Extended Producer Responsibility Commission

DRAFT FINAL REPORT

December 2025

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EPR Commission Background

Pursuant to Chapter 239 of the Acts of 2024, Section 108, the Massachusetts Legislature established a legislative commission to recommend to the general court extended producer responsibility policies for the commonwealth.

The Extended Producer Responsibility Commission (EPRC) was formed in Spring 2025. The Commission consisted of the following:

- A commissioner of environmental protection or a designee, who shall serve as chair
- The secretary of economic development or a designee
- The commissioner of public health or a designee
- One person to be appointed by the attorney general, who shall have expertise in consumer protection
- One person to be appointed by the senate chair of the joint committee on environment and natural resources
- One person to be appointed by the senate chair of the joint committee on telecommunications, utilities and energy
- One person to be appointed by the minority leader of the senate
- One person to be appointed by the house chair of the joint committee on environment and natural resources
- One person to be appointed by the house chair of the joint committee on telecommunications, utilities and energy
- One person to be appointed by the minority leader of the house of representatives
- One person to be appointed by the Massachusetts Association of Regional Planning Agencies
- Ten additional persons to be appointed by the chair:
    - One of whom shall represent an organization representing product or packaging producers
    - One of whom shall represent retailers
    - One of whom shall represent waste haulers and material recovery facility operators
    - One of whom shall represent municipal officials or employees
    - One of whom shall represent a statewide or regional environmental protection organization
    - Three of whom shall represent environmental justice organizations
    - One of whom shall represent a statewide recycling advocacy organization
    - One of whom shall represent an environmental health and public health organization

The chair shall consider geographic diversity in making appointments to the commission. The Massachusetts Department of Environmental Protection (MassDEP) strove to assemble the Commission with representation as instructed by the Legislature but was unable to fill one of the three environmental justice organizations.

The EPRC was charged with developing extended producer responsibility (EPR) policy recommendations to include, but not be limited to:

1. Recommendations on specific EPR approaches and other strategies for product and packaging categories including, but not limited to, paint, mattresses, electronics, lithium-ion batteries, plastics and other packaging;
2. A proposed structure for each product and packaging category including collection, processing and financial responsibility;
3. Information on cost impacts of residential curbside collection or transfer station operations, on-site processing costs for each readily recyclable material type, management costs of non-readily recyclable materials and other cost factors;
4. Methods for incentivizing product and packaging production, including material reduction, reuse and lifecycle extensions; and

5. Impacts on waste generation and waste stream contamination reduction.

This report summarizes the recommendations of the Commission and provides further background information on each topic discussed.

EPR Commission: Executive Summary

Commission appointees are listed in Table 1.

Table 1. — Massachusetts Extended Producer Responsibility Commission members.

Appointment category	Name	Organization
MassDEP Commissioner or Designee	John Beling	MassDEP
Executive Office of Economic Development Secretary or Designee	Sarah Kalish	Executive Office of Economic Development
Massachusetts Department of Public Health Commissioner or Designee	Dalene LaPointe	Massachusetts Department of Public Health
Office of the Attorney General Appointee, Consumer Protection Expert	Tracy Triplett	Office of Attorney General Andrea Joy Campbell
Senate Chair of the Joint Committee on Environment and Natural Resources Appointee	David Melly	Environmental League of Massachusetts
Senate Chair of the Joint Committee on Telecommunications, Utilities, and Energy Appointee	Michael Barrett	Massachusetts State Senate
Senate Minority Leader Appointee	Sharon Byrne Kishida	Recycling Professional
House Chair of the Joint Committee on Environment and Natural Resources Appointee	Michael Day	Massachusetts House of Representatives
House Chair of the Joint Committee on Telecommunications, Utilities, and Energy Appointee	Abbie Webb	Casella Waste Systems
House Minority Leader Nominee	Conor O'Shaughnessy	Office of Representative Brad Jones
Massachusetts Association of Regional Planning Agencies	Catherine Ratte	Pioneer Valley Planning Commission
Product/Packaging Producer Organization	Magda Garncarz	Associated Industries of Massachusetts
Retailers	Bill Rennie	Retailers Association of Massachusetts
Waste Haulers & Material Recovery Facility Operators	Lew Dubuque	National Waste and Recycling Association
Municipal Officials or Employees	Andrew Potter	Town of West Stockbridge
Statewide or Regional Environmental Protection Organization	Neil Rhein	Keep Massachusetts Beautiful
Environmental Justice Organization (2)	Leigh-Anne Cole/Max Haworth	Community Action Works
Statewide Recycling Advocacy Organization	Waneta Trabert	MassRecycle
Environmental Health and Public Health Organization	Janet Domenitz	MassPIRG
Environmental Justice Organization (1)	Jose Degado	Arise for Social Justice
Environmental Justice Organization (3)	Vacant	

Commission process

MassDEP engaged a third-party facilitator, GreenerU, to assist in facilitating the work of the Commission. The Commission met seven times over the course of 2025 with an initial meeting to establish the Commission ground rules, one dedicated meeting for each product category (paint, mattresses, batteries, and plastics and packaging) for a total of five meetings, and one meeting to discuss and finalize the recommendations of the Commission.

Commission meetings followed Commonwealth of Massachusetts (Commonwealth) open meeting law protocols. Agendas, minutes, presentations, and other materials from these meetings are available on the MassDEP website at https://www.mass.gov/info-details/extended-producer-responsibility-commission#commission-meetings.

In addition, at its May 21, 2025, meeting, the Commission voted to establish two advisory groups: (a) electronics and (b) plastics and packaging. Advisory groups were charged with gathering information on existing EPR programs, identifying questions and additional information, and sharing this information with the EPR Commission to assist in developing policy recommendations. Advisory groups consisted of MassDEP staff, Commission members, and members of the public. Each advisory group met twice between June and September 2025. Details and findings from the advisory groups are available on the MassDEP website at https://www.mass.gov/info-details/extended-producer-responsibility-commission#advisory-groups.

Public comment

All public comments regarding Commission deliberations are available at the MassDEP website at https://www.mass.gov/info-details/extended-producer-responsibility-commission#public-comment.

Recommendations and Votes

Following are Commission recommendations for each product category and a vote summary (Table 2).

Paint

The Commission recommends the Massachusetts legislature enact legislation establishing an EPR for paint by July 1, 2026. The Commission recommends the development and implementation of a program (e.g., PaintCare) that aligns with programs already in place in other Northeast states (Connecticut, Maine, Rhode Island, Vermont, and New York), to provide consistency across the region.

The Commission acknowledges proposed paint EPR legislation under consideration before the Massachusetts legislature at time of report publication: H.886, which includes aerosol-based paint, and S.647.[1,2]

Mattresses

The Commission recommends that the Massachusetts Legislature enact legislation to EPR program for mattresses. The Commission recommends the development and implementation of a program that aligns with existing programs to the greatest extent possible.

The Commission acknowledges proposed mattress EPR legislation under consideration before the Massachusetts legislature at the time of this recommendation—H.1023, H.3985, and S.614—but does not endorse any specific bill. H.1023 incorporates some of the elements contained in Oregon's updated law, which the Commission recommends exploring.

The Commission recommends consideration of the following questions:

1. Should the mattress fee be a flat fee or a variable fee based on size of mattress or cost? Current EPR programs have a flat fee regardless of the size (twin, full, queen, king) or cost of the mattress.
2. Should the disposal cost of mattresses that cannot be collected and recycled through the program be included?
3. Should the fee be collected at the wholesale or retail level? In current mattress EPR programs the fee is collected at the point of retail sale.

Batteries

The Commission recommends that the Massachusetts Legislature enact legislation to establish an EPR program for batteries. The Commission recommends the development and implementation of a program that aligns with PRBA—The Portable Rechargeable Battery Association (PRBA) model EPR legislation to the greatest extent possible.

The Commission acknowledges proposed battery EPR legislation under consideration before the Massachusetts legislature at the time of this recommendation—H.968 and S.556—but does not endorse any specific bill.

The Commission recommends consideration of the following:

[1] The 194th General Court of the Commonwealth of Massachusetts, Bill H.886, "An act relative to paint recycling." From https://malegislature.gov/Bills/194/H886, accessed May 23, 2025.
[2] The 194th General Court of the Commonwealth of Massachusetts, Bill S.647, "An act relative to paint recycling." From https://malegislature.gov/Bills/194/S647, accessed May 23, 2025.

- As movement on EPR for batteries in other states is rapidly evolving to address various issues such as management of damaged, defective, recalled (DDR) batteries, embedded batteries in products, and proper collection and management solutions, harmonization of state programs will serve states and industry.

- Impacts of any restriction on parties outside the EPR program from collecting batteries through existing infrastructures should be considered.

Draft Electronics – Subject to final vote

The Commission endorses enactment of legislation to establish an EPR program for electronics. The Commission recommends the development and implementation of a program that aligns with existing programs in other states to the greatest extent possible.

The Commission acknowledges proposed electronics EPR legislation under consideration before the Massachusetts legislature at the time of this recommendation—H.1015 and S.653—but does not endorse any specific bill.

Specific recommendations on elements to include in electronic EPR legislation are as follows:

Covered products	Computers, laptops, tablets, monitors, televisions, printers, computer peripherals; in 2026 to include fax machines, DVD players, VCRs, portable music players, game consoles, digital converter boxes, cable/satellite receivers, scanners, small-scale servers, routers, modems
Covered entities	Households, schools, government, small business
Performance goal	Convenience standard and target reduction of electronics in the waste stream
Collection/recycling service	Must include municipal electronics collection points
Financial structure	No fee to covered entity. Funding covered by producer based on market share of total cost, including orphaned electronics.
Recycling standards	Entities processing electronics on behalf of producers must have E-stewards, R2 certification or equivalent
Outreach and education	Comprehensive outreach and education plan by producers

Other recommended initiatives to consider

Although most electronic EPR laws do not include issues related to the right to repair, several states (California, Connecticut, New York, Oregon) have passed right-to-repair legislation or have legislation pending. A right-to-repair law would make extending the life of existing electronics easier by increasing consumer and repair shops' access to necessary parts, tools, and documentation.

Draft Plastics and Packaging – Subject to final vote

The Commission endorses the concept of EPR for plastics and packaging. Due to the vast amount of technical information and expanded stakeholder engagement needed to advance such an initiative, the Commission recommends that MassDEP be charged with establishing a subcommittee of its Solid Waste

Advisory Committee to further discuss EPR for plastics and packaging and be provided the necessary resources to pursue a needs assessment, which will help determine how EPR for plastics and packaging could have a meaningful impact on advancing material recovery in the Commonwealth

Commission votes

Table 2. —Extended Producer Responsibility Commission votes on enacting stewardship legislation.

	Vote				
Commissioner	**Paint**[3]	**Mattresses**[4]	**Batteries**[5]	**Electronics**[6]	**Plastics and Packaging**[7]
John Beling, Chair	Yea	Yea	Yea		
Rep. Christine Barber	Yea	Absent	Absent		
Senator Mike Barrett	Absent	Absent	Absent		
Sharon Byrne Kishida	Yea	Yea	Yea		
Kris Callahan	Yea	Absent	Yea		
Leigh-Anne Cole/Max Haworth	Yea	Yea	Absent		
Jose Delgado	Yea	Absent	Yea		
Janet Domenitz	Yea	Abstain	Yea		
Lew Dubuque	Yea	Yea	Yea		
Magda Garncarz	Yea	Yea	Yea		
Sarah Kalish	Yea	Yea	Yea		
David Melly	Yea	Yea	Yea		
Conor O'Shaughnessy	Yea	Absent	Yea		
Andrew Potter	Yea	Absent	Absent		
Catherine Ratte	Yea	Yea	Yea		
Bill Rennie	Nay	Nay	Yea		
Neil Rhein	Yea	Yea	Yea		
Waneta Trabert	Yea	Yea	Yea		
Tracy Triplett	Yea	Yea	Yea		
Abbie Webb	Yea	Absent	Yea		

[3] From a vote taken at a June 18, 2025, EPR Commission meeting.
[4] From a vote taken at a September 17, 2025, EPR Commission meeting.
[5] From a vote taken at an October 29, 2025, EPR Commission meeting.
[6] From a vote taken at a December 9, 2025, EPR Commission meeting.
[7] From a vote taken at a December 9, 2025, EPR Commission meeting.

BACKGROUND:

PAINT

Executive Summary

Americans generate more than 80 million gallons of leftover latex and oil-based paint every year.[8] In the Commonwealth, an estimated 1.8 million gallons of leftover paint is generated annually, with more than half—67%—discarded in either a combustion facility (waste-to-energy) or a landfill.[9,10]

When dumped in the trash or down the drain, leftover paint—particularly oil-based paint—can contaminate the environment with hazardous materials. According to MassDEP's most recent waste characterization studies, paint accounts for 0.13% of all solid waste annually, or 6,100 tons, in Massachusetts.[11]

Currently in Massachusetts, responsibility for the collection and appropriate disposal of household hazardous waste (HHW) falls predominately on municipalities. Most leftover paint that is recovered is collected by municipalities during an annual, one-day HHW event, which is an inconvenient and expensive method to divert paint away from household trash bins and drains, This collection method costs taxpayers approximately $2 million annually on paint alone.[12] A third of Massachusetts residents have no access to municipal HHW collection services and only 23% of Massachusetts residents have access to year-round paint collection.[13]

Paint is highly recyclable. Leftover oil-based paint can be used as industrial fuel.[14] Approximately 70% of collected latex paint is reused or recycled back into paint or non-paint products.[15]

EPR programs for paint have been operating successfully in 12 states and the District of Columbia, beginning with Oregon in 2010. PaintCare, a nonprofit 501(c)(3) organization established by the American Coatings Association, collects and recycles unwanted and leftover paint, preventing it from being discarded.[16] PaintCare collects leftover paint through participating retail stores and municipal HHW collection efforts providing extensive access to this service year-round. It also provides consumers with information and resources on how much paint to buy, how to store paint longer, and ideas on how to use leftover paint. To date, PaintCare programs have collected nearly 80 million gallons of unwanted paint, 80% of which is recycled.[17]

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[8] Product Stewardship Institute. EPR by product: paint. From https://productstewardship.us/products/paint/, accessed May 23, 2025.
[9] Commonwealth of Massachusetts, Executive Office of Energy and Environmental Affairs, Department of Environmental Protection. Summary of Waste Combustor Class II Recycling Program Waste Characterization Studies (2019 & 2022). From https://www.mass.gov/guides/solid-waste-master-plan, accessed May 23, 2025.
[10] Data from Product Stewardship Institute based on national sales figures scaled to the Massachusetts population multiplied by an estimated 10% of leftover paint annually.
[11] Waste Characterization Studies 2019 & 2022.
[12] Figures extrapolated from PaintCare Connecticut 2024 Annual Report and PaintCare Vermont 2024 Annual Report with costs indicated at $9.11 and $8.69 per gallon, respectively.
[13] Data from MassDEP 2024 Recycling Survey reported by municipalities. From https://www.mass.gov/lists/recycling-solid-waste-data-for-massachusetts-cities-towns, accessed June 6, 2025.
[14] Coatings World. EPR achievements: the case of paint in the U.S. November 2019: p. 42. From https://productstewardship.us/wp-content/uploads/2023/05/EPR-Achievements-The-Case-of-Paint-in-the-U.S.-Published.pdf, accessed May 23, 2025.
[15] *Ibid.*
[16] See details at https://www.paintcare.org/.
[17] PaintCare.com, Our Story. From https://www.paintcare.org/our-story/#:~:text=To%20date%20PaintCare%20has%E2%80%A6%20*%20Collected%20an,pickups.%20*%20Hosted%20381%20paint%20drop%2Doff%20events, accessed May 23, 2025.

Background: The Problem

Americans generate more than 80 million gallons of leftover latex and oil-based paint every year.[18] In Massachusetts, an estimated 1.8 million gallons of leftover paint is generated annually, with more than half—67%—disposed of in either a combustion facility (waste-to-energy) or a landfill (see Table 3).[19,20] According to MassDEP waste characterization studies, paint accounts for 0.13% of all solid waste annually, or 6,100 tons, in Massachusetts.[21]

Table 3. — Paint generation and disposition in Massachusetts (estimated).

Paint generation and disposition	Gallons (est.)	Percent of total
Total leftover paint generated annually	1,800,000	100%
Discarded in trash	1,200,000	67%
Landfill	*420,000*	*24%*
Massachusetts combustion facility	*780,000*	*43%*
Recycled, reused, collected with HHW, or disposed down drain/sewer	600,000	33%
Processed by RECOLOR® into recycled paint[22]	*360,000*	*60%*
No data available yet	*240,000*	*40%*

Based on a 2007 study by the U.S. Environmental Protection Agency (EPA) released at a meeting of the Paint Product Stewardship Initiative, approximately 10% of consumer-purchased paint goes unused.[23]

When dumped in the trash or down the drain, leftover paint—particularly oil-based paint—can contaminate the environment with hazardous materials. According to the EPA, leftover paint can also contain volatile organic compounds, fungicides, and, in the case of very old paint, significant quantities of hazardous metals such as mercury and lead.

While latex paint is far less environmentally hazardous than solvent-based paints, the primary environmental toxicity of latex paint is to fish and aquatic life as a result of improper disposal into the water system.[24] Other releases occur through wastewater treatment plants, illegal dumping or leachate from landfills into ground and surface water.

Of all HHW, paint is the single most voluminous and expensive material collected and managed by municipalities.[25]

[18] Product Stewardship Institute. EPR by product: paint. From https://productstewardship.us/products/paint/, accessed May 23, 2025.
[19] Waste Characterization Studies 2019 & 2022.
[20] Data from Product Stewardship Institute based on national sales figures scaled to the Massachusetts population multiplied by an estimated 10% of leftover paint annually.
[21] Waste Characterization Studies 2019 & 2022.
[22] RECOLOR® is a women-owned surplus recycled latex paint retailer based in Hanover, Massachusetts.
[23] U.S. Environmental Protection Agency, Office of Strategic Environmental Management, Sector-Based Information and Resources: Paint and Coatings. From https://archive.epa.gov/sectors/web/html/paint.html, accessed May 23, 2025.
[24] Product Stewardship Institute, "Final paint technical report," March 2004: p. 6. From https://productstewardship.us/wp-content/uploads/2025/05/PaintTechnicalReportFinal3-21-04.pdf, accessed May 27, 2025.
[25] U.S. EPA.

Currently, in Massachusetts, responsibility for the collection and appropriate disposal of HHW falls predominately on municipalities. Most leftover paint that is recovered is collected by municipalities during an annual, one-day HHW event, which is an inconvenient and expensive method to divert paint away from household trash bins and drains. This collection method costs taxpayers approximately $2 million annually on paint alone.[26] This figure could increase to approximately $16 million annually if all 1.8 million gallons of leftover paint generated each year were collected and recycled or properly managed.[27] Only 23% of Massachusetts residents have access to year-round paint collection (see Table 4).[28] A third of Massachusetts residents have no access to municipal HHW collection services.[29]

Table 4. — Percentage of Massachusetts communities and residents with leftover paint collection access.

Collection frequency	% of communities	% of population
Year-round	26%	23%
Weekly/monthly	2%	2%
6-11 months of the year	5%	7%
< 6 months of the year	16%	25%
0	32%	32%
No data	18%	11%

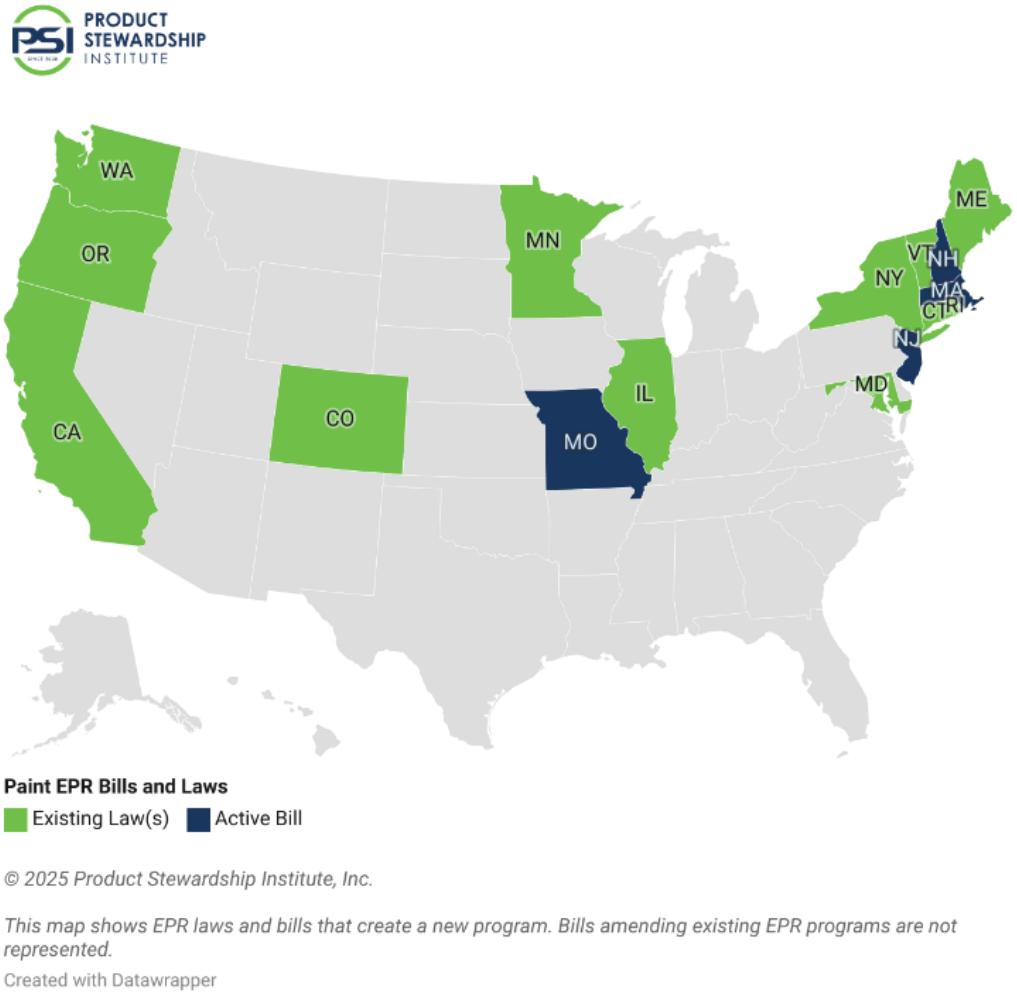
[26] PaintCare Connecticut and Vermont 2024 Annual Reports.
[27] *Ibid.*
[28] MassDEP 2024 Recycling Survey.
[29] *Ibid.*

Proposed Solution

Paint is highly recyclable. Leftover oil-based paint can be used as industrial fuel.[30] Approximately 70% of collected latex paint is reused or recycled back into paint or non-paint products.[31]

EPR programs for paint have been operating successfully in 12 states and the District of Columbia, starting with Oregon in 2010 and followed by California, Connecticut, Rhode Island, Minnesota, Vermont, Maine, Colorado, D.C., Washington, New York, Illinois, and Maryland (see Figure 1). Four state legislatures have introduced paint EPR legislation in 2025, including Massachusetts, Missouri, New Hampshire, and New Jersey.

Figure 1. — Paint EPR laws and bills in the United States.[32]



PaintCare, a nonprofit 501(c)(3) organization established by the American Coatings Association, is the leading provider of paint stewardship in the U.S. PaintCare collects and recycles unwanted and leftover paint,

[30] Coatings World. EPR achievements: the case of paint in the U.S. November 2019: p. 42. From https://productstewardship.us/wp-content/uploads/2023/05/EPR-Achievements-The-Case-of-Paint-in-the-U.S.-Published.pdf, accessed May 23, 2025.
[31] *Ibid.*
[32] Map courtesy of Product Stewardship Institute, Inc.

preventing it from being discarded.[33] PaintCare also provides consumers with information and resources on how much paint to buy, how to store paint longer, and ideas on how to use leftover paint. To date, PaintCare programs nationwide have collected nearly 80 million gallons of unwanted paint with a recycling rate of more than 80%.[34]

Results of PaintCare programs in other states

Table 5 highlights a summary of PaintCare program results where active across the U.S. In all, 95% of residents are within 15 miles of a convenient paint drop-off-location and an estimated 83% of all latex paint collected among state program participants is reused or recycled.

Table 5. — Summary of PaintCare program results through 2024.[35]

	CA	CO	CT	DC	ME	MN	NY	OR	RI	VT	WA	Total
State characteristics												
Population (millions)	39.5	5.96	3.68	0.7	1.4	5.8	19.9	4.3	1.1	0.6	7.9	90.8
Urbanization rate	95%	86%	86%	100%	39%	72%	87%	81%	91%	35%	83%	
Year-round drop-off sites												
Retail store	667	180	102	8	82	208	301	142	23	72	212	1,997
HHW and other	208	42	58	0	47	61	33	52	4	11	67	583
Totals	*875*	*212*	*160*	*8*	*129*	*269*	*334*	*194*	*27*	*82*	*279*	*2,569*
Convenience												
% residence within 15 miles of drop-off site	99.4%	97.5%	100%	100%	95.5%	98.3%	99.2%	98.3%	100%	99.8%	97.9%	
Paint processing												
Annual gallons processed per 1,000 people*	84	134	103	37	87	157	36	215	61	133	121	91
% latex reused or recycled	**87%**	**91%**	**82%**	**82%**	**82%**	**60%**	**83%**	**73%**	**82%**	**75%**	**87%**	**83%**

Figure 2 illustrates how latex paint was processed in 2023 by state, which showcases that the vast majority of leftover latex paint was recycled into new paint.[36] Figure 3 shows the progression of diverted latex paint in enacting states using the PaintCare stewardship program from 2011 through 2023. With ten states and the District of Columbia participating in 2023, nearly 8 million gallons of leftover paint were diverted from landfills.

[33] See details at https://www.paintcare.org/.
[34] PaintCare.com, Our Story. From https://www.paintcare.org/our-story/#:~:text=To%20date%20PaintCare%20has%E2%80%A6%20*%20Collected%20an,pickups.%20*%20Hosted%20381%20paint%20drop%2Doff%20events, accessed May 23, 2025.
[35] Based on PaintCare annual reports for Washington (2024), Oregon (2024), California (2024), Colorado (2024), Minnesota (2024), District of Columbia (2024), New York (2023), Connecticut (2024), Rhode Island (2024), Vermont (2024), and Maine (2024), available at PaintCare.com.
[36] Minnesota standards for recycling paint are more stringent than in other states, and thus a significant portion of leftover paint is applied toward "alternative/beneficial use," which in this case is for landfill cover. Some emerging technologies allow for paint as an additive for concrete and other consumer products.

Figure 2. — How latex paint was processed by state under the PaintCare stewardship program in CY23.[37]

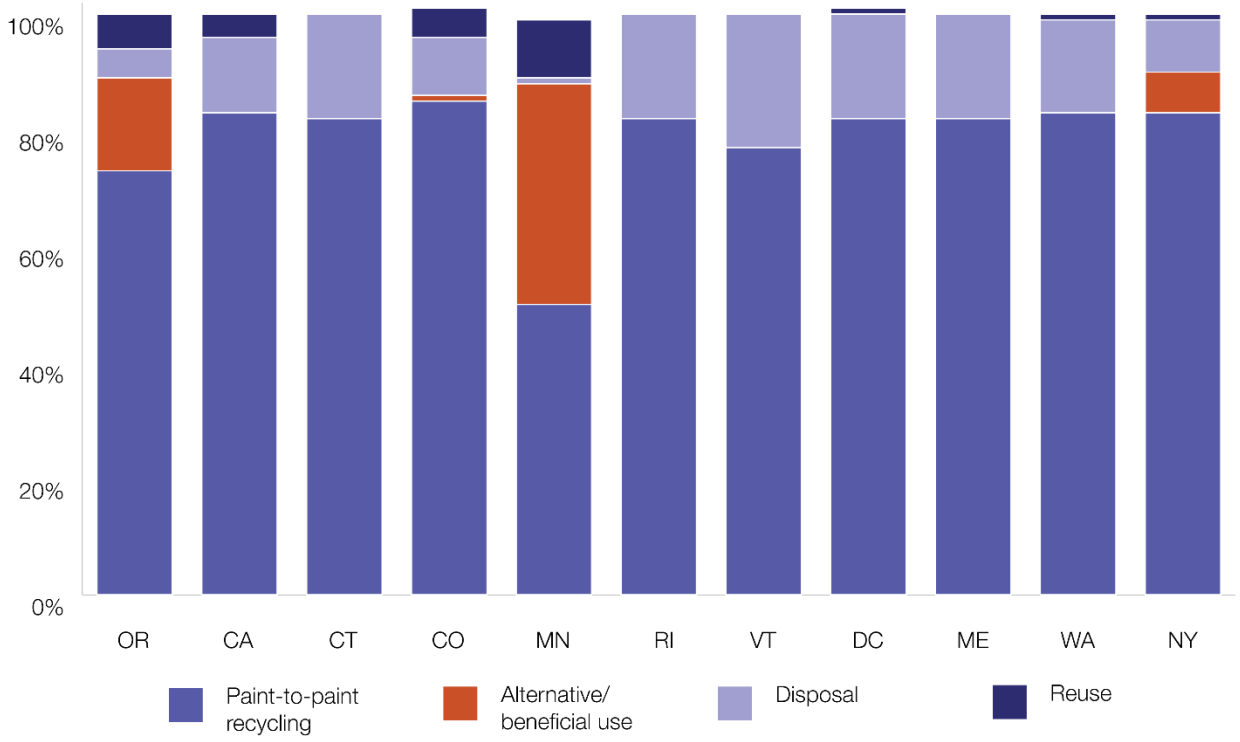
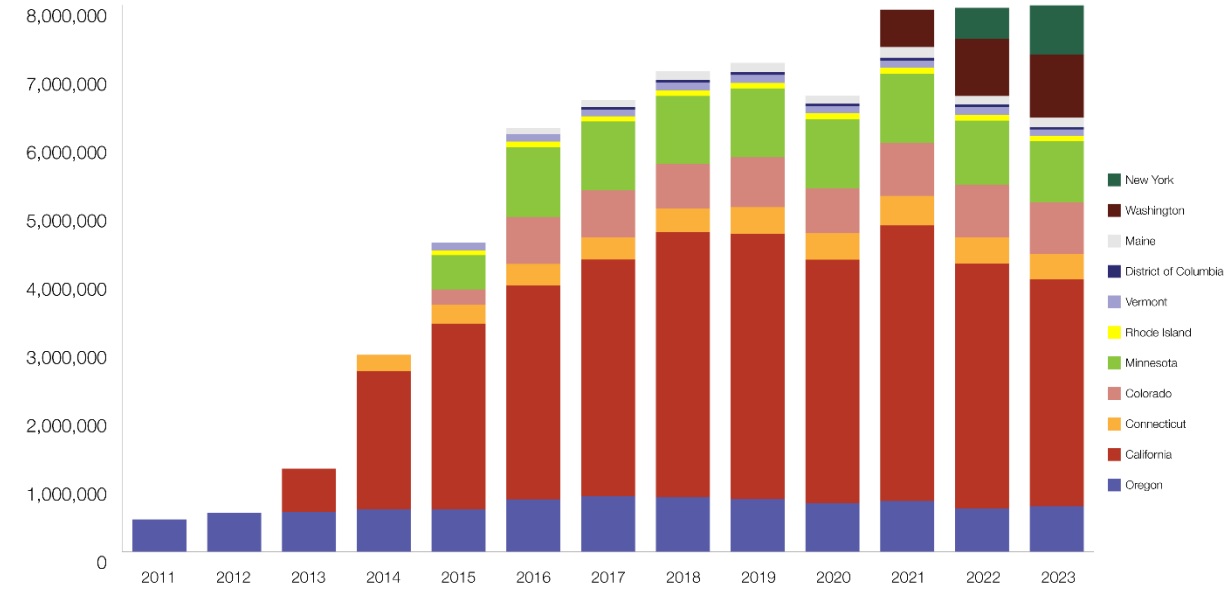


Figure 3. — Gallons of diverted latex paint in states with the PaintCare stewardship program, 2011–2023.[38]



[37] Data from PaintCare.
[38] Data from PaintCare.

Roles and responsibilities of a paint stewardship program in Massachusetts

If established, a state-approved paint stewardship program should consist of the roles and responsibilities detailed in Table 6. Figure 4 illustrates an example diagram of the paint stewardship program process.

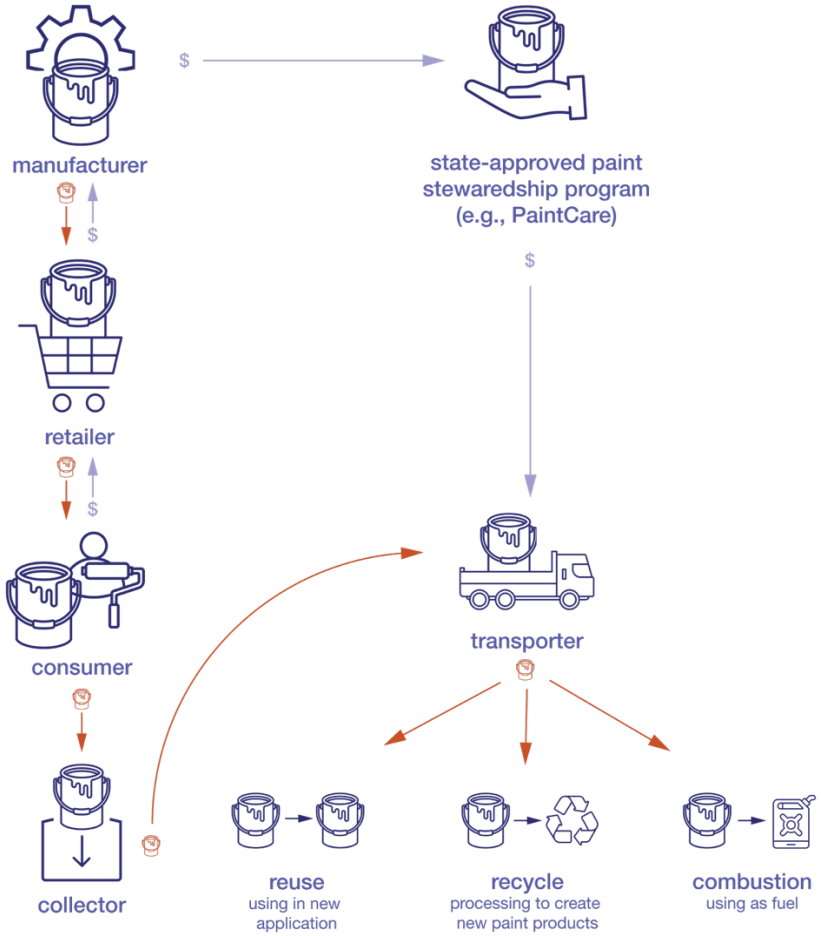
Table 6. — Roles and responsibilities of paint stewardship program.

Party	Roles and responsibilities
State-approved paint stewardship program provider (e.g., PaintCare)	1. Develop and submit a detailed program plan to the MassDEP for approval, which requires drop-off convenience based on distance and population (e.g., 95% of residents must be within 15 miles of a drop-off site, and one additional site must be added per 30,000 residents); 2. Secure and contract with collection sites (e.g., retailers, HHW facilities, etc.) while ensuring equitable access in urban, suburban, and rural areas 3. Provide supplies, training, educational materials, and logistical support for registration and reporting to retailers and collection sites 4. Secure and contract transporters and recyclers and processors, prioritizing reuse and recycling over landfill and incineration 5. Conduct public education and outreach to paint consumers 6. Manage finances, using revenue exclusively for nonprofit program operations 7. Determine a fee schedule for point-of-sale transactions 8. Monitor producer compliance and reporting 9. Report annually to MassDEP on program activities and results 10. Ensure transparency and accountability through third-party financial audits and evaluations
MassDEP	1. Ensure compliance with stewardship law 2. Maintain information about paint stewardship program 3. Review and approve program plan, including financial reports and fee structure 4. Review and approve annual reports, including financial reports
Manufacturers (producers)	1. Register with a state-approved paint stewardship program (e.g., PaintCare) 2. Charge a fee on all wholesale paint sold via retailers and direct-to-consumer outlets (e.g., online)
Retailers	1. Pay paint stewardship fee to manufacturer when buying paint wholesale 2. Pass fees onto consumers (optional) 3. Register with state-approved paint stewardship program 4. Report on all brands of paint sold (they may not sell paint from non-participating brands) 5. Educate consumers about program and fee 6. Volunteer their store as a drop-off site (optional)
Consumers	1. Pay paint stewardship fee depending on container size at point of sale (fees vary from state to state and can be amended over time; see Table 5) 2. Bring leftover paint to a collection site for proper management, whether paint was purchased before or after law is enacted
Municipalities	1. Participate as collection sites via a contract with the state-approved paint stewardship program (optional)

Table 7. — PaintCare fees in Northeast states.[39]

State	< half pint	> half pint < 1 gallon	1–2 gallons	> 2 gallons ≤ 5 gallons
Connecticut	$0.00	$0.35	$0.75	$1.60
New York	$0.00	$0.45	$0.95	$1.60
Maine	$0.00	$0.35	$0.75	$1.60
Rhode Island	$0.00	$0.35	$0.75	$1.60
Vermont	$0.00	$0.65	$1.35	$2.45

Figure 4. — Paint stewardship program journey and fee pathway under EPR.



[39] Data from Product Stewardship Institute.

Variations and elements of paint stewardship across states

Table 7 identifies key policy elements and considerations for Massachusetts.

Table 7. — Paint stewardship program policy elements and considerations.

Element	Paint program policy model

Covered materials	• Interior/exterior architectural paint
	• Optional phase-in:
	  ○ Aerosols
	  ○ Non-industrial specialty paints (e.g., furniture, craft, marine)
	  ○ Paint products (e.g., paint thinners)

Covered entities	• Consumers of architectural paint (e.g., residents, contractors, small businesses)
Collection convenience	• Maintain and expand existing infrastructure • Convenient, free, ongoing collection

Producer/responsible party	• Tiered definition:
	  ○ Brand owner or licensee or
	  ○ First importer into state, a retailer in some cases

Governance	• Producer responsibility organization (PRO) runs program • Massachusetts DEP provides oversight and enforcement
Funding	• Consumer fee at point of sale
Funding allocation	• Collection • Transportation • Processing • Government administration • Education and outreach
Performance standards (waste management hierarchy)	• Reduce • Reuse • Paint-to-paint recycle • Recycle into another product (e.g., paving stones or concrete) • Incineration with energy recovery and alternative daily cover • Compliant disposal
Outreach and education	• Must include outreach and education program • Must include method for evaluating such efforts (e.g., consumer awareness study) • Must address consumers, painting contractors, and paint retailers
Enforcement	• Noncompliant producers may not sell or distribute paint in the state • State may impose civil penalties • No consumer fees may be used to pay penalties or for lobbying
Program plan	• Must be updated and resubmitted every five years • Must be approved by oversight agency • Must include details about the program as required by statute
Annual report	• Must contain where and how paint was collected and processed • Must contain program budget • Must contain evaluation of progress toward outreach and education goals and performance targets • Must contain results of an independent audit • Must be published online
Implementation timeline	• Agency has 120 days to review and approve plan
Additional	• Producers are provided antitrust provisions

Costs and Benefits

A state-approved paint stewardship program would require administrative oversight from MassDEP's Solid Waste Division. The costs for this would be paid by the paint stewardship organization.

In addition to diverting upwards of 1 million gallons of latex and oil-based paint from Massachusetts disposal facilities, benefits include approximately $2 million in annual savings for taxpayers by reducing municipal collection and disposal of paint-related HHW. The savings would be closer to $16 million if the estimated annual quantity of 1.8 million gallons of leftover paint is collected and recycled or properly managed through a state-approved paint stewardship program.

A paint stewardship program would significantly increase collection convenience for residents and businesses by requiring the establishment of paint drop-off locations within 15 miles of all parties. These drop-off locations would be available year-round with expanded acceptance hours, exponentially increasing the current year-round residential access of only 23% in Massachusetts.

Additionally, the enactment of a paint stewardship program in Massachusetts would divert approximately 420,000 gallons of unused paint from landfills, as well as 500 tons of paint containers (see Table 1).

Additional benefits of paint EPR include:

- Removal of hazardous waste in residents' basements that pose a significant threat during flood events
- Additional foot traffic at voluntary retail paint drop-off sites
- Economic benefits of more than $7 million in job creation and other spending[40]
- An estimated additional $1.5 million in economic benefits to the state spent on outreach, education, supplies, and program administration
- A total of approximately 40 to 65 new full-time jobs based in Massachusetts
- Programmatic efficiencies resulting from regional cost-sharing and increased program participation
- Increased support for the expansion of a Massachusetts-based women-owned paint recycling business, RECOLOR®, and potentially other small businesses resulting from the recycled paint industry

[40] Assumes paint collection doubles from current municipal solid waste characterization to approximately 785,000 gallons at an average of $8.90 per gallon to transport and process based on costs in Connecticut and Vermont.

BACKGROUND:

MATTRESSES

Executive Summary

Between 75–90% of mattress components, including steel, wood, cotton, and foam, are recyclable.[41] But according to the U.S. Environmental Protection Agency (EPA), with data from the Department of Commerce, International Sleep Products Association (ISPA), and the Mattress Recycling Council (MRC), less than 10% of used mattresses are recovered for reuse or recycling nationally.[42]

Landfilling, illegally dumping, or other improper disposal of mattresses waste valuable resources and contribute to pollution:

- Ferrous metals (i.e., iron and steel) are the largest category of metals found in municipal solid waste collection.[43] While steel is 100% recyclable, the EPA estimates that the recycling rate of ferrous materials from durable goods, including from furniture, to be 27.8%.[44]
- Mattress foam is made up of materials such as polyurethane, flame retardants, and volatile organic compounds, which can leech into groundwater and soil and pose a threat to ecosystems.[45]
- Mattresses are bulky and costly to transport.
- Mattresses take up a considerable amount of space in landfills and are difficult to handle in municipal waste-to-energy facilities.[46]

The Massachusetts Department Environmental Protection (MassDEP) reports that more than 600,000 mattresses and box springs are discarded annually in Massachusetts.[47] On November 1, 2022, Massachusetts added mattresses to its waste disposal bans (310 CMR 19.017), meaning these materials cannot be discarded in the state's landfills, waste-to-energy facilities, or transferred for disposal unless they are contaminated.

The nonprofit Mattress Recycling Council (MRC) operates recycling programs in states that have enacted mattress extended producer responsibility (EPR) laws: California, Rhode Island, Connecticut, and, most recently, Oregon. The program is funded through a flat-rate fee at the point of sale for consumers—including individuals, hotels, hospitals, and universities—for all mattresses and foundations (box springs), regardless of size or type. Both brick-and-mortar and e-commerce retailers are required to assess the fee at the point of sale.

Program fees in current participating states range from $16.00–$22.50 to cover the costs of program administration, contracting, transportation, containers, collection events, education and outreach, and oversight.

Data suggest that MRC's mattress recycling program has made significant progress toward participating states' goals. For example:

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[41] Estimates range between 75% (Mattress Recycling Council) and 90%, according to some recyclers.
[42] U.S. Environmental Protection Agency. "Facts and figures about materials, waste, and recycling for durable goods: furniture and furnishings." Accessed June 10, 2025, at https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/durable-goods-product-specific-data#DurableGoodsOverview.
[43] U.S. Environmental Protection Agency. Ferrous metals: material-specific data. Accessed June 27, 2025, from https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/ferrous-metals-material-specific-data.
[44] *Ibid.*
[45] CollectYourOldBed.com. The consequences of improperly disposing of a mattress. Accessed June 27, 2025, from https://collectyouroldbed.com/the-consequences-of-improperly-disposing-of-a-mattress/.
[46] Massachusetts Department of Environmental Protection. Mattress Recycling. Accessed June 27, 2025, from https://www.mass.gov/guides/mattress-recycling.
[47] Massachusetts Department of Environmental Protection. Mattress Recycling. Accessed June 27, 2025, from https://www.mass.gov/guides/mattress-recycling.

- In its first year of implementation, the mattress recycling rate in Connecticut rose from 8.7% to 63.5%.[48]
- The City of San Diego saw a 25% decrease in illegal mattress dumping in 2023.[49]
- Tallying up all four participating states through 2025, more than 500 million pounds of materials have been recycled throughout the lifetime of the program, saving 14.9 million cubic yards of landfill space.[50]

While municipal mattress recycling programs have grown considerably since 2016, 27% of Massachusetts residents live in a community where there is either no municipal mattress collection program or there is no data available on a municipal program[51]. In these municipalities, residents must pay directly for mattress recycling and collection services. Mattress collection and recycling costs, which are paid for by municipalities or by fees paid by residents, are estimated at $12.4 million annually[52]. Municipal officials have stated that mattress recycling fees can create incentives for illegal dumping, which can increase management costs.

A statewide EPR program would alleviate costs to municipalities that absorb program costs via their municipal solid waste programs and are burdened with the administrative responsibilities of collection, contracting for recycling, and transportation. A mattress EPR program would provide clear, uniform instructions for residents and bulk users such as hotels, hospitals, and universities on end-of-life options for mattress removal. Yet another benefit is a reduction in illegal dumping, which can occur when mattress disposal options are expensive, unavailable, or unclear.

Note that the MRC mattress recycling program does not include the cost of curbside pickup or in-home mattress removal, which some municipalities provide independently.

[48] Product Stewardship Institute. "Up to 90% of materials in mattresses are recyclable."
[49] Inside San Diego. City News Team. "City of San Diego celebrates success of mattress recycling program." March 3, 2025, 11:16 a.m. Accessed June 30, 2025, from https://www.insidesandiego.org/city-san-diego-celebrates-success-mattress-recycling-program.
[50] *Ibid.*
[51] Based on data reported to the MassDEP through the 2024 Municipal Solid Waste and Recycling Survey. Accessed June 10, 2025. https://www.mass.gov/doc/2024-municipal-solid-waste-recycling-survey-responses/download.
[52] Mattress EPR Background Document, June 10, 2025, Product Stewardship Institute, https://www.mass.gov/doc/2025-06-10-mattress-background-document/download.

Background: The Problem

Approximately 36 to 42 million mattresses are sold annually in the U.S., though these estimates are challenged by a lack of uniform national data collection methodology.[53,54] Based on these figures, Americans discard 18–20 million mattresses annually, which is an approximate 45–50% mattress replacement rate, according to the MRC—meaning for every two mattresses sold, approximately one is thrown out.[55]

Between 75–90% of mattress components, including steel, wood, cotton, and foam, are recyclable.[56] But according to the EPA, with data from the Department of Commerce, ISPA, and the MRC, less than 10% of used mattresses are recovered for reuse or recycling nationally.[57]

Landfilling, illegal dumping, or other improper disposal of mattresses waste valuable resources and contribute to pollution:

- Ferrous metals (i.e., iron and steel) are the largest category of metals found in municipal solid waste collection.[58] While steel is 100% recyclable, the EPA estimates the recycling rate of ferrous materials from durable goods, including from furniture, to be 27.8%.[59]
- Mattress foam is made up of materials such as polyurethane, flame retardants, and volatile organic compounds, which can leech into groundwater and soil and pose a threat to ecosystems.[60]
- Mattresses are bulky and costly to transport
- Mattresses take up a considerable amount of space in landfills and are difficult to handle in municipal waste-to-energy facilities.[61]

Mattress removal and recycling in Massachusetts

According to the MassDEP, an estimated 600,000 mattresses and box springs are discarded annually in Massachusetts.[62]

On November 1, 2022, Massachusetts added mattresses to its waste disposal bans (310 CMR 19.017), meaning these materials cannot be discarded in the state's landfills, waste-to-energy facilities, or transferred for disposal unless they are contaminated with mold, bodily fluids, insects, or oil or hazardous substances.

Leading up to the waste disposal ban, MassDEP provided $2.7 million in grants to 128 municipalities and 34 additional regional participants to assist with mattress collection and recycling efforts. The state has also contracted with four vendors to accept and manage mattress recycling.[63]

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[53] TheRoundUp.org. 39 official mattress industry statistics. Accessed June 30, 2025, from https://theroundup.org/mattress-industry-statistics/#:~:text=Statistics%20show%20that%20the%20majority,firms%20are%20in%20the%20US?.
[54] Sleepdoctor.com. 25+ stats about mattresses. Accessed June 30, 2025, from https://sleepdoctor.com/pages/reviews/statistics-about-mattresses.
[55] Mattress Recycling Council. Program Guide. 2021, page 2. Accessed June 10, 2025, at https://mattressrecyclingcouncil.org/wp-content/uploads/2021/09/MRCprogramguide.pdf.
[56] Estimates range between 75% (Mattress Recycling Council) and 90%, according to some recyclers.
[57] U.S. Environmental Protection Agency. "Facts and figures about materials, waste, and recycling for durable goods: furniture and furnishings." Accessed June 10, 2025, at https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/durable-goods-product-specific-data#DurableGoodsOverview.
[58] U.S. Environmental Protection Agency. Ferrous metals: material-specific data. Accessed June 27, 2025, from https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/ferrous-metals-material-specific-data.
[59] *Ibid.*
[60] CollectYourOldBed.com. The consequences of improperly disposing of a mattress. Accessed June 27, 2025, from https://collectyouroldbed.com/the-consequences-of-improperly-disposing-of-a-mattress/.
[61] Massachusetts Department of Environmental Protection. Mattress Recycling. Accessed June 27, 2025, from https://www.mass.gov/guides/mattress-recycling.
[62] *Ibid.*
[63] Commonwealth of Massachusetts. Operational Services Division: FAC90designatedDEP: Carpet and Mattress Recycling Services Statewide Contract. Accessed July 2, 2025, from https://www.mass.gov/doc/fac90designateddep/download.

As of June 2025, there are nine known mattress recyclers in the state.[64] As of 2024, an estimated 399,000 mattresses and box springs were recycled or reused, or roughly 66% of the total estimated number of units discarded that year.

Massachusetts' mattress waste disposal ban and current recycling system, however, has resulted in a patchwork of municipalities and communities with widely varying options, policies, and costs (see Figure 5). For example:

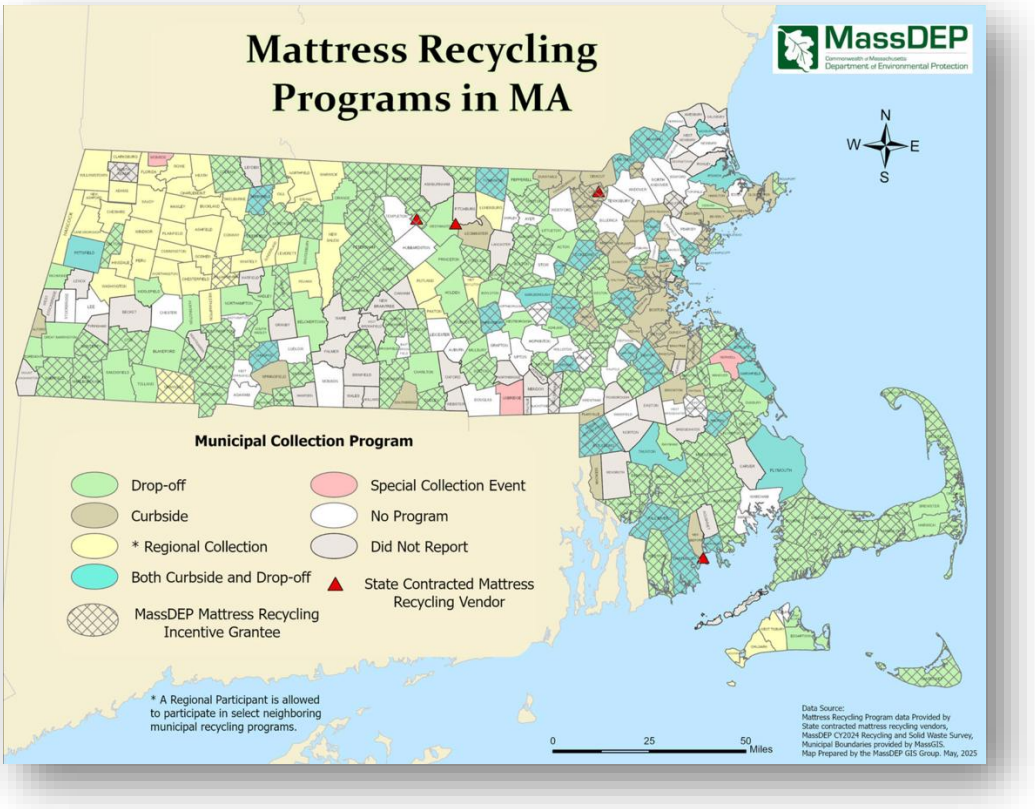
- The suburban community of Sudbury, with a median household income of $234,634 and a 2.6% poverty rate, will accept mattresses (from residents) at the Sudbury Transfer Station on Boston Post Road for a fee of $50 per item.[65,66]

- The more urban community of Chelsea, with a median household income of $72,220 and a 20.6% poverty rate, offers no-cost curbside mattress pickup on Mondays and Thursdays for city trash customers.[67,68] Those who are not city trash customers pay a fee of $40 per item for city mattress pickup. The service costs the city approximately $250,000 annually, which includes collection, temporary storage, transit to the facility, and recycling for roughly 4,000 units per calendar year.[69]

- In western Massachusetts, the rural community of Chester, with a median household income of $87,308 and a 2.0% poverty rate, neither offers mattress disposal, nor provides resources or information on mattress disposal or recycling on its website.[70,71]

[64] Data from Massachusetts Department of Environmental Protection review of available information including state contract vendors, general permits issued for mattress recycling operations, and other available information, conducted spring 2025.
[65] United States Census Bureau. Quick Facts: Sudbury town, Middlesex County, Massachusetts, data in 2023 dollars. Accessed June 26, 2025, from https://www.census.gov/quickfacts/fact/table/sudburytownmiddlesexcountymassachusetts,MA.
[66] Town of Sudbury. Transfer Station Fees. Published February 15, 2024. Accessed June 26, 2025, at https://sudbury.ma.us/transferstation/2024/02/15/transfer-station-fees/.
[67] United States Census Bureau, Quick Facts: Chelsea city, Massachusetts, data in 2023 dollars. Accessed June 26, 2025, from https://recyclingworksma.com/recyclers/?fwp_material=mattresses.
[68] City of Chelsea, Massachusetts. Mattress Recycling. Accessed June 25, 2026, from https://www.chelseama.gov/departments/public_works/trash,_recycle,___yard_waste/disposal_regulations/mattress_recycling.php.
[69] Information from Cate Fox-Lent, Commissioner, Chelsea Department of Public Works, provided July 25, 2025.
[70] United States Census Bureau. Chester town, Hampden County, Massachusetts, data from 2023 estimates. Accessed June 26, 2025, from https://test.data.census.gov/profile/Chester_town,_Hampden_County,_Massachusetts?g=060XX00US2501313485#income-and-poverty.
[71] Town of Chester. Transfer Station. Accessed June 25, 2026, from https://townofchester.net/transfer-station/.

Figure 5. — Mattress recycling programs in Massachusetts.[72]



Beyond municipal recycling programs, Massachusetts residents have some additional options:

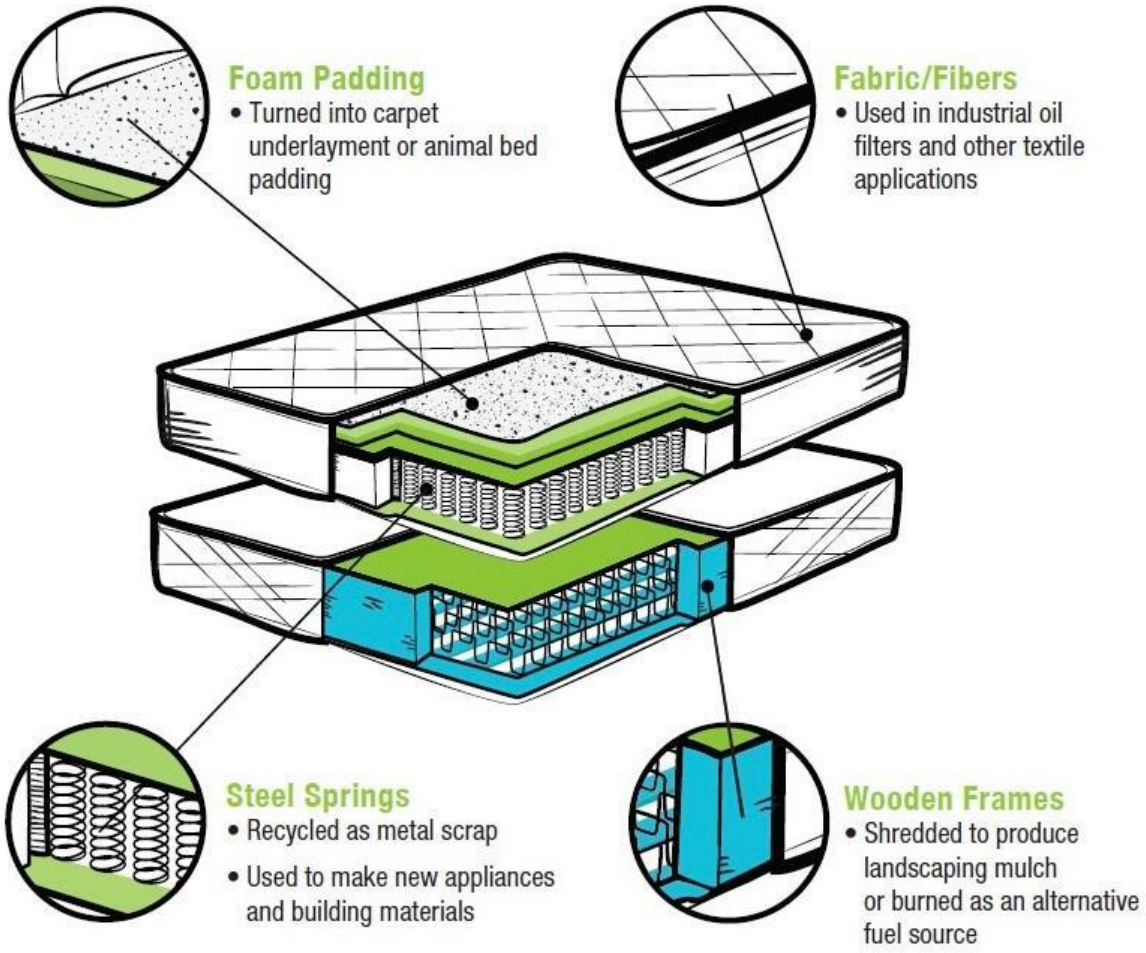
- When buying a new mattress, retailers will often offer to remove and recycle an old mattress as part of new mattress delivery. There may be a separate fee for this service.
- MassDEP's Beyond the Bin identifies organizations that will accept or collect used mattresses for reuse or recycling. These organizations will typically charge a fee.

Components of mattresses are recycled or reused by disassembling them using a combination of manual and automated equipment and organizing their raw materials.[73] As shown and described in Figure 6, parts of mattresses can be recycled in the following ways:

- Foam padding is turned into carpet underlayment or animal bed padding.
- Fabric and fibers are used in industrial oil filters and other textile applications.
- Steel springs are sent to scrap yards and ground up to be resold and reused to make new appliances and building materials.[74]
- Wooden frames are shredded to produce landscaping mulch or burned as an alternative fuel source.

[72] Image from the MassDEP, accessed June 25, 2025, from https://www.mass.gov/info-details/map-massachusetts-communities-that-provide-for-mattress-recycling.
[73] Data from Mattress Recycling Council.
[74] MassDEP. HandUp Case Study. Accessed June 27, 2025, at https://www.mass.gov/doc/handup-case-study/download.

Figure 6. — How mattress components are recycled.[75]



[75] Image courtesy of the Mattress Recycling Council.

Proposed Solution

The International Sleep Products Association (ISPA) is a trade association representing mattress manufacturers and component suppliers. In 2015, the ISPA formed the nonprofit Mattress Recycling Council (MRC) to operate recycling programs in states that have enacted mattress EPR laws. MRC in turn created a consumer-facing program, Bye Bye Mattress, to provide responsible mattress recycling currently in four states: California, Rhode Island, Connecticut, and, most recently, Oregon.

As it exists in other states, the Bye Bye Mattress program is funded through a flat-rate fee at the point of sale for consumers—including individuals, hotels, hospitals, and universities—for all mattresses and foundations (box springs), regardless of size or type. Both brick-and-mortar and e-commerce retailers are required to assess the fee at the point of sale.

How Mattress Recycling Council programs work

MRC offers three channels for mattress and box spring collection:[76]

- Via existing state solid waste collection infrastructure to establish collection sites at landfills, transfer stations, or public works yards or by working with curbside collectors such as municipalities or waste contractors
- Via collection events for consumers
- Via commercial volume programs

MRC uses the point-of-sale fee to provide:

- Program administration
- Competitive bidding for contracts with collection sites, transporters, and mattress recyclers
- Mattress and box spring transportation to recyclers and recycling
- Containers for collection sites
- Hosting collection events
- Education and outreach efforts
- Oversight and enforcement

Flat vs. adjusted fee

MRC uses a flat per-unit fee in each participating state, rather than assessing fees based on variables such as mattress size, density, content, or price. MRC has considered alternative formulas for calculating the mattress recycling fee and concluded that it was necessary to set a fee that:

- Is simple and easy for consumers and retailers to understand and apply
- Is easy to verify whether the retailer has applied and collected the fee correctly
- Covers the full cost to dismantle and recycle the mattress being discarded
- Allows MRC to budget revenues in a predictable manner

In short, according to MRC, complexity may compromise program success, as complex fee schedules may decrease the likelihood of compliance from retailers, recyclers, and consumers. The current legislation filed in Massachusetts does not specifically identify fee structures, only that an assessment would be established in the plan to be approved by MassDEP.

[76] Mattress Recycling Council 2025.

Costs and benefits

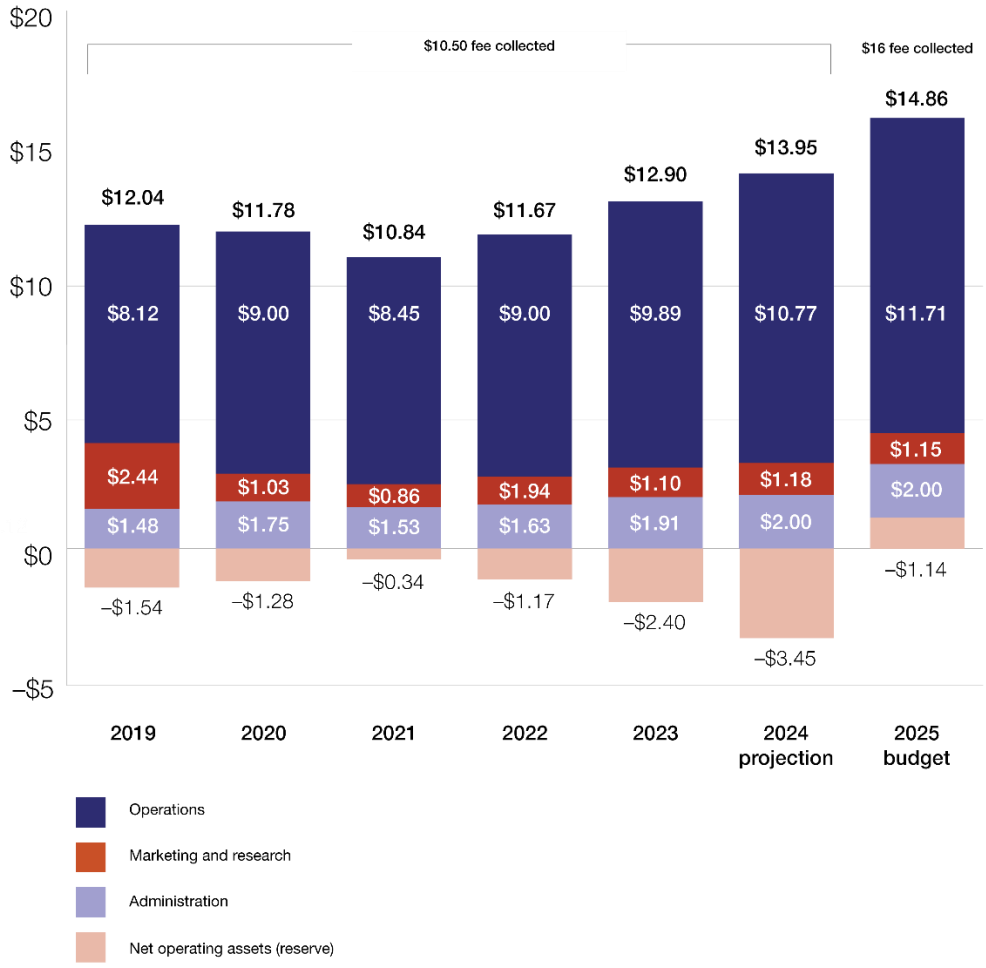
Program fees in current participating states range from $16.00–$22.50, as illustrated in Table 8. Fees are occasionally reassessed to adjust for inflation and market fluctuation (see Figure 7).

Table 8. — Overview of Mattress Recycling Council programs in participating states.[77]

	Connecticut	California	Rhode Island	Oregon
Launch date	May 1, 2015	Dec 30, 2015	May 1, 2016	Jan 1, 2025
Flat fee in 2025	$16.00	$16.00	$20.50	$22.50
State population	3,675,069[78]	39,431,263[79]	1,112,308[80]	4,272,371[81]
Mattresses recycled to date	1,700,000	13,000,000	750,000	no data

[77] Data from Mattress Recycling Council.
[78] U.S. Census Bureau. Fast Facts: Connecticut. Accessed June 27, 2025, from https://www.census.gov/quickfacts/fact/table/CT/PST045224.
[79] U.S. Census Bureau. Fast Facts: California. Accessed June 27, 2025, from https://www.census.gov/quickfacts/fact/table/CA/PST045224.
[80] U.S. Census Bureau. Fast Facts: Rhode Island. Accessed June 27, 2025, from https://www.census.gov/quickfacts/fact/table/RI/PST045224.
[81] U.S. Census Bureau. Fast Facts: Oregon. Accessed June 27, 2025, from https://www.census.gov/quickfacts/fact/table/OR/PST045224.

Figure 7. — Cost of mattress recycling per unit sold, California: 2019–2025 budgeted.[82]



One main benefit to a statewide mattress EPR program is alleviating costs to municipalities. As shown in Figure 1 above, Massachusetts' 351 municipalities offer a range of mattress recycling options to residents, including collection events, drop-off sites, and free curbside pickup. Municipalities that offer no program leave residents without a clear option for disposal.

Thus, a statewide mattress EPR program would alleviate costs to municipalities that absorb program costs via their municipal solid waste programs and are burdened with the administrative responsibilities of collection, contracting for recycling, and transportation. A mattress EPR program would provide clear, uniform instructions for residents and bulk users such as hotels, hospitals, and universities on end-of-life options for mattress removal. Yet another significant benefit is a reduction in illegal dumping, which can occur when mattress disposal options are expensive, unavailable, or unclear to residents.

[82] Data from California Used Mattress Recovery and Recycling 2025 Program Budget. July 1, 2024. Submitted by Mattress Recycling Council California, LLC, to California Department of Resources Recycling and Recovery.

Program success in participating states

Data suggest that MRC's mattress recycling program has made significant progress toward participating states' goals. For example:

- In its first year of implementation, the mattress recycling rate in Connecticut rose from 8.7% to 63.5%.[83]
- The City of San Diego saw a 25% decrease in illegal mattress dumping in 2023.[84]
- Tallying up all four participating states through 2025, more than 500 million pounds of materials have been recycled throughout the lifetime of the program, saving 14.9 million cubic yards of landfill space.[85]

[83] Product Stewardship Institute. "Up to 90% of materials in mattresses are recyclable."
[84] Inside San Diego. City News Team. "City of San Diego celebrates success of mattress recycling program." March 3, 2025, 11:16 a.m. Accessed June 30, 2025, from https://www.insidesandiego.org/city-san-diego-celebrates-success-mattress-recycling-program.
[85] *Ibid.*

BACKGROUND:

BATTERIES

Executive Summary

The Extended Producer Responsibility Commission (EPRC) was charged with identifying policy recommendations for batteries. Current EPR programs in other states focus on small to medium size batteries typically generated in a household. This includes a variety of everyday use batteries including lithium-ion batteries. Lithium-ion batteries are generally safe and unlikely to fail, but only so long as there are no defects and the batteries are not damaged. When lithium-ion batteries fail to operate safely or are damaged, they may present a fire and/or explosion hazard. Damage from improper use, storage, or charging may also cause lithium-ion batteries to fail.[86] Oftentimes such common waste management processes, which include machines that crush waste, can damage lithium-ion batteries that ignite fires in waste vehicles and facilities.

One key danger for lithium-ion batteries is thermal runaway. According to the *Journal of Power Sources*, thermal runaway is "a positive temperature feedback effect of a system with higher heat generation than effective cooling through the battery walls."[87] This uncontrolled heating can spread to other cells, leading to larger fires or explosions. Lithium-ion battery fires also carry additional risks, including the release of flammable and toxic gases, the ejection of batteries during failure leading to secondary ignitions, and reignition even after a fire is extinguished.[88]

The U.S. Environmental Protection Agency (EPA) compiled a report in 2021 on fires caused by lithium-ion batteries in the waste management system using publicly available news reports as the primary source of information. Their analysis found reports of 245 fires caused by lithium-ion batteries between 2013 and 2020, and noted that based on anecdotal evidence, lithium-ion battery fires in the waste management process are severely underreported, and the actual number of such fires is likely much higher. [89] A recent report from the National Waste & Recycling Association (NWRA) and Resource Recycling Systems (RRS) conducted in 2023 estimates that more than 5,000 fires occur annually at recycling facilities alone, which indicates an average of 18 fires per material recycling facility per year.[90]

In the first six months of voluntary data collection on lithium-ion battery fires in Massachusetts, fire departments reported 50 lithium-ion battery-related fires across the state. [91] State Fire Marshal Davine subsequently reported at least 135 lithium-ion fires in Massachusetts in 2024 and approximately three dozen injuries to firefighters and civilians since late 2023.[92] State Fire Marshall Jon Davine reported to the EPRC that these numbers don't include a rising number of fires in trash disposal vehicles and at transfer stations that some experts believe are caused by large numbers of improperly discarded batteries.[93]

In Massachusetts, battery recycling is paid for by local governments, producers, and consumers. Municipalities collect household and lithium-ion batteries at household hazardous waste (HHW) facilities, drop-off centers and special events, supported by taxpayer dollars, user fees, or grants from the

[86] U.S. Department of Labor, Occupational Safety and Health Administration, "Preventing Fire and/or Explosion Injury from Small and Wearable Lithium Battery Powered Devices," Safety and Health Information Bulletin, January 18, 2019, 2, https://www.osha.gov/sites/default/files/publications/shib011819.pdf.
[87] Balakrishnan, P.G., Ramesh, R., Prem Kumar, T., "Safety mechanisms in lithium-ion batteries," Journal of Power Sources, Vol. 155, No. 2, (April 21, 2006): 401-414, https://doi.org/10.1016/j.jpowsour.2005.12.002.
[88] United States Fire Administration, "Lithium-Ion Batteries: Risks and Response Strategies," last reviewed November 7, 2024, https://www.usfa.fema.gov/a-z/lithium-ion-batteries/risks-and-response-strategies/.
[89] U.S. Environmental Protection Agency, An Analysis of Lithium-ion Battery Fires in Waste Management and Recycling, EPA 530-R-21-002, July 2021, https://www.epa.gov/system/files/documents/2021-08/lithium-ion-battery-report-update-7.01_508.pdf.
[90] Michael R. Timpane, "Metrics on the Lithium-based Battery Threat to U.S. Single Stream Material Recovery Facilities ('MRFs') Summary Opinion," Resource Recycling Systems (RRS), September 28, 2023, 11, https://resource-recycling.com/recycling/wp-content/uploads/sites/3/2024/01/RRS-Lithium-battery-opinion-final-2.pdf.
[91] Commonwealth of Massachusetts, "After Six Months, New Tracking Tool Identifies 50 Lithium-Ion Battery Fires," April 17, 2024, accessed August 6,2025, from https://www.mass.gov/news/after-six-months-new-tracking-tool-identifies-50-lithium-ion-battery-fires.
[92] Massachusetts Department of Environmental Protection, Extended Producer Responsibility Commission, draft meeting minutes from July 16, 2025, accessed August 6, 2025, from https://www.mass.gov/info-details/extended-producer-responsibility-commission.
[93] EPR Commission minutes July 16, 2025.

Massachusetts Department of Environmental Protection (MassDEP).[94] According to MassDEP, 269 municipalities report collecting lithium-ion batteries (268 report collecting other household batteries) and there are 337 battery collection locations in Massachusetts listed on Beyond the Bin.[95]

Based on data from MassDEP's 2024 recycling and solid waste survey, which focuses on municipally provided services, the following access rates for battery recycling were reported:

- Approximately 56% of the population has access to year-round household battery recycling services, with 53% having access to year-round lithium battery recycling services.
- An additional 27% to 30% of residents have limited access to household and lithium-ion battery recycling, respectively.
- This leaves up to 17% of Massachusetts residents without access to battery recycling services through their municipality.[96]

Consumers in Massachusetts also have access to collection services from organizations such as Call2Recycle, which offers collection sites and mail-in options for rechargeable and single-use batteries using their recycling boxes.[97] This includes collection locations at retailers as well as municipal sites.

Vermont passed the country's first battery EPR law for single-use batteries in 2014. Since 2020, many EPR laws have been passed and are being implemented, encompassing a growing scope of materials. They all cover primary (single-use) batteries of less than 4.4 pounds, portable rechargeable batteries that weigh less than 11 pounds, and medium-format batteries.[98] Some laws also include battery-containing products (such as electric toothbrushes). Three states have required a study on embedded batteries, i.e., not intended for removal by the consumer. The inclusion of damaged, defective, and recalled batteries (DDR) is still under consideration.

An EPR program would bring financial benefits to Massachusetts municipalities and residents by shifting the responsibility for funding battery collection, transportation, and recycling from the municipalities to battery producers. The producer responsibility organization (PRO) Call2Recycle spent $392,925 to collect 154,956 pounds of batteries in Vermont in 2024.[99] This extrapolates to roughly $2.52 per battery collected and $1.40 per household in Vermont.[100] A similar model would translate to roughly $3.9 million in spending for battery collection, transportation, and recycling from a PRO in Massachusetts, resulting in avoided costs to municipalities and more consistent and convenient collection methodologies.[101]

Some key considerations for EPR in Massachusetts are the inclusion of embedded batteries, DDR batteries, and battery collection performed outside of the EPR program.

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[94] The Massachusetts Department of Environmental Protection CY2024 Recycling and Solid Waste Survey results use the categories of household batteries and lithium batteries. Household batteries is understood to mean all batteries used at home. Lithium batteries is understood to mean any battery chemistry that uses lithium. From https://www.mass.gov/lists/recyclingsolid-waste-data-for-massachusetts-cities-towns, accessed July 8, 2025.
[95] Data from RecycleSmart, Beyond the Bin, accessed August 6, 2025 from https://recyclesmartma.org/beyond-the-bin-search/.
[96] Data from MassDEP 2024 Recycling Survey reported by municipalities. From https://www.mass.gov/lists/recyclingsolid-waste-data-for-massachusetts-cities-towns, accessed July 8, 2025.
[97] Call2Recycle, "Store," accessed August 6, 2025, https://www.call2recycle.org/store/?srsltid=AfmBOorLt-FqXT5zKMBeNdclk0zbLJNUzCJ7RE1f6nOMQKq6cEYnkdli.
[98] See Appendix B for terms and definitions.
[99] Call2Recycle, 2024 Vermont Annual Report, page 16, accessed August 15, 2025, from https://dec.vermont.gov/sites/dec/files/documents/2024%20Vermont%20Annual%20Report.pdf.
[100] According to the U.S. Census Bureau, Vermont had 279,612 households in 2023. Data from U.S. Census Bureau, 2023 American Community Survey 1-Year Estimates, Vermont, accessed August 15, 2025, from https://data.census.gov/profile/Vermont?g=040XX00US50.
[101] Figure derived from multiplying $1.40 by 2,800,984 households in Massachusetts. Data from U.S. Census Bureau, 2023 American Community Survey 1-Year Estimates, Massachusetts, accessed August 15, 2025, from https://data.census.gov/profile/Massachusetts?g=040XX00US25.

Background: The Problem

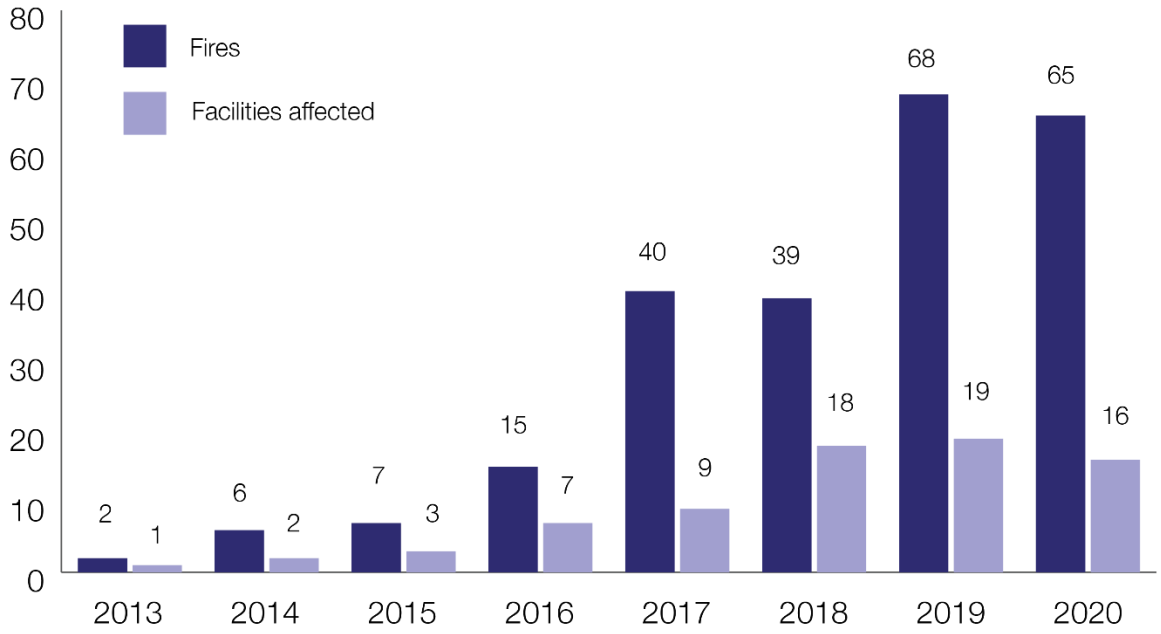
Rechargeable lithium-ion batteries were initially developed in the early 1970s following decades of exploration of lithium's electrochemical properties.[102] While lithium-ion batteries are generally safe and appropriate for consumer use, they can cause fires and explosions when they fail due to defects, damage, or incorrect use, storage, or charging [103] Oftentimes such common waste management processes, which include machines that crush waste, can damage lithium-ion batteries that ignite fires in waste vehicles and facilities.

One key danger for lithium-ion batteries is thermal runaway. According to the *Journal of Power Sources*, thermal runaway is "a positive temperature feedback effect of a system with higher heat generation than effective cooling through the battery walls."[104] This uncontrolled heating can spread to other cells, leading to fires or explosions. Lithium-ion battery fires also carry additional risks, including the release of flammable and toxic gases, the ejection of batteries during failure leading to secondary ignitions, and reignition even after a fire is extinguished.[105]

While fires caused by lithium-ion batteries have been on the rise for more than a decade, only recently have fire safety entities begun to quantify the problem. EPA compiled a report in 2021 on fires caused by lithium-ion batteries in the waste management system using publicly available news reports as the primary source of information. Their analysis found reports of 245 fires caused by lithium-ion batteries between 2013 and 2020, and the facilities most affected were materials recovery facilities (MRFs). The final report noted that based on anecdotal evidence, lithium-ion battery fires in the waste management process are severely underreported, and the actual number of such fires is likely much higher. A key result from this study was the large increase in lithium-ion battery fires during the eight-year timeframe studied (see Figure 8).[106]

[102] Reddy, Mogalahalli V., Mauger Alain, Julien, Christian M., Paolella, Andrea, and Zaghib, Karim, "Brief history of early lithium battery development," Materials 2020, 13(8), 1884; https://doi.org/10.3390/ma13081884.
[103] U.S. Department of Labor, Occupational Safety and Health Administration, "Preventing Fire and/or Explosion Injury from Small and Wearable Lithium Battery Powered Devices," Safety and Health Information Bulletin, January 18, 2019, 2, https://www.osha.gov/sites/default/files/publications/shib011819.pdf.
[104] Balakrishnan, P.G., Ramesh, R., Prem Kumar, T., "Safety mechanisms in lithium-ion batteries," Journal of Power Sources, Vol. 155, No. 2, (April 21, 2006): 401-414, https://doi.org/10.1016/j.jpowsour.2005.12.002.
[105] United States Fire Administration, "Lithium-Ion Batteries: Risks and Response Strategies," last reviewed November 7, 2024, https://www.usfa.fema.gov/a-z/lithium-ion-batteries/risks-and-response-strategies/.
[106] U.S. Environmental Protection Agency, An Analysis of Lithium-ion Battery Fires in Waste Management and Recycling, EPA 530-R-21-002, July 2021, https://www.epa.gov/system/files/documents/2021-08/lithium-ion-battery-report-update-7.01_508.pdf.

Figure 8. — Fires and facilities in the U.S. waste management system affected by lithium-ion battery fires by year.[107]



A recent report from the National Waste & Recycling Association (NWRA) and Resource Recycling Systems (RRS) conducted in 2023 estimates that more than 5,000 fires occur annually at recycling facilities alone, which indicates an average of 18 fires per MRF per year.[108] These data are also supported by a study conducted at the Shoreway Environmental Center MRF in San Carlos, California, in 2017, which tracked the lithium-ion batteries pulled out of its incoming recyclables.[109] In less than five weeks, they collected more than 1,000, meaning that more than five lithium-ion batteries enter the facility every hour.[110] These operational risks have also increased the cost of recycling facility insurance from under $0.20 to as high as $10 per $100 of insured property value.[111]

Battery recycling

[107] U.S. Environmental Protection Agency, "The Importance of Sending Consumers' Used Lithium-ion Batteries to Electronic Recyclers or Hazardous Waste Collection Facilities," last updated March 5, 2025, https://www.epa.gov/recycle/importance-sending-consumers-used-lithium-ion-batteries-electronic-recyclers-or-hazardous.
[108] Michael R. Timpane, "Metrics on the Lithium-based Battery Threat to U.S. Single Stream Material Recovery Facilities ('MRFs') Summary Opinion," Resource Recycling Systems (RRS), September 28, 2023, 11, https://resource-recycling.com/recycling/wp-content/uploads/sites/3/2024/01/RRS-Lithium-battery-opinion-final-2.pdf.
[109] U.S. Environmental Protection Agency, "Lithium ion batteries in the solid waste system," SBWMA MRF survey (March 17, 2018), accessed August 6, 2025, from https://www.epa.gov/sites/default/files/2018-03/documents/timpane_epa_li_slides312_ll_1.pdf.
[110] RethinkWaste, "Lithium-based Battery Assessment," 2017, https://rethinkwaste.org/wp-content/uploads/legacy_media/7-a-attachment-d-lithium-based-battery-assessment-2017.original.pdf.
[111] National Waste & Recycling Association, "NWRA and RRS Release Report on Threat of Lithium Batteries to Waste and Recycling Infrastructure," January 10, 2024, https://wasterecycling.org/press_releases/nwra-and-rrs-release-report-on-threat-of-lithium-batteries-to-waste-and-recycling-infrastructure/.

While nation-wide battery recycling rates are unclear, Call2Recycle®, a U.S.-based non-profit and the country's largest consumer battery stewardship and collection program, reported that it collected more than 8 million pounds of batteries for recycling in 2023, 5.4 million pounds of which were rechargeable batteries.[112]

Increasing recycling rates for lithium-ion batteries could significantly reduce reliance on raw natural resources, cutting the need for newly extracted ore by up to 50% and curbing the emissions tied to mining and material processing.[113] Raw materials account for half of the costs to produce lithium-ion batteries, so increasing recycling rates could also drive down battery costs.[114] Municipal battery recycling programs also put a financial burden on municipal governments and taxpayers, as the responsibility to dispose/recycle of batteries safely falls on them.

Barriers to battery recycling programs

According to Product Stewardship Institute (PSI), there are multiple barriers to recycling programs for consumer batteries:

- **Awareness.** Because different batteries are accepted at different locations, many consumers may be unaware of which batteries require recycling and where they can recycle them. Without clear information, they may attempt to recycle all battery types together, regardless of differences in materials or hazards.

- **Accessibility:** Even when the intent to recycle exists, the lack of accessible drop-off locations or convenient collection options can prevent follow-through by consumers.

- **Embedded batteries:** A growing number of batteries are embedded within electronic products, making it difficult for consumers to remove them. As a result, entire devices must be collected so the batteries can be safely removed and recycled.

- **Transparency.** According to the PSI, greater certainty is needed around battery processing practices. Some advocates call for the development of environmentally sound recycling standards, noting that even with high recovery rates, environmental impacts may occur during manufacturing, use, or end-of-life stages.

Data collection on lithium-ion battery fires in Massachusetts

In Massachusetts, State Fire Marshal Jon Davine began collecting data on lithium-ion batteries and the potential for fire hazards in fall 2023.[115] In the first six months of voluntary data collection, fire departments reported 50 lithium-ion battery-related fires across the state.[116] Davine subsequently reported at least 135 lithium-ion fires in Massachusetts in 2024 and approximately three dozen injuries to firefighters and civilians since late 2023.[117] Davine reported to the Massachusetts EPRC that these numbers do not include the rising

[112] Call2Recycle, "Call2Recycle Releases 2023 U.S. National Battery Collection & Recycling Data," March 4, 2024, https://www.call2recycle.org/call2recycle-releases-2023-u-s-national-battery-collection-recycling-data/.
[113] U.S. Environmental Protection Agency, An analysis of lithium-ion battery fires in waste management and recycling, July 2021, p. 7, accessed August 12, 2025, from https://www.epa.gov/system/files/documents/2021-08/lithium-ion-battery-report-update-7.01_508.pdf.
[114] *Ibid.*
[115] Commonwealth of Massachusetts, Executive Office of Public Safety and Security, Department of Fire Services, "DFS launches tool to track lithium-ion battery fires," October 17, 2023, accessed August 6, 2025, from https://www.mass.gov/news/dfs-launches-tool-to-track-lithium-ion-battery-fires.
[116] Commonwealth of Massachusetts, "After Six Months, New Tracking Tool Identifies 50 Lithium-Ion Battery Fires," April 17, 2024, accessed August 6,2025, from https://www.mass.gov/news/after-six-months-new-tracking-tool-identifies-50-lithium-ion-battery-fires.
[117] Massachusetts Department of Environmental Protection, Extended Producer Responsibility Commission, meeting minutes from July 16, 2025, accessed August 6, 2025, from https://www.mass.gov/info-details/extended-producer-responsibility-commission.

number of fires in trash disposal vehicles and solid waste transfer stations that some experts believe are driven by large numbers of improperly discarded batteries.[118]

Battery disposal and recycling in Massachusetts

Massachusetts residents purchase about 63 million batteries each year, many of which replace old, spent batteries that are then discarded.[119] Up to 6,000 tons of these batteries are discarded in the trash each year, according to Massachusetts waste characterization studies.[120] According to PSI, the remainder may be stored in the home or recycled, as there is no comprehensive data available on the total volume or weight of batteries recycled within the state.

Municipalities collect household and lithium batteries at HHW facilities, drop-off centers and special events, supported by taxpayer dollars, resident fees or grants from MassDEP.[121] According to MassDEP, 269 municipalities report collecting lithium-ion batteries (268 report collecting other household batteries) and there are 337 battery collection locations in Massachusetts listed on Beyond the Bin.[122] Some retailers take back batteries from consumers, but these outlets are not highly publicized, acceptance criteria change frequently, and those criteria are inconsistent.

One challenge Massachusetts faces is high lithium-ion battery recovery costs that vary by vendor ($0.99–$5.50/lb), and costs are higher for DDR battery recycling since they pose an increased management burden, cost, and may require additional supplies. Additional data about spending from municipalities and other entities on battery recycling in Massachusetts is currently unavailable, although PSI is currently conducting a survey of municipalities to gather data about municipal costs of battery management in the Commonwealth.

Based on data from MassDEP's 2024 recycling and solid waste survey, which focuses on municipally provided services, the following access rates for battery recycling are reported:

- Approximately 56% of the population has access to year-round household battery recycling services, with 53% having access to year-round lithium battery recycling services.
- An additional 27% to 30% of residents have limited access to household and lithium-ion battery recycling, respectively.
- This leaves up to 17% of Massachusetts residents without access to battery recycling services through their municipality.[123]

It is important to note that since this survey is limited to municipally provided services, the actual statewide access rates are likely higher. Services from other entities, such as collection points provided by Call2Recycle and other private entities, are not included in these figures. Tables 9 and 10 provide a summary of the access rates reported by municipalities in the survey.

[118] EPR Commission minutes July 16, 2025.
[119] The U.S. Environmental Protection Agency estimates that U.S. residents purchase 3 billion batteries per year scaled to the Massachusetts population. From https://web.archive.org/web/20110202212818/http://www.epa.gov/waste/conserve/materials/battery.htm, accessed July 8, 2025.
[120] Batteries comprised about 0.1% of 6 million tons of Massachusetts solid waste disposed, or approximately 6,000 tons. Massachusetts Department of Environmental Protection, "Waste characterization and capacity studies," 2022, accessed July 8, 2025 at https://www.mass.gov/guides/solid-waste-master-plan#-waste-characterization-&-capacity-studies-
[121] The Massachusetts Department of Environmental Protection CY2024 Recycling and Solid Waste Survey results use the categories of household batteries and lithium batteries. Household batteries is understood to mean all batteries used at home. Lithium batteries is understood to mean any battery chemistry that uses lithium. From https://www.mass.gov/lists/recyclingsolid-waste-data-for-massachusetts-cities-towns, accessed July 8, 2025.
[122] Data from RecycleSmart, Beyond the Bin, accessed August 6, 2025, from https://recyclesmartma.org/beyond-the-bin-search/.
[123] Data from MassDEP 2024 Recycling Survey reported by municipalities, accessed August 15, 2025, from https://www.mass.gov/lists/recyclingsolid-waste-data-for-massachusetts-cities-towns/.

Table 9. — Access to household battery collection in Massachusetts in 2024.[124]

Collection opportunity	Percent of communities	Percent of population
Year round	63%	56%
Once a week	1%	1%
Once a month	2%	2%
Between 6 and 11 months per year	3%	6%
Less than 6 months per year	7%	16%
None	5%	6%
No data	18%	11%

Table 10. — Access to lithium battery collection in Massachusetts in 2024.[125]

Collection opportunity	Percent of communities	Percent of population
Year round	60%	53%
Once a week	2%	1%
Once a month	2%	4%
Between 6 and 11 months per year	3%	5%
Less than 6 months per year	10%	20%
None	5%	6%
No data	18%	11%

Residents in Massachusetts also have access to recovery services from organizations such as Call2Recycle. Call2Recycle is a U.S.-based, nonprofit PRO that works to advance battery collection and recycling with the support of battery and product manufacturers, to residents through collection sites. They also offer options to mail in rechargeable and single-use batteries using their recycling boxes, which are sometimes referred to as "premium services."[126]

[124] *Ibid.*
[125] MassDEP 2024 Recycling Survey.
[126] Call2Recycle, "Store," accessed August 6, 2025, https://www.call2recycle.org/store/?srsltid=AfmBOorLt-FqXT5zKMBeNdcIk0zbLJNUzCJ7RE1f6nOMQKq6cEYnkdli.

Proposed Solution

According to PSI, the first EPR laws in the U.S. were established for batteries in 1991, when Vermont began a program for certain government-purchased rechargeable batteries. In 1994, Call2Recycle was formed to manage existing and future battery EPR laws. Two years later, a federal law focused on single-use mercury batteries, which paved the way for Call2Recycle to roll out a voluntary national program in states without EPR laws, which still exists today.

Vermont passed the country's first battery EPR law for single-use batteries in 2014. Since 2020, many EPR laws have been passed and are being implemented, encompassing a growing scope of batteries. These laws all cover primary (single-use) batteries of less than 4.4 pounds, portable rechargeable batteries that are less than 11 pounds, and medium-format batteries. Some laws also include battery-containing products (such as electric toothbrushes). Three states have required a study on embedded batteries, i.e., not intended for removal by the consumer. The inclusion of DDR batteries is still under consideration. Table 11 and Figure 9 summarize current battery EPR laws in the U.S.

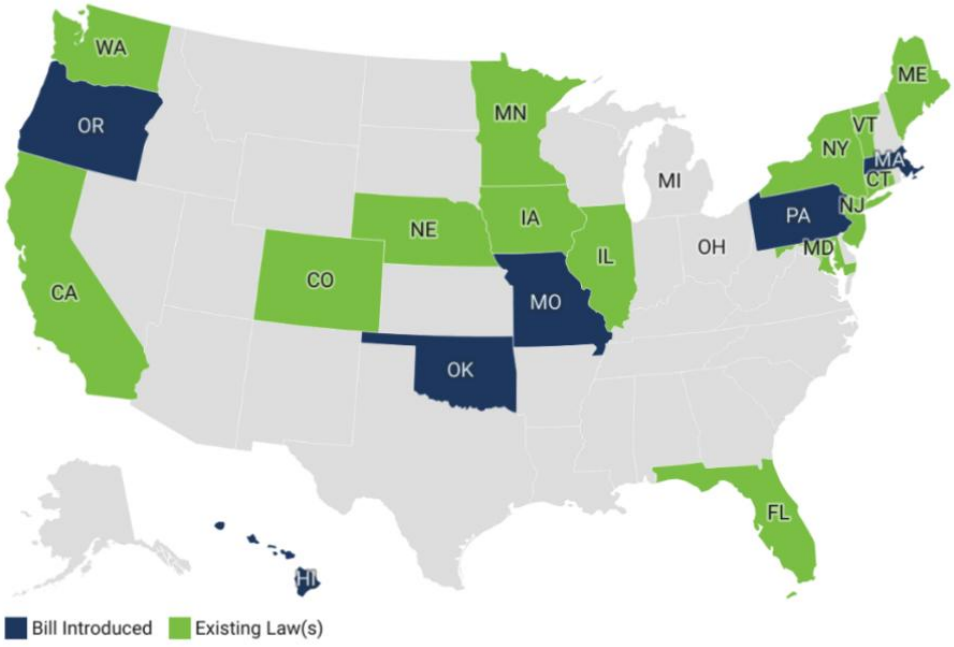
Table 11. — Battery EPR laws in the United States (as of July 8, 2025).[127]

State	Enacted	Amended	Batteries covered
California	2006		Rechargeable
California	2022		Primary and rechargeable
Colorado	2025		Primary, rechargeable, medium-format
Connecticut	2025		Primary, rechargeable, medium-format, battery-containing devices
District of Columbia	2020	2023	Primary and rechargeable
Florida	1993		Rechargeable
Illinois	2024		Primary, rechargeable, medium-format
Iowa	1996		Rechargeable Ni-Cd and SSLA, mercuric oxide
Maine	1995		Mercuric oxide batteries
Maryland	1993		Rechargeable
Maryland	1994		Mercuric oxide batteries
Minnesota	1991		Rechargeable batteries
Nebraska	2005		Primary, rechargeable, medium-format, battery-containing devices
New Jersey	1991		Rechargeable Ni-Cd and SSLA, mercuric oxide batteries
New Jersey	2023		Electric and hybrid vehicle batteries

[127] Data from the Product Stewardship Institute.

New York	2010	2025	Rechargeable, medium-format
Vermont	1991		Rechargeable Ni-Cd purchased by a government entity, mercuric oxide batteries
Vermont	2010	2024	Primary, rechargeable, battery-containing devices
Washington	2023		Primary, rechargeable, medium-format

Figure 9. — Battery EPR laws and bills in the United States in 2025 (as of July 9, 2025).[128]



This map shows EPR laws and bills that create a new program. Bills amending existing EPR programs are not represented.

PRBA, the industry association that represents large battery manufacturers in the U.S., has a model EPR bill (Appendix C) which contains the most common household batteries with a few exceptions, including:[129]

- Recalled batteries (see more below)
- Non-consumer medical devices
- Free liquid electrolyte batteries
- Lead acid batteries (> 11 pounds)
- Embedded batteries (for now; see more below)
- Motor-vehicle batteries
- Large batteries (> 25 pounds)

[128] U.S. Environmental Protection Agency, "The Importance of Sending Consumers' Used Lithium-ion Batteries to Electronic Recyclers or Hazardous Waste Collection Facilities."
[129] See Appendix C: Model battery EPR bill.

How battery EPR programs work

According to PSI, in states with EPR laws, Call2Recycle, a PRBA-led PRO, develops a detailed program plan and submits it to the state's environmental oversight agency (i.e., MassDEP) for approval. Once approved, the organization manages the battery recycling program to meet all legal requirements.

Program operations typically include:

- Establishing and contracting with a network of convenient collection sites, such as retailers, municipalities and HHW facilities and events, in urban, suburban, and rural areas
- Providing these collection sites with the necessary supplies, training, and educational materials
- Contracting with transporters and processors to handle the collected batteries
- Conducting public education and outreach, including statewide education campaigns
- Funding the program by assessing fees on producers based on their market share
- Collecting data on various metrics, including collection and processing volumes and public awareness
- Submitting an annual report to the oversight agency detailing the program's activities and results
- Ensuring transparency and accountability through regular audits and evaluations

These programs have the following impacts on major stakeholder groups:

- **Producers.** Usually defined by battery brand, producers must register with the state and participate in a program such as Call2Recycle, report their sales, and pay fees to fund the program in order to sell in a state with a battery EPR law.
- **Consumers.** Consumers can recycle batteries for free at approved collection sites, such as HHW events/facilities, municipal collection points, and certain retailers, or they can pay for a premium collection service such as curbside pickup or mail-back boxes.
- **Transporters and processors.** Transporters collect batteries from various locations, delivering them to processors who are required to recycle them in an environmentally responsible manner.
- **Retailers.** In states with EPR laws, retailers are prohibited from selling batteries from non-compliant producers and often voluntarily serve as collection sites, but in New York and California, there are mandatory requirements for retailers of a certain size to serve as collection points and provide producer-funded educational materials.
- **Municipalities.** Local governments typically act as collection sites for batteries at HHW and other locations, and they may also provide outreach, education, and premium services for a fee.

Discussion: EPR in Massachusetts

EPR laws mandate a specific number of year-round battery collection sites for residents. The criteria for these sites vary by state, with some requiring a minimum number per county (Vermont) or per capita (District of Columbia), while others mandate that retailers serve as collection sites (New York).

The battery EPR law in Washington State requires at least one permanent, year-round collection site within a 15-mile radius of 95% of residents and one site per 30,000 residents in urban areas. If Massachusetts were to adopt a similar law to Washington's, access to lithium-ion battery recycling could increase from the current 53% (municipal access) to 95%.[130]

An EPR program would bring financial benefits to Massachusetts municipalities and residents by shifting the responsibility for funding battery collection, transportation, and recycling from the municipalities to battery producers. The PRO Call2Recycle spent $392,925 to collect 154,956 pounds of batteries in Vermont in 2024.[131] This extrapolates to roughly $2.52 per battery it collected and $1.40 per household in Vermont.[132] A similar model would translate to roughly $3.9 million in spending for battery collection, transportation, and recycling from a PRO in Massachusetts, resulting in avoided costs to municipalities, more consistent and convenient collection methodologies, increased recovery of batteries and reduced expenses associated with fires.[133]

For example, solid waste and recycling facilities experience thousands of fires each year, most of which are believed to be caused by lithium-ion batteries. The damage caused by reported fires has ranged between $2,600 to more than $50 million.[134] In addition, insurance for material recovery facilities has increased more than tenfold.[135] Reducing batteries entering the waste or recycling stream will reduce the incidence of fires and the associated costs.

Key considerations

The following topics were raised as key issues during the July 16, 2025 EPRC meeting by various stakeholders.

Embedded batteries, found in products such as laptops and smart phones, present a challenge for assigning responsibility when they are collected. While many are already part of an electronics EPR program, there is increasing interest in ensuring both the batteries and their products are managed responsibly. Three state EPR programs—Washington, Vermont, and Illinois—require that studies be performed to determine how to safely manage and equitably finance the recycling of these items. Comments on this consideration voiced during the July 16, 2025, Massachusetts EPR Commission meeting included the following:

- Commissioner Waneta Trabert, Vice President of MassRecycle and Director of Sustainable Materials Management for the City of Newton, flagged that one of the biggest areas of concern that isn't addressed by the current battery EPR programs is embedded batteries. She noted that municipalities

[130] MassDEP 2024 Recycling Survey. https://www.mass.gov/lists/recycling-solid-waste-data-for-massachusetts-cities-towns
[131] Call2Recycle, 2024 Vermont Annual Report, page 16, accessed August 15, 2025, from https://dec.vermont.gov/sites/dec/files/documents/2024%20Vermont%20Annual%20Report.pdf.
[132] According to the U.S. Census Bureau, Vermont had 279,612 households in 2023. Data from U.S. Census Bureau, 2023 American Community Survey 1-Year Estimates, Vermont, accessed August 15, 2025, from https://data.census.gov/profile/Vermont?g=040XX00US50.
[133] Figure derived from multiplying $1.40 by 2,800,984 households in Massachusetts. Data from U.S. Census Bureau, 2023 American Community Survey 1-Year Estimates, Massachusetts, accessed August 15, 2025, from https://data.census.gov/profile/Massachusetts?g=040XX00US25.
[134] RRS fact sheet, Lithium-based Battery Fire Threat to U.S. Single Stream Material Recovery Facilities, accessed August 15, 2025, from https://drive.usercontent.google.com/download?id=1ZS32M83OmOi2_1rFYst5lyfd8akwaMSw&authuser=1&acrobatPromotionSource=GoogleDriveListView.
[135] *Ibid.*

would still be financially responsible for educating consumers on how to dispose of products with embedded batteries safely since they are not included in the PRBA model bill.

- Andrew Ferrara, Project Manager with Berkshire Environmental Action Team in Pittsfield, shared that they see embedded battery devices, especially vapes, "all the time" at river and park cleanups. He noted that, battery recyclers do not currently accept electronics with embedded batteries, particularly vapes, hazardous waste companies will not take some of them, and there doesn't seem to be a safe or correct solution

Damaged, defective, and recalled (DDR) batteries pose significant safety and cost challenges due to their fire risk. While recalled batteries are often handled separately through manufacturer warranties, they are frequently collected at HHW facilities along with other DDR batteries. As a result, proponents of new battery EPR laws seek to include most or all DDR batteries in these regulations to ensure their safe management, though recalled batteries are currently exempt from the PRBA's model bill. Comments on this consideration voiced during the commission meeting included the following:

- Commission memberTrabert raised the issue that many battery recall notices from manufacturers and retailers instruct consumers to take the recalled batteries to local HHW facilities. She cited a recent personal experience with this where she received a notice from Amazon that a device they purchased had been recalled and to take it to local HHW. She mentioned that at a battery ERP strategy meeting of local governments a Washington State official found that eight out of nine recalls instructed consumers to take recalled batteries to HHW programs as well. This transfers the financial and logistical burden of managing these potentially hazardous items onto local and state governments.

- Marc Boolish, Executive Director of the PRBA, indicated that there is a provision in the model law that would enable stewardship organizations to seek compensation for DDR batteries. He shared that everyone who touches DDR batteries requires dangerous-goods training.

Collection outside the EPR program: Some battery recycling companies operate independent of state EPR programs, often through contracts with original equipment manufacturers for valuable batteries such as those from electric vehicles. According to PSI, these recyclers view EPR programs as unnecessary regulation, while critics argue they cherry-pick the most profitable batteries and leave lower-value batteries for others to manage.

- Daniel Zotos, Director of State Policy and Public Affairs, Redwood Materials, expressed support for EPR models for small consumer batteries on behalf of his company, a leading lithium-ion battery recycler in North America; however, the company believes current proposals in Massachusetts should better integrate the existing battery recycling industry. Redwood Materials advocates for an independent collection path for recyclers and waste management companies to work alongside a stewardship program, rather than being restricted by it. They highlighted their own direct-to-consumer programs and the need to increase overall battery collection rates.

- Carin Stuart, Director of Steward Services at Call2Recycle, shared that a balance is needed in battery EPR laws to ensure the program is not penalized for batteries that are recycled outside of its official system. The organization is held accountable to a proposed collection rate but faces a challenge when other recyclers collect batteries without being part of the program, which can make their performance appear lower than it is. While Call2Recycle supports a multi-player collection scheme, they emphasize the need for a cohesive, collective voice in marketing and public education to avoid confusing consumers and to achieve higher collection rates.

- Phil Goddard, Manager of Facility Compliance and Technology Development, Integrated Solid Waste Management, Town of Bourne, drew a comparison between these concerns and a concern he heard from Recolor, a well-established recycled-paint company in Massachusetts. Recolor has expressed a fear that a paint EPR program may exclude them or negatively impact the system they've been building for years.

BACKGROUND:

ELECTRONICS

Executive Summary

Electronics ownership in the U.S. has burgeoned in recent decades. The average American household has 24 devices, with total ownership of more than 3 billion electronic products in the U.S.[136] Many of these products have an increasingly shorter lifespan, resulting in e-waste becoming the fastest-growing component of the municipal waste stream in the U.S.[137]

Electronic waste by weight in landfills has steadily declined, however. A study by researchers at the Rochester Institute of Technology's Institute for Sustainability and the Yale Center for Industrial Ecology has estimated that e-waste generation peaked in 2015 nationally and has been declining in the past decade.[138] Additionally, the most recent U.S. Environmental Protection Agency (EPA) data showcase that electronics are the fastest declining product in the municipal solid waste stream as well as making up less than 1% by weight of all municipal solid waste.[139] Although not a large fraction of overall weight, electronics contain a number of toxic components including lead, cadmium, arsenic, nickel, flame retardants, and other toxics.

According to the Consumer Technology Association, manufacturers are producing electronic devices with fewer and lighter materials enabled by technological innovations. Materials used in consumer technology products have continuously improved and devices now result in much less e-waste. Problem materials have also been designed out of new products.

In Massachusetts, of 4.5 million tons of municipal solid waste, 0.4% was characterized as computer-related electronics, brown goods, televisions, and computer monitors in 2022, which amounted to 18,000 tons.[140] This is a drop from 3.3%, or 155,000 tons in 2010 and 0.8%, or 54,500 in 2019.

The EPA has illuminated concerns about the unsafe handling of electronic waste, particularly in developing countries, resulting in harm to human health and the environment.[141] These concerns include:

- Open-air burning and acid baths used to recover materials from electronic components
- Toxic materials leaching into the environment
- Worker exposure to contaminants such as lead, mercury, cadmium, and arsenic
- Irreversible health effects, including cancers, miscarriages, neurological damage, and diminished IQs
- Brominated flame-retardant contents, which have been linked to endocrine disruption and thyroid dysfunction[142]

In Massachusetts, fees charged to residents range anywhere from free to $50 per item to drop off, according to the Department of Environmental Protection (MassDEP). Furthermore, electronic waste collection

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[136] U.S. Environmental Protection Agency, "Helping communities manage electronic waste," published June 1, 2021, and last updated June 23, 2025; accessed July 21, 2025, from https://www.epa.gov/sciencematters/helping-communities-manage-electronic-waste.
[137] *Ibid.*
[138] Althaf, Shahana, Babbitt, Callie, and Chen, Roger, "The evolution of consumer electronic waste in the United States," Journal of Industrial Ecology, June 2021: Vol. 25, No. 3: 693–706.
[139] U.S. Environmental Protection Agency, "Durable goods: product-specific data," 2018 data, accessed July 22, 2025, from https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/durable-goods-product-specific-data.
[140] MassDEP Waste Characterization Studies 2010, 2019, and 2022. "Computer-related electronics" includes computer CPUs, laptop computers, notebook computers, processors, printers, scanners, keyboards, etc. This category does not include automated typewriters or typesetters, portable handheld calculators, portable digital assistants or other similar devices. "Brown goods" includes cell phones, iPods, PDAs, small electronic appliances such as toasters, telephones, stereos, radios, clocks, hair dryers, etc. "Televisions and computer monitors" mean a stand-alone display system containing a cathode ray tube (CRT) or any other type of display primarily intended to receive video programming via broadcast. Examples also include non-CRT units such as plasma and LCD monitors.
[141] U.S. Environmental Protection Agency, "Cleaning up electronic waste (e-waste)," accessed July 21, 2025, from https://www.epa.gov/international-cooperation/cleaning-electronic-waste-e-waste.
[142] National Institutes of Health, National Institute of Environmental Health Sciences, "Flame retardants," accessed July 21, 2025 from https://www.niehs.nih.gov/health/topics/agents/flame_retardants.

locations in Massachusetts is an inconsistent patchwork. Some collectors, including municipalities, register on a section of the Recycle Smart website called Beyond the Bin, where consumers can search for one of 385 drop-off locations for computers and home electronics.[143] MassDEP received reporting from 288 out of 351 municipalities in 2024 with the following results:[144]

- 276 municipalities reported that they collect televisions and computers.
- Of those, 268 reported that they collect additional electronics, including DVDs, VCRs, phones, stereos, and other electronics.
- 227 municipalities representing 4.9 million people (69% of state) reported collecting over 2800 tons of electronics at a cost of up to $2 million. Recycling the remaining 18,000 tons currently being disposed through municipal efforts could cost up to $15 million annually.[145] This does not include the cost of operating the collection point.

Methods of municipal e-waste collection in Massachusetts also vary:

- 126 municipalities reported drop-off trash with likely electronics collection at small transfer stations.
- 110 municipalities reported curbside trash collection and likely similar electronics collection.
- 29 municipalities reported both drop-off and curbside trash collection but did not specify whether electronic waste was collected via drop-off or curbside.
- 11 are subscription municipalities and did not indicate how e-waste is collected.[146]

Collection frequency in Massachusetts also varies:

- 214 municipalities collect electronic waste year-round.
- 62 collect electronics at varied frequencies, including one-day special collection events, monthly, or less frequently.

Electronics EPR legislation has the potential to recover valuable electronics components, streamline electronics recycling programs across the state, clarify recyclable products and eligible entities to participate, and adhere to a variety of other safe, responsible and best practices in processing electronic waste.

[143] RecycleSmartMA.org, "Beyond the Bin" database, accessed July 22, 2025 from https://recyclesmartma.org/beyond-the-bin-search/?_material=computers-home-electronics.
[144] Based on data reported by municipalities through the 2024 Municipal Solid Waste and Recycling Survey. See Open XLSX file, 207.69 KB, 2024 Municipal Solid Waste & Recycling Survey Responses (English, XLSX 207.69 KB)
[145] MassDEP extrapolation of remaining electronics waste (18,000 tons) managed through municipal collection programs at $0.39/lb.
[146] Subscription trash collection is when the municipality does not play a role in providing solid waste management services to residents. Residents are required to independently subscribe for these services.

Background: The Problem

Electronics ownership in the U.S. has burgeoned in recent decades. The average American household has 24 devices, with total ownership of more than 3 billion electronic products in the U.S.[147] Many of these products have an increasingly shorter lifespan, resulting in e-waste becoming the fastest-growing component of the municipal waste stream in the U.S.[148]

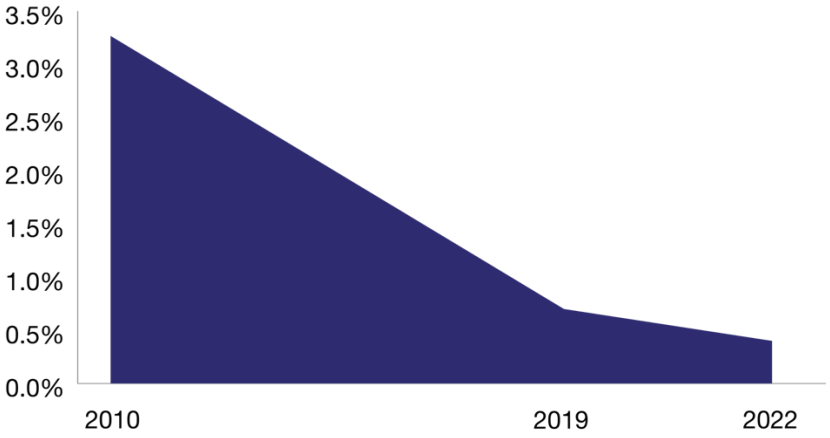
Electronic waste by weight in landfills has steadily declined, however. A study by researchers at the Rochester Institute of Technology's Institute for Sustainability and the Yale Center for Industrial Ecology has estimated that e-waste generation peaked in 2015 nationally and has been declining in the past decade.[149] Additionally, the most recent EPA data showcase that electronics are the fastest declining product in the municipal solid waste stream as well as making up less than 1% by weight of all municipal solid waste.[150] Although not a large fraction of overall weight, electronics contain a number of toxic components including lead, cadmium, arsenic, nickel, flame retardants, and other toxics.

According to the Consumer Technology Association, manufacturers are producing electronic devices with fewer and lighter materials enabled by technological innovations. Materials used in consumer technology products have continuously improved and devices now result in much less e-waste. Problem materials have also been designed out of new products. For example, the old cathode ray tube (CRT) technology required leaded glass but has been replaced by two subsequent generations of video display technologies that produce better displays without leaded glass.[151]

In Massachusetts, of 4.5 million tons of municipal solid waste, 0.4% was characterized as computer-related electronics, brown goods, televisions, and computer monitors in 2022, which amounted to 18,000 tons.[152] This is a drop from 3.3%, or 155,000 tons in 2010 and 0.8%, or 54,500 in 2019, as shown in Figure 11.

[147] U.S. Environmental Protection Agency, "Helping communities manage electronic waste," published June 1, 2021, and last updated June 23, 2025; accessed July 21, 2025, from https://www.epa.gov/sciencematters/helping-communities-manage-electronic-waste.
[148] *Ibid.*
[149] Althaf, Shahana, Babbitt, Callie, and Chen, Roger, "The evolution of consumer electronic waste in the United States," Journal of Industrial Ecology, June 2021: Vol. 25, No. 3: 693–706.
[150] U.S. Environmental Protection Agency, "Durable goods: product-specific data," 2018 data, accessed July 22, 2025, from https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/durable-goods-product-specific-data.
[151] Data provided by Katie Reilly, Consumer Technology Association, on July 18, 2025.
[152] MassDEP Waste Characterization Studies 2010, 2019, and 2022. "Computer-related electronics" includes computer CPUs, laptop computers, notebook computers, processors, printers, scanners, keyboards, etc. This category does not include automated typewriters or typesetters, portable handheld calculators, portable digital assistants or other similar devices. "Brown goods" includes cell phones, iPods, PDAs, small electronic appliances such as toasters, telephones, stereos, radios, clocks, hair dryers, etc. "Televisions and computer monitors" mean a stand-alone display system containing a cathode ray tube (CRT) or any other type of display primarily intended to receive video programming via broadcast. Examples also include non-CRT units such as plasma and LCD monitors.

Figure 11. — Percent change in computer-related electronics, brown goods, televisions, and computer monitors in Massachusetts municipal solid waste.[153]



Discarded electronic waste

The EPA has illuminated concerns about the unsafe handling of electronic waste, particularly in developing countries, resulting in harm to human health and the environment.[154] These concerns include:

- Open-air burning and acid baths used to recover materials from electronic components
- Toxic materials leaching into the environment
- Worker exposure to contaminants such as lead, mercury, cadmium, and arsenic
- Irreversible health effects, including cancers, miscarriages, neurological damage, and diminished IQs
- Brominated flame-retardant contents, which have been linked to endocrine disruption and thyroid dysfunction[155]

Electronic waste collection in the U.S. and Massachusetts

In 2009, the EPA estimated nationally that e-waste totaled 2.37 million tons; 25% of these electronics were collected for recycling, with the remainder disposed of in landfills.[156]

In Massachusetts, fees charged to residents range anywhere from free to $50 per item to drop off, according to the MassDEP. Municipalities may use a state contract (FAC110) for the collection and recycling of mixed electronics, which is priced at $0.19–$0.39 per pound. Electronics retailers typically do not charge a fee, except for cathode ray tubes (CRTs) in some cases. Some retailers and manufacturers offer mail-back options.

Electronic waste collection locations in Massachusetts is an inconsistent patchwork. Some collectors, including municipalities, register on a section of the Recycle Smart website called Beyond the Bin, where

[153] MassDEP Waste Characterization Studies 2010, 2019, and 2022.
[154] U.S. Environmental Protection Agency, "Cleaning up electronic waste (e-waste)," accessed July 21, 2025, from https://www.epa.gov/international-cooperation/cleaning-electronic-waste-e-waste.
[155] National Institutes of Health, National Institute of Environmental Health Sciences, "Flame retardants," accessed July 21, 2025 from https://www.niehs.nih.gov/health/topics/agents/flame_retardants.
[156] EPA "Cleaning up."

consumers can search for one of 385 drop-off locations for computers and home electronics.[157] MassDEP received reporting from 288 out of 351 municipalities in 2024 with the following results:[158]

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Collection frequency in Massachusetts also varies:

- 214 municipalities collect electronic waste year-round.
- 62 collect electronics at varied frequencies, including one-day special collection events, monthly, or less frequently.

In 2004, MassDEP provided grant funding to municipalities to establish collection programs, but these grant programs are no longer in place. Costs of electronics collection throughout Massachusetts have not been calculated, but the MassDEP awarded a grant to collect this information in 2025.

Licensing requirements, regulations, and permits for electronics recyclers

At present, there are two certification programs for responsible electronics recycling: R2, administered by the Sustainable Electronics Recycling International (SERI), and e-Stewards formed by the Basel Action Network.[161] Each organization regularly updates its standards and requires that an accredited certification body audit a recycling facility before granting certification. Each recycling facility, as opposed to company, must pass an audit to be certified. Certificates are valid for a specified period before recertification to the current standard is required. R2 or e-Stewards may perform additional surveillance or surprise audits throughout the year.

In general, certifications focus on:

- Responsible management and a leadership commitment from the overall company to responsible electronics recycling practices

[157] RecycleSmartMA.org, "Beyond the Bin" database, accessed July 22, 2025 from https://recyclesmartma.org/beyond-the-bin-search/?_material=computers-home-electronics.
[158] Based on data reported by municipalities through the 2024 Municipal Solid Waste and Recycling Survey. See Open XLSX file, 207.69 KB, 2024 Municipal Solid Waste & Recycling Survey Responses (English, XLSX 207.69 KB)
[159] MassDEP extrapolation of remaining electronics waste (18,000 tons) managed through municipal collection programs at $0.39/lb.
[160] Subscription trash collection is when the municipality does not play a role in providing solid waste management services to residents. Residents are required to independently subscribe for these services.
[161] See https://sustainableelectronics.org/r2/ and https://e-stewards.org/the-e-stewards-standard/ for more information about standards and certification processes.

- Legal requirements and compliance monitoring, which could include requirements regarding forced labor, non-discrimination policies, import/export compliance, and more
- Environmental, health, and safety management systems and practices
- Tracking throughput of materials (e.g., mass balance accounting, bills of lading) including documenting downstream disposition (where material outputs end up)
- Packaging, storing, transporting, sorting/categorizing and recycling processes including documentation, recordkeeping procedures, equipment, etc.
- Data security and sanitization
- Reuse and refurbishment processes
- Management of materials of concern—also called focus materials—typically requiring greater care in the overall management and recycling process (e.g., batteries, CRTs, circuit boards, mercury, etc.)
- Facility safety and security, including health and safety of workers as well as contingency planning and insurance

In addition, some electronics recyclers may choose to pursue additional certifications beyond R2 or e-Steward via the International Organization for Standards (ISO). Manufacturers may also require recyclers to obtain these certifications. Certifications in quality management systems, environmental management systems, and occupational health and safety management systems can augment recyclers' standards and assist in meeting R2 or e-Steward certification requirements.

In Massachusetts, electronic waste and CRT recycling are conditionally exempt from state hazardous waste regulations when managed for donation or recycling.[162] If the electronic waste—such as circuit boards or CRTs—are not handled in accordance with the regulatory requirements, they revert to being a hazardous waste subject to the full requirements of 310 CMR 30.0000.

Electronics recycling

Electronic products contain a number of valuable resources and materials that can be extracted and recycled in lieu of using virgin materials. These materials include low- or no-value materials such as plastics and glass, as well as high-value metals such as gold, copper, nickel, indium, and palladium.[163,164]

The e-waste recycling process consists of the following phases:

1. Consumer drops off electronics with an e-waste collector
2. Collector sends e-waste to an electronics recycler
3. Electronics recycler destroys personal information on reusable/refurbishable items and resells OR electronics recycler dismantles the devices either via shredding or manual dismantling processes
4. The electronics recycling process separates e-waste into commodities (metals, plastic, glass, etc.). Electronics recyclers ship individual commodities to downstream vendors
5. Commodities are processed and manufactured into new items

The recycling process can also vary greatly across recyclers from predominantly manual dismantling to advanced shredding technology, CRT glass cleaning systems, and flat panel display processing technology.

Figure 12 from the Wisconsin Department of Natural Resources illustrates this cycle.

[162] Massachusetts Department of Environmental Protection, "310 CMR 30.000: Massachusetts Hazardous Waste Regulations," accessed July 22, 2025, from https://www.mass.gov/regulations/310-CMR-30000-massachusetts-hazardous-waste-regulations.
[163] U.S. Environmental Protection Agency, "Electronics donation and recycling," accessed July 21, 2025, from https://www.epa.gov/recycle/electronics-donation-and-recycling.
[164] U.S. Environmental Protection Agency, "Helping communities manage electronic waste," published June 1, 2021, and last updated June 23, 2025; accessed July 21, 2025, from https://www.epa.gov/sciencematters/helping-communities-manage-electronic-waste.

Figure 12. — Wisconsin's e-cycling process.[165]

Market for downstream recycled components

According to the Consumer Technology Association, demand for recycled e-waste commodities includes the broad categories of metals, plastic, circuit boards, batteries, and glass. Prices for such commodities fluctuate, as they do for other recycled goods; metals (aluminum, copper, and circuit boards) are typically of higher value, whereas some materials have low, no, or even negative value (plastics, glass).

[165] Wisconsin Department of Natural Resources, "What happens when I e-cycle?" flyer, accessed July 22, 2025, from https://apps.dnr.wi.gov/doclink/waext/wa1627.pdf.

Electronics EPR Programs

According to the PSI, EPR programs have been in place in other U.S. states since 2004. Unlike categories such as paint or mattresses, electronics EPR programs vary significantly from state to state.

Twenty-four states plus the District of Columbia have some form of electronics EPR program in place as of July 2025:

- Ten states plus the District of Columbia require that electronics producers meet weight-based recycling goals based on a percentage of total sales of products covered under the law. In most cases, financial penalties are assessed against manufacturers based on the weight of electronics not recycled in comparison to the goals. In most cases, manufacturers' fees are established via negotiation with recyclers.

- Fifteen states operate programs based around other parameters, such as convenience standards, with manufacturers paying their assessed market share to a collection and recycling system or simply providing educational information for voluntary programs. Fees are established through a variety of means, ranging from negotiation with recyclers to state agencies setting rates.

- California requires consumers to pay a recycling fee at the point of purchase for specific electronics. That fee is remitted to the state, which then reimburses the collection and recycling system for managing specific electronics covered under the program. This is not an EPR program by definition as the program is funded by consumer and run by the state government.

Tables 12 and 13 provide a distilled list of program characteristics by participating states.

Table 12. — Characteristics of state electronics EPR programs with weight-based goals.[166]

State	Penalties for unmet weight goals	Products recycled	Eligible entities
Hawaii	$1.50/lb	Desktops, e-readers, laptops, monitors, printers, tablets, televisions	Individuals, businesses, partnerships, LLCs, corporations, nonprofits, government, public benefit corporations, public authorities
Indiana	$0.40/lb @ < 50% goal met $0.30/lb @ ≥ 50% < 90% goal met $0.20/lb @ ≥ 90% goal met	E-readers, laptops, monitors, tablets, televisions, computers, keyboards, printers, fax machines, DVD players, VCRs	Household/consumers, schools, businesses
Michigan	None	Televisions	Households, small businesses (up to seven TVs/day)
Minnesota	$0.50/lb @ < 50% goal met $0.40/lb @ ≥ 50% < 90% goal met	Televisions, monitors, computers, laptops, tablets, keyboards,	Households

[166] Data from the Consumer Technology Association.

	$0.30/lb @ ≥ 90% goal met	printers, fax machines, DVD players, VCRs	
New Jersey	$0.50/lb	Computers, monitors, laptops, portable computers, desktop printers, desktop fax machines, televisions	Consumers, state entities, schools, local governments, small businesses (<50 FTEs)
New York	$0.50/lb @ < 50% goal met $0.40/lb @ ≥ 50% < 90% goal met $0.30/lb @ ≥ 90% goal met	Computers, laptops/notebooks, e-readers, smart displays, smart watches, virtual reality headsets (with processors), printers (<100 lbs), keyboards, mice, external hard drives, label printers (<100 lbs), digital picture frames, fax machines (<100 lbs), cable/satellite receivers, digital converter boxes DVD players, DVRs, video game consoles, portable digital music players, Project (with DVD player capability), FCRs, small-scale servers, televisions, cables/cords	Consumers, businesses, corporations, limited partnerships, nonprofits, public corporations, schools, government
North Carolina	None	Televisions	Households, nonprofits (<10 FTEs)
Pennsylvania	$2/lb + 10%	Computers, laptops, computer monitors, peripherals (printers, keyboards, mice), televisions	Households, small businesses (<50 FTEs)
Texas	None	Televisions	Households
Washington, D.C.	$0.58/lb @ < 50% goal met $0.46/lb @ ≥ 50% < 90% goal met $0.35/lb @ ≥ 90% goal met	Computers, laptops, tablets, e-readers, keyboards, mice, printers (<100 lbs), computer monitors, televisions, VCRs, DVRs, DVD players, game consoles, signal converter boxes, cable/satellite/digital media receivers	Households, small businesses, nonprofits
Wisconsin	$0.50/lb @ < 50% goal met $0.40/lb @ ≥ 50% < 90% goal met $0.30/lb @ ≥ 90% goal met	Computers, laptops, small-scale servers, tablets, printers, monitors, televisions, peripherals (keyboards, mice, cords, headsets, scanners, speakers, webcams, cable/satellite receivers, digital converter boxes, remotes, security/surveillance system cameras, streaming devices/receivers), DVRs, DVD players, fax machines, cell phones, telephones, VCRs, video game systems, portable hand-held video games	Households, K12 schools

Table 13. — Characteristics of state electronics EPR programs without weight-based goals.[167]

State	Program structure	Products	Eligible entities
Connecticut	Market share of total cost	Computers (desktop, portable), computer monitors, printers, televisions, tablets, e-readers, phones > 4”	Households
Illinois	Manufacturer takeback program meeting convenience standards	Computers, computer monitors, televisions, printers, keyboards, fax machines, VCRs, portable digital music players, DVD players, video game consoles, mice, scanners, digital converter boxes, cable/satellite receivers, DVRs, small-scale servers, home audio components, peripherals	Any entity returning seven or fewer items
Maine	Market share of total cost	Televisions, monitors, laptops, tablets, e-readers, game consoles, portable DVD players, digital picture frames, virtual-reality headsets	Household/consumer, nonprofits, schools, small businesses (<100 employees)
Maryland	Manufacturer takeback program	Computers, e-readers, laptops, monitors, tablets, televisions	Any
Missouri	Manufacturer takeback program	Computers, e-readers, laptops, monitors, tablets	Households
Oklahoma	Manufacturer takeback program	Computers, e-readers, laptops, tablets, monitors	Households
Oregon	Manufacturer takeback program meeting convenience standards	Computers, laptops, tablets, monitors, televisions, printers, computer peripherals; in 2026 to include fax machines, DVD players, VCRs, portable music players, game consoles, digital converter boxes, cable/satellite receivers, scanners, small-scale servers, routers, modems	Any returning seven or fewer items
Rhode Island	Manufacturer takeback program or participation in state-run program	Computers, monitors, laptops, televisions, tablets	Households, schools
South Carolina	Manufacturer takeback program meeting convenience standards	Computers, monitors, laptops, televisions, tablets, printers	Households
Utah	Consumer education program only	Computers, e-readers, keyboards, laptops, monitors, portable DVD players, printers, tablets, televisions	Households
Virginia	Manufacturer takeback program	Computers, laptops, monitors	Households

[167] Data from the Consumer Technology Association.

Vermont	Manufacturer opt-out program or participation in market share of total cost	Computers, laptops, monitors, printers, tablets, televisions	Any returning seven or fewer items
Washington	Manufacturers implement an independent program	Computers, laptops, monitors, Televisions, tablets, e-readers, portable DVD players	Households
West Virginia	Takeback program or higher registration fee	Computers, laptops, monitors, televisions, tablets	Households, nonprofits, schools, government, small- to medium-sized businesses

In developing an EPR solution for electronics recycling in Massachusetts, collection frequency and convenience should be taken into consideration. Population density resources are available through the Mass.gov website.[168]

PSI identified the following typical implementation challenges of older laws regarding electronics EPR programs in other states:[169]

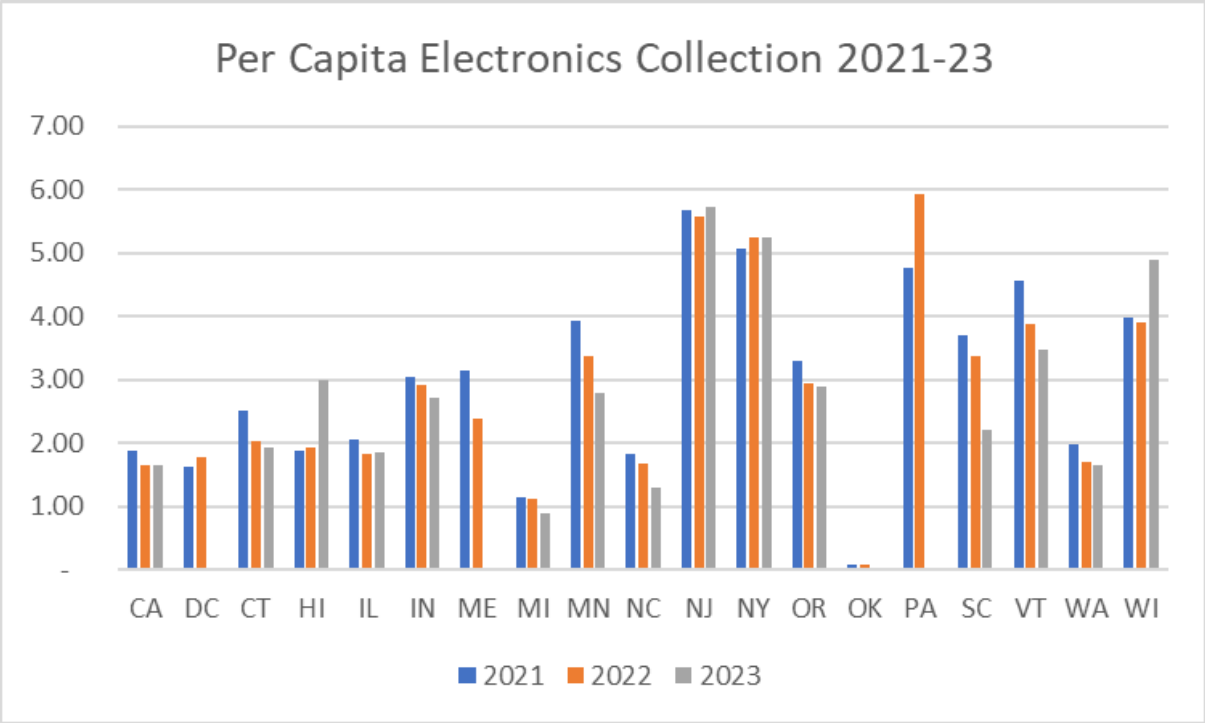
- Limiting the scope of e-waste products and participating entities does not meet the need for electronics waste diversion.
- Producers may interpret weight-based goals as a ceiling versus a floor and may therefore stop paying or collecting once their goal has been reached, destabilizing program funding, and leaving municipalities to cover the remaining costs.
- As the weight of electronic devices has decreased, weight-based metrics have become an insufficient measure of program success.
- The lack of convenience standards limits access to services.
- The lack of a coordinating body (PRO or clearinghouse) contributes to statewide inconsistency of outreach, education, and awareness.
- When there is no funding mechanism defined, programs are funded inadequately.

Program success in participating states

Again, while programs vary in terms of eligible entities to participate and items collected, collection rates are more successful in some states than in others in terms of the weight of electronic waste collected per capita, illustrated in Figure 3.

[168] Massachusetts Executive Office of Technology Services and Security, Bureau of Geographic Information, "MassGIS Data: 2020 U.S. Census." Accessed July 22, 2025, from https://www.mass.gov/info-details/massgis-data-2020-us-census.
[169] Observations from the Product Stewardship Institute included in the Massachusetts EPR Commission electronics advisory group slide deck, June 30, 2025.

Figure 13. — State electronics EPR program performance in pounds per capita.[170]



As a rule of thumb, the Product Stewardship Institute has identified 16 characteristics of stable electronics EPR programs:

1. Scope should be comprehensive
2. Brands, manufacturers, and importers can be responsible parties
3. There can be one or more stewardship organizations, but will benefit from a coordinating body or PRO
4. Eligible entities should include, at a minimum, residents, schools, small businesses, and governments
5. Funding should be covered by producers according to market share, not weight based goals
6. Performance goals should be established based on prior year's data or a formula
7. Convenience should be based on population and distance to a collection site
8. Recyclers should be required to have e-Stewards or R2 certification
9. Operating standards should be based on a materials management hierarchy, where the state environmental agency provides an oversight and enforcement role, and all eligible collection sites can participate
10. Each stewardship plan should describe how a program will be implemented to meet the statute
11. Outreach and education campaigns should reach all residents, including educational materials for retailers; outreach programs should include evaluation according to awareness of the program
12. EPR laws should align with other such laws and have no negative effect on market competition
13. There should be no preemption of existing local laws
14. Disposal bans should be phased in once the recycling program is well established
15. Penalties, administrative, and agency oversight fees should be covered by producers
16. Each program should undergo an annual audit to include outcomes

[170] Data provided by NCER to EPRC at a September 17, 2025, meeting.

BACKGROUND:

PLASTICS AND PACKAGING

Executive Summary

A 2024 report from The Recycling Partnership found that Massachusetts' residential recycling rate was 27%, which includes material captured through deposit return systems.[171] In addition, 93% of single-family households in Massachusetts had access to recycling, as did 46% of multifamily households.

According to MassDEP, households that may not have access to municipal recycling programs include some apartments of a certain size (determined by the municipality); condominiums; public housing; mixed-use parcels; rooming houses; and/or residents living in municipalities without regulations on private haulers to bundle trash and recycling pickup services.[172]

While Massachusetts municipalities' aggregate annual spending on waste and recycling is not publicly available, a WGBH news piece indicated that the cost per ton of recycling processing increased from $5 in 2017 to $140 in 2020.[173] The Massachusetts Municipal Association cites recent MassDEP data in determining that there has been an 18% increase in municipal solid waste disposal and recycling processing costs between 2021 and 2024, which is likely a result of more single-stream recycling programs statewide.[174]

Extended producer responsibility (EPR) for plastics and packaging was first introduced in Europe in 1990 as a potential solution to address issues of landfill capacity and the high financial and environmental burdens of packaging waste.[175] The 1991 Packaging Ordinance introduced container deposits, required retailers to accept used packaging, and set recycling targets for producers. By 2021, most EU member states had packaging EPR systems, and a new Packaging and Packaging Waste Regulation will ensure full adoption by August 2026. The United Kingdom, Norway, Switzerland, and other non-EU countries have their own programs. Similar programs emerged in Canada; today, almost all ten Canadian provinces have implemented some form of packaging EPR.

Additionally, packaging EPR is also widely established in Australia, Brazil, Chile, China, Colombia, India, Japan, New Zealand, Peru, the Philippines, Singapore, South Africa, and South Korea.

Since 2021, seven U.S. states—Maine, Oregon, Colorado, California, Minnesota, Maryland, and Washington—have enacted EPR legislation directed at packaging. On July 1, 2025, Oregon's program was the first to officially begin. The others are expected to launch between 2026 and 2030.

Packaging and plastics EPR legislation encourage the use of sustainable packaging materials by charging lower fees for them. When companies switch from materials such as virgin plastic to recycled content, they directly reduce the carbon emissions associated with production. Improved recycling rates, another impact of EPR programs, also drive measurable emissions reductions.[176]

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[171] *Ibid.*
[172] Commonwealth of Massachusetts, Department of Environmental Protection, Implementing Mandatory Recycling and Private Hauler Regulations, accessed August 25, 2025, from https://www.mass.gov/lists/implementing-mandatory-recycling-private-hauler-regulations.
[173] LeMoult, Craig, "The cost of recycling hits budgets in Massachusetts cities and towns, WGBH, March 9, 2020, accessed August 26, 2025, from https://www.wgbh.org/news/local/2020-03-09/the-cost-of-recycling-hits-budgets-in-massachusetts-cities-and-towns.
[174] Massachusetts Municipal Association, testimony, "MMA asks Environment and Natural Resources Committee to support bills to encourage recycling and reduce plastics pollution," May 29, 2025, accessed August 26, 2025, from https://www.mma.org/advocacy/mma-asks-environment-and-natural-resources-committee-to-support-bills-to-encourage-recycling-and-reduce-plastics-pollution/.
[175] *Ibid.*
[176] *Ibid.*

Background: The Problem

Americans generate roughly 96 million tons of packaging waste annually—made primarily from plastic, paper, glass, and metal—yet only 39% is currently recycled.[177] When it comes to plastic, that number is as low as 6%.[178]

Although the U.S. has more than 5,800 facilities that recover packaging material waste, 40% of households still do not have recycling services that match the convenience and quality of their trash collection.[179] Even where services are available, differences in accepted materials create confusion for residents about what can and cannot be recycled.

At the same time, the cost of operating municipal recycling systems has skyrocketed as markets for recycled materials have shifted due to changing international policies. Local governments currently bear significant costs for managing packaging waste, highlighting the pressing need for policies that can alleviate this strain.

Recycling rate of plastics and packaging in Massachusetts

Based on data from the MassDEP, residents generate approximately 4.3 million tons of municipal solid waste each year.[180] While Massachusetts-specific figures are not available, containers and packaging have historically made up the largest share of U.S. municipal solid waste, accounting for 28.1% in 2018 and 30% in 2012, according to the EPA.[181]

Massachusetts is a net exporter of waste for disposal, sending more waste out of state for disposal than it imports.[182]

Table 14 compares the residential recycling rate by commodity in Northeastern states.

[177] U.S. Environmental Protection Agency, An Assessment of the U.S. Recycling System: Financial Estimates to Modernize Material Recovery Infrastructure, August 2024, from https://www.epa.gov/system/files/documents/2024-12/financial_assessment_of_us_recycling_system_infrastructure.pdf.
[178] Packaging Dive, 9 Stats about US packaging recycling, Jan. 24, 2025, from https://www.packagingdive.com/news/epa-packaging-materials-recycling-infrastructure-data/738151/.
[179] U.S. Environmental Protection Agency, n 1.
[180] Commonwealth of Massachusetts, Department of Environmental Protection, 2021 Solid Waste Data Update, June 2023, from https://www.mass.gov/doc/2021-solid-waste-data-update/download.
[181] U.S. Environmental Protection Agency, Containers and Packaging: Product-Specific Data, accessed Sept. 2025, from https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/containers-and-packaging-product-specific#:~:text=Containers%20and%20packaging%20make%20up,beverages%2C%20medications%20and%20cosmetic%20products.
[182] Commonwealth of Massachusetts, n 4.

Table 14. — Residential recycling rate by commodity in the Northeast United States.[183]

Commodity	MA	CT	ME	NH	RI	NH	NY	NJ	PA
Carboard	37%	38%	24%	29%	**41%**	29%	35%	37%	33%
Mixed paper	28%	28%	18%	21%	**30%**	21%	26%	27%	23%
Aseptic and gabletop	4%	14%	6%	4%	**16%**	4%	11%	7%	6%
Glass container	41%	46%	**60%**	20%	31%	20%	57%	28%	21%
Steel can	23%	23%	15%	17%	**25%**	17%	22%	23%	21%
Aluminum can	35%	49%	**82%**	19%	27%	19%	61%	25%	23%
PET bottle	34%	47%	**65%**	18%	26%	18%	59%	24%	21%
Non-bottle PET	11%	12%	7%	9%	**14%**	9%	10%	10%	7%
HDPE natural	30%	31%	18%	22%	**33%**	22%	29%	30%	27%
HDPE colored	27%	27%	16%	20%	**29%**	20%	25%	27%	24%
Polypropylene	12%	12%	6%	7%	**13%**	7%	10%	7%	6%
Plastic nos. 3, 4, 6, 7	1%	2%	2%	2%	0.1%	2%	1%	0.4%	1%
Bulky rigid plastic	0.4%	1%	1%	0.4%	0%	0.4%	**7%**	0.2%	0.1%

Bold indicates highest rate per commodity category

Access to recycling in Massachusetts

A 2024 report from The Recycling Partnership found that Massachusetts' residential recycling rate was 27%, which includes material captured through deposit return systems.[184] In addition, 93% of single-family households in Massachusetts had access to recycling, as did 46% of multifamily households.

According to MassDEP, households that may not have access to municipal recycling programs include some apartments of a certain size (determined by the municipality); condominiums; public housing; mixed-use parcels; rooming houses; and/or residents living in municipalities without regulations on private haulers to bundle trash and recycling pickup services.[185]

Some Massachusetts towns have 100% subscription "washed hands" programs, meaning the municipality does not offer solid waste service or recycling. Of 36 municipalities with subscription programs in Massachusetts, 16 have private hauler regulations (PHRs) that mandate bundled trash and recycling services. This accounts for 56,101 households. The remaining 20 "washed-hands" municipalities without PHRs represent 13,728 households. Among these municipalities, recycling access is unclear.[186]

[183] The Recycling Partnership, State of Recycling: The Present and Future of Residential Recycling in the U.S., 2024, from https://recyclingpartnership.org/wp-content/uploads/dlm_uploads/2024/05/SORR_Methodology-1-1.pdf.
[184] *Ibid.*
[185] Commonwealth of Massachusetts, Department of Environmental Protection, Implementing Mandatory Recycling and Private Hauler Regulations, accessed August 25, 2025, from https://www.mass.gov/lists/implementing-mandatory-recycling-private-hauler-regulations.
[186] *Ibid.*; additional data from MassDEP Hazardous and Solid Waste staff.

Municipal costs of recycling in Massachusetts

While Massachusetts municipalities' aggregate annual spending on waste and recycling is not publicly available, a WGBH news piece indicated that the cost per ton of recycling processing increased from $5 in 2017 to $140 in 2020.[187] The Massachusetts Municipal Association cites recent MassDEP data in determining that there has been an 18% increase in municipal solid waste disposal and recycling processing costs between 2021 and 2024, which is likely a result of more single-stream recycling programs statewide.[188]

[187] LeMoult, Craig, "The cost of recycling hits budgets in Massachusetts cities and towns, WGBH, March 9, 2020, accessed August 26, 2025, from https://www.wgbh.org/news/local/2020-03-09/the-cost-of-recycling-hits-budgets-in-massachusetts-cities-and-towns.
[188] Massachusetts Municipal Association, testimony, "MMA asks Environment and Natural Resources Committee to support bills to encourage recycling and reduce plastics pollution," May 29, 2025, accessed August 26, 2025, from https://www.mma.org/advocacy/mma-asks-environment-and-natural-resources-committee-to-support-bills-to-encourage-recycling-and-reduce-plastics-pollution/.

Plastics and packaging EPR as a possible solution

EPR for packaging is a policy framework that transfers the financial and operational responsibility for managing packaging waste from taxpayers and local governments to the producers who create and sell packaged products. EPR laws also create an extensive network of holding accountable all those involved in managing consumer products and packaging, including recyclers, local governments, and state oversight agencies. This approach seeks to increase waste reduction, recycling, and composting, and foster sustainable packaging design. By making producers accountable for the full lifecycle of their packaging, EPR incentivizes innovations in material selection, waste reduction, and the creation of more effective recycling systems.[189]

History of packaging EPR

Extended producer responsibility first gained traction in Europe, with packaging as an initial focus.[190] The idea—producers being held responsible for the post-consumer management of their products and packaging—was introduced in 1990 by Swedish professor Thomas Lindhqvist. With mounting concern over landfill capacity and the high environmental and fiscal burdens of packaging waste, German policymakers felt compelled to put theory into practice. The 1991 Packaging Ordinance introduced container deposits, required retailers to accept used packaging, and set recycling targets for producers. EPR policies quickly spread across Europe. By 2021, most EU member states had packaging EPR systems, and a new Packaging and Packaging Waste Regulation will ensure full adoption by August 2026. The United Kingdom, Norway, Switzerland, and other non-EU countries have their own programs.

As European producer responsibility systems were evolving, similar waste management dynamics began to unfold in Canada.[191] British Columbia led the way, becoming the first jurisdiction in North America to implement a full EPR program for packaging and printed paper in 2014. Over its first ten years, Recycle BC collected nearly two million tons of packaging and paper, invested more than $1 billion from producers, achieved higher than 98% plastic recycling rates, expanded access to cover 99% of residents, and ensured that 73% of recycled materials stayed in North America.[192] Today, almost all ten of Canada's provinces have implemented some form of packaging EPR.

In addition to Europe and Canada, packaging EPR is also widely established in Australia, Brazil, Chile, China, Colombia, India, Japan, New Zealand, Peru, the Philippines, Singapore, South Africa, and South Korea.

Packaging EPR laws in the U.S. today

Since 2021, seven U.S. states—Maine, Oregon, Colorado, California, Minnesota, Maryland, and Washington—have enacted EPR legislation directed at packaging. Taking population into account, one in five Americans now live in a state with EPR for packaging.

Maine was the first state to adopt EPR for packaging in July 2021, amended in 2025. Oregon followed in August of 2021, Colorado and California in 2022, Minnesota in 2024, and Maryland and Washington in 2025. Another seven states introduced packaging EPR legislation in 2025 (Figure 14).

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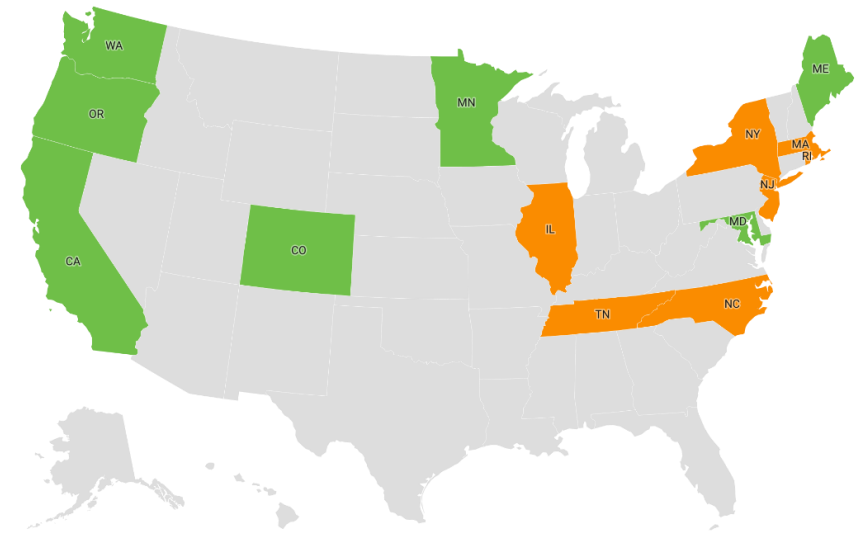
[189] Cassel, Scott, "Perspectives on Product Stewardship: Navigating an Extended Producer Responsibility Path to a Circular Economy," 2023, Bernan Press.
[190] *Ibid.*
[191] Product Stewardship Institute, Extended Producer Responsibility for Packaging and Paper Products: Policies, Practices, and Performance, September 2020, from https://productstewardship.us/wp-content/uploads/2022/11/PSI_EPR_for_PPP.pdf.
[192] Recycle BC, Program Overview and Impact, May 2024, from https://recyclebc.ca/wp-content/uploads/2024/05/2024_10YearsofImpactOverview.pdf.

Oregon's program officially began on July 1, 2025. The others are expected to launch between 2026 and 2030. In the meantime, there are several program deadlines that stakeholders will be following, including rulemaking, producer registration and reporting, and submission and approval of program plans.

Figure 14. — State packaging EPR laws and 2025 bills.



This map shows EPR laws and bills that create a new program. Bills amending existing EPR programs are not represented.

Table 15. — U.S. packaging EPR laws.

State	Bill #	Year	Amended	Implementation	Program
Maine	LD 1541	2021	LD 1423 (2025)	2026	Link
Oregon	SB 582	2021	n/a	2025	Link
Colorado	HB 1355	2022	n/a	2026	Link
California	SB 54	2022	n/a	2027	Link
Minnesota	HF 3911	2024	n/a	2029	Link
Maryland	SB 901	2025	n/a	2029	Link
Washington	SB 5284	2025	n/a	2030	Link

How packaging EPR laws work

Each of the seven states with packaging EPR laws have somewhat different approaches. That said, the three most recent laws—in Minnesota, Maryland, and Washington—have more in common than the four that came before, such as industry proposed performance targets and phased funding of the system (Table 16).

Table 16. — U.S. packaging EPR laws comparison across states.

	ME	OR	CO	CA	MN	MD	WA
Packaging covered	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Paper products covered	No	Yes	Yes	No	Yes	Yes	Yes
Food serviceware	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Multiple PRO possible	No	Yes	After 2028	After 2030	After 2031	After 2033	After 2035
Producer funds system	100%	28%	100%	100%	Phased	Phased	Phased
Eco-modulated fees	Regs.	PRO proposes	PRO proposes	PRO proposes	PRO proposes	PRO proposes	PRO proposes
Performance targets	Regs.	Statute	PRO develops	Statute	PRO proposes	PRO proposes	PRO proposes

Covered materials

All seven states regulate packaging and food serviceware (e.g., cups, lids, straws, utensils). Early EPR states like California and Oregon treated food serviceware as a distinct category separate from packaging. More recently, states have incorporated food serviceware into the definition of packaging. Five states also include paper products, generally defined to include magazines, flyers, brochures, booklets, catalogs, and other printed paper.

With respect to packaging types, all states cover both primary and secondary packaging, while tertiary packaging—used to protect goods during transport—is often excluded except in the context of e-commerce (see Table 17 for descriptions and examples of packaging types). Each state's program applies to packaging intended for consumer use; business-to-business packaging is generally excluded unless the material is ultimately distributed to end consumers. Compostable packaging is covered under every program, while two states provide exemptions for reusable and refillable packaging.

Other exemptions generally fall into the following categories: small producers; federally regulated products (e.g., medical food, infant formula, drugs, animal medicine, pesticides); and products already managed under an EPR or deposit return system (e.g., architectural paint, beverage containers).

Table 17. — Types of packaging.

Packaging type	Description	Example
Primary packaging	Sales packaging most closely containing the product.	Plastic sleeve/film on the smartphone screen or the tray that holds the phone inside the box.
Secondary packaging	Grouped packaging intended to bundle, sell in bulk, brand, or display the product.	Smartphone box with printed branding, technical specs, and contents.
Tertiary packaging	Transport packaging protecting the product during transport.	E-commerce shipping box, possibly with protective air pillows or paper inside.

Producer responsibility organization (PRO)

The "producer" is typically defined as the brand owner of a product sold in the state, or if that entity is outside the U.S., the importer or first seller. If neither applies, responsibility shifts to the retailer or distributor.

In states with packaging EPR laws, producers generally fulfill their obligations by joining a PRO, a nonprofit entity approved by the state to operate the program on their behalf. The PRO collects fees from participating producers, which are typically based on the weight, material type, and recyclability of packaging, and uses those funds to reimburse municipalities for eligible recycling system costs, contract with service providers, and invest in infrastructure, education, and outreach.

The PRO is responsible for developing a stewardship plan, typically informed by input from an advisory council representing stakeholders across the value chain—waste haulers, local governments, retailers, environmental groups, recycling facilities, and manufacturers of goods from recycled products. This plan must be submitted to the state agency for approval, which also oversees audits and enforces penalties for noncompliance. In addition, the PRO is required to submit annual reports detailing packaging placed on the market, materials collected, and progress toward statutory goals for recycling, reuse, and source reduction. Although producers technically have the option to comply individually, in practice the PRO functions as the primary vehicle for meeting obligations and coordinating program activities. While most states authorize the creation of multiple PROs, they generally designate a single organization to launch the program.

Circular Action Alliance (CAA) is the PRO selected to implement packaging EPR laws in four states: Oregon, Colorado, California, and Minnesota. CAA was founded in 2022 by companies in the food, beverage, and consumer goods industries to manage EPR compliance with these emerging laws.

Collection convenience

Packaging EPR programs are designed to ensure that all residents have reasonable and equitable access to recycling services for covered packaging. Programs must provide convenient collection options through curbside pickup or drop-off locations that serve both urban and rural areas, with several states emphasizing access for underserved communities. EPR programs also help reduce consumer confusion by requiring a statewide list of items deemed recyclable. These lists identify which types of packaging materials—such as paper, cardboard, plastics, metals, glass—are eligible for collection and recycling under the program.

Performance standards

Performance standards are designed to gauge the success and progress of the EPR program and may be established through legislation, rulemaking, or proposed in the PRO stewardship plan. Performance targets for packaging generally focus on waste reduction, recycling rate, and recycled content. For example, California law mandates that by 2032, all single-use packaging and plastic food serviceware must be recyclable or compostable, achieve a 65% recycling rate, and be reduced by 25% compared to 2023 levels.

Colorado's performance targets were informed by a needs assessment conducted by the Circular Action Alliance, which evaluated statewide recycling systems, existing infrastructure, services, and costs, and identified opportunities to help the state achieve its waste diversion goals.[193] Based on this report, the legislature approved the "medium scenario," a recycling system projected to increase paper and packaging recycling rates from 25% to a high-end estimate of 58% by 2035, while expanding curbside recycling at no cost to residents or the state.

Potential impacts of plastics and packaging EPR

Resource Recycling Systems Inc. (RRS), a consulting firm that specializes in waste minimization, conducted a study for the Oregon Recycling Steering Committee in 2020 investigating the impact of EPR packaging programs on recycling rates in Europe and Canada. In every jurisdiction with available data, recycling rates increased after the implementation of an EPR program.[194] In its memo on this topic, RRS noted that comparing data before and after EPR implementation can be difficult due to differences in data sources, quality, and reporting methods, and that it's even harder to compare recycling rates between different jurisdictions. Therefore, the data is most useful for comparing a single jurisdiction's performance over time rather than comparing it to another's.

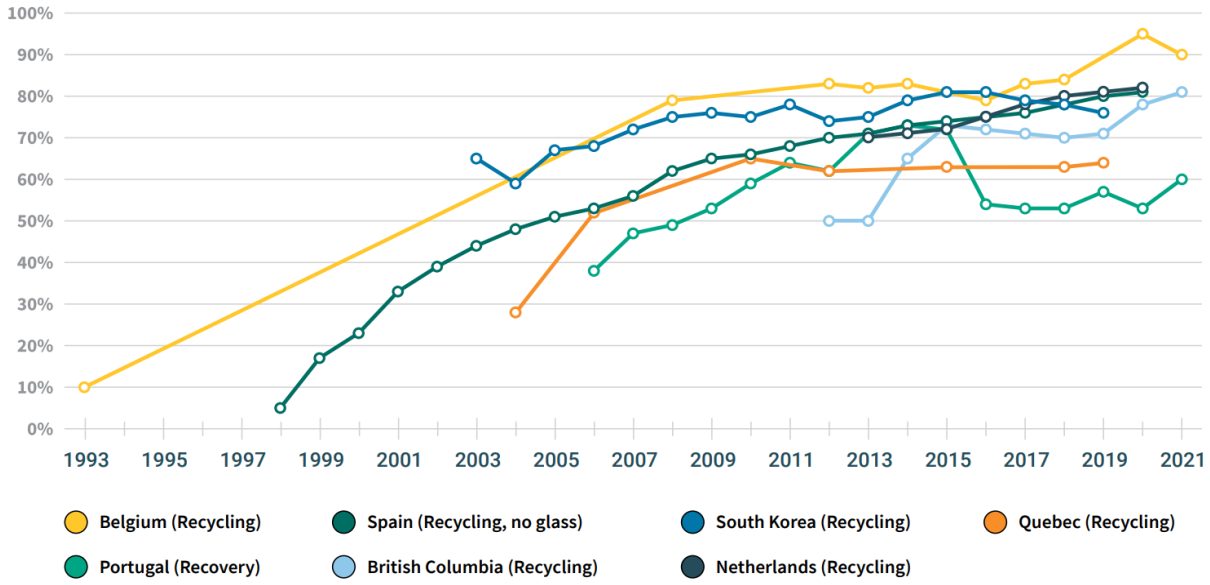
National Waste & Recycling Association (NWRA), a private-sector waste and recycling services industry representative, commissioned international environmental consulting firm Eunomia to conduct a study on packaging EPR. In its analysis of the most established packaging EPR programs in the European Union (EU)—Germany, France, and Italy—Eunomia found that recycling rates have increased in all three countries since EPR was introduced. Specifically, Germany's packaging recycling rate increased from 37.7% in 1991 to 76.2% in 2016. They also found that one of the drivers for increasing recycling rates in the EU was material-specific targets implemented through the Packaging and Packaging Waste Directive.[195,196]

Most recently, The Recycling Partnership, a national nonprofit funded by numerous consumer brand manufacturers, released a report in 2023 that analyzed seven jurisdictions with EPR packaging programs: British Columbia, Quebec, Belgium, Spain, Portugal, the Netherlands, and South Korea. Five of these seven reached a recycling rate of more than 75% within the last five years (see Figure 15). Belgium is a top performer, with a 95% recycling rate in 2020. In North America, British Columbia leads with an 81% recycling rate in 2021. The outcomes varied based on factors such as program start date, prior systems, and the scope

[193] Circular Action Alliance, Colorado Needs Assessment, Jan. 2025, from https://static1.squarespace.com/static/64260ed078c36925b1cf3385/t/6799420fed5d6f0caf9b978f/1743456731209/Needs+Assessment+Full+Report+2025.pdf.
[194] Oregon Department of Environmental Quality, "Recycling Rates in States with EPR," accessed August 26, 2025, from https://www.oregon.gov/deq/recycling/Documents/rscRRSrates.pdf.
[195] National Waste & Recycling Association, "Extended Producer Responsibility for Packaging: Elements and Outcomes," (undated), accessed August 26, 2025, from https://wasterecycling.org/wp-content/uploads/2022/03/NWRA-report-v3-Final-Issued-.pdf.
[196] The EU's Packaging and Packaging Waste Directive was enacted on February 11, 2025, and will go into effect in August 2026. The directive aims to prevent and reduce packaging waste, including through more reuse and refill systems; make all packaging on the EU market recyclable in an economically viable way by 2030; safely increase the use of recycled plastics in packaging; and decrease the use of virgin materials in packaging and put the sector on track to climate neutrality by 2050. Accessed August 26, 2025, from https://environment.ec.europa.eu/topics/waste-and-recycling/packaging-waste_en.

of materials collected, with some programs handling only packaging while others, such as Canada's, also including paper.[197]

Figure 15. — EPR for packaging recycling rates across international jurisdictions.[198]



EPR programs have also significantly improved individual material recycling rates. In Belgium, the plastic recycling rate rose from 38% in 2012 to 52% in 2021. Spain's plastic container recycling rate saw an increase from 17% in 2002 to 75.8% in 2018. In Quebec, a comparatively weaker program, paper and cardboard recycling rate climbed from 56% to 72% after the implementation of the EPR system.[199]

The Recycling Partnership report also argued that the reason EPR programs raise recycling rates is that they fill four gaps in recycling programs that can cause them to fall short:[200]

1. **Access and participation.** EPR shifts the financial responsibility for recycling from taxpayers to the producers of products. This funding ensures a more robust and equitable recycling system. In regions with EPR programs, including British Columbia, Quebec, Spain, and Belgium, 98–99% of residents have access to recycling services. This is a significant improvement over the U.S., where 40% of households lack equitable access to recycling. EPR-funded programs also see much higher participation rates: in Quebec and British Columbia, 97% and 99% of residents who can recycle do so all or most of the time. This is in stark contrast to the overall U.S. household participation rate of 72%.[201]

2. **Infrastructure.** Under EPR, producers must invest in recycling infrastructure to meet performance standards. This contrasts with traditional recycling programs, which are often hindered by limited budgets, consumer unwillingness to pay, and unstable markets for recycled materials. By shifting

[197] The Recycling Partnership, "EPR Policy Report," page 8, accessed August 26, 2025, from https://recyclingpartnership.org/wp-content/uploads/dlm_uploads/2023/02/Recycling-Partnership-EPR-Policy-Report-final.pdf.
[198] *Ibid.*
[199] *Ibid.*
[200] This finding is echoed in the RRS memo on impact of EPR on recycling rates.
[201] The Recycling Partnership, "EPR Policy Report," p. 5.

financial responsibility to producers, EPR encourages long-term investment in a more efficient recycling system.[202]

3. **Education.** Funding for recycling education in the U.S. is often limited, relying on municipal efforts, grants, and nonprofits. A 2019 survey found that average spending on education was just $0.95 per household per year, with less than half of communities having dedicated budgets. In contrast, EPR programs provide significantly more funding for recycling education. For example, in 2021, British Columbia's EPR program, RecycleBC, spent $1.54 per household, which is more than five times what Connecticut's RecycleCT spent in 2019 ($0.31 per household).[203]

4. **Market stability.** EPR programs ensure recycling rates remain stable even during market downturns, such as during China's 2018–2020 "National Sword" policy that prohibited recyclables from Western countries from entering the country.[204] While many U.S. recycling programs suffered and even shut down due to low material values, EPR programs continued to improve recycling rates. This is because EPR shifts the financial burden from local governments and private facilities to producers, who are required to meet recycling performance goals regardless of market fluctuations. Essentially, EPR provides a stable funding source that insulates the recycling system from the unpredictable market for recycled materials.

While EPR packaging programs focus on waste reduction, they are also a powerful tool for achieving carbon reduction goals due to their impact on Scope 3 greenhouse gas emissions, which are indirect emissions from a company's value chain.[205]
EPR laws encourage the use of sustainable packaging materials by charging lower fees for them. When companies switch from materials like virgin plastic to recycled content, they directly reduce the carbon emissions associated with production. Improved recycling rates, another impact of EPR programs, also drive measurable emissions reductions.[206]

According to Eunomia's report for the NWRA, France introduced eco-modulation to support design for recyclability, and its recycling rate has steadily increased since it was introduced compared to Germany's; however, Italy's rate has increased by more than France's without eco-modulation. Eunomia thus claims that there is no definitive data that shows that EPR results in increased design-for-recycling of packaging.[207]

The data needed for EPR compliance—such as material type and weight—is the same data needed to report on Scope 3 emissions. By collecting this information for EPR, companies can more easily and accurately report on their carbon footprints.[208]

A primary concern raised about EPR packaging programs is the impact on consumers, primarily through an increase in the prices of goods using packaging covered by the program. A study often cited to support these concerns was authored by Calvin Lakhan, Faculty of Environment and Urban Change at York University, originally in 2019, and most recently updated in 2025. "Modeling direct and total economic impacts resulting from the adoption of Extended Producer Responsibility in New York State" aimed to understand the

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[202] *Ibid.*, p. 6.
[203] *Ibid.*
[204] Upadhyaya, Nidhi, "Recycling is going to waste!" Atlantic Council EnergySource, August 28, 2019, accessed August 26, 2025, from https://www.atlanticcouncil.org/blogs/energysource/recycling-is-going-to-waste/.
[205] CEMA Systems, "Why EPR is Trending: The Intersection of Circular Economy, Climate Action, and Waste Reduction Mandates," accessed August 26, 2025, from https://www.portal.cemasys.com/post/why-epr-is-trending-the-intersection-of-circular-economy-climate-action-and-waste-reduction-mandates.
[206] *Ibid.*
[207] NWRA report, p. 6.
[208] *Ibid.*

relationship between producer responsibility fees and the impact to the New York State economy.[209] The study modeled a scenario intended to estimate the economic impact of proposed EPR packaging legislation on consumers.

Lakhan's study estimates that an EPR packaging program in New York State would place a direct financial burden of about $1.2 billion annually on producers.[210] Lakhan uses the assumption, based on studies conducted by Thomas C. Kinnaman, et al., in 2020, that 80% of these direct costs will be passed onto the consumer.[211] Lakhan details the increase in prices that products with different types of packaging would experience, and estimates the total price impact on a "basket of goods" to range from 4.25% to 6.75%.[212] He identifies the following five impacts on consumers due to this cost increase:

1. **Higher prices for single-use products.** Single-serve and individually packaged products will become more expensive, disproportionately affecting lower-income consumers who often buy smaller sizes.

2. **Packaging reformulation.** To lower costs, producers may switch to cheaper, more recyclable materials, like switching from plastic pouches to paperboard cartons.

3. **Bulk savings.** Larger, bulk-sized products will be a better value, encouraging those who can afford it to buy more at once.

4. **Disparate impacts on products.** Products that heavily use plastic, like dairy and cleaning supplies, will see greater price increases, while those in aluminum cans or cardboard boxes will be less affected.

5. **Inequitable burden.** Low-income households will be disproportionately impacted as they often buy pre-packaged foods that use harder-to-recycle materials.

There are several common criticisms of Lakhan's research, many of which revolve around a lack of citations and references. The Recycling Partnership, in a response to Lakhan's original paper, wrote the following:

> Studies citing consumer surveys, average grocery costs for families, increased consumer price indexes in EPR jurisdictions, assumptions of business practices, and assumptions about the elasticity and pricing of goods lack any supporting references. Key datasets and assumptions used in the New York state EPR for packaging white paper are missing, making it impossible to check the calculations from the study.[213]

The Recycling Partnership also claims the paper uses "a mixture of proxy and out-of-date data" for calculations on producer costs and fails to take positive economic impacts into account in the input-output analysis.[214]

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[209] Lakhan, Calvin, "Modeling direct and total economic impacts resulting from the adoption of Extended Producer Responsibility in New York State," accessed August 26, 2025, from https://www.bcnys.org/sites/default/files/2025-03/EPR%20Study%20New%20York%202025%20FINAL%20030425.pdf
[210] *Ibid.*
[211] Unable to find the study referenced in Lakhan's paper.
[212] Lakhan, "Modeling direct and total economic impacts," 18. It is not clear how this range is calculated.
[213] The Recycling Partnership, "Extended Producer Responsibility: Responding to Claims About the Impact on Consumer Price," p. 2, accessed August 26, 2025, from https://drive.google.com/file/d/1GcfT3I4NOAwzpFbjaM2c-Bt3ONOvYIC_/view.
[214] *Ibid.*

Other organizations have conducted studies on packaging EPR's impact to consumers, including from RRS in 2020 and Columbia University Professor Satyajit Bose in 2022. RRS conducted a study examining the prices of consumer goods in jurisdictions with and without EPR packaging programs.[215] The team conducted a virtual shopping study, comparing product costs in Canadian provinces with and without these policies. Ultimately, they found no clear link between product prices and the presence of EPR policies.[216]

Satyajit Bose, Professor of Practice and Associate Director of the Sustainability Management Program at Columbia University, conducted a study analyzing the potential impact of a nationwide EPR program on consumer prices, specifically for groceries.[217] He estimated the maximum increase in a typical U.S. household's monthly grocery bill would be about $4, or roughly 0.69% of their total monthly grocery spending. This estimate assumes a worst-case scenario where EPR costs double a product's packaging cost. Given that a typical household's grocery bill can fluctuate by much more than this due to inflation, Bose notes that this change would be difficult to notice.

Small businesses

One concern about EPR packaging legislation is the impact on small businesses for whom compliance may be a burden. Each piece of EPR packaging legislation passed in the U.S. so far addresses this concern differently. Table 18 summarizes exemptions granted to small businesses.

Table 18. — U.S. EPR packaging laws' small-business exclusion thresholds.

State	Revenue threshold	Weight of covered material sold into state	Notes
Maine[218]	$5 million gross revenue	1 ton	Threshold decreases to $2 million after three years
Oregon[219]	$5 million gross revenue	1 metric ton	Metric ton = 2,204 lbs
Colorado[220]	$5 million gross revenue	1 ton	
California[221]	$1 million sales into state	n/a	Currently no exemption for small producers regarding 2032 law for all packaging to be recyclable or compostable
Minnesota[222]	$2 million global revenue	1 ton	
Maryland[223]	$2 million global	1 ton	

[215] Oregon Department of Environmental Quality, "Recycling Rates in States with EPR."
[216] *Ibid.*
[217] Bose, Satyajit, "Economic impacts to consumers from extended producer responsibility (EPR) regulation in the consumer packaged goods sector," July 21, 2022, accessed August 26, 2025, from https://academiccommons.columbia.edu/doi/10.7916/n2af-vv87.
[218] 38 Me. Rev. Stat. Ann. §2146(2).
[219] 36A Or. Rev. Stat. § 459A.863(32); § 459A.872.
[220] Colo. Rev. Stat. § 25-17-713.
[221] Cal. Pub. Res. Code § 42060(a)(5); Cal. Code Regs. tit. 14, § 18980.5.2 (proposed July 2025), https://www2.calrecycle.ca.gov/Docs/Web/130779.
[222] Minn. Stat. § 115A.1441, subd. 13, 26(b)
[223] Md. Code, Env't § 9–2501(j) & (p)(2), https://mgaleg.maryland.gov/2025RS/bills/sb/sb0901E.pdf.

State	Revenue threshold	Weight of covered material sold into state	Notes
	revenue		
Washington[224]	$5 million global revenue $5 million in state for agriculture	1 ton	Threshold will be adjusted for inflation beginning in 2031

Haulers and recyclers

The changes EPR for packaging would make to the waste system would impact waste haulers and recyclers as well. An article published in 2020 by RRS highlights some of the conflicting opinions from waste haulers and recyclers.[225] Their concerns largely revolve around a potential loss of control over local decision-making. Many waste haulers work to develop personal relationships with customers to understand their specific needs, which could be disrupted in a system that relies on a PRO to manage the entire process. There are also benefits to this legislation for these entities. EPR could improve equity and access to collection services, benefiting rural recycling systems and providing financial support for the long-distance transportation to end-markets often required in rural areas. EPR could also increase contamination-reduction efforts, increase quality and reduce sorting costs, and provide a stable flow of financial support into the market.[226]

Ten benefits of packaging EPR for Massachusetts

Packaging EPR offers Massachusetts a range of economic, environmental, and community benefits, including:

1. **Cost savings.** Shifting more financial and operational responsibility to producers will provide meaningful financial relief for cities and towns.
2. **Efficiency.** Creates more consistent, convenient, and comprehensive recycling programs across the Commonwealth.
3. **Clarity.** Standardized education and accepted materials reduce confusion over what can and cannot be recycled.
4. **Stability.** Dedicated funding and systemwide coordination reduce the impact of market fluctuations on recycling systems.
5. **Infrastructure improvements.** Producer funding can modernize recycling systems, expand technology, increase access, and upgrade facilities.
6. **Innovation.** Companies are incentivized to design packaging that is easier to recycle, reuse, or compost.
7. **Environmental protection.** Reduces litter, plastic pollution, and associated environmental impacts.
8. **Waste diversion.** Diverting waste by increased reduction, reuse, recycling, and composting reduces the costs and impacts of in-state and out of state disposal.
9. **Climate progress.** Supports Massachusetts' waste reduction and climate goals.
10. **Economic development.** Expands markets for recycled and composted materials and creates new job opportunities and economic development in recycling and composting.

[224] Rev. Code Wash. § 70A.102(16), (29)(b), https://lawfilesext.leg.wa.gov/biennium/2025-26/Pdf/Bills/Session%20Laws/Senate/5284-S2.sl.pdf.
[225] Colin Staub, "Recycling operators sound off on packaging EPR," Resource Recycling, December 22, 2020, https://resource-recycling.com/recycling/2020/12/22/recycling-operators-sound-off-on-packaging-epr/.
[226] *Ibid.*

Legislation and policy considerations

2025 state legislation

State lawmakers across the U.S. introduced more than 148 EPR bills in 2025, with packaging remaining one of the primary areas of focus. This year at least 13 states considered 30 bills related to packaging. Four bills were enacted this session, two creating new programs in Maryland (SB 901) and Washington (SB 5284), and two amending existing laws in Maine (LD 1423) and Oregon (SB 992). Seven bills—in Massachusetts, New Jersey, and North Carolina—are currently pending. Fourteen bills—in Hawaii, Illinois, Minnesota, New York, Tennessee, and Washington—will carry over to 2026.

Policy consideration

Over the past 25 years, through extensive stakeholder engagement, PSI developed 16 essential elements of EPR that serve as a framework for developing legislation, analyzing existing laws, and guiding implementation.[227] These elements apply across product categories, including packaging. Table 19 below contains policy considerations for packaging EPR as they relate to each element.

Table 19. — PSI's 16 elements of packaging EPR.

Element	Description	Policy considerations
1. Covered materials	Materials that are subject to the EPR program	Packaging (including food serviceware) and paper products sold or distributed into the state
2. Covered entities	Stakeholders that may use the EPR program (receive free recycling services)	Single and multi-family residences, and some non-residential locations (schools, public buildings, hospitality, etc.)
3. Collection and convenience	Minimum level of collection convenience that a program plan must provide to covered entities	Free, convenient statewide collection that maintains and expands on current system; recycling "as convenient as trash" and available to covered entities
4. Responsible party	Defines who is responsible for funding and managing the EPR program	Tiered hierarchy including brand owner, manufacturer/licensee, and first importer into the state
5. Governance	Defines roles for producer responsibility organization (PRO), advisory council, and state oversight	One PRO to start; option to add additional PRO after first program cycle; option for independent producer plan; multi-stakeholder advisory council
6. Funding inputs	How funding enters the EPR system	Producer fees based on material type, weight, and cost to manage with adjustments made for eco-modulation
7. Funding allocation	How EPR program funds are spent	Full responsibility (traditional EPR): 100% net cost of recycling (including collection, transportation, processing, education, agency costs); needs assessment often funded by PRO
8. Design for environment	Provisions beyond eco-modulated fees that minimize environmental and health impacts of covered materials	PRO fee structure incentivizes environmental design (e.g., toxics reduction, source reduction, PCR content, etc.)

[227] Product Stewardship Institute, n 15.

Element	Description	Policy considerations
9. Performance standards	Requirements and metrics to gauge the success and progress of the EPR program	Specific performance targets set in program plan and informed by needs assessment
10. Outreach and education	Provisions to ensure that consumers, retailers, and other key stakeholders are informed about the EPR program	PRO funds and implements statewide consistent outreach and education campaigns for wide reach; evaluated in annual reports
11. Equity and environmental justice (EJ)	Components that encourage equitable and just practices	Equity studies to identify how to improve access in underserved communities; advisory board representation by EJ organization; living wages; workplace conditions study and/or requirement
12. Enforcement and penalties for violation	Measures to ensure compliance with the EPR law and penalties for non-compliance	PRO responsible for ensuring producers are compliant; state enforces compliance and issues penalties for non-compliant producers
13. Stewardship plan contents	Minimum components of a stewardship plan describing how responsible parties will implement the EPR program	Participating producers; product categories; covered entities; funding mechanism; targets; collection & convenience; education; integration with existing programs/infrastructure; compliance; reporting; closure plan; other info
14. Annual report contents	Minimum components of an annual report that responsible parties will submit to the state	Materials introduced; targets; costs; financial audit; program issues; technical assistance provided; education; advisory board consultations; non-compliant producers; proposed amendments; recommendations for material changes; other info
15. Implementation timeline	Schedule for the submission, review, and approval of program plans	Year 1 appoint PRO, advisory board, service providers register and state conduct assessment; Year 2 create statewide list, PRO submits first plan; Year 3 PRO implements approved plan, PRO covers costs and submits annual reports to state.
16. Additional components and definitions	Additional sections of the bill that do not fit in other elements and key definitions	Clear, consistent definitions

Attachment A - EPRC Recommendation Letters to Legislature

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