Ridge at the end of 2009 was approximately 7,114,614 cubic yards, which translates into space for approximately

[13] In addition to the Juniper Ridge Landfill, the State Planning Office owns 1,500 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.

6.05 million tons of solid waste. At projected fill rates[14], the present licensed capacity should provide nine years of disposal capacity for the State, consuming that capacity in 2018.

In late 2006, the Juniper Ridge Landfill operator and the Office began its initial investigation into expanding Juniper Ridge to provide an additional 21.9 million cubic yards of disposal capacity. In late 2009, the Office submitted its public benefit determination application as part of the expansion process. The DEP issued a draft denial decision on that application, stopping the planned expansion process. Discussions are currently underway with the DEP to evaluate next steps.

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

Commercial Landfills

Through 2009, Maine had two commercial landfills grandfathered under the 1989 Solid Waste Management Act that banned the development of new commercial disposal facilities. The two commercial landfills are:

- Crossroads Landfill, located in Norridgewock, owned by Waste Management, Inc.
- Pine Tree Landfill, located in Hampden, owned by Casella Waste Services, Inc. (the facility closed and ceased accepting solid waste at the end of 2009)

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 over 40 Maine communities in Western Maine. In 2009, the landfill accepted 287,634 tons of solid waste, including cover materials. Of that tonnage, 184,024 tons were Maine generated municipal solid wastes, CDD and their residues. 103,610 tons were wastes generated outside of Maine.

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 2009, the Pine Tree Landfill accepted 413,207 tons of solid waste, including cover materials. Of that, 117,995 tons were Maine generated MSW, CDD and their processing residues. The balance of wastes, 338,829 tons, included out-of-state generated CDD, processing residues and special wastes.

Together the two commercial landfills took in 302,019 tons of Maine-generated MSW, CDD, and residues from Maine processing facilities and WTE plants.

[14] The State Planning Office projected that wastes delivered to Juniper Ridge would average 550,000 tons per year, but would 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.

Table B: Capacity at Maine's Commercial Landfills – end of 2009				
	2009 Fill Rate (tons)	**Remaining Capacity (Cubic Yards)**	**Remaining Capacity (tons)**	**Estimate in years of life remaining based on 2009 fill rates**
Crossroads Landfill	287,634	4,254,517	4,250,000	12-14 years
Pine Tree Landfill (at the end of 2009 this landfill closed)	413,207	0	0	0
Total	700,841	4,254,517	4,250,000	

Assessment of Facilities

The total disposal capacity currently licensed at Crossroads Landfill, the only remaining commercial landfill, is approximately 4.2 million cubic yards. 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, cover materials, special wastes and other residues, whether generated within the State or delivered from outside the borders.

Municipally-operated Landfills

In 2009, 225,659 tons of solid wastes, including cover materials, were disposed of at ten municipally owned landfills. Of that tonnage, 149,149 tons were MSW including bulky wastes and CDD and 76,510 tons were residues from two WTE facilities. Table C provides information on each individual landfill, including fill rates and estimated available remaining capacity.

Assessment of Facilities

Among the eight municipally-operated MSW landfills[15], there are approximately 4.9 million cubic yards of remaining available capacity that can accept approximately 3 million tons of MSW. Maine municipal operations do not typically achieve the 1 ton to 1 cubic yard compaction ratio of the commercial landfill. This capacity is sufficient to carry the MSW for most of the communities served by these landfills for an average of 20 years or more, based on current waste tonnages and types 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.

[15] This does not include the 2 municipally owned "ash-fills".

Table C: Municipal Landfill Tonnages – 2009				
Municipal Landfills that accept unprocessed MSW and CDD				
	2009 Fill Rate (all wastes & cover) (tons)	**Remaining Capacity Cubic Yards (est.)**	**Remaining Capacity (tons) (est.)**	**Years of life remaining based on 2008 fill rates (estimated)**
MSW Landfills:				
Bath	9,220	355,000	153,000	26 years
Brunswick	4,370	230,000	115,000	17 years
Greenville	4,113	10,000	5,000	To close in 2011
Hatch Hill (Augusta)	38,324	1,807,714	1,350,000	36 years
Presque Isle	20,010	305,146	155,000	15 years
Tri-Community (Fort Fairfield)	29,164	1,790,150	1,250,000	40 years
MidCoast SWC	4,385	75,700	38,000	9 years
Rockland	39,563	346,572	200,000	5 years
CFWF (West Forks)	Closed in 2008			
Total Tons:	**149,149**			
Total Remaining Capacity (est.)		**4,920,282**	**3,266,000**	
Publicly Owned Landfills that accept residues from processing of MSW				
	2009 Fill Rate (all wastes & cover) (tons)	**Remaining Capacity Cubic Yards (est.)**	**Remaining Capacity (tons) (est.)**	**Years of life remaining based on 2008 fill rates (estimated)**
Ash Landfills:				
ecomaine	58,361	1,013,111	1,000,000	30 years
Lewiston	18,149	266,286	260,000	15 years
Total Tons:	**76,510**			
Total Remaining Capacity (est.)		**1,279,397**	**1,260,000**	
Total	**225,659**	**6,199,679**	**4,526,000**	20+ years

Municipal CDD Disposal Facilities

There are approximately 20 municipal land disposal facilities that accept locally-generated CDD, 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 2009.

Assessment of Facilities

The remaining capacity at individual CDD facilities varies, but based on prior year's data, it appears that this type of landfill capacity will be available 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.

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 two large-scale commercial CDD processors: KTI Biofuels in Lewiston and the CPRC Group in Scarborough.

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. In 2009, it received 115,948 tons of clean wood and CDD, of which 27,329 tons were from in-state generators.

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. In 2009, it accepted 40,041 tons of various CDD and other products, of which approximately 34,000 tons were from in-state sources.

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.

CDD can be disposed at Juniper Ridge Landfill and other licensed disposal facilities if there are no other options, but landfilling remains the least desirable management method.

B. Waste-To-Energy (WTE) Facilities

In 2009, 33.3% of Maine's MSW was sent to a WTE facility. Maine's WTE facilities received a total of 874,862 tons of MSW from both in-state and out-of-state sources, an increase of 24,002 tons from 2008. Of these 874,862 tons of MSW, 590,266 tons were generated in-state and 284,596 tons were imported (an increase from the 2008 deliveries).

Of the Maine generated 590,266 tons of MSW, 352,633 tons were combusted, 14,301 tons of metal were recovered, and landfilled residues and by-pass totaled 223,332 tons. Table D shows the processing capacity of the four WTE facilities:

Table D: Maine WTE Capacity		
Waste-To-energy Facility	**Annual processing capacity (tons/year)**	**Tons Received in 2009**
ecomaine	170,000	184,582
Maine Energy Recovery Company	310,000	291,339
Mid Maine Waste Action Corporation	70,000	81,716
Penobscot Energy Recovery Company	304,000	317,225
Total of WTE Facilities	**854,000**	**874,862**

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 weight of waste requiring landfilling by about two-thirds.

To produce the electrical generation contracted for, WTE 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 WTE 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 MSW stream intended for delivery to and incineration at a WTE 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.

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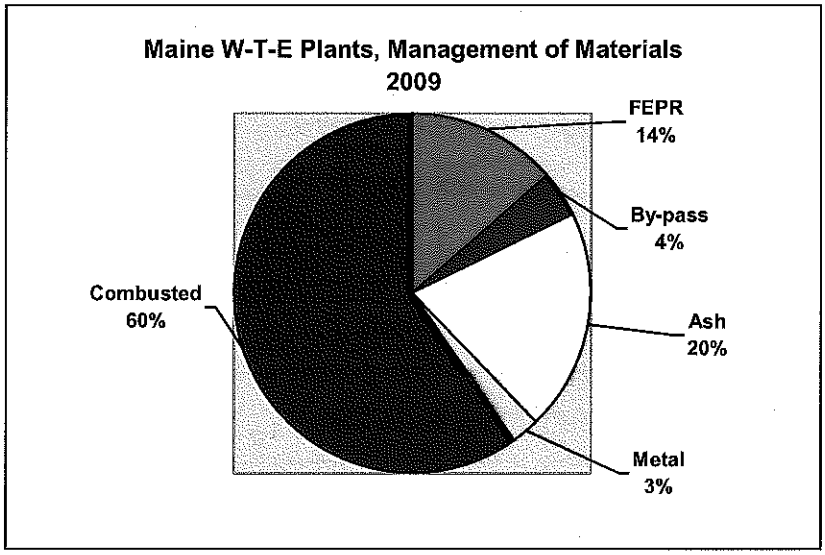


Figure 4: Maine WTE Plants, Management of Materials
Source: Facility Annual Reports, State Planning Office

- *Front-end Process Residue (FEPR):* Maine Energy Recovery Company (MERC) and Penobscot Energy Recovery Company (PERC) use a refuse derived fuel technology and generate FEPR as a by-product of their operations.[16] FEPR is removed prior to incineration because it lowers the burning efficiency. FEPR includes 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.

- *WTE Facility Ash:* Ash, 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 *ecomaine'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 them functioning well and should continue to do so for the foreseeable future. Facility upgrades occur in response to environmental regulations, primarily aimed at air emissions reductions. All of the Maine WTE facilities perform at or better than their license requirements.

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

Biddeford City officials continue to work to close or move operations of the Maine Energy Recovery Company, which serves 23 municipalities. In addition, disposal contracts for the PERC 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 MSW

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

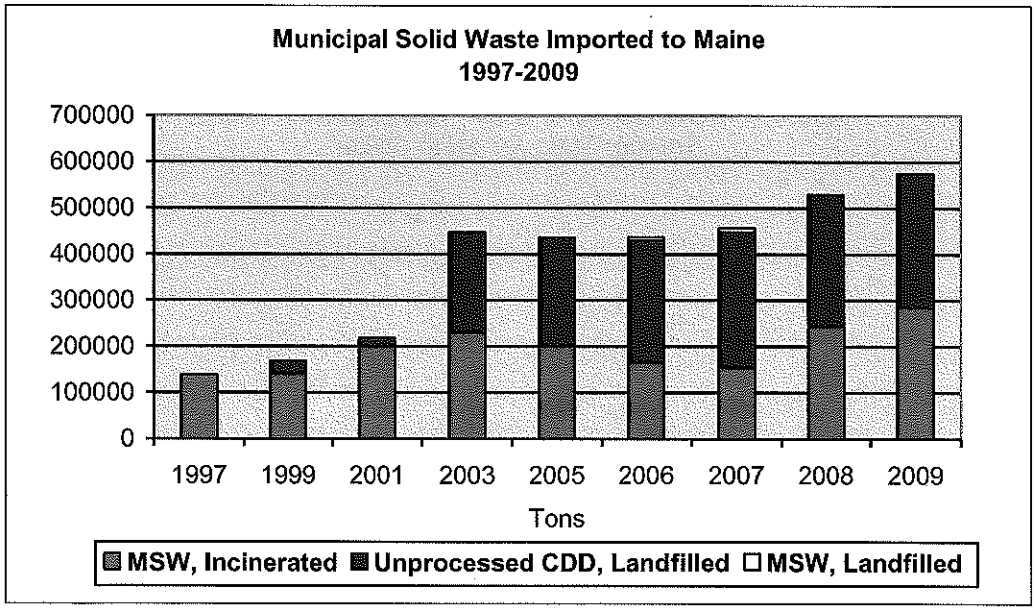


Figure 5: Municipal Solid Waste Imported to Maine, 1997-2009
Source: State Planning Office

In 2009, 574,345 tons of MSW were imported to Maine, up from the 529,125 tons of MSW imported to Maine in 2008. The amount of CDD imported remained relatively constant with a slight increase of 4,000 tons. Zero tons of MSW were imported directly to commercial landfills in 2009. The continued decrease in Maine-generated MSW caused the WTE facilities to increase their deliveries of imported MSW by 41,000 tons. Exports of MSW in 2009 were 43,153 tons, down over 30% from the 2008 tonnage of 62,438 tons (See Figures 5 and 6).

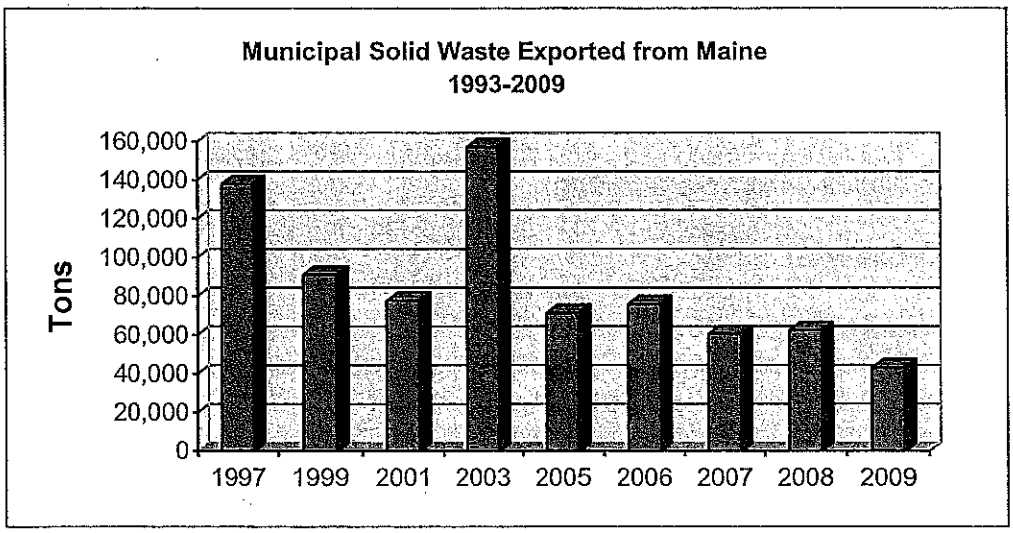


Figure 6: Municipal Solid Waste Exported from Maine
Source: State Planning Office

V. Projected Landfill Disposal Needs and Capacity

Landfill Capacity Calculation

To determine Maine's disposal capacity needs, the Office first calculated the available capacity in 2009. It then projected tons of waste generated in Maine that will need to be managed over 20 years. This projection is based on a 2.8% growth in solid waste per year starting in 2012. Adding in a projected tonnage of imported waste, and subtracting wastes that do not get landfilled in Maine (wastes that are recycled, exported, or combusted), the Office calculated the tons of waste needing land disposal over the 20-year timeframe of this analysis. That tonnage was then converted to cubic yards to compare to the available capacity.

The Office made several assumptions in making its 10- and 20-year disposal capacity projections. It assumed:

- A constant recycling rate of 38%;
- Exported wastes continue to decline;
- Continued operation of and reliance on the four waste-to-energy facilities, at the existing mix of tonnages (out-of-state waste, processing residues, etc); and
- No significant change in municipally-operated landfills.

Maine currently has 17.5 million cubic yards of permitted, available disposal capacity. An estimated 24.4 million cubic yards of landfill capacity will be required over the next 20 years.

Table E: Projected Disposal Capacity Available vs. Needed at 2.8% growth 2009-2029

Landfill Capacity Available (cubic yards)			**Capacity Needed (tons)**	
Municipal Landfills	4,920,282		Total waste generated	44,419,614
Municipal Ash –"Landfills"	1,279,397			
Municipal CDD Landfills	Incomplete data		Imported Waste	4,000,000
Commercial	4,254,517		Recycled	(17,190,391)
Juniper Ridge	7,114,614[17]		Exported	(1,066,071)
			Combusted at WTE	(9,194,860)
Total Landfill Capacity Currently Permitted:	**17,568,810**		**Total Landfill Capacity[18] Needed: Tons to Cyds**	**24,381,735**

Source: State Planning Office

[17] The Juniper Ridge Landfill 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.
[18] Converting tons to cubic yards using .86 tons per yard.

Based on the projection in Table A, we can see that Maine has sufficient disposal capacity for 10 years through 2020, but it currently cannot meet projected statewide needs for a 20-year outlook. Maine needs to plan for developing new disposal capacity beyond 2020 in order to meet the waste management needs of the State's municipalities and businesses.

The largest single source of Maine's disposal capacity is the state-owned Juniper Ridge Landfill, which has capacity through 2017-1018. To avoid a shortfall in landfill capacity, the State needs to begin the application process for additional, state-owned, landfill capacity at that landfill in 2011. This timeframe takes into account the current economic slowdown, and the anticipated duration of the complete development process, from the initial preparation of the application for public benefit determination, the permitting process, through construction of new capacity licensed and prepared to receive waste.

Title 38, chapter 24, section 2156-A outlines the Office's responsibility to notify the Legislature of the need to develop more solid waste disposal capacity when there is six (6) years or less of licensed and available disposal capacity for MSW or special waste in the State."[19]

Based on the analysis of remaining landfill disposal capacity at the state-owned Juniper Ridge Landfill and the commercial Crossroads Landfill, the Office believes it will make that finding in 2011.

Factors that can affect Capacity Projections

There are a number of factors that will influence the Office's projections.

Natural or Man Made Disasters

Natural or man made disasters such as floods, ice storms, or oil spills would produce special wastes that would consume landfill capacity. This report does not attempt to estimate potential demand that these types of special waste and CDD disposal may place on Maine landfill capacity in such an event.

Changes in Policy, Law or Regulation

Under Maine's solid waste management hierarchy, landfilling is the least desirable solid waste management option. As policy, all other solid waste

[19] The report must recommend which state agency or department will own the facility and how it will be operated. The report must also include a review of disposal options outside of the State; a review of existing efforts to reduce, reuse, recycle, compost and incinerate the affected municipal solid waste and special waste streams and the impact of these efforts on capacity requirements; a thorough economic analysis of the facility's expected costs; and commitments from entities to utilize the facility and projected revenues. It is the intent of the Legislature that the facility be operated by a private contractor. A state-owned solid waste disposal facility may not be constructed or operated unless authorized by legislation pursuant to subsection 3. [2007, c. 192, §6 (AMD) .] 3. Authorization for development. The joint standing committee of the Legislature having jurisdiction over natural resource matters may report out legislation authorizing construction and operation of a state-owned solid waste disposal facility in response to a report submitted pursuant to subsection 2.

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 facilitities 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. We now look at other ways to project generation. State economists found a strong positive correlation between waste generation and retail sales. We have included an analysis of that comparison in Appendix D. The Office will continue to monitor this correlation to supplement its analysis of historical trends.

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 lowered 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, the Office strives to maintain a conservative approach in order to anticipate that time lag, and reduce the possibility of a capacity shortage crisis.

The Office analyzed the lifespan of existing statewide disposal capacity using three different scenarios, zero growth, 1% growth, and 2.8% growth over 10 years. These more conservative projected increases in waste generation would extend the life of Maine's existing state-owned and commercial landfills by one-to-two years, only.

Authority and Control

Although in its annual capacity assessment, the Office 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, and 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 its operator of the Juniper Ridge Landfill, requires reserving 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 may not be available for statewide capacity.

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 yards of landfill space.

Current Policy Issues Which Could Affect Capacity Needs

The amount of available landfill disposal capacity can be affected by policy decisions as follows:

Recycling

Recycling will continue to divert significant tonnages from disposal. The Office estimates that over 20 years, recycling will divert an estimated 17 million tons (cumulatively) from disposal, at 2009'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]

Expansions and Closures

The question of the public benefit of expansion of the Juniper Ridge Landfill was presented to the DEP by the landfill operator and the Office in 2009. The public benefit determination application was withdrawn after issuance of a draft denial by DEP. The Office plans to resubmit at some point in the future.

The Presque Isle landfill received 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.

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 is diverted to the Juniper Ridge Landfill.

Out-of-state Waste

The WTE 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, as the economy recovers, Maine-generated solid waste tonnages needing disposal will gradually increase, and the WTE facilities' reliance on imported MSW will decrease.[22]

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 wide fluctuations. 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 243,397 tons in 2008 and then to a twelve-year high of 284,596 tons in 2009, as Maine generation of MSW continued to drop along with Maine consumer activity. The relative strength or weakness of the regional economy and changes in waste

[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.

[22] The state's remaining commercial landfill may continue to accept unprocessed CDD from out-of-state.

management at the regional level can also affect the price and availability of solid waste imports.

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[23] per ton at Maine's landfills and WTE facilities and are stable, allowing predictability for municipal budgeting and long-term planning.

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

Energy Revenues

Tipping fees at WTE 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 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 today 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. Because of this cap, Juniper Ridge is perceived by the private and public waste sectors as having a limiting 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 consulted with the Department of the Attorney General to assist with its analysis of disposal pricing.

[23] This does not reflect spot market prices.

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.

The Office consulted with the Department of the Attorney General in reaching the following findings.

Disposal Facilities

During 2009, there was no change in ownership or operation of the disposal facilities, whether WTE facilities or landfills, except that the Pine Tree Landfill in Hampden, owned and operated by Casella Waste Systems Inc., was closed at the end of 2009.

Collection Services

During 2009, 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 there was commercial competition for accounts accompanied by increased levels of services offered. For example, several firms/organizations offered single stream recycling or expanded the types of materials they accept for recycling, and competed 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.

Recycling Services

During 2009, continued growth of the 'single sort', 'single stream', Zero Sort® 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 works to expand municipal participation in that program. FCR Goodman and Pine Tree Waste, subdivisions of Casella Waste Systems, offer a single stream recycling collection service through their program known as Zero Sort®. The collected recyclables are consolidated and shipped to either of the company's two processing

facilities in Auburn, Massachusetts and Charleston, Massachusetts. Based upon municipal reports submitted to the Office, approximately 65 communities participated in a 'single stream' recycling program.

Hauling Services

In 2009, 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 utilize their own hauling equipment and staff.

APPENDICES

A: Waste Disposal Capacity Available, 2009-2020

Scenario 1 – 'No Growth' in Waste Generation

	Waste Disposal Capacity Available (in cubic yards)											
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	actual	"0" growth →										
Facility												
Juniper Ridge	7,114,614	6,300,661	5,486,708	4,672,755	3,858,802	3,044,849	2,230,896	1,416,943	602,990	0	0	0
Crossroads	4,254,517	3,954,517	3,654,517	3,354,517	3,054,517	2,754,517	2,454,517	2,154,517	1,854,517	1,554,517	1,254,517	954,517
Total Statewide Capacity (w/o Municipal Landfills)	11,369,131	10,255,178	9,141,225	8,027,272	6,913,319	5,799,366	4,685,413	3,571,460	2,457,507	1,554,517	1,254,517	954,517

Scenario 2 – 'Low Growth' in Waste Generation

	Waste Disposal Capacity Available (in cubic yards)											
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	actual	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	7,114,614	6,300,661	5,486,708	4,664,615	3,834,301	2,995,684	2,148,681	1,293,208	429,180	0	0	0
Crossroads	4,254,517	3,954,517	3,654,517	3,351,517	3,045,487	2,736,397	2,424,216	2,108,913	1,790,457	1,468,817	1,143,960	815,855
Total Statewide Capacity (w/o Municipal Landfills)	11,369,131	10,255,178	9,141,225	8,016,132	6,879,788	5,732,081	4,572,897	3,402,121	2,219,637	1,468,817	1,143,960	815,855

Scenario 3 - Growth Rates projected based on actual economic indicators

	Waste Disposal Capacity Available (in cubic yards)											
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	actual	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	7,114,614	6,300,661	5,486,708	4,649,964	3,789,791	2,905,533	1,996,516	1,062,047	101,412	0	0	0
Crossroads	4,254,517	3,954,517	3,654,517	3,346,117	3,029,082	2,703,170	2,368,133	2,023,715	1,669,652	1,305,676	931,508	546,864
Total Statewide Capacity (w/o Municipal Landfills)	11,369,131	10,255,178	9,141,225	7,996,081	6,818,873	5,608,703	4,364,649	3,085,762	1,771,064	1,305,676	931,508	546,864

DATA NOTES:

- End of the year 2009 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 reported 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 = 813,953 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)
- 2009 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.

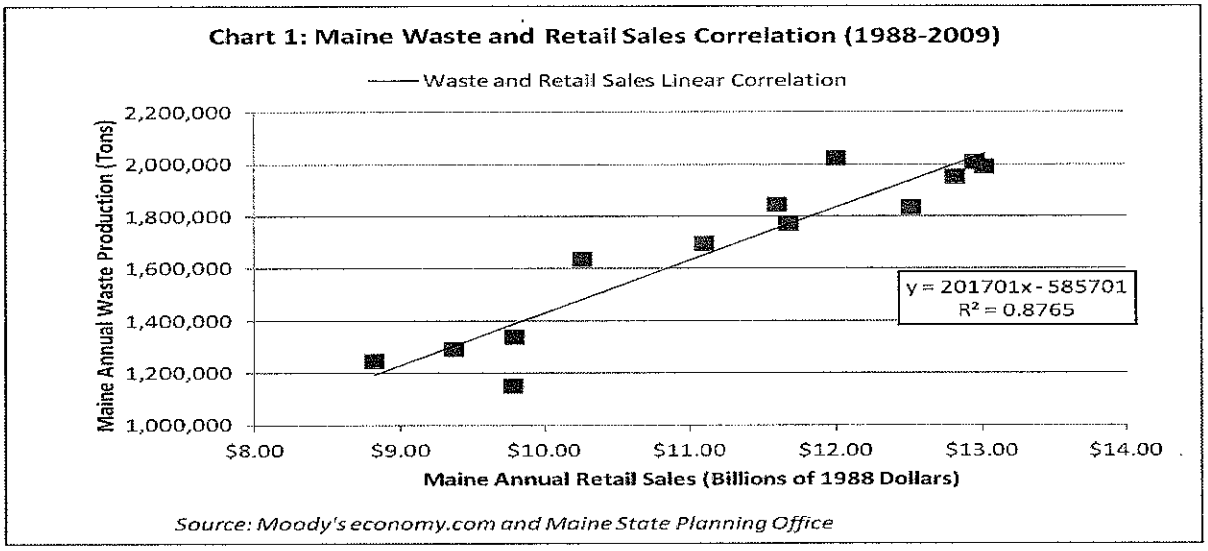
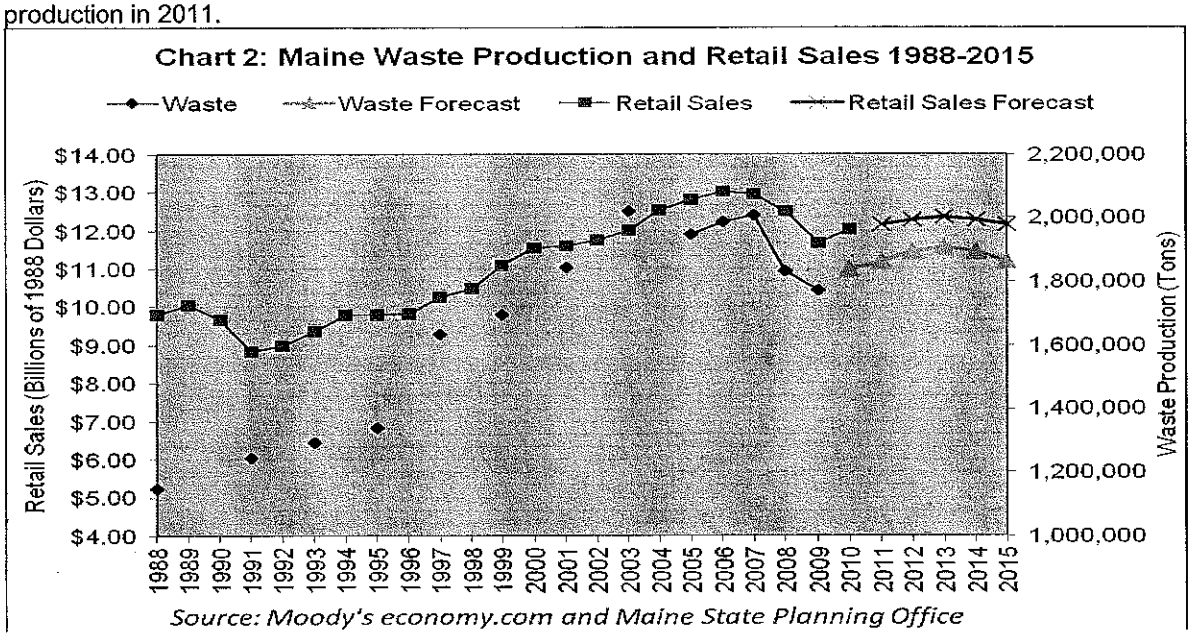
The joint standing committee of the Legislature having jurisdiction over solid waste matters may report out legislation related to the report submitted pursuant to this section.

C. Maine Recycled Materials, 1997-2009

Materials:	2009	2008	2005	2003	1999	1997
high grade paper	23,762	54,226	72,965	3,951	11,570	31,470
corrugated cardboard	79,455	103,692	117,144	88,166	198,442	214,536
newspaper	9,402	16,817	32,300	33,442	42,612	44,710
magazines	1,064	4,238	8,723	1,881	6,104	3,702
mixed paper	7,548	8,250	5,226	13,919	12,860	12,207
other paper	11,328	26,528	8,900	3,166	12,671	6,465
commingled fibers	3,495	31,543	36,805	132,475		
Total paper	**136,054**	**245,294**	282,063	277,000	284,259	313,090
Single Stream	30,200					
Co-mingled Containers	14,367					
Totals	**44,567**					
clear glass	7,693	8,743	11,058	6,334	8,324	10,590
brown glass	13,335	16,422	24,377	11,270	12,545	7,060
green glass	4,813	7,022	12,622	3,142	26,167	11,767
commingled containers		11,215	3,598	21,672	440	1,734
Total glass	**25,841**	**43,402**	51,655	42,418	47,476	31,151
white goods	92,886	87,399	78,401	68,125	142,640	122,895
aluminum	4,359	2,232	2,163	2,109	1,862	1,332
tin cans	1,452	1,955	1,089	3,154	18,833	10,693
non ferrous	25,921	22,467	23,213	18,847	18,652	21,572
other (various metals)	72,287	72,119	68,432	68,984		
Total Metal	**196,905**	**186,172**	173,298	161,219	181,987	156,492
HDPE	8,130	8,632	9,377	3,420	4,410	4,160
PET	5,463	5,166	4,766	8,725	6,521	6,021
LDPE film	1,058	784	526	711		
polystyrene			8	0	6	6
Other	1,986	1,381	631	531	1,211	1,042
Total Plastic	**16,637**	**15,963**	15,308	13,387	12,148	11,229
wood waste	119,813	82,318	93,582	92,154	41,103	38,402
leaves	22,671	26,224	29,938	33,376	27,421	24,528
food waste	1,113	2,745	142	2,623	24,582	23,240
Total Organic	**143,597**	**111,287**	123,662	128,153	93,106	86,170
tires	28,490	28,473	30,374	35,467	32,530	30,559
CDD, other wastes	67,021	66,332	23,425	49,714	39,469	44,209
Mercury-added/UW	3,248	4,872	487	327		
Total Hard to Manage	**98,759**	**99,677**	54,286	85,508	71,999	74,768
Textiles/Reuse	**16,026**	**3,543**	1,724	2,260	6,023	1,726
Other nonbulky MSW	**9,395**	**4,286**	6,935	7,638	2,740	5,252
TOTAL TONS RECYCLED:	**687,781**	**709,624**	**708,931**	**717,583**	**699,738**	**679,878**

D. Maine MSW Generation and Retail Sales Comparison, 1988-2015

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, a visual examination of the historical data on Chart 1 below suggests a strong correlation, and the correlation coefficient R-square value is .8765, indicating strong correlation.



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 ertical axis on the left. We predict 1,864,173 million tons of waste production in 2011.