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Report to the Joint Standing Committee on Environment  
and Natural Resources  
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# Implementation of Product Stewardship in Maine

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Contact: George MacDonald, Director  
Division of Sustainability  
Phone: (207) 287-2870



MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION  
17 State House Station | Augusta, Maine 04333-0017  
[www.maine.gov/dep](http://www.maine.gov/dep)

## Executive Summary

The Maine Department of Environmental Protection (Department) is submitting this report in accordance with 38 M.R.S.A. § 1772(1), which requires the Department to provide an annual update on the performance of existing product stewardship programs, as well as product or product categories that when generated as waste may be appropriately managed under a product stewardship program.

From 1992 to 2009, Maine enacted five product-specific laws which require producers to establish programs to recover their products from Maine's waste stream and ensure proper handling and recycling, recovery, or disposal of these products. These products include: dry mercuric oxide and rechargeable batteries; mercury auto switches; electronic waste; mercury thermostats; and mercury lamps. In addition to these programs, Maine also has a product stewardship program for cellular telephones; however that law makes retailers responsible for the collection and recycling of unwanted cell phone, rather than the manufacturers. Lastly, P.L. 2013, ch. 395 was enacted last session, creating a program for architectural paint, which is currently set to be implemented in Maine in 2015.

The following trends have been observed under the existing programs:

- The total weight of rechargeable batteries recycled between 2008 to 2012 increased by 33%;
- Mercury auto switch recycling reached its highest rate of recycling in recent years;
- Maine's overall recycling rate of electronic waste per person is among the top five states, at 6.57 pounds per person;
- Total pounds of mercury collected from thermostats, at 46.69 pounds, is the highest it has been since 2009;
- In only its second year, the mercury-added lamps program has seen a recycling rate of 29%; and
- Used cellular telephones are still a desirable commodity, and Maine continues to have a robust collection network.

Over the next year, the Department will collaborate with other New England states to identify possible methods to encourage the recycling of mattresses and carpets, and the Northeast Waste Management Officials Association (NEWMOA) will explore opportunities to harmonize existing extended producer responsibility (EPR) efforts across the region. This approach can achieve economies of scale to achieve an adequate flow of materials to new processing and recycling enterprises.

## I. Introduction

The product stewardship programs at the Department of Environmental Protection are defined at 38 MRSA § 1771(5), as “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,” in order to support the State’s solid waste management hierarchy (38 MRSA § 2101). This hierarchy prioritizes the management of solid waste, through various actions, the highest being reduction in volume and

toxicity of waste at the source to the lowest being land disposal of waste. Product stewardship, which also may be referred to as “extended producer responsibility,” shifts the cost of the end-of-life management of products from municipalities and taxpayers to the producers and the consumers who purchase the products that are included in that program.

Product stewardship programs can be an effective tool to encourage the diversion of materials from disposal to recycling, and to encourage manufacturers to alter product design to support the recovery of materials from the products, and to invest in management systems to ensure the recycling of their products at the end of life. This reduces the costs of recapturing commodity materials from products, and ideally results in a positive commodity value when products reach the end of their useful life. As the concept of product stewardship has become more familiar, manufacturers of some products are proactively developing preferred model programs for recycling their products.

In accordance with 38 M.R.S.A. § 1772(1), this report includes updates and evaluations on the performance of Maine’s existing product stewardship programs, with recommended next steps to improve program performance and evaluation. The report also addresses future product strategies under development.

## **II. Performance of Existing Product Stewardship Programs**

Currently, five product stewardship programs that mandate manufacturer responsibility for recycling have been implemented in Maine. These extended producer responsibility (EPR) programs provide for the recycling of rechargeable batteries, mercury auto switches, electronics, mercury-added thermostats, and mercury-added lamps. In addition, Maine has a product stewardship law to enhance the recycling of cellular telephones. Maine’s cellular telephone law makes retailers responsible for the collection and recycling of unwanted cell phones rather than the manufacturers.

Also, manufacturers of architectural coatings (paint) will be implementing an EPR program in Maine in 2015.

### ***A. Rechargeable batteries program performance***

38 M.R.S.A. §2165, requires that manufacturers provide a system through which government agencies, and industrial, communications, and medical facilities can recycle their nickel-cadmium and sealed lead acid rechargeable batteries. This law was enacted in 1991, and the rechargeable battery manufacturers met their commitment through a program established by the former non-profit Rechargeable Battery Recycling Corporation (RBRC). RBRC, now known as Call2Recycle, voluntarily provides the Department annual data on its registered collection sites in Maine and the amount of rechargeable batteries and cell phones recycled from each. Although Maine’s law only requires free recycling for the specified types of businesses, Call2Recycle accepts rechargeable batteries from everyone.

The data Call2Recycle provides can be used to assess changes in the number of different types of collection sites and in the amount of batteries handled. Table 1 provides a comparison of the types and numbers of collection sites enrolled and active, and of the amount of batteries returned for recycling by each.

**Table 1: 2008 & 2012 Rechargeable Battery Recycling in Maine**

Collection site type	Number collection sites enrolled		Number returning boxes		Percent returning boxes		Pounds batteries returned		Percent of returns		Percentage change in pounds 2008 to 2012
	Year	2008	2012	2008	2012	2008	2012	2008	2012	2008	
Government	238	199	92	102	38.66	51.26	9,630	14,658	36.23	41.36	52.21%
Business	43	155	13	45	30.23	29.03	1,206	3,658	4.54	10.32	203.32%
Retail	391	324	153	160	39.13	49.38	15,745	17,123	59.23	48.32	8.75%
Totals	672	678	258	307	38.39	45.28	26,581	35,439	-	-	33.32%

The total weight of batteries recycled increased 33% from 2008 to 2012, reflecting an increase in the public awareness and participation. The data shows little change in the overall number of collection sites, with a shift toward more collection at businesses rather than government or retail locations, but a significant increase in the percentage of collection sites actively participating (i.e., sending rechargeable batteries for recycling).

### ***B. Mercury auto switches program performance***

2012 was the first year that the automobile manufacturers' National Vehicle Mercury Switch Recovery Program (NVMSRP) was fully implemented in Maine. This program is administered by End-of-Life Vehicle Solutions (ELVS), a non-profit stewardship organization established by the mercury auto switch manufacturers to manage both their required and voluntary programs throughout the U.S. The NVMSRP provides auto dismantlers with free buckets, shipping and recycling for all collected switches, and pays the incentives to the dismantlers as required by Maine law. With implementation of this more convenient program (FedEx delivers and picks up buckets at the dismantlers' shops rather than requiring the dismantlers to deliver to Portland or Bangor), performance in 2012 reached the highest annual recycling rate of 40% since 2006, when the US EPA established the national switch removal program.

**Table 2: Mercury Auto Switch Recycling 2008 -2012**

Year:	Number of switches recycled	Percentage of estimated number of switches available	Pounds of Mercury collected
2008	6972	28	15
2009	6868	33	15
2010	5685	27	13
2011	2236	12	5
2012	7139	40	16

Along with furnishing a very convenient collection system, ELVS provides the dismantlers with training videos (via YouTube), listings of vehicles with mercury switches and ABS sensors, and photo-based guidance documents showing where to find and how to remove the switches. In addition, the Department annually sends postcards to all vehicle dismantlers to remind them about the ELVS program, the availability of payment for switches recycled, and to send their mercury switches in for recycling. In addition, staff from the Department's Response Services, Hazardous Waste Enforcement, and Stormwater Management programs, all check on the auto dismantlers' implementation of the switch collection program when they visit auto dismantlers' yards on business related to their respective programs.

### ***C. Electronic waste program performance***

The amount of electronics recycled through Maine's legislated extended producer responsibility (EPR) program increases each year and has reached a total of nearly forty two million pounds. Recycling of covered electronic devices (CEDs) through Maine's EPR program began in 2006. CEDs include consumer products with video displays greater than 4" diagonal (TVs, monitors, laptops, digital picture frames, tablets, e-readers), game consoles and desktop printers. In addition to the CEDs recycled through the EPR program, some CEDs as well as other electronics from Maine are recycled through independent programs or in conjunction with the state's program CEDs. In 2010, Goodwill and Dell began accepting computer-related electronics through their ReConnect program at all Goodwill locations in Maine. Both Best Buy and Staples have instituted free electronics recycling at their retail locations within the past couple of years. Table 3 shows the total and per capita weights of electronics recycled each year from 2008 through 2012, plus voluntarily-reported weights recycled from other programs.

**Table 3: Electronic waste Recycling in Maine**

	Maine Program - total pounds	Maine Program Per Capita	Goodwill-Dell ReConnect - pounds	Maine Program Plus ReConnect Per Capita	Other non-program e-waste	Total all reported – total pounds	Maine Program Plus All Other – Pounds Per Capita
<b>2008</b>	5,274,419	3.99	N/A			<b>5,274,419</b>	3.99
<b>2009</b>	7,912,292	5.99	N/A			<b>7,912,292</b>	5.99
<b>2010</b>	5,368,445	4.06	1,151,997	4.93		<b>6,520,442</b>	4.93
<b>2011</b>	6,931,248	5.24	1,160,233	6.12		<b>8,091,481</b>	6.12
<b>2012</b>	7,438,861	5.62			1,253,748	<b>8,692,609</b>	6.57
Total	<b>41,774,391</b>		<b>2,312,230</b>		<b>1,253,748</b>	<b>45,340,369</b>	

Maine’s overall collection and recycling rate of 6.57 pounds per person in 2012 compares favorably with data reported by other states, with only a few other states reporting a higher per capita rate (see data collected by the Electronics Recycling Coordination Clearinghouse at [www.ecycleclearinghouse.org/Content.aspx?pageid=59](http://www.ecycleclearinghouse.org/Content.aspx?pageid=59)).

#### ***D. Mercury-added thermostat program performance***

38 M.R.S.A. §1665-B, Maine’s *Mercury-added Thermostats* law, was enacted in 2005 to establish extended producer responsibility for the collection and recycling of mercury-added thermostats. This law requires that the program be designed and implemented to achieve a maximum rate of collection [38 M.R.S.A. § 1665-B(2)(A)(1)], and it sets collection and recycling goals by weight, of at least 125 pounds of mercury within two years of implementation of a collection program for contractors and service technicians, and 160 pounds per year within three years of implementation of a program for homeowners. The law also requires manufacturers to “provide a financial incentive with a minimum value of \$5 for the return of each mercury-added thermostat”. In the program’s beginning, collection rates were below 10%, despite the availability of collection boxes at all HVAC wholesalers.

In 2007, the Thermostat Recycling Corporation (TRC), a non-profit organization that facilitates and manages the collection and proper disposal of mercury-containing thermostats, began implementation of the incentive program, where five dollars was provided to the deliverer of each mercury containing thermostat at a collection point, with HVAC wholesalers continuing participation as mandatory collection sites; voluntary retail participation to serve residents began in 2008. Estimated recycling rates reached 25.84% (including collections through both the TRC program and Maine’s universal waste system) in 2009, and have remained around 25% in subsequent years. In 2012, the TRC program collected and recycled 46.49 pounds of mercury from Maine, and total collections were the highest since 2009. The Department does not have data on the actual number of mercury-added thermostats still available for collection, and only has estimates of the number that would be removed each year in Maine. The Department will explore methods to improve available data to evaluate the appropriateness of the current weight-based statutory goals.

Table 4 shows thermostat collection numbers from 2008-2012. In 2012, there was a significant increase in the number of thermostats turned in through municipal household hazardous waste (HHW) collections. It appears that this increase was primarily due to a temporary program in which *ecomaine* (a non-profit waste management company owned and operated by 21 municipalities in Southern Maine) supplemented the TRC \$5 incentive with an additional \$5 incentive (providing a \$10 incentive) for each mercury-added thermostat turned in to their facility in Portland.

**Table 4: 2008-2012 Maine Thermostat Collections**

Year	Retail to TRC	Wholesale to TRC	Contractor to TRC	HHW to TRC	Mail-back to TRC	Other (not TRC)	Total	Pounds mercury by TRC	Recycling rate*	T-stats Per 10,000**
2008	N/A	4395	466	110	422	1176	6569	<b>46.24</b>	24.15%	49.45
2009	997	4760	234	267	116	655	7029	<b>48.75</b>	25.84%	52.91
2010	1011	4635	554	291	32	170	6693	<b>44.90</b>	24.61%	50.39
2011	2607	3139	92	773	5	256	6872	<b>46.36</b>	25.26%	51.73
2012	2239	1784	388	2264	4	333	7012	<b>46.49</b>	25.78%	52.78
<b>Totals</b>	<b>6854</b>	<b>29477</b>	<b>1914</b>	<b>3705</b>	<b>579</b>	<b>7524</b>	<b>50053</b>	<b>323.98</b>		

\*Based on a baseline calculation at the beginning of the program, of 27,200 estimated mercury thermostat removals per year in Maine.

\*\*Based on 2010 census population (1,328,361)

In addition, the Department performed an analysis of collections by the TRC program by regions in the state. For the purposes of this analysis, the State was divided into the following regions:

Region #1 = Southern Maine: York and Cumberland counties

Region #2 = MidCoast Maine: Androscoggin, Sagadahoc, Kennebec, Waldo, Lincoln and Knox counties

Region #3 = Western Maine: Oxford, Franklin and Somerset counties

Region #4 = Downeast Maine: Hancock and Washington counties

Region #5 = Central Maine: Penobscot and Piscataquis counties

Region #6 = Northern Maine: Aroostook county

Table 5 shows the collection rate for 2012 by region and by collection site type (retail, wholesale or HHW), which illustrates differences in collection site participation rates and the collection rate per 10,000 population between regions. This information is utilized by both the Department and the TRC in developing and planning outreach efforts.



**Table 5: 2012 Mercury-added Thermostat Collection by Region**

Region	Population 2010 Census	# active*/enrolled collection sites			# t-stats collected by TRC	Collection rate per 10,000
		Retail	Wholesale	HHW		
1	478,807	11/20	4/28	4/19	3384	70.59
2	378,125	13/20	10/18	1/22	2188	57.86
3	140,689	0/8	0/1	1/6	21	1.49
4	87,414	0/1	1/4	0/2	87	0.99
5	171,456	3/7	5/10	0/5	575	33.54
6	71,870	1/3	5/6	0/1	420	58.44
<b>Totals</b>	1,328,361	28/59 (47.5%)	25/69 (36.2%)	6/55	6671**	

\* Sites are considered “active” if they returned a thermostat collection bin within the calendar year. In both the active and enrolled site numbers, contractors are included in the wholesale category. For example, in Region 6, 4 out of the 5 active “wholesale” collection locations are contractor businesses.

\*\* TRC’s 2012 annual report states it collected both 6671 and 6675 thermostats. There were 4 sent in through the homeowner mail-back and are not included above since their county of origin is unknown. The difference in the totals is not statistically significant.

### ***E. Mercury-added lamps program performance***

Manufacturers of mercury-added lamps utilize the National Electrical Manufacturers Association (NEMA) to implement their product stewardship responsibilities for household mercury-added lamps. This program provides free containers, shipping and recycling services to voluntary retail and municipal collection sites.

NEMA reports that 50,492 mercury-added lamps were recycled through its product stewardship program in Maine in 2012. Based on historic sales data, NEMA estimates that there were 708,889 residential mercury-added lamps available for recycling in Maine in 2012. Based on that estimate, 7.1% of available lamps were collected and returned for recycling through the manufacturers’ program in 2012. In addition, the Department received manifests documenting the recycling of 155,159 household lamps from municipal waste collection sites. Taken together, this yields a recycling rate of 29% (205,651/708,889) for household mercury-added lamps in Maine in 2012, the second year of NEMA’s program.

38 M.R.S.A. § 1672(4)(A)(1), requires the manufacturers to establish “Convenient collection locations throughout the State”. In 2011, the NEMA program focused on signing up retailers that had previously participated as collection sites in the Efficiency Maine CFL recycling program. By the end of 2011, 149 retail and municipal sites had signed up to act as collection sites. This number increased to a total of 263 collection sites, (128 municipal and 135 retail), by August 2013. In 2013 NEMA and department staff worked to identify areas of the state underserved by collection sites. Both NEMA and department staff are reaching out to towns and retailers in the two small

underserved areas, Downeast Maine and in southwestern Maine, to encourage participation in the program.

Convenient collections in conjunction with high consumer awareness of recycling opportunities are necessary to support adequate program performance. In 2013, NEMA continued a coordinated marketing campaign to educate Maine consumers on their free recycling program and about the disposal ban on fluorescent light bulbs. This included: print ads in *Uncle Henry's*, *Downeast Magazine*, the *Bangor Daily News*, *Portland Press Herald* and some local weeklies; distribution of a radio PSA to 95 area-specific radio stations; internet search purchases; and, print and signage advertising at University of Maine Black Bear athletic events.

### ***F. Cell phone recycling program performance***

The recycling of cellular telephones is encouraged in Maine by a product stewardship law. However, unlike other product-specific programs, the law assigns recycling requirements to retailers and reporting requirements to cellular telephone service providers, rather than producers.

Currently, unwanted cell phones have market value, and a free collection system, offered by retailers and varying organizations, for recycling cell phones is very widespread in Maine. The collection network includes 100 locations offered by the five cellular telephone services providers and their authorized dealers and 675 additional sites offering the Call2Recycle® program (371 retail and 304 municipal, public agency and business locations, including many local solid waste and recycling facilities). Retailers utilizing the Call2Recycle® program include several of the larger retail chains (Rite Aid, RadioShack, Best Buy and Wal-Mart).

In addition to these physical collection sites located across the state, there are many internet-based non-profit organizations soliciting donations of cell phones, as well as for-profit businesses offering to purchase cell phones from consumers. A quick Google search for “cell phone recycling for cash” finds over 2 million “results” and 11 paid advertisers on “page 1” offering to buy cell phones directly from consumers. The strength and success of these various programs in capturing unwanted cell phones should be celebrated, and indicates that the government mandated recycling program for unwanted cell phones is unnecessary.

Although the collection network in Maine is robust, the data is not available from which to develop a quantitative assessment of program performance, i.e., a recycling rate. The plethora of internet outlets for the recycling of cell phones makes it infeasible to collect complete and accurate data on the number of cell phones recycled from Maine each year. Consistent reporting to the Department by the cellular telephone service providers over the past six years highlights their commitment to making cell phone recycling easy and even financially beneficial for their customers.

### **III. Evaluation of the Performance of Maine's EPR Programs and Recommendations**

The Department is required to report annually to the legislature on the performance of Maine's product stewardship programs, and include any recommendations for improvements to the programs. Recommendations for improvement may be warranted when there is evidence that a program is underperforming. Based on the performance evaluation of each program discussed in the previous section, the Department believes additional information should be collected to evaluate if adjustments to the rechargeable batteries and mercury-added thermostats programs may be appropriate in coming years.

#### ***A. Rechargeable Batteries Program***

The rechargeable battery recycling program has established a robust collection system, but there is insufficient information to accurately assess actual program performance, i.e., what percentage of batteries available for recycling are collected each year?

The first step needed to understand how much change, if any, is needed in the current EPR program for rechargeable batteries is to gather additional information on program performance. Missing key performance indicators include the collection rate (number of batteries collected/number of batteries available for collection), recovery rate (amount recycled/amount collected), and recycling rate (collection rate x recovery rate). The Department will evaluate options for obtaining and/or estimating these data points, and may provide recommendations in the future.

#### ***B. Mercury-Added Thermostats***

The mercury-added thermostat program has not achieved the statutory capture rate in pounds, and there is a level of uncertainty in data supporting the percentage of thermostats available for recycling.

As noted earlier, the mercury-added thermostat program recycling rates remain around 25% (of the mercury-added thermostats estimated to be available for recycling), which is 29% of the statutory weight-based goal. In its report on the program for 2011, TRC wrote: "The current performance goal of 160 pounds is based upon a flawed metric. The assumptions used to develop this goal were not empirically based and represent little more than guesses... No one knows the remaining installed base of mercury thermostats in Maine or the number that become waste annually."

To more accurately evaluate program performance, the uncertainty in both the average number of mercury-added thermostats available for recycling each year (this is determined based on the average lifespan) and in the number of thermostats in each home and business should be addressed. A more accurate estimate of the number of thermostats per home and business, and the percent containing mercury, are needed. The Department will explore options to develop a more valid, updated estimate of the number of mercury-containing thermostats available for recycling, and that are replaced each year in Maine.

## IV. Future Product Strategies

Department staff are engaged in a number of discussions and activities with other states, non-profits and trade associations, both within the Northeast as well as nationally, in reviewing the success and concerns of existing product stewardship programs and laws, as well as in considering additional strategies to divert difficult to manage materials from disposal.

### A. *Paint*

P.L. 2013, ch. 395 directs manufacturers of architectural paint to work with a stewardship organization to submit a program plan to the Department by April 1, 2015, to establish a paint stewardship program in Maine. The Department will propose changes to hazardous waste regulations in 2014 to accommodate this new law, and review subsequent program plan submissions. Product stewardship programs for architectural paint are underway in California, Oregon and Connecticut, with Vermont and Rhode Island starting in 2014.

### B. *Mattresses and Carpets*

Solid waste facility operators in Maine frequently identify mattresses and carpets as difficult to manage products in Maine's MSW waste stream.

Product stewardship laws for mattresses were recently enacted in Connecticut, Rhode Island, and California, as a method to divert these products from disposal sites and lead to the recovery and reuse of the materials associated with the products.

Laws in these states require manufacturers to utilize a stewardship organization to provide free collection and recycling services to municipalities, including collection containers for local transfer stations. To fund the program, manufacturers pay a fee per mattress sold to the stewardship organization; this fee is then charged by retailers to consumers when a mattress is purchased. Mattress manufacturers must submit a program plan for approval to Connecticut's environmental department by July 1, 2014, and to the responsible state agencies in Rhode Island and California by July 1, 2015.

Currently there are limited numbers of mattress recycling facilities available in the Northeast, located in Massachusetts and in Connecticut.

There have been several attempts nationally to address the recovery of used carpets. The carpet industry established the 'Carpet America Recovery Effort (CARE) to encourage the diversion of unwanted carpet from landfills and is a resource for planning. The State of California has adopted a stewardship program for carpet, and CARE is the stewardship organization administering that program, which is funded by a fee of five cents per square yard for each square yard of carpet sold in California. The Department will work with other New England states to evaluate options for a regional approach to managing used mattresses and carpets in ways that encourage recovery of the materials and reduce the use of landfill space for disposal of these products.

## **V. Conclusion**

Maine has one of the highest number of product stewardship programs established by law in the country. Information collected by and reported to the Department under these programs indicates they are successfully diverting materials from disposal in Maine, and that diversion rates are increasing for many of the affected products.

Based on our review of program performance and goals, the Department has identified the need to improve and update information regarding the numbers of rechargeable batteries in Maine's market, and the number of mercury-added thermostats that are removed and available for recycling in Maine each year.

The Department will be working to implement the new stewardship program for architectural paint in 2014, and exploring opportunities to work with other states in our region to divert mattresses and carpets from disposal.