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**Report to the Joint Standing Committee on the
Environment and Natural Resources**

127th Legislature, Second Session

**Maine Solid Waste Generation and
Disposal Capacity Report:
Calendar Year 2014**

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I. Executive Summary

This report is submitted to the Joint Standing Committee on Environment and Natural Resources pursuant to 38 M.R.S.A. § 2124-A. It provides an overview of Maine's solid waste generation, diversion, and disposal activities for 2014, the most recent full calendar year of data available, and a projection of how those activities will impact available solid waste disposal capacity.

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 projects how the fill rate at each solid waste landfill could affect the expected lifespan of that landfill.

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

The information in this report can assist policymakers with planning for future solid waste disposal capacity investment. This report evaluates Maine's progress toward our waste reduction and recycling goals and the impact on disposal capacity.

Highlights

- The total amount of solid waste generated in Maine in 2014 was 2,770,991 tons, an increase from the total of the 2,561,555 tons of solid waste tonnage generated in 2013. Within that total, the tonnage of Municipal Solid Waste (MSW) increased only slightly from 2013 to 2014, the generation of Construction or Demolition Debris (CDD) remained virtually stable, but the tonnage of Special Wastes increased by approximately 26%.
- Almost 26% of Maine's municipal solid waste, construction and demolition debris, and land-clearing debris, and 45% of other solid wastes were diverted from disposal in 2014. Using a calculation method that permits Maine's recycling rate to be compared to that of other states, Maine's MSW recycling rate in 2014 was 36.24%. This decrease is primarily due to a slightly larger tonnage of MSW being generated in 2014, as compared with 2013's tonnage, and a lower tonnage of "Other MSW" Materials being recycled" (electronics, white goods and other metals, tires, vehicle batteries, and asphalt shingles), and was influenced by an improving economy and reduced material recovery efforts, led by lower value for recovered metals and other products.
- The tonnage of food scraps and other organic materials diverted from disposal and sent to composting almost doubled from 2013 to 2014.

- The capacity for disposal of MSW generated in Maine remains adequate into the foreseeable future, based on the currently operating disposal facilities and management systems in place. This includes three waste-to-energy (WTE) facilities, seven municipally-owned landfills, two state-owned landfills, and one commercially-owned landfill.

A. Waste Management Hierarchy

Maine statute establishes a hierarchy for management of solid waste, to be used as a guiding principle in decision-making. 38 M.R.S.A. § 2101(1) establishes:

It is the policy of the State to plan for and implement an integrated approach to solid waste management for solid waste generated in this State and solid waste imported into this State, which must be based on the following order of priority:

- A. Reduction of waste generated at the source, including both amount and toxicity of the waste;*
- B. Reuse of waste;*
- C. Recycling of waste;*
- D. Composting of biodegradable waste;*
- E. Waste processing that reduces the volume of waste needing land disposal, including incineration; and*
- F. Land disposal of waste.*

To provide a broader context in which to view Maine's recycling efforts, the recent *Fact Sheet on Challenges Facing Municipal Solid Waste (MSW) Recycling in the Northeast*, prepared by the Northeast Waste Management Officials' Organization (NEWMOA) and the Northeast Recycling Council (NERC), is included as Appendix B. This document was presented to the Northeast Committee on the Environment (NECOE) at their November 2015 meeting. The NECOE is comprised of the state environmental department's commissioners of the Northeast states.

II. Background

Title 38 § 2124-A requires the Maine Department of Environmental Protection (Department) to annually submit a “Solid Waste Generation and Disposal Capacity Report” to the joint standing committee of the Legislature having jurisdiction over natural resources matters and the Governor. This report must set forth information on the generation of solid waste in Maine, the statewide recycling rate for MSW, and the remaining available disposal capacity for solid waste. The report must also include an analysis of how changes in available disposal capacity have affected or are likely to affect disposal prices, an analysis of how the rate of fill at each solid waste landfill has affected the expected lifespan of that solid waste landfill, and an analysis of consolidation of ownership in the disposal, collection, recycling and hauling of solid waste.

This report focuses on municipal solid waste (MSW) as defined by Maine law. MSW is comprised of household baggable waste and construction demolition debris, including such items as furniture, tires, and metal. The report does include certain sludge and ash tonnages which are considered ‘special wastes’, since the disposal of those wastes at landfills impacts the disposal capacity remaining at the disposal facility, which is one of the metrics tracked in this report. Special wastes are wastes that are generated by other than households or typical businesses and, due to their quantity or chemical or physical properties, require particular handling. They include primarily ashes, sludge, and some processing wastes. Industrial wastes are not included in this report. Industrial wastes are not part of the waste managed by municipalities.

CDD is solid waste resulting from construction, remodeling, repair, and demolition of structures, including building materials, discarded furniture, wall board, pipes, metal conduits, and similar debris. Most CDD is generated by the household and commercial (building industries) sector, and is considered to be a subset of MSW. To help with planning for solid waste management, solid waste facilities accepting CDD track those materials separately from MSW, to the extent practicable.

The industrial sector also generates significant amounts of other types of solid wastes that are regulated as “special waste” under Maine law because they have chemical or physical properties that make them difficult to handle, or potentially pose a threat to public health, safety or the environment.

This report includes various tables that contain data on solid waste generated in Maine, as well as data on the amounts and types of solid waste managed by disposal facilities in Maine, including sources and tonnages of solid wastes imported to Maine for disposal. The data on solid waste generated in Maine is used to calculate Maine’s recycling rate, while the data on wastes accepted for disposal at waste-to-energy facilities and landfills is used to project available disposal capacity into the future.

III. Management of Maine-generated Solid Waste in 2014

The most current, complete data available for solid waste management in calendar year 2014 come from a variety of sources, including:

- licensed public and private processing, composting, and disposal facilities' annual reports submitted to the Department (in accordance with 38 M.R.S.A. §§ 1304-C, 2205, and 2232), and to other states' regulatory agencies (from out-of-state facilities which receive waste from Maine);
- data on the recycling of electronics, tires, vehicle batteries, consumer batteries, mercury-added lamps and textiles was obtained through a combination of voluntary and mandatory reports from the specialized businesses that manage these consumer products. Along with voluntary reporting by major collectors of these items, this included data reported under Maine's product stewardship laws as well as data from hazardous waste manifests; and
- voluntary reporting¹ by commercial entities managing recyclables generated in Maine.

Table 1 presents a summary of the types and amounts of solid waste generated in Maine in 2014.

Table 1 - 2014 Maine Generated Solid Waste by Type and Amount	
Waste type	2014 Amount Generated (tons)
Municipal Solid Waste (MSW)	1,187,265
Construction / Demolition Debris (CDD)/wood waste/land-clearing debris	695,876
Special solid wastes (see Table 3 for break out by waste types and amounts)	887,850
Total Maine Generated Solid Waste - 2014	2,770,991

These same categories reported 2,561,555 tons of waste being generated in 2013 (MSW 1,161,578; CDD 696,213; Special wastes 704,681). The amount of MSW generated increased slightly (by 25,687 tons) from 2013 to 2014, the generation of CDD remained virtually stable, and the amount of special solid wastes increased from 704,681 tons to 887,850 tons, or approximately 26%. The increase in special waste tonnage was the result of reported increases in the generation of certain ashes and sludges, as well as in contaminated soils.

¹ The Department is appreciative of the data voluntarily provided by a number of generators/brokers of recyclables and acknowledges the reluctance of others in providing their data due to that information not being identified as 'confidential business information'.

Maine's solid waste management infrastructure includes municipal, commercial, and private industrial waste handling facilities. Once collected, solid waste in Maine is stored, transported, recycled, processed, composted, anaerobically digested, beneficially used in place of virgin materials and as fuel, combusted at one of three waste-to-energy facilities, or landfilled.

IV. Progress toward Maine's Waste Reduction and Recycling Goals

In keeping with the Solid Waste Management Hierarchy (38 M.R.S.A. § 2101), there are a variety of options employed for managing Maine's solid waste. Appendix B is a table that provides an overview of management options currently employed for the various components of Maine's solid waste stream. This table provides a qualitative assessment of the comparative use of the management options. The options are grouped by levels on the Hierarchy, with those listed to the left preferable to those toward the right due to the resulting preservation and use of materials. By examining Maine's waste stream by material type and current management options, we can identify opportunities for "moving up the hierarchy", decreasing disposal and increasing waste reduction, reuse, recycling and beneficial use.

Maine's Municipal Solid Waste Reduction Goal

Maine's statutory goals for waste reduction focus specifically on MSW. 38 M.R.S.A. § 2132(1-A) sets a State goal of reducing the biennial generation of municipal solid waste tonnage by 5% beginning on January 1, 2009, and by an additional 5% every subsequent 2 years. The baseline for calculating this reduction is the 2003 solid waste generation data gathered by the former State Planning Office (2,019,998 tons).

It is not possible to project the amount of waste that would have been generated without waste reduction efforts implemented by entities ranging from individuals (e.g., backyard composting) to corporations (e.g., light-weighting of consumer packaging), so the best alternative for measuring waste reduction is using the amount of MSW disposed. Over the past several years, the amount of MSW generated in Maine and disposed of in landfills and waste-to-energy incinerators has declined.

Maine's Municipal Solid Waste Generation Overview

In 2014, Maine residents generated and disposed an average of 0.570 tons (1140 pounds) of MSW per person, an increase from the 0.513 tons per person generated in 2013, which is reflective of an improving economy. In 2008, Maine residents and businesses generated and disposed of 755,086

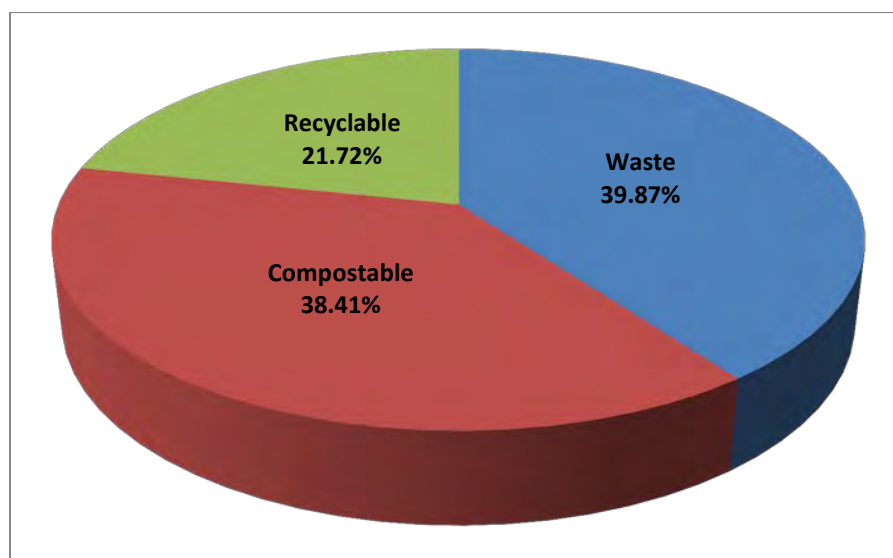
tons of MSW (exclusive of CDD and Waste-to-Energy ash). The amount of MSW disposed of in 2014 was 757,049 tons, which is slightly above the amount disposed of in 2008.

The most recent regional comparisons of per capita disposal rates available for the Northeast (2012) show Mainers generated an average lower amount of MSW per person that year than most other Northeastern states, which reflected an average of 0.7 tons of MSW generation per person in the Northeastern states, with the rate ranging from 0.52 tons per person for New Hampshire to 0.91 tons per person for Rhode Island.²

A. Maine's Municipal Solid Waste Composition and Management

In 2011, the University of Maine was contracted by the former Maine State Planning Office to undertake a study to understand the types of solid waste Maine residents are disposing of in the mixed MSW waste stream. Figures 1 and 2 are reproduced from that report³ to show the percentages of MSW by material type, reflecting the composition of the waste stream in 2011.

Figure 1 - Composition of Disposed MSW

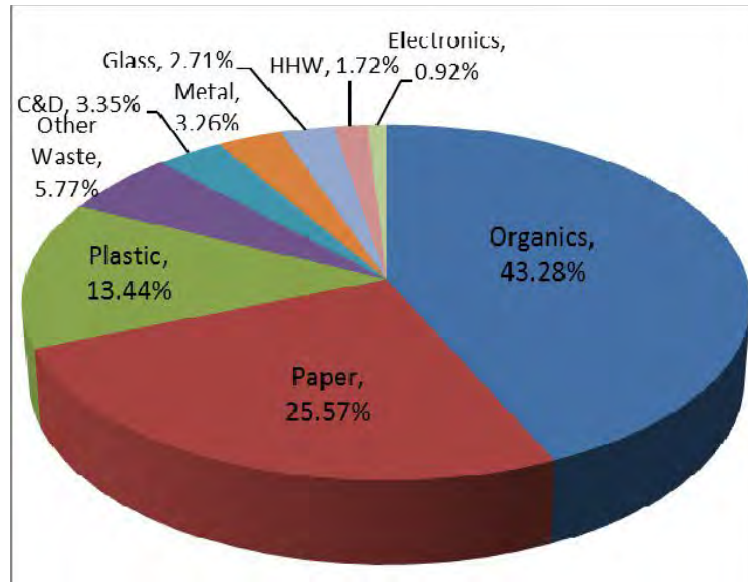


From: 2011 Maine Residential Waste Characterization Study – School of Economics Staff Paper #601

² *Municipal Solid Waste (MSW) Interstate Flow in 2012*, March 27, 2015, Northeast Waste Management Officials' Association

³ 2011 Maine Residential Waste Characterization Study – School of Economics Staff Paper #601; Criner, George K. and Blackmer, Travis L., University of Maine; <http://umaine.edu/wcs/files/2012/02/2011-Maine-Residential-Waste-Characterization-Study1.pdf>

Figure 2 - Composition of Disposed MSW by Nine Major Categories



From: 2011 *Maine Residential Waste Characterization Study* – School of Economics Staff Paper #601

This 2011 Maine Residential Waste Characterization Study documented organics, paper and plastics as the three largest components in MSW disposed of from Maine. Based upon the results of this study, diversion of organics from disposal remains the largest opportunity to reduce Maine’s waste stream, which is why the Department has established an initiative focused on separating and recovering discarded food and other organics.

B. Maine’s Municipal Solid Waste Recycling Rate

In 1989, the Maine Legislature enacted 38 M.R.S.A. § 2132, establishing a goal to recycle or compost 50% of the state’s municipal solid waste annually. 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.

The MSW recycling rate is calculated by dividing the total amount of MSW recycled by the total amount of reported in-state generated MSW in accordance with 38 M.R.S.A. § 2132 (3). The term “municipal solid waste” is not defined in Maine law, but has historically been interpreted as solid waste normally managed by municipalities in Maine, including CDD. However, other states and the U.S. Environmental Protection Agency (US EPA) exclude CDD from their calculations of MSW recycling rates. This creates inconsistencies when trying to compare Maine’s calculated MSW

recycling rate with the MSW recycling rates of other states. To address this, the Department has calculated the recycling rate for MSW as defined by the US EPA, and a separate recycling rate that includes CDD. This approach allows Maine to perform an ‘apples-to-apple’s comparison with other states’ MSW recycling rates, while also enabling Maine to evaluate where further efforts are needed to improve diversion of the broader spectrum of disposed materials handled by municipalities in Maine. All totaled, 45.06% (compared with 2013’s rate of 46.72%) of Maine’s MSW, CDD and land-clearing debris was diverted from disposal and recycled or beneficially used (see Table 3).

Table 2 (next page) shows the amounts of each waste type managed through disposal, recycling, composting, and beneficial use, and includes calculated recycling and diversion from disposal rates for Maine-generated MSW, CDD, and land-clearing debris.

Table 2 - 2014 Management of Maine's Solid Waste (except Special Solid Wastes)	
Municipal Solid Waste (MSW) Disposition	Tons
Maine MSW landfilled in state	249,407
Maine MSW disposed of at waste-to-energy facilities in state (amount destroyed through combustion)	333,344
Maine MSW waste-to-energy ash landfilled in-state	104,775
Maine MSW disposed of out-of-state	69,524
Subtotal Maine MSW (exclusive of CDD) disposed	757,049
Recycling/Organics Management	
Paper, cardboard, plastics, metals, glass and textiles recycled	229,609
Other MSW recycled (electronics, white goods and other metals not reported by brokers, tires, and vehicle batteries)	176,979
Reported MSW composted (includes leaf & yard rakings, food scraps)	23,627
Subtotal Maine MSW recycled or composted	430,215
Total Maine MSW (exclusive of CDD)	1,187,265
Maine's MSW recycling rate (exclusive of CDD)	36.24%
Construction or Demolition Debris	
Mixed CDD landfilled in-state	259,541
Mixed CDD disposed of out-of-state	9,239
Land-clearing debris landfilled	8,688
Composting and beneficial use of processed CDD and land-clearing debris as fuel	60,579
Other beneficial use of processed CDD and land-clearing debris	357,636
Total CDD and land-clearing debris	695,876
Maine's CDD & land-clearing debris recycling rate	8.73%
Maine's CDD & land-clearing debris 'diversion from disposal' rate	60.13%
Summary of Management and Disposition	
Total tonnage of MSW, CDD & land-clearing debris	1,883,141
Total MSW, CDD and land-clearing debris recycled (including wood used as fuel)	490,988
Total MSW, CDD and land-clearing debris diverted from disposal	848,624
Maine's combined MSW, CDD & land-clearing debris 'recycling rate'	26.07%
Maine's combined MSW, CDD & land-clearing debris 'diversion from disposal' rate	45.06%

Changes in generation of solid waste in Maine from 2013 to 2014 show a positive trend in the management of organics - there has been almost a doubling of the amount of food scraps and leaf and yard rakings composted, from 12,674 tons to 23,627 tons. The 2014 data also show an increase in the amount of Maine MSW being generated and disposed of through landfilling and incineration, which is most likely a reflection of an improving economy. However, the 2014 data show almost 54,000 tons less of metals being recycled than in 2013, perhaps reflecting the peak of metal prices in 2013 when stockpiled metals were sent for recycling. These factors, when combined, result in the statewide MSW recycling rate dropping from 41.36% in 2013 to 36.24% in 2014.

C. Special Solid Wastes and Beneficial Use

Table 3 shows the amounts of solid wastes other than MSW, CDD and land-clearing debris generated in Maine and how each waste type was managed. Almost 16% of these special wastes were composted or used as soil amendments for agronomic benefit. Another 23% was used as fuel in multi-fuel boilers, or beneficially used in another way. The beneficial use of waste is the use or reuse of a solid waste as a raw material substitute in manufacturing, as construction material or construction fill, as fuel, or in agronomic utilization. Unlike the recycling of commodity materials, materials that are beneficially used are not used in products that may continue to be available for recycling. Beneficial use diverts waste from disposal, thus preserving disposal capacity, but it does not preserve materials for on-going recycling.

Table 3 - 2014 Disposition of Maine 'Special Solid Wastes' (in tons)								
WASTE TYPE	Compost & N-Viro*	Beneficial Use – Fuel	Beneficial Use - other	Land applied	Anaerobic digestion	Combusted	Landfilled	Totals
Asbestos/Asbestos Containing Waste	-	-	-	-	-	-	2,718	2,717.90
Ash - Coal, oil and multi-fuel boiler	8,854	-	20,057	26,645	-	-	152,655	208,212
Ash - MSW Incinerator	-	-	-	-	-	-	108,207	108,207
Ash - unspecified	-	-	-	-	-	-	64	64
Ash- Burn pile/hot loads	-	-	-	-	-	-	3,491	3,491
Ash/Liming Agent - Other	-	-	-	5,510	-	-	-	5,510
Carpet Fiber and Padding	-	-	25	-	-	-	-	25
Catch basin grit and street sweepings	-	-	14,259	-	-	-	1,636	15,895
Contam. Soils – contam. unknown	-	-	-	-	-	-	17,547	17,547
Contam. Soils - non-petroleum	-	-	-	-	-	-	16,636	16,636
Contaminated soils - Oil	-	-	29,019	-	-	-	8,067	37,086
Dredge Spoils	-	-	35,340	-	-	-	-	35,340
Fish/Food Process Residue	7,895	-	2,038	41,347	1,458	-	831	53,569
Industrial/Industrial Process Waste	-	-	425	-	-	-	13,297	13,722
Other Special Wastes	-	4	-	-	-	5,016	33,748	38,768
Pulp/Papermill Sludge	3,664	4,631	57,355	-	-	-	2,770	68,419
Sandblast Grit	-	-	2,215	-	-	-	268	2,483
Short-Paper Fiber	-	-	39,174	2,050	-	-	21,686	62,910
Shredder Residue	-	-	-	-	-	-	27,814	27,814
WWTP Sludge - industrial	-	-	-	12	-	-	78,197	78,209
WWTP Sludge - municipal	41,339	-	-	1,975	-	-	47,914	91,228
Totals	61,752	4,635	199,907	77,538	1,458	5,016	537,545	887,850

*N-Viro is a company located in Maine that utilizes a conversion process for treatment of sludge

V. Solid Waste Disposal Capacity

In 2014, Maine's solid waste disposal facilities included three waste-to-energy (WTE) facilities, seven municipally-owned landfills, two state-owned landfills, and one commercially owned landfill. The State has another licensed landfill site, known as Carpenter Ridge, located in T2 R8, that remains undeveloped. That site, with a landfill design for approximately two million cubic yards of special wastes, was acquired by the State in the mid-1990's and has been held by the State for development of disposal capacity when it is needed. The state-owned Dolby Landfill, located in East Millinocket, accepted minimal amounts of solid waste in 2014, and due to environmental and fiscal considerations, is slated to cease operations in 2016.

The Department receives landfill capacity estimates from each of the public and commercial disposal facilities, and annual reports of the types and amounts of waste being disposed at each facility. Based on the data in these reports, the Department projects the amount of waste expected to be disposed over time (using current disposal rates) and estimates the projected remaining life span of each facility.

Landfills receive a variety of wastes. The types of wastes permitted for disposal differ among the facilities, as requested in their licensing applications. 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 projecting the consumption of landfill capacity, the Department combined the tonnages of the various cover materials and the other special wastes that were landfilled, along with the municipal solid waste tonnages, to estimate the remaining life of the landfills since all these waste types consume landfill capacity. For that reason, those wastes and their impact on landfill capacity are included in this report.

Table 4 shows the current and projected available Waste-to-Energy processing and Landfill disposal capacity in Maine, by licensed facility, through 2034. In 2014, 1,308,189 cubic yards of landfill capacity were consumed in Maine by MSW (257,706 tons), CDD (462,036 tons), and special wastes (394,584 tons), and 369,549 tons of MSW were destroyed through combustion. This 1,483,875 tons of waste disposed of in Maine included waste from out-of-state sources as well as wastes from Maine. Maine-generated MSW, CDD and special wastes sent for disposal 2014 totaled 1,437,362 tons, not including special wastes disposed of in generator owned landfills affiliated with specific industrial facilities. This includes 145,809 tons of special waste into commercial and state-owned landfills in Maine, and 78,863 tons of MSW & CDD disposed of out of state.

Table 4 - Available Licensed MSW Disposal Capacity in Maine

Waste-to-Energy Facilities (W-T-E)	Annual capacity	2014 (tons/year)	2019 (tons/year)	2024 (tons/year)	2034 (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
PERC – Orrington	304,000	304,000	304,000	304,000	304,000
Total Waste-to-Energy Facility capacity in tons	544,000	544,000	544,000	544,000	544,000
	<i>2014 Fill rate (yd³)</i>	<i>2014 available (yd³)</i>	<i>2019 available (yd³)</i>	<i>2024 available (yd³)</i>	<i>2034 available (yd³)</i>
State-owned landfills					
Carpenter Ridge – T 2 R 8	N/A	not developed	Assumed not developed	Assumed not developed	Assumed not developed
Dolby – East Millinocket	141	398,000	0 (closed)	0 (closed)	0 (closed)
Juniper Ridge – Old Town	733,400	3,903,600	236,600	0	0
Municipal MSW landfills					
Hatch Hill (Augusta)	59,500	867,600	570,100	272,600	0
Bath	31,500	295,300	137,800	0	0
Brunswick	9,600	207,137	159,137	111,137	15,137
Presque Isle	14,508	1,429,441	1,356,901	1,284,361	1,139,281
Tri-Community (Fort Fairfield)	34,594	1,634,891	1,461,921	1,288,951	943,011
W-T-E ash landfills					
ecomaine	62,824	684,775	370,655	56,535	0
Lewiston	17,959	557,065	467,270	377,475	197,885
Commercial landfill					
Waste Management Crossroads - Norridgewock	304,109	3,107,865	1,587,320	66,775	0
Total landfill capacity in cubic yards	-	13,085,674	6,347,704	3,457,834	2,295,314
Total remaining landfill capacity in tons (MSW)*	-	10,468,539	5,078,163	2,766,267	1,836,251

*Average weight of 1 cubic yard of landfilled MSW =1500 pounds, and all remaining licensed landfill capacity will be used for MSW

Based on the current operations of the licensed disposal facilities, the Department projects that the disposal capacity for MSW (including CDD) generated in Maine will remain adequate into the foreseeable future. Management of out-of-state generated waste can be provided by the waste-to-energy facilities and the commercially owned landfill, but not by state-owned disposal facilities.

The Department is currently considering two solid waste processing/disposal facility applications that, if approved and constructed, will add additional solid waste management capacity in Maine. The projections considered in this report do not take into account this proposed capacity.

Table 5 shows the types and amounts of solid wastes delivered to the various disposal facilities in 2014, and shows the estimate of remaining disposal capacity in cubic yards and years.

TABLE 5 - 2014 Solid Waste Tonnage that was Landfilled, and Remaining Landfill Capacity (as of December 31, 2014)

Landfill	MSW (tons)	CDD (tons)	Special Wastes (tons)	Capacity Consumed in 2014 (cubic yards)	Constructed Capacity Remaining (cubic yards)	Licensed Capacity Remaining (cubic yards)	Years of Licensed Capacity Remaining at current fill rate
Hatch Hill (Augusta)	27,917	(included in MSW)	7,931	59,500	867,600	867,600	14.6
Bath	13,528	1,169	880	31,500	81,300	295,300	9.4
Brunswick	4,302	(included in MSW)	0	9,600	207,137	207,137	21.6
Presque Isle	7,715	1,470	2,919	14,508	239,441	1,429,441	98.5
Tri-Community	15,717	1,939	2,046	34,594	513,241	1,634,891	47.3
ecomaine	11,460	0	48,837	62,824	106,865	684,775	10.9
Lewiston	0	541	17,325	17,959	557,065	557,065	31.0
Waste Management / Crossroads	81,533	65,130	153,776	304,109	3,107,865	3,107,865	10.2
Juniper Ridge	95,534	373,820	159,579	733,400	995,000	3,903,600	5.3
MidCoast Solid Waste Corporation	0	1,097	46	2,131	26,523	26,523	12.4
Rockland	0	16,870	1,245	36,064	147,300	147,300	4.1
TOTALS	257,706	462,036	394,584	1,306,189	6,849,337	12,861,497	--

Table 6, below, shows the source of the MSW received by each of the three Waste-to-Energy Facilities, and how that waste was managed, including the various residue streams created.

Table 6 - 2014 MSW Handled by Maine Waste-to-Energy Facilities (in tons)											
<i>Facility</i>	Municipally Delivered MSW received	Commercially Delivered MSW received	Spot market MSW received	Other wastes received	Total waste received	Waste shipped as by-pass	Front end process residue produced	Metals recovered	MSW combusted	Ash	MSW destroyed through combustion
ecomaine	66,588	75,207	40,149	2,836	184,780	6,328	--	4,810	172,656	44,178	128,478
Mid Maine Waste Action Corporation	38,205	14,671	22,848	0	75,724	5,684	--	1,963	69,509	17,226	52,283
Penobscot Energy Recovery Company	192,720	108,488	11,106	5,164	317,479	1,613	57,828	8,016	242,822	54,034	188,788
TOTALS	297,513	198,366	74,103	8,000	577,983	13,625	57,828	14,789	484,987	115,438	369,549

Table 7, below, shows the state's source of generation of the MSW which was received by each of the three Waste-to-Energy Facilities.

Table 7 – Tons of MSW Received at Waste-to-Energy Facilities - - by State of Origin								
<i>Facility</i>	Maine	MA	NH	Total Tons		% Maine	% MA	% NH
ecomaine	162,269	--	6,771	169,040		96.0%	0.0%	4.0%
Mid Maine Waste Action Corporation	75,586	--	138	75,724		99.8%	0.0%	0.2%
Penobscot Energy Recovery Corporation	260,931	50,060	1,324	312,315		83.6%	16.0%	0.4%
Totals	498,786	50,060	8,233	557,079		89.5%	9.0%	1.5%

VI. Solid Waste Industry Consolidation in 2014

The Waste Generation and Disposal Capacity Report includes an analysis of consolidation in the ownership of the collection, recycling, hauling, and disposal sectors. This is performed to review Maine's solid waste industry for possible undue consolidation and the potential for unfavorable impacts on competition. The Department examines these industry sectors for conditions that may either create a decrease in services or a monopolistic situation.

During 2014, Maine's solid waste (aka, 'materials management') industry continued to be a mix of public and private investments and services that handled over 7,500 tons of materials each day. A review of that system and its components shows that the interrelated services of collection and hauling of recyclables and trash, and the processing or disposal of those materials, were provided in a consistent fashion, responding to Maine's solid waste management needs.

Disposal Facilities

During 2014, there were no noted changes in the ownership/operation of the licensed disposal facilities in Maine.

Collection and Hauling Services

Since the last Waste Generation and Disposal Capacity Report, the Department has learned that three smaller sized hauling services companies (each with less than five collection vehicles) were acquired by three separate larger hauling companies: two were as the result of changes in company leadership and one was a purchase to obtain a permanent presence in a different service area.

Recycling Services

In 2014, Casella Waste Services, Inc., in partnership with the City of Lewiston, converted the city's recycling facility into a 'Zero Sort[®]' materials processing facility and began processing recyclables from the City and other municipalities. This is the second 'materials recovery facility' (MRF) serving Maine's municipalities and businesses; the other MRF is owned and operated by ecomaine, a non-profit waste management company owned by 21 municipalities in Southern Maine.

The Department has noted a move by many municipalities to adopt a single stream/single-sort/ZeroSort[®] recycling program, which has led to the abandonment of long established 'source separated' recycling programs and facilities that had successfully been baling and marketing recyclables for many years.

VII. Disposal Fees and Supracompetitive Prices

Disposal Fees

Disposal expenses are comprised of collection and transportation costs, and tipping fees on the disposal of waste at a facility. Disposal fees or tipping fees are a major factor in solid waste management costs for municipalities and businesses. Current tipping fees range from \$40 to \$95 per ton at Maine’s transfer stations, waste-to-energy facilities and landfills. These have stabilized in most instances, allowing predictability for municipal budgeting and long-term planning.

Tipping fees at two of the three waste-to-energy facilities have undergone various alterations in recent years, with ecomaine reducing their tipping fee at their waste-to energy facility, and the Penobscot Energy Recovery Company (PERC) raising their tipping fee⁴.

The State, in its operating services agreement with Casella Waste Systems Inc., established a ceiling for tipping fees that set an upper limit on how much can be charged for various categories of wastes delivered to the Juniper Ridge Landfill, which has had a stabilizing impact on pricing for the disposal of similar materials at other solid waste facilities.

Tipping fees at waste-to-energy facilities are influenced by revenues received from the sale of the electricity they generate. The revenues reduce 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.

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 Department to determine whether changes in available landfill capacity have generated, or have the potential to generate, supracompetitive prices and if so, provide recommendations for legislative or regulatory changes as necessary.

⁴ Note: the Municipal Review Committee (MRC) represents 187 Maine municipalities that ship their MSW to PERC for disposal and provides a tipping fee reduction program to MRC’s charter members.

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, nor does it appear in the near term to have the potential to generate, supracompetitive disposal fees. In looking ahead, however, at that point when disposal capacity exists with fewer facilities than today, it is possible that prices will become supracompetitive. Where the actual date and timing of this is not known, nor predictable, it is critical that the Department maintains a firm awareness of this possibility and keeps the Governor and Legislature informed.

Appendix A - Definitions and Acronyms

The following definitions and acronyms are provided to assist the reader in reviewing this document:

Beneficial Use – to use or reuse a solid waste or waste derived product: as a raw material substitute in manufacturing, as construction material or construction fill, as fuel, or in agronomic utilization.

Bulky Wastes – solid wastes that do not typically fit into a 30 gallon trash container, and may include such items as wood, large metal appliances and construction materials.

Construction/Demolition Debris (CDD) – wastes generated by building, remodeling and/or destruction activities and may include such wastes as wood and wood products, concrete and brick, gypsum board, shingles and other common components of buildings.

Department – Maine Department of Environmental Protection

Diversion Rate – Waste diversion is the prevention and reduction of generated waste through source reduction, recycling, reuse (including beneficial reuse), or composting.

Front-end Process Residue (FEPR) – residual of municipal solid waste resulting from the processing of solid waste prior to incineration or landfilling, and includes, but is not limited to, ferrous metals, glass, grit and fine organic matter.

Municipal Solid Waste (MSW) – solid waste emanating from household and normal commercial activities.

Special Solid Waste – wastes that are generated by other than domestic and typical commercial establishments that exist in such an unusual quantity or in such a chemical or physical state that require special handling, transportation and disposal procedures.

Supracompetitive – when 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.

Universal Wastes – a category of wastes that includes: PCB containing lighting ballasts, Cathode Ray Tube (CRT) containing devices, fluorescent lamps, other lamps containing hazardous wastes, and, mercury-added devices from commercial sources.

Waste-to-Energy Ash – residue from the combustion of municipal solid waste at waste-to-energy facilities. It may also contain fly ash from the facility's operation and is designated as a "special solid waste".

Waste-to-Energy facilities (W-T-E) – facilities which receive municipal solid waste, and through processing and combustion, recover energy and convert it into electricity, while reducing the volume of waste requiring disposal.

Appendix B – Fact Sheet Presented to the Northeast Committee on the Environment

Fact Sheet

Presented to the Northeast Committee on the Environment Challenges Facing Municipal Solid Waste (MSW) Recycling in the Northeast at their November 9, 2015 meeting

Prepared by the Northeast Waste Management Officials' Association (NEWMOA) and the
Northeast Recycling Council (NERC)
November 2015

(Presented here with permission from NEWMOA & NERC)

This fact sheet identifies some of the challenges facing MSW residential recycling programs in the northeast. It describes the overall economic benefits of recycling for the region and focuses on paper, glass, and plastic as key materials that are challenging for the materials recovery facilities (MRFs) to process economically. It focuses on paper, glass, and plastics because they present some of the most difficult challenges for today's MRFs.

Background

The overall U.S MSW recycling rate was approximately 34 percent for 2013, according to EPA.⁵ In many locations, municipal recycling programs focus on paper, plastic, glass, and metal. There are significant differences in the materials collected in various locations.

States in the northeast use inconsistent approaches for estimating recycling, and many agency staff report low confidence in the available data. Solid waste program staff have reported greater confidence in the disposal data that they collect from permitted facilities. Because of data challenges, this fact sheet does not present or compare the states' recycling rates.

Economics of Recycling

Recycled materials are part of an international marketplace, and many factors impact them. Some of these contribute to market volatility, including the price of oil; the price of virgin resin; the value of the U.S. dollar; China's Green Fence; the economies of foreign markets; and communication among the U.S. MRFs, brokers, processors, and manufacturers about the industry's changing needs.

⁵ <http://www2.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures>

According to the Institute of Scrap Recycling Industries (ISRI), the total number of jobs created directly and indirectly (through suppliers and related jobs) through recycling of scrap metals, plastics, textiles, glass, and electronics in the seven states in CONEG is approximately 41,777. This translates to more than \$9.5 million in wages and taxes.⁶

Changing Materials in the Recycling Stream

The composition of MSW has been evolving in recent years with less newsprint, glass, aluminum, steel packaging, paper board, and paper packaging and more aluminum foil and closures, corrugated card, high-density polyethylene (HDPE) bottles and other containers, polyethylene terephthalate (PET) bottles and jars, and other plastic packaging.

Demand for paper has declined for the past decade. The most dramatic reduction has been in newspaper use. This is due to the increased use of electronic devices. North American newsprint shipments went from 12.7 million metric tons 2005 to 6.4 million metric tons in 2013.⁷ Newspaper historically made up 60 percent of the recyclables collected, and all types of paper made up 80 percent of the material recycling facilities received. Today paper makes up just 45-60 percent of incoming material.⁸

Packaging is rapidly changing away from the use of glass and metal toward lighter materials, including multi-layer, multi-resin pouches, plastic packaging, and other types of containers that are either less recyclable or not recyclable. In addition, the plastic that is used for packaging has been light-weighted. For example, plastic makes up approximately 12.7 percent of the incoming recyclables by weight, but over 25 percent by volume. Processing costs are incurred by volume, but revenue is by weight. Therefore, recyclers need to process more material to generate a ton of recyclables.

The changing waste stream means MRFs need to process more volume, with less weight, increasing processing costs.⁹ These shifts have been affecting the business models that have dictated the designs of the MRFs.

Trends in Municipal Collection for Recycling

Increasingly in the northeast and elsewhere in the U.S. recycling has transitioned from a dual stream to a single stream system. These programs collect all recyclables, including glass, paper, plastic, and metal in one container. Trash is collected separately. Single stream recycling (SSR) has grown rapidly in the region during the past five years. There were 81 communities in Massachusetts with SSR systems in 2011; by 2014 108 communities had transitioned. In New Hampshire, 38 facilities accepted SSR waste in 2011; by 2014 there were 53 facilities. In most single stream programs, the traditional 18 gallon recycling bin has been replaced by a 64 or 95 gallon cart. Single stream programs typically result in significantly more recyclables being

⁶ <http://www.isri.org/docs/default-source/recycling-analysis-%28reports-studies%29/economic-impact-study-u-s-based-scrap-recycling-industry-2015.pdf?sfvrsn=10>

⁷ April 27, 2015, Dylan de Thomas, Resource Recycling presentation to the Maine Resource Recovery Association

⁸ Ibid.

⁹ Susan Robinson, Waste Management, November 13, 2014 Presentation, EPA SMM Webinar Academy - http://www2.epa.gov/sites/production/files/2015-09/documents/changng_wste_stream.pdf.

collected due to the convenience for residents and the additional space for a bulky recycling stream. In Massachusetts, increases range from 10 percent to 60 percent (for Boston), depending on the baseline recycling rate in a given community.

With the growth of single stream collection and the use of large containers, is a rise in contamination of the materials. This contamination takes the form of film plastics, Styrofoam, non-recyclable plastic materials being put in the single stream bins; food waste and broken glass contaminating paper; liquids being absorbed into the paper; non-recyclable packaging, and a wide range of other non-recyclable materials. Contamination can drive up costs facing the municipalities and individual customers.

Paper

According to EPA's latest estimates, paper is approximately 27 percent of MSW.¹⁰ Paper collection and recycling focuses in general on newsprint, office, magazines, cardboard, and boxboard. In the NECOE states, there are approximately 61 facilities that process and recycle one or more of these kinds of paper. A list of these facilities is available from the Northeast Recycling Council (NERC).

MRFs sort paper and send it directly to "end use" mills in the U.S. or abroad. Demand for cardboard has increased significantly since 1990 due to the increase in e-commerce shipments of products directly from manufacturers or wholesalers to consumers. Demand for other types of paper has been dropping, particularly newsprint (as noted above.). However, China continues buying U.S. paper. For a number of years, it has been the largest export material from the Port of Boston.

Single-stream recycling has resulted in an increase in "mixed paper" that is low value and often shipped to China. In addition, the liquids and glass present in SSR are absorbed by and stick to the paper, degrading its marketability.

Glass

According to EPA's latest estimates, glass is approximately five percent of MSW.¹¹ Glass collection and recycling at the curb focuses on mixed colored and clear glass. There is a demand for high-quality glass cullet.¹² In the NECOE states, there are several facilities that are processing and recycling one or more of these kinds of glass. A list of these facilities is available from the Glass Packaging Institute (GPI).

Of the NECOE states, five have bottle bill programs. Glass from these programs is generally clean and is shipped directly to the glass processors (not through MRFs) and then shipped to glass bottle manufacturers.

Some MRFs are no longer able to produce the quality of glass that manufacturers can use. Glass fines often end up mixed with the facility's residue that contains dirt and small-sized paper, plastic, and metal contamination. Due to the low quality product and the high cost of

¹⁰ <http://www2.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures>

¹¹ <http://www2.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures>

¹² <http://www.gpi.org/>; Cullet.net: <http://www.cullet.net/cgi-bin/mexview.cgi?wsc=01-0901>

transportation, many MRFs face limited markets for their glass, and it ends up as processed glass aggregate and being used for alternative daily cover or shaping and grading materials. Some MRFs have recently started to employ more sophisticated sorting technology that improves the quality of recovered glass or conduct an additional processing step to recover a cleaner glass product from the residue. Encouraging other MRFs to make the similar investments could be an important aspect of addressing this challenge.

Some communities have begun to try to improve the quality of collected glass by adding drop-off locations. A few municipalities are piloting or considering trying this approach by carefully installing drop-offs that are conveniently accessible for residents.

Plastics

According to EPA's latest estimates, plastic is approximately 13 percent of MSW.¹³ Collection of plastic for recycling focuses on number 1 polyethylene terephthalate (PET), (e.g. soda bottles, and milk jugs or number 2 high-density polyethylene (HDPE)) because they have the highest value. Many communities also collect numbers 3, 4, 6 and 7, however markets for some of these materials are less prevalent. The markets for number 5 plastic (polypropylene) are growing because of their use in containers, caps, and other packaging. In the NECOE states, there are approximately four facilities that are processing and recycling one or more of these plastics. A list of these facilities is available from the Northeast Recycling Council (NERC).

The Association of Plastic Recyclers¹⁴ is working with MRFs and processors, who convert plastic into useable materials (e.g., pellets) and sell it to end users, on some initiatives to help smooth out market fluctuations for recycled plastics. These include creating specifications for new types of materials to ensure that end users for those materials obtain what they can use.

Education & Outreach

SSR programs provide large bins to residents for collection of recyclables. This has greatly increased the amount of material that programs are collecting. However, the education of residents in the programs has not kept up.

In general, municipalities communicate with households about what is recyclable at the curb or transfer stations. People are often confused about what to put in their SSR bins. The changes in the waste streams described above have added to this confusion. Residents include materials that they “wish” were recyclable. In a recent MassDEP market research survey, 48 percent of respondents characterize themselves as “wishful recyclers”, meaning they put items in the recycling bin that the MRF is not designed to sort and recover, such as plastic bags, Styrofoam, large metal objects, textiles and garden hoses.¹⁵ The researchers concluded that while the public believes they are doing a good job recycling, it's easy, and they know the rules, in fact they are misinformed and do not know the rules. A lesson from this study is that state programs and municipalities need to do a better job recalibrating the public's understanding of what can and

¹³ <http://www2.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures>

¹⁴ <http://www.plasticsrecycling.org/>

¹⁵ <http://www.mass.gov/eea/docs/dep/public/committee-4/recpart15.pdf>

cannot be recycled in the bin, while being careful not to discourage people or make them feel that the programs are slapping their hands.

Depending on the location, neighboring cities and towns may have different wastes that they collect for recycling. Anecdotally, it appears as though the investment in recycling education programs has been in decline in many locations in the region, and creating cross-community education programs is challenging since the collection systems differ. Many recycling coordinators think that their programs have neglected education in recent years. Massachusetts DEP ended its recycling education grants for municipalities in 2007. Prior to that, the Agency spent about a half million dollars per year printing and mailing customized recycling flyers for about two million households. The SSR carts include a label on the top with pictures of what and what not to put in, which provides some guidance, but for many communities there is not much more outreach underway.

Some municipal recycling and state programs in the region have recently launched public education campaigns combined with greater enforcement, which could provide models for others. The Recycling Partnership (www.recyclingpartnership.org), Waste Management (“Recycle Often. Recycle Right” www.recycleoftenrecycleright.com), and Keep America Beautiful have also launched public education campaigns to address the challenges outlined above and others.

Appendix C - Status of Northeast States' Product Stewardship Laws

Status of Northeast States' Product Stewardship Laws November 2015

Briefing Report for the Northeast Committee on the Environment
Prepared by the Northeast Waste Management Officials' Association's (NEWMOA) Extended
Producer Responsibility (EPR) Implementation Workgroup

The following table summarizes the status of EPR legislation enacted in the Northeast.

Summary of Enacted Legislation

States	CT	ME	MA	NH	NY	RI	VT
Products							
Electronics	✓	✓			✓	✓	✓
Paint	✓	✓				✓	✓
Thermostats	✓	✓	✓	✓	✓	✓	✓
Auto switches		✓	✓			✓	✓
Lamps		✓					✓
Rechargeable batteries	?	✓			✓		
Primary batteries							✓
Mattresses	✓					✓	
Framework		✓					
Bottle Bill*	✓	✓	✓		✓		✓

*Some state officials', but not all, view bottle bills as a form of EPR legislation so it is included in this table.

Overview of Findings on Impacts of EPR Programs in the Northeast

Connecticut DEEP is conducting an evaluation of the impacts of its e-waste EPR program in the State and overall has found:

- In 2014, there were 273 permanent collection sites for covered e-waste
- More than 18 million pounds of e-waste was collected in 2014 through the program; the quantity has increased each year since 2011

- Per capita e-waste collected has increased since the program began and was 5.16 pounds/year/person in 2014
- In 2013 and 2014 more than 50 percent of generated CT household e-waste was collected
- In 2014, the amount of covered electronics that was recycled was more than 14.5 million pounds, representing 86 percent of the collected material
- The greenhouse gas savings in 2013 and 2014 was more than 8.5 million kilograms of carbon equivalents each year
- The total number of jobs created in the State between the start of the program and 2014 was 41
- The avoided municipal disposal costs for 2014 was more than \$500K; these costs have increased each year since the start of the program

In two years, the paint EPR program in CT has collected more than 500,000 gallons of paint. 80 percent of the latex is recycled into new paint.

Maine DEP is conducting an evaluation of the impacts of its e-waste EPR program and overall has found (www.maine.gov/dep/commissioners-office/kpi/details.html?id=586531):

- The program collected more than 8.4 million pounds of e-waste in 2014; the quantity has increased each year since 2011
- Approximately, 3.4 million pounds of e-waste was handled outside of the ME EPR program in 2014; the major handlers were consolidators, Goodwill, and retailers
- The amount of per capita e-waste collected through the EPR program and outside of the program has grown each year since 2011; in 2014 approximately 6.4 pounds/person was collected through the EPR program
- E-waste handlers have informally reported creating more than 40 jobs in Maine as a result of the EPR program

New York State DEC has analyzed the results of its e-waste program as of 2014 and found:

- There are 95 registered manufacturers
- There are 1300+ registered recyclers, consolidators, and collectors
- More than 325 million pounds of total e-waste was collected since inception of the e-waste law
- In 2015 manufacturers are mandated to collect approximately 97 million pounds of total e-waste

DEC is working with a contractor, ReTrac to develop an electronic reporting system for all e-waste entities within the program. DEC is developing regulation and holding stakeholder meetings to solicit input.

Rhode Island DEM has compiled results for their EPR programs. In 2014, the e-waste program had:

- 58 approved manufacturers
- 35 permanent collection locations and 36 seasonal/temporary collection locations
- 4.97 pounds per capita of covered products collected

The RI mercury thermostats program collected:

- 2,618 mercury-added thermostats (18.27 pounds of mercury) in 2013
- 2,720 mercury-added thermostats (23.43 pounds of mercury) in 2014

Collections of whole thermostats increased in Rhode Island by 7 percent in 2014, following a 53 percent increase in 2013. Out of 13 mandatory programs in the U.S., RI's participation rate ranks first with over 60 percent of the Thermostat Recycling Corporation collection locations returning one or more containers in 2014.

In 2014, the RI auto switch collection program collected 4,298 switches. RI has consistently ranked at the top for percent switches recovered.

The RI paint collection program began on June 1, 2014. The program processed 64,525 gallons of postconsumer paint during its first year. Latex paint made up 62 percent of the total paint; 87 percent was made into recycled content paint, and 13 percent was unrecyclable and sent to landfill. Oil-based paint made up 38 percent of the total paint. All of it was used as fuel. In addition, 27 tons of metal and plastic containers were recycled.

Vermont DEC regularly analyzes the impacts of the State's e-waste EPR program and identifies opportunities for improvement. The following are results for October 1, 2014 to September 30, 2015:

- 95 permanent collection sites and 83 manufacturers registered
- State Standard Program and one Opt-out Program in Program Year 4 operated (the majority of the collection sites were shared by both programs and the total pounds collected by the recycler from those shared sites were allocated according to percentage of participating manufacturers in each program)
- Over 4.6 million pounds or 7.34 pounds per capita collected, (statewide performance goal was 4,632,991 pounds)
- 13 collection events were held at various locations across the State to supplement the permanent collection locations

Proposed Legislation

There continues to be legislation introduced in some states, mostly by interested stakeholders, to advance EPR for certain product categories. This proposed legislation for 2015 is summarized below.

Bills Proposed for Targeted Products in 2015

States	CT	ME	MA	NH	NY	RI	VT
Products							
Electronics			•				
Paint			•		•		
Tires	•						•
Auto switches					•		
Lamps					•	•	
All batteries	•				•		
Pharmaceuticals			•			•	
Smoke Detectors					•		
Framework			•				
Bottle Bills	•	•	•			•	•