



Pennsylvania
Resources
Council

Act 101 and Recycling in Pennsylvania: Past, Present, and Future



Partners

[Pennsylvania Resources Council](#), a statewide nonprofit organization dedicated to the vision of a Pennsylvania where nothing is wasted, led the effort to produce this report. Penn Environment provided strategic advice.

[PennEnvironment Research and Policy Center](#) is a nonprofit organization dedicated to protecting Pennsylvania’s air, water, and open spaces. They work to protect the places we love, advance the environmental values we share, and win real results for our environment.

[Eunomia](#), an independent consultancy dedicated to helping clients achieve better environmental and commercial outcomes, researched and wrote the initial draft of this report.

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Executive Summary

Act 101 Purpose and Goals

Act 101 was signed into law in 1988, jump starting recycling, reuse, and waste reduction in Pennsylvania. The bipartisan legislation created the most extensive recycling program enacted by any state at that time. Its purpose was to:

- Establish and maintain a State and local program of planning, technical, and financial assistance for comprehensive municipal waste management;
- Encourage the development of waste reduction strategies/programming and recycling as a means of managing municipal waste, conserving resources, and supplying energy through planning, grants, and other incentives; and
- Protect the public health, safety, and welfare from the short- and long-term dangers of transportation, processing, treatment, storage, and disposal of municipal waste.

To satisfy these objectives, Act 101 established four main goals. The goals and the extent to which they have been achieved are summarized below.

Goal	Achievement of Goal
At least 25% of all municipal waste and source-separated recyclable materials generated in this Commonwealth on and after January 1, 1997, should be recycled.	Unsure. The Commonwealth does not release a yearly recycling rate as a benchmark.
The weight or volume of municipal waste generated per capita in this Commonwealth on January 1, 1997, should, to the greatest extent practicable, be less than the weight or volume of municipal waste generated per capita on the effective date of this act.	No. Waste generation has grown year after year. The per capita generation has increased from 0.79 tons per person in 1990, to 1.15 tons in 2018 a 45% increase.
Each person living or working in this Commonwealth shall be taught the economic, environmental and energy value of recycling and waste reduction and shall be encouraged through a variety of means to participate in such activities.	Partially. Education was strong after the Act was introduced but with budget cuts and changing priorities investment in education has reduced.

The Commonwealth should, to the greatest extent practicable, procure and use products and materials with recycled content and procure and use materials that are recyclable.

No. There is little evidence to demonstrate that this goal has been achieved.

Although not all the goals established in Act 101 have been achieved, the Act substantially improved recycling in Pennsylvania. As of the writing of this report, there are 1,141 curbside recycling programs and 814 drop off recycling programs in the state. In 2018 the 5.47 million tons of material recycled offset the equivalent of more than 9.2 million tons of carbon dioxide, the equivalent of removing more than 2 million vehicles off the road in one year.

Unintended Impacts of Act 101

However, the environmental landscape has changed dramatically over the years and there have been few modifications to the Commonwealth’s solid waste management system in response to this new landscape. Packaging waste streams have evolved due to an increasingly throwaway economy, a greater reliance on flexible plastics, and municipalities have moved towards single stream recycling collection. At the same time, in recent years many local and national government agencies have shifted focus from basic waste management to more ambitious goals through zero waste¹ targets and circular economy strategies. Additionally, the importance of effective waste reduction and diversion to reduce greenhouse gas (GHG) emissions continues to grow.

Over the past decade, several reviews of Act 101 found that provisions within the Act have created unintended impacts limiting Pennsylvania’s waste management and recycling system. Several are outlined here; the full report provides additional examples.

Act 101 unintentionally creates limited uniformity and coordination between municipalities. For example, municipalities mandated to provide recycling only need to collect three out of a list of eight materials. This makes it difficult to coordinate recycling messaging and education across the Commonwealth and may lead to valuable recyclable materials left out of collections.

The narrow types of funding opportunities within Act 101 pose another challenge. Act 101 currently includes only four grant categories, making it hard to fund innovative recycling activities to manage additional waste streams, such as organics² and textiles.

¹ The United States Conference of Mayors Zero Waste definition -- <https://www.usmayors.org/the-conference/resolutions/?category=b83aReso050&meeting=83rd%20Annual%20Meeting>

² When used in this report, organics or organic waste refers to material such as leaf waste, food waste and other materials that can be decomposed to make compost, not organic chemicals.

The State has made limited updates to Act 101 since 1988. Because the Act has not been regularly updated, it cannot resolve current and emerging priorities and challenges in waste and resource management, including aiming for large scale waste reduction goals and designing systems to support a circular economy.

Additional challenges hamper the Act as well, keeping the law from achieving its full potential in its 33rd year.

Landscape Analysis

This report reviews best practices in other jurisdictions to identify what measures can support the Commonwealth’s work towards zero waste and encourage a circular economy.

Policies outside of Pennsylvania as well as some started at the local level provide potential paths to improve Act 101. For example, in 2012, Vermont passed the Universal Recycling Law (Act 148) which introduced a landfill ban on various materials including paper, cardboard, aluminum, steel cans, glass bottles and jars, and plastic containers with resin codes #1 or #2 (PET and HDPE). Additionally, in the U.S., 33 states have adopted 119 producer responsibility laws, addressing 14 types of consumer products such as packaging, electronics, and paint. Several of these are outlined in our report.

In addition to policies and programs outside Pennsylvania, there are several within the Commonwealth that can be expanded or used as learning opportunities for future programming. In Philadelphia, starting October 1st, 2021, retail establishments are prohibited from providing single use plastic bags and paper bags which do not meet specific requirements. Also in 2021, Pittsburgh established a pilot program through executive order which promoted deconstruction of some blighted properties rather than removing them solely through demolition.

Recommendations

To improve and modernize Pennsylvania’s recycling system, this report puts forth a set of 15 policy recommendations. These include recommendations that can be implemented through the enforcement of existing Act 101 provisions, some that require new policy and legislation, and several more longer-term policy goals for the Commonwealth to build towards. The suite of options summarized below, if implemented, will strengthen Pennsylvania’s recycling programs and increase the rate of materials being recycled, help reduce waste, improve coordination and clarity, reduce greenhouse gas emissions, and support the creation of local jobs.

Act 101 provides a solid foundation for waste management and recycling in Pennsylvania; the first set of recommendations involves enforcing a set of existing provisions. Many of these recommendations can be completed through guidance documents or executive order.

Recommendations to improve and modernize Pennsylvania's recycling system

PROPOSED MEASURE

Enforce Existing Act 101 Provisions

1. Require additional recycling of Commonwealth agencies so they can lead by example
2. Enforce Commercial Recycling Requirements of Act 101
3. Recommit to the education component of Act 101

	IMPLEMENTATION METHOD				BENEFIT					
	Act 101 Amendment	New Legislation	Guidance Document or Directive	New Program	Increased Coordination	Improved Clarity	GHG Reduction	Increased Recycling	Better Financing	Job Creation
1. Require additional recycling of Commonwealth agencies so they can lead by example										
2. Enforce Commercial Recycling Requirements of Act 101										
3. Recommit to the education component of Act 101										

The second set of recommendations includes new policy and program options, some of which may require new legislation. These new policies and programs seek to resolve many of the unintended negative impacts of Act 101, to address antiquities in the law, and to create a recycling framework which can meet the current challenges in the consumer and recycling marketplaces.

Recommendations to improve and modernize Pennsylvania's recycling system

PROPOSED MEASURE Priority New Policy and Program Options	IMPLEMENTATION METHOD				BENEFIT					
	Act 101 Amendment	New Legislation	Guidance Document or Directive	New Program	Increased Coordination	Improved Clarity	GHG Reduction	Increased Recycling	Better Financing	Job Creation
4. Develop and publish success metrics on Pennsylvania's recycling program										
5. Streamline data reporting process for recycling collection to once per year										
6. Establish reporting requirements under material recovery facility to obtain both inbound and outbound materials										
7. Establish a standard set of materials to be collected by recycling programs to ensure uniformity of the materials collected										
8. Increase incentives for intergovernmental agreements to promote coordination between municipalities										
9. Create additional incentives for organic waste programs as organics makes up the largest share of the waste stream										
10. Increase grant categories to allow for more innovative programming										
11. Promote "reduce" and "reuse" for materials such as single use plastics and construction & demolition waste										
12. Enact a landfill ban for select materials or require disposal facilities to pre sort key materials										

The final set of recommendations provides a path towards new waste reduction policies.

Recommendations to improve and modernize Pennsylvania's recycling system

PROPOSED MEASURE

Future Vision for New Legislation

PROPOSED MEASURE	IMPLEMENTATION METHOD				BENEFIT					
	Act 101 Amendment	New Legislation	Guidance Document or Directive	New Program	Increased Coordination	Improved Clarity	GHG Reduction	Increased Recycling	Better Financing	Job Creation
13. Develop right to repair regulation so residents have access to the needed information, tools, and third party services for repairs										
14. Develop a deposit return system for beverages based on best in class principles										
15. Develop extended producer responsibility legislation for packaging and other materials										

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List of Abbreviations

Construction and Demolition (C&D) materials consist of the debris generated during the construction, renovation and demolition of buildings, roads, and bridges. C&D materials constitute a significant waste stream in the United States.

Department of Environmental Conservation (DEC) is the New York State Department of Environmental Conservation. It was created on July 1, 1970, to combine all state programs designed to protect and enhance the environment into a single agency.

Department of Environmental Protection (DEP) is the Pennsylvania Department of Environmental Protection. The DEP enforces Pennsylvania’s environmental laws. However, the DEP does not manage the protection of Pennsylvania’s natural resources

Deposit Return System (DRS) is a system where a surcharge is given on a product at the time when it is purchased, and a rebate is given when the product is returned. An example is New York State’s plastic bottle DRS, where at the time of purchase, an extra \$.05 is added to the cost which is then refunded when the bottle is returned to a redemption center.

Extended Producer Responsibility (EPR) is a concept where manufacturers and importers of products should bear a significant degree of responsibility for the environmental impacts of their products throughout the product life cycle.

Greenhouse gases (GHG) are gases such as Carbon Dioxide or Methane that trap some of the Earth's outgoing energy, thus retaining heat in the atmosphere. This heat trapping causes changes in the balance between energy received from the sun and emitted from Earth—that alter climate and weather patterns at global and regional scales.

Lancaster County Solid Waste Management Authority (LCSWMA) manages the trash and recyclable materials from Lancaster County, Pennsylvania, homes and businesses, as well as trash from the City of Harrisburg and surrounding Dauphin County communities.

Northern Montgomery County Recycling Commission (NMCRC) is a group of 11 municipalities in Montgomery County, Pennsylvania, that work together to increase recycling and to promote recycling awareness and education.

The Responsible Recycling Task Force (RRTF) was created by the Washington State Solid Waste Advisory Committee (SWAC) and the Washington State Metropolitan Solid Waste Management Advisory Committee (MSWMAC) to respond to changes in international recycling markets and develop a coordinated approach to improving recycling in the region.

Re-TRAC Connect is a web-based software program that transforms the way you manage and measure your waste and recycling programs. It makes accounting for and communicating your waste data easier. Re-TRAC Connect Solutions include Hauler Reporting, Facility Reporting, Local Government Reporting, Recycling Ordinances, Grant Application Management and Recycling Directories.

1.0 Introduction

In 1988 the Pennsylvania legislature passed the Municipal Waste Planning, Recycling, and Waste Reduction Act, also known as Act 101. The goals of Act 101 are to:

- Increase the Commonwealth’s recycling rates;
- Decrease the Commonwealth’s waste generation to conserve landfill space;
- Promote the benefits of recycling through education; and
- Increase the use of products with recycled content for Commonwealth agencies.

These goals were ambitious when enacted, as Pennsylvania’s recycling rate was less than 2% before 1988.³ Since its passage, the Act has been responsible for developing Pennsylvania’s waste management and recycling infrastructure. The reported recycling rate rose from less than 5% in 1990 to over 50% in 2014.

More than 90% of the population now has access to a recycling program. However, the definition of what constitutes access varies substantially across the state -- and can mean one or few public drop offs for an entire county. Recyclable materials also vary by town, city, municipality, and county, creating another type of limit to access. Via inconsistent standards across municipalities Act 101 has unintentionally impeded uniformity and coordination, the Act’s funding categories constrain opportunities for innovation, and it has received few updates over the years.

Act 101 was developed under a different set of circumstances to solve a different set of problems and no longer provides the necessary regulatory framework for a thriving waste management and recycling system. In recent years, the waste generation and waste diversion landscape has changed dramatically, yet there have been few modifications or reforms to the Commonwealth’s solid waste management system. Packaging waste streams have evolved, there is now a greater reliance on flexible plastics, and municipalities have shifted towards single stream recycling collection. Many local and national government agencies have changed their focus from basic waste management to more ambitious goals through zero waste targets and circular economy strategies. Additionally, the importance of effective waste management tools to reduce greenhouse gas (GHG) emissions continues to grow.

It is important to reassess Act 101 in the context of this changed environment and marketplace and understand how the Act and other policies and programs can better enable Pennsylvania to rise to current challenges.

This report is intended to provide Pennsylvania’s waste management and recycling stakeholders with a comprehensive set of options for improvement that can be used as a foundation for advocacy, policy making, and program development.

³ Dernbach, J (2011) [Next Generation Recycling and Waste Reduction: Building on the Success of Pennsylvania’s 1988 Legislation](#)

Through analysis of Pennsylvania’s recycling system and research into current and emerging waste management programs in other jurisdictions, this report assesses the:

- Extent to which Act 101 has met its goals;
- Adequacy of the provisions established to achieve these goals; and
- Suitability of the goals in the current environment -- where the focus has grown to achieving zero waste, creating a circular economy, and ultimately reducing GHG emissions.

The analysis of the outcomes from the above activities can inform future programs and policies to move Pennsylvania towards a more circular economy.

2.0 Methodology

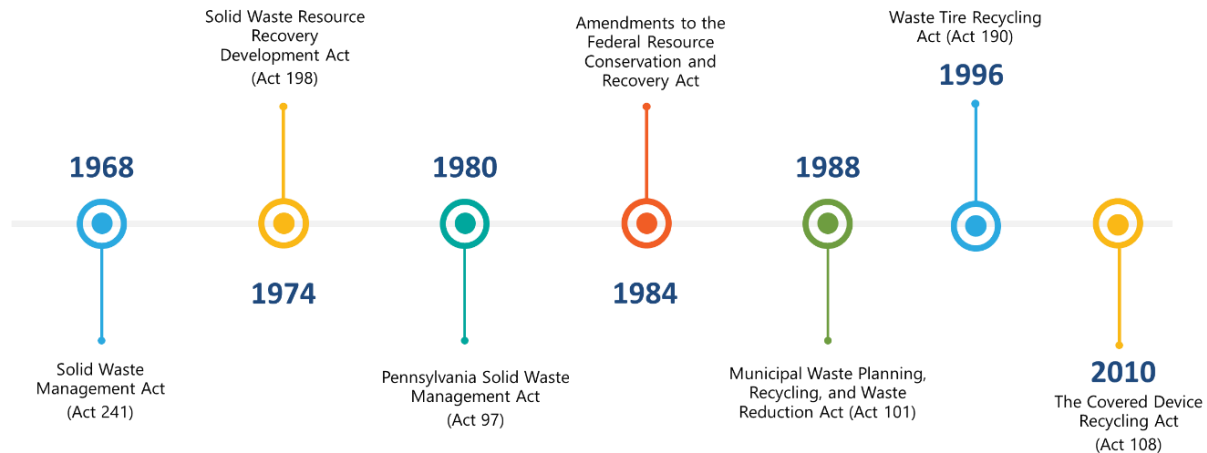
Research for this report included secondary literature review, primary interviews, and data analysis. These steps were conducted as an iterative process. Learnings from the literature, interviews, and data built on each other to identify recommendations to improve and modernize Pennsylvania’s recycling system.

Published academic articles, annual reports, and news articles were also reviewed to develop a holistic understanding of the state of solid waste management in Pennsylvania and to identify case studies for the landscape analysis. The authors reviewed quantitative data from Pennsylvania’s Re-TRAC system, which collects data from municipalities on their recycling programs. This analysis was mainly used to identify if the goals of Act 101 were achieved; the results are outlined in Section 4. Interviews were conducted with various stakeholders, including staff from the Pennsylvania Department of Environment (DEP), the Lancaster County Solid Waste Management Authority (LCSWMA), and the Northern Montgomery County Recycling Commission (NMCRC). A workshop with Pennsylvania Resources Council staff and board members provided feedback on a long list of preliminary recommendations.

3.0 Solid Waste Laws in Pennsylvania

To consider the future, it is important to understand the past. Figure 3-1 summarizes the history of solid waste management legislation in the Commonwealth.

Figure 3-1: Timeline of Solid Waste Legislation in Pennsylvania



Before Act 101, Pennsylvania enacted three main pieces of solid waste management legislation. The **Solid Waste Management Act (Act 241)** in 1968, the **Solid Waste Resource Recovery Development Act (Act 198)** in 1974, and the **Pennsylvania Solid Waste Management Act (Act 97)** in 1980. The main purposes of these laws were to govern the planning, roles and responsibilities, and regulation of solid waste storage, collection, transportation, processing, treatment, and disposal. These Acts included little emphasis or incentive for solid waste recycling.

As a result of both Act 97 and the 1984 amendments to the federal **Resource Conservation and Recovery Act** which created new standards for operating landfills, landfills were closed across the country, including in Pennsylvania. Landfill space became a limited resource. Due to this scarcity, Pennsylvania required new strategies to better plan waste management services and reduce the amount of waste sent to landfill. The Commonwealth enacted Act 101 to meet these requirements.

After Act 101, there have been several additions to Pennsylvania’s solid waste management framework. These include the **Waste Tire Recycling Act** and the **Covered Device Recycling Act**, both of which focus on recycling problematic waste materials.

3.1 Act 101

3.1.1 Purpose and Goals

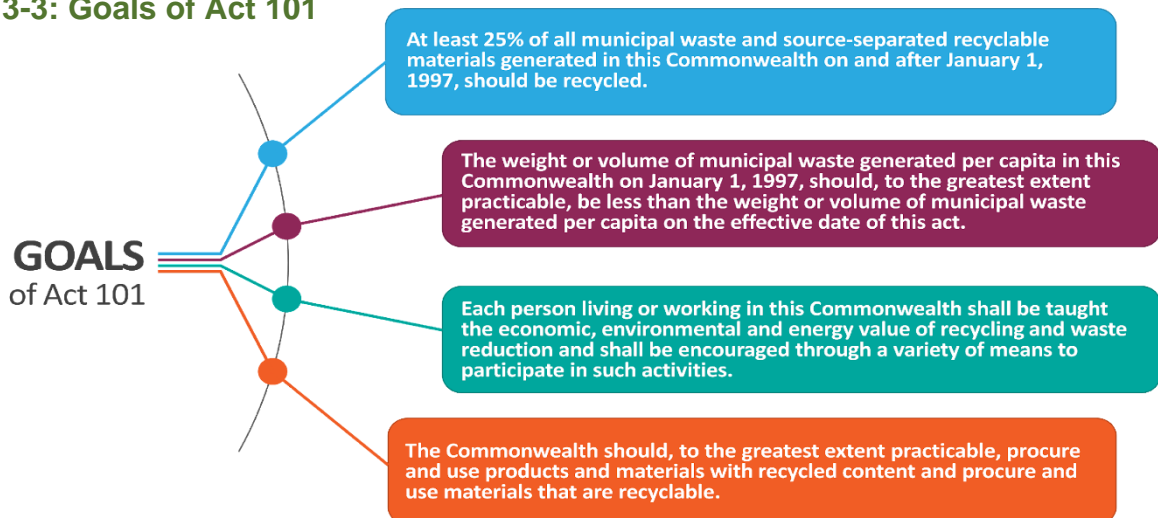
Due to the “inadequate and rapidly diminishing processing and disposal capacity for municipal waste,”⁴ the Municipal Waste Planning, Recycling, and Waste Reduction Act, also known Act 101, was enacted in 1988. The purpose of Act 101 is outlined in Figure 3-2.

Figure 3-2: Purpose of Act 101



To satisfy these objectives, Act 101 included four main goals with targets against which to measure progress. The goals appear below.

Figure 3-3: Goals of Act 101



⁴ Municipal Waste Planning, Recycling and Waste Reduction Act (1988)

3.1.2 Powers and Duties

To help achieve the goals set out in Act 101, the law designated certain powers to different government bodies. Figure 3-4 summarizes the powers and duties outlined in the Act.

Figure 3-4: Powers and Duties Outlined in Act 101

Department of Environmental Protection (DEP)

- Provide technical assistance to municipalities and local agencies including training of personnel
- Approve or disapprove of municipal waste management plans
- Conduct innovative and effective public education on waste management and recycling
- Collect the recycling fee, maintain the recycling fund, and administer the distribution of funds

Counties

- Ensure the availability of adequate permitted processing and disposal capacity for the municipal waste which is generated within its boundaries.
- Execute the municipal waste planning process with guidance from DEP

Municipalities

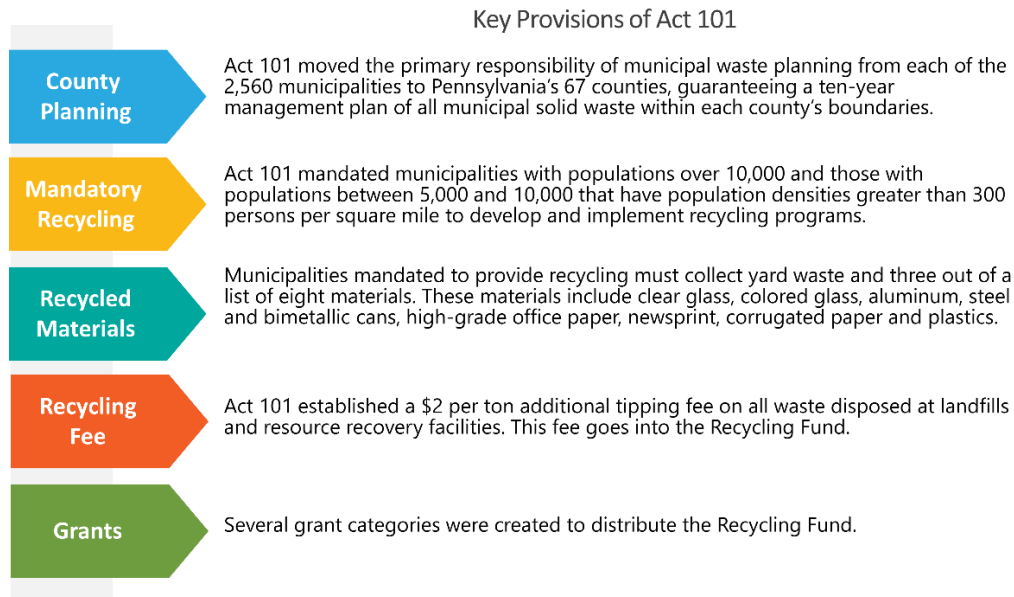
- Adopt ordinances, regulations and standards for the recycling, transportation, storage and collection of municipal wastes or source-separated recyclable materials,
- Contract with any person to carry out its duties for the recycling, transportation, collection and storage of municipal waste and source-separated recyclable materials
- Report to the county on the yearly weight or volume of materials that were recycled by the recycling program.

3.1.2.1 Key Provisions

In addition to the designated roles and responsibilities identified above, Act 101 included key provisions to regulate how solid waste is managed in Pennsylvania. The key provisions created a framework of rules and requirements for achieving the Act’s goals. Figure 3-5 outlines these provisions, which transformed Pennsylvania’s recycling system.

The provision creating grants was intended to allocate funding to facilitate or support the development of recycling programs across the Commonwealth. The Act established four grant categories, relating to differing aspects of the law and with differing eligible parties. These are detailed in Box 3-1.

Figure 5: Key Provisions of Act 101



Box 3-1: Grant Categories Created in Act 101

Section 901 – Planning Grants. This program directly funds “80% of the approved cost” of complying with the planning requirements of Act 101.

Section 902 – Grants for the development and implementation of municipal recycling programs. 902 grants support equipment, education and the development of markets for recycling.

Section 903 – Grants for recycling coordinators. These grants reimburse 50% of the salary and expense costs of employing a county Recycling Coordinator.

Section 904 – Performance Grants for municipal recycling programs. 904 grants reward municipalities with a set dollar amount per ton of commercial and residential recycling which is collected and marketed from within a municipality’s boundaries.

4.0 Act 101 – Achievement of Goals and Impact of Key Provisions

The authors conducted a detailed analysis to assess the extent to which the goals of Act 101 have been met and the extent to which the Act’s provisions are suitable for achieving zero waste goals. This analysis used Pennsylvania’s 2019 Re-TRAC data of municipal and county recycling programs, other publicly available data, and secondary research. The goals and key provisions, and the extent to which they have been achieved, are detailed below.

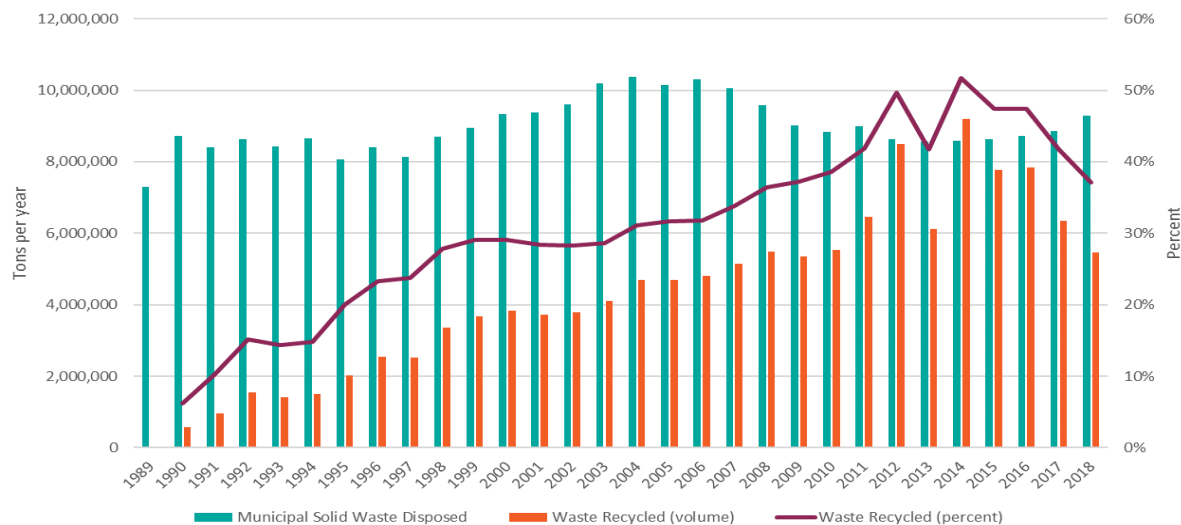
Goals

Goal: At least 25% of all municipal waste and source-separated recyclable materials generated in this Commonwealth on and after January 1, 1997, should be recycled.

Was this achieved: Uncertain

Analysis: Figure 4-1 shows that since Act 101 was passed in 1988, the reported recycling rate rose from less than 5% in 1990 to over 50% in 2014.⁵ Using available data, the 2018 rate appears to be 37%, however multiple factors undermine the accuracy of this rate

Figure 4-1: Waste Disposal and Recycling Rate in Pennsylvania 1989 – 2018



Sources: Disposal⁶ (DEP); Recycling⁷ (DEP); Recycling Rate (Eunomia Calculation). To accurately calculate the recycling rate the figure above only includes disposal of waste generated in Pennsylvania not out of state.

⁵ According to DEP there was a C&D reporting anomaly in 2014 which has been removed for this analysis.

⁶ Pennsylvania DEP.

http://cedatareporting.pa.gov/reports/powerbi/Public/DEP/WM/PBI/Solid_Waste_Disposal_Information

⁷ Pennsylvania DEP.

https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Documents/Total_recycling_by_county_1990-2018.jpg

It is worth noting that municipalities report on the amount of recyclable material collected for recycling, not on the amount that is in fact recycled, therefore the recycling tonnage reported does not measure the true recycling rate. The true recycling rate would be calculated at the point where the material collected has been sorted and processed such that it can be used as an input into a new product. A recent state by state assessment of containers and packaging recycling rates outlines where points of measurement can be placed in a recycling value chain to identify the true recycling rate.⁸

Goal: The weight or volume of municipal waste generated per capita in this Commonwealth on January 1, 1997, should, to the greatest extent practicable, be less than the weight or volume of municipal waste generated per capita on the effective date of this act.

Was this achieved: No

Analysis: Figure 4-2 shows that since the passage of Act 101 the per capita waste generation rate has steadily increased. Since the recycling rate increased in parallel to the increase in waste generation, the rate at which waste is sent to the landfill per capita has remained flat. However, without residue rates (the rate of material not able to be or not actually recycled) being included in the Re-Trac data, it is unclear whether the recycling rates are lower than recorded. PA DEP currently utilizes a 20% residual rate for the Section 904 grant program.

Figure 4-2: Per Capita Waste Generation and Waste Landfilled Rate 1990-2018



Sources: Disposal⁹(DEP), Population (US Census)

⁸ Eunomia Research & Consulting (2021) The 50 States of Recycling [page 25]
<https://www.eunomia.co.uk/reports-tools/the-50-states-of-recycling-a-state-by-state-assessment-of-containers-and-packaging-recycling-rates/>

⁹ Pennsylvania DEP.
http://cedatareporting.pa.gov/reports/powerbi/Public/DEP/WM/PBI/Solid_Waste_Disposal_Information

Goal: Each person living or working in this Commonwealth shall be taught the economic, environmental and energy value of recycling and waste reduction and shall be encouraged through a variety of means to participate in such activities.

Was this achieved: Partially

Analysis: According to secondary research and stakeholder interviews, since the passage of Act 101, education on recycling and waste reduction has increased. Just after the passage of Act 101, the educational campaigns conducted by the State were strong, but in more recent years these campaigns have waned due to budget cuts and changing priorities.¹⁰ Local municipalities still provide updates and education on their recycling programs, as this is a condition for receiving performance grant funding.

Goal: The Commonwealth should, to the greatest extent practicable, procure and use products and materials with recycled content and procure and use materials that are recyclable.

Was this achieved: No

Analysis: Discussions with stakeholders, including DEP, suggest that this goal has not been achieved. There is little guidance and few details within Act 101 regarding this goal and there has been no measure to ensure that the goal is met.

¹⁰ Dernbach, J (2015) [Next Generation Recycling and Waste Reduction: Building on the Success of Pennsylvania's 1988 Legislation](#)

Key Provisions of Act 101

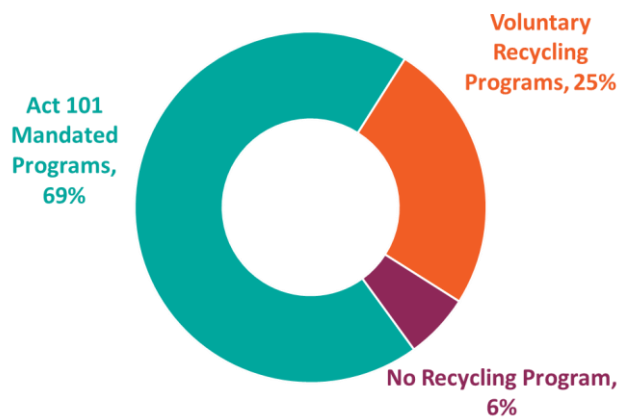
Key Provision, County Planning: Act 101 moved the primary responsibility of municipal waste planning from each of the 2,560 municipalities to Pennsylvania’s 67 counties, requiring a ten-year management plan of all municipal solid waste within each county’s boundaries.

Result of Key Provision: Each county has effectively provided the ten-year management plans for waste since the Act was passed.

Key Provision, Mandatory Recycling: Act 101 mandated that municipalities with populations over 10,000 and those with populations between 5,000 and 10,000 that have population densities greater than 300 persons per square mile develop and implement recycling programs.

Result of Key Provision: There are 475 municipalities that are mandated to provide recycling under Act 101 and an additional 586 municipalities that voluntarily provide curbside recycling.¹¹ In total, there are 1,141 curbside recycling programs and 814 drop off recycling programs in Pennsylvania.¹² Many communities have more than one program, as they may have different haulers or create a specific program for an individual waste stream, such as leaf waste. As shown in Figure 4-3, recycling programs mandated under Act 101 serve nearly 70% of the population, despite representing less than half of the programs in the Commonwealth. In addition to municipal recycling programs, there are also 10 county-provided curbside recycling programs, and 35 county-provided drop-off programs.¹³

Figure 4.3: Estimated Population Covered by Municipal Recycling Programs



Source: Re-TRAC 2019 and DEP Total Respondents: 2,562

Key Provision, Recycled Materials: Municipalities mandated to provide recycling must collect leaf waste and at least three of eight listed materials. These materials include clear glass, colored glass, aluminum, steel and bimetallic cans, high-grade office paper, newsprint, corrugated paper, and plastics.

Result of Key Provision: As seen in Figure 4-4 and Figure 4-5, the Act 101 materials, excluding leaf waste, are the most collected materials in both curbside and drop-off recycling programs. These figures also show that because the Act requires collection of only

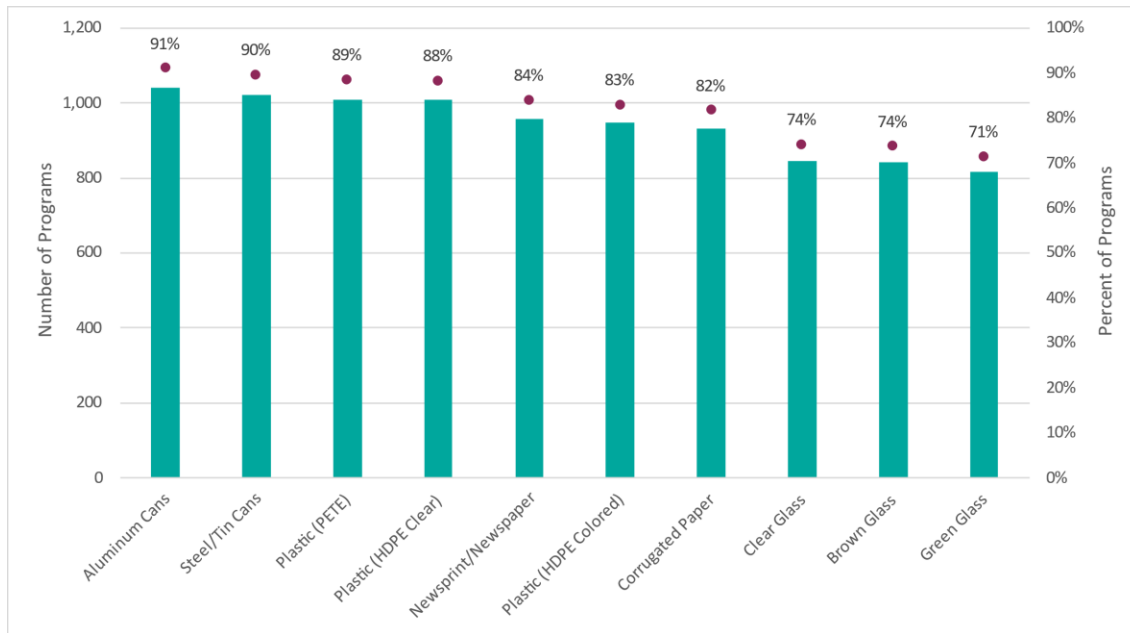
¹¹ Haney, J. Bodenman (2021) An Examination of Recycling Programs in Rural Pennsylvania, 2010-2019

¹² Pennsylvania DEP (2019) Re-TRAC data

¹³ Pennsylvania DEP (2019) Re-TRAC data

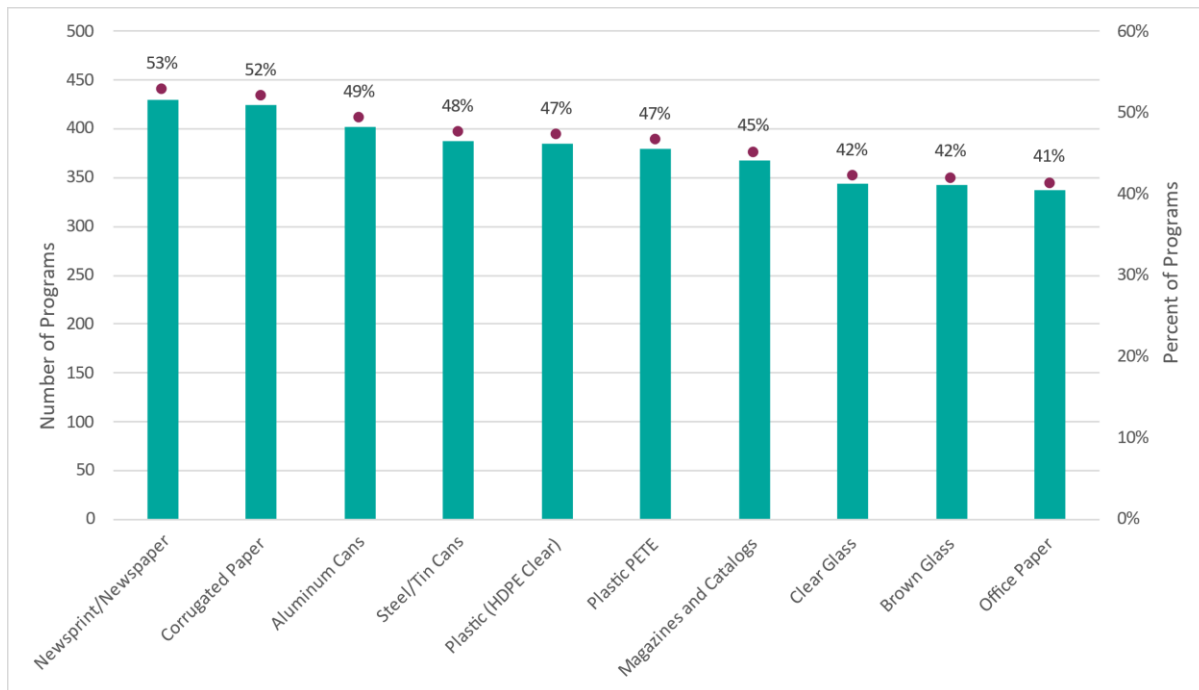
three of the eight materials, no material is collected by 100% of programs, as reported by Re-TRAC.

Figure 4-4: Most Collected Materials in Curbside Programs



Source: Re-TRAC 2019. Total Respondents 1,141

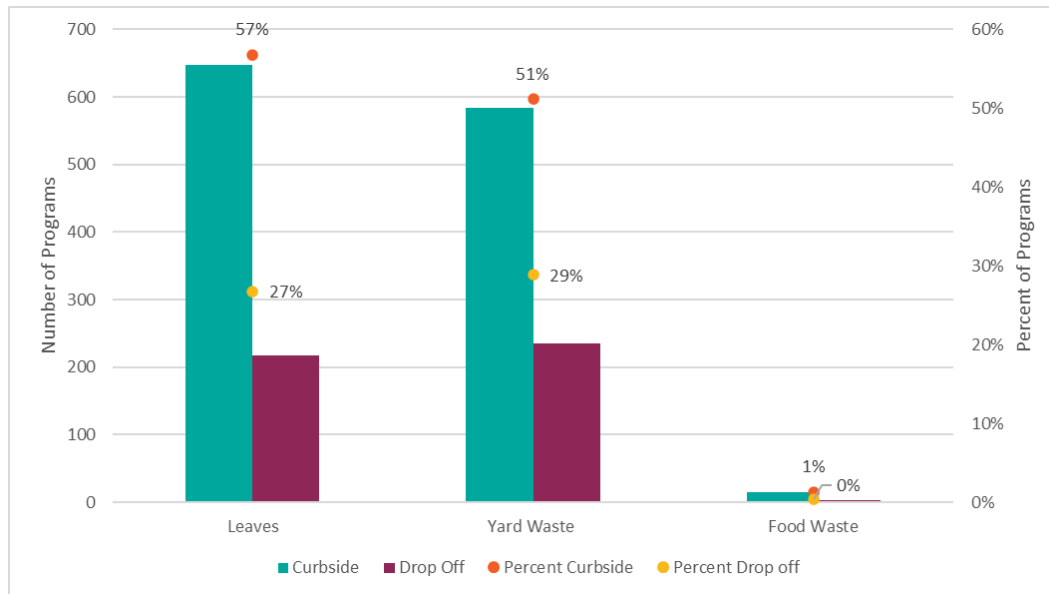
Figure 4-5: Most Collected Materials in Drop-Off Programs



Source: Re-TRAC 2019. Total Respondents 814

As seen in Figure 4-6, a relatively small proportion of municipalities collect organic waste such as leaves or yard waste. Only 1% of municipalities collect food waste, even though an estimated 30 to 40% of the food supply is wasted¹⁴. Leaf waste is mandated to be collected under the Act in 475 municipalities and is collected in 648 curbside programs.

Figure 4-6: Prevalence of Organic Waste Collection



Source: Source: Re-TRAC 2019. Total Respondents 1,141 for Curbside and 814 for Drop-Off

Key Provision, Recycling Fee: Act 101 established a \$2 per ton additional tipping fee on all waste disposed at landfills and resource recovery facilities. This fee goes into the Recycling Fund.

Result of Key Provision: Based on an analysis of municipal solid waste disposed at Pennsylvania facilities, nearly \$1 billion was generated from the tipping fee from 1988-2020. About one-third of this revenue came from waste imported into Pennsylvania’s landfills. Since the Recycling Fund’s inception in 1988, there have been years where funding was transferred from the Recycling Fund into the General Fund, including \$15 million in the 2017-2018 fiscal year. From 1988 - 2020, \$237 million was diverted from the Recycling Fund into the General Fund.¹⁵

The DEP Recycling Fund Reports do not indicate specific reductions in programming due to funding transfers to the General Fund. More generally, the reports do show that when funding moves into the General Fund there is less funding available for grants to municipalities, which may limit their ability to fund recycling programs. As shown in Table 4-

¹⁴ USDA <https://www.usda.gov/foodwaste/faqs>

¹⁵ Interview with Pennsylvania DEP 7-30-21

1, when the General Fund transfer increased from \$9 million in FY 2017 to \$15 million in FY 2018, municipal recycling grants shrank from \$19.6 million to \$8.3 million.

Key Provision, Grants: As detailed in Box 3-1, Act 101 created four grant categories to distribute the Recycling Fund.

Result of Key Provision: The Recycling Fund provides grant support to municipalities, as described in Section 3 of this report. As shown in Table 4-1, the State provides most of this support in the form of performance-based grants on the total tons of material recycled, or municipal recycling grants to support the development of recycling programs.

Table 4-1: Summary of Recycling Fund Expenditures 2015-2018 ('000s)

	FY 2015-16	FY 2016-17	FY 2017-18
	ACTUAL	ACTUAL	ACTUAL
Recycling Coordinator Reimbursement	\$ 1,600	\$ 1,600	\$ 2,600
Reimbursement for Municipal Inspections	\$ 300	\$ 400	\$ 400
Reimbursement for Host Municipality	\$ 20	\$ 10	\$ 10
Administration of Recycling Program	\$ 1,490	\$ 1,177	\$ 1,152
County Planning Grants	\$ 396	\$ 2,000	\$ 758
Municipal Recycling Grants	\$ 19,537	\$ 19,600	\$ 8,321
Municipal Recycling Performance Grants	\$ 18,500	\$ 19,000	\$ 19,500
Public Education/Technical Assistance	\$ 3,230	\$ 3,839	\$ 2,756
Transfer to General Fund - ESN 16-051	\$ -	\$ 9,000	\$ 15,000
Total Expenditures	\$ 45,073.00	\$ 56,626.00	\$ 50,497.00

Source: Adapted from DEP Recycling Fund Report

4.1 Additional Benefits from Act 101

Act 101 did not set environmental goals beyond waste management, nor did it set economic goals. Despite this fact, Act 101 has created wider benefits for Pennsylvania, which should not be discounted.

4.1.1 Environmental Benefits

For every ton of material recycled there are associated GHG emission reductions, as recycling eliminates the need to make products from raw materials. This means that fewer natural resources need to be harvested and less energy is required to manufacture the product.

The DEP reported the quantified environmental benefits of recycling in Pennsylvania for several years on their website. For 2018, the 5.47 million tons of material recycled offset the equivalent of more than 9.2 million tons of carbon dioxide. The equivalent of removing more than 2 million combustion engine vehicles from the road in one year or the total

volume of emissions associated with electricity used in one year by 1.56 million American homes.¹⁶

4.1.2 Economic Benefits

The recycling sector in Pennsylvania provides economic benefits as well. In 2017, the Pennsylvania Recycling Markets Center commissioned a report to identify the economic contributions of recycling to Pennsylvania’s economy.

The study found that in 2015, the recycling marketplace directly employed over 66,000 people, while the indirect and induced jobs created from the recycling industry employed an additional 110,000 people. The total direct and indirect jobs generated from the recycling industry represents nearly 3% of the entire employed population. In 2015, the recycling marketplace additionally contributed \$22.6 billion to the Commonwealth’s gross state product. In turn, the direct economic activity generated \$635 million in state and local taxes.¹⁷ Table 4-2 presents a summary of economic contributions.

Table 4-2: Summary of Pennsylvania Recycling Marketplace Economic Contribution

	Direct	Indirect	Induced	Total
Employment (workers)	66,041	56,075	53,470	175,586
Value added (\$, mil.)	11,271	6,934	4,481	22,685
Labor income (\$, mil.)	4,812	3,921	2,587	11,319
Output (\$, mil.)	29,971	13,674	7,323	50,968
Labor income/worker (\$)	72,860	69,918	48,377	64,465
Value added/worker (\$)	170,660	123,651	83,805	129,198
State and local taxes (\$, mil.)	635	579	436	1,650
Federal taxes (\$, mil.)	1,242	849	560	2,651

Source: Adapted from IHS Markit (2017) *The Economic Contributions of Recycling to the Pennsylvania Economy*

¹⁶ Pennsylvania DEP <https://www.dep.pa.gov/Business/Land/Waste/Recycling/Pages/Recycling-Reports-and-Studies.aspx>

¹⁷ IHS Markit (2017) *The Economic Contributions of Recycling to the Pennsylvania Economy* https://files.dep.state.pa.us/waste/recycling/recyclingportalfiles/RMC_PAREcyclingMarketplace_Analysis_2017.pdf

5.0 Unintended Impacts of Act 101

Act 101 achieved its initial goal of a 25% recycling rate in Pennsylvania, but in the last decade the recycling system has seen few additional improvements. After more than 30 years, the provisions in Act 101 have created several unintended impacts, which broadly relate to the themes of limited uniformity and narrow funding opportunities. Brief summaries of these themes and the related unintended impacts of Act 101 appear below.

5.1 Limited Uniformity and Coordination

Act 101 established flexibility for municipalities and counties when establishing recycling programs. This flexibility, while acknowledging differences in communities, has created hundreds of different recycling programs with little uniformity. The fragmented nature of recycling across the Commonwealth is a barrier to delivering a consistent and common set of services and to achieving service cost efficiencies resulting from economies of scale when, for example, services can be tendered together. Provisions in the Act that should be highlighted as contributing to a lack of consistency and coordination are detailed below.

Act 101 Provision: Act 101 mandates only three of eight materials are required to be recycled by municipalities.

Unintended Impact: Municipalities collect different materials.

Resulting Challenge: This unintended impact creates challenges for coordinating universal recycling education across the Commonwealth as a whole, as each municipality may collect a different set of materials. This can lead to increased contamination of materials at Material Recovery Facilities (MRFs) due to “wishcycling”. It may also proliferate misinformation, such as the myth that hauler’s removal of glass from curbside bins relates to the material’s marketability and ability to be recycled. A review of posters intended to educate residents about recycling in different Pennsylvania municipalities showed there are differences in how residents are educated on recycling in terms of both style and types of materials. (See Appendix).

Additionally, when contracting with haulers, because there is no uniform set of materials to be collected, each municipality has unique negotiations and may end up with varied costs. This may also encourage haulers or MRFs to exclude materials not based on the material recyclability but the cost-benefit for their collection and sorting.

The waste stream and marketability of recyclables has changed over the last 30 years since Act 101 was enacted; the requirement for municipalities to collect only three of eight materials does not recognize this fact. To provide context, the 2003 Statewide Waste Composition Study¹⁸ included only six waste categories, while the to-be-released 2021 waste composition study commissioned by DEP will track 62 categories.

¹⁸ Pennsylvania DEP (2003) Statewide Waste Composition Study

Act 101 Provision: The only organic waste stream required to be collected under Act 101 is leaf waste.

Unintended Impact: In 2018 the EPA estimated 350,000 plus tons of food waste were landfilled nationally.¹⁹ Food waste is a significant proportion of the waste stream yet is only collected by 1% of municipalities. Act 101 does not require the collection of food waste, hence, it is not supporting the reduction of GHG associated with the biodegradation of food waste in landfills. In the United States, food is the single largest category of material placed in municipal landfills, where it emits methane, a powerful greenhouse gas. Municipal solid waste landfills are the third-largest source of human-related methane emissions in the United States, accounting for approximately 14.1 percent of these emissions in 2017²⁰

Resulting Challenge: The lack of a provision in the Act to specifically address food waste limits DEP’s ability to provide grants through the Recycling Fund for food waste reduction, donation, and recycling initiatives.

Act 101 Provision: Municipalities that meet population requirements must follow the standards in Act 101. Voluntary recycling programs do not need to follow the standards in Act 101.

Unintended Impact: This creates two sets of standards for municipalities, limiting uniformity among recycling programs.

Resulting Challenge: Only 475 municipalities are mandated to recycle under Act 101. Therefore, a majority of the 1,955 municipal programs are voluntary. The voluntary programs are not required to follow the standards outlined in Act 101. This may limit coordination among municipalities as a neighboring municipality which has a voluntary program may not meet the same standards of service. More importantly, it leads to less waste diverted. If municipalities are not mandated, they do not have to recycle any set number of materials no matter how valuable those materials may be. If each municipality was required to meet the same set of standards, then they could more easily jointly contract for services to increase efficiencies and potentially lower costs.

Act 101 Provision: Act 101 established four goals. The goals for the recycling rate and waste generation had a deadline of 1997. While the recycling rate was increased to 35% by 2003²¹, no formal mechanism or mandate was included to update these goals.

Unintended Impact: By setting targets and deadlines without mechanisms for updates, the goals of Act 101 have not been regularly updated nor reported on to the DEP.

¹⁹ EPA <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials>

²⁰ USDA <https://www.usda.gov/foodlossandwaste/why>

²¹ House Resolution

<https://www.legis.state.pa.us/CFDOCS/Legis/PN/Public/btCheck.cfm?txtType=HTM&sessYr=1999&sessInd=0&billBody=H&billTyp=R&billNbr=0085&pn=1137>

Resulting Challenge: Without goal setting and the corresponding release of relevant data, it is difficult for stakeholders to plan and build grassroots support for greater investment in recycling. Goal one of Act 101 set a recycling rate. That goal was met in 1997 but the recycling rate has not been maintained over time and, in fact, has fallen since its peak in 2014. In recent years, DEP has publicized the total tons of material collected for recycling and the environmental benefits of recycling, but has not published an annual recycling rate. As goal one of Act 101 relates to the recycling rate, the reported recycling data no longer align with the goals of the Act. Additionally, the total tonnage collected for recycling does not equal the total tonnage of material actually recycled, as there are losses throughout the system due to contamination and other factors.

5.2 Lack of Funding Opportunities

Act 101 outlines how revenue for the Recycling Fund is generated and is to be spent. The details and sometimes the lack of details limit opportunities for Pennsylvania’s recycling system. Unintended consequences related to duties and funding are outlined below.

Act 101 Provision: The additional tipping fee to support the Recycling Fund was set at a flat rate of \$2 with no conditions for increases. Additionally, Act 101 does not give authority to municipalities or counties to impose fees directly on their residents to support recycling programs.

Unintended Impact: The relative value of the tipping fee has decreased due to inflation. This fee is now only worth \$0.87 in 1988 constant dollars and would be worth \$4.50 if it was indexed to inflation.²²

Municipalities do not have access to increased funds that would be associated with an inflation adjusted tipping fee and are unable to assess costs to residents for recycling. This results in underfunded services, leading to limited ability to increase household coverage or collect a broader range of materials.

Resulting Challenge: Difficulty to fund existing or new services that are increasing in cost with limited revenue streams.

Act 101 Provision: Act 101 set four defined grant categories to support recycling programs.

Unintended Impact: The recycling landscape in Pennsylvania has changed significantly since 1988 and more flexibility on how funds can be distributed by DEP and used by municipalities could be beneficial. For example, there is limited opportunity for municipalities to establish more innovative programming for materials other than those listed, such as textiles.

Resulting Challenge: Identifying funding opportunities or expanding current grant programs to include innovative programming not currently covered.

²² Eunomia analysis

5.3 Limited Updates to Act 101

Act 101 Provision: Act 101 was designed to meet the challenges Pennsylvania faced in 1988 and did not require regular updates and reviews.

Unintended Impact: Act 101 is not capable of resolving the current and emerging priorities in waste and resource management, including striving towards zero waste goals and designing systems to support a circular economy.

Resulting Challenge: Act 101 was not designed to manage current waste streams and deliver on achieving the goal of zero waste. The resulting challenge is to determine what additional measures are needed for the Commonwealth to reduce GHG emissions and move towards a more zero waste system and how these measures can be effectively implemented.

6.0 Landscape Analysis

To understand what additional options the Commonwealth might want to consider in the future, it is important to understand best practices, programs, and policy from cities and states in other jurisdictions. This section provides a targeted selection of best practices and summaries. Where noted, additional information can be found in the Appendix.

6.1 Targets and Planning

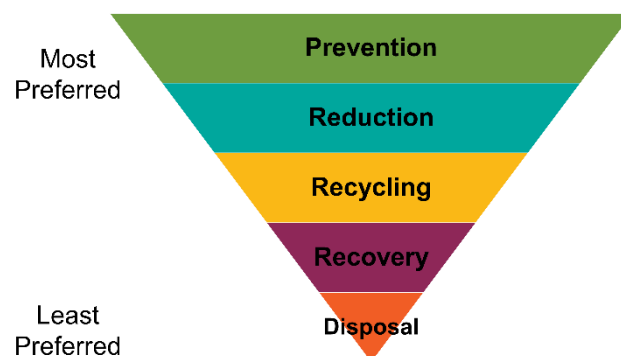
Many local and national government agencies have shifted focus in recent years from basic waste management to more ambitious goals through zero waste targets and circular economy strategies.

Setting New Zero Waste Targets and Circular Economy Strategies

The last several decades have seen a shift in philosophy from waste management being viewed as a linear system of collection and disposal to a more circular system where the goal is to keep resources in use for as long as possible. Rather than focus on waste disposal, new initiatives focus on a full set of waste minimization strategies. These strategies are expressed as a waste management hierarchy, as shown in Figure 6-1.

The U.S. EPA has for the first time set a 50% recycling rate goal by 2030 to move towards a more circular economy. It recognizes that collective and collaborative commitments are best achieved when there are common goals.

Figure 6.1: Waste Management Hierarchy



Beyond a recycling goal, several local governments have enacted more ambitious zero waste plans. In 2013, the City of Fort Collins, Colorado enacted a “Road to Zero Waste Plan” which included waste diversion goals of 75% by 2020, 90% diversion by 2025, and zero waste by 2030.²³ According to the city’s 2019 annual report, the city reached a high of 68% waste diversion rate in 2014 but has yet to reach their 75% goal.²⁴ There are several other cities that have set zero waste targets including Austin, Texas, whose goal is to divert 90% of solid waste from landfills and incineration by 2040 through both increased recycling and reducing waste generation.²⁵

Zero waste plans and initiatives can also be found in Pennsylvania. The city of Pittsburgh released their “Roadmap to Zero Waste” in 2017.²⁶ A key focus of this roadmap is to alter the value proposition of waste and to move away from an expense-based approach to a resource management-based approach where waste is considered an asset rather than a liability. Also in 2017, Philadelphia released a Zero Waste and Litter Action Plan.²⁷ The plan identifies five key action areas which include zero waste, litter enforcement and cleaner public spaces, data, behavioral science, and communications and engagement.

Cleveland is currently in the process of developing a circular economy strategy and roadmap²⁸. The City of Charlotte, North Carolina has “*Circular Charlotte – towards a zero waste and inclusive city*”.²⁹

Larger circular economy strategies can also be found internationally. The city of Derry and the Strabane District Council in Northern Ireland developed a Circular Economy and Zero Waste Strategy in 2017.³⁰ The strategy identified key sectors which have opportunities for moving towards a circular economy including food, wholesale and retail, education,

²³ City of Fort Collins (2013) Road to Zero Waste

https://www.fcgov.com/recycling/pdf/RoadtoZeroWasteReport_FINAL.pdf

²⁴ City of Fort Collins (2019) Waste Reduction and Recycling Report

<https://www.fcgov.com/recycling/files/2019-final-waste-reduction-and-recycling-report.pdf?1597961657>

²⁵ U.S. EPA. <https://www.epa.gov/transforming-waste-tool/how-communities-have-defined-zero-waste>

²⁶ The City of Pittsburgh (2017) Roadmap to Zero Waste

https://apps.pittsburghpa.gov/redtail/images/543_Pittsburgh-Road-Map-to-Zero-Waste-Final.pdf

²⁷ City of Philadelphia (2017) Zero Waste and Litter Action Plan <https://www.phila.gov/documents/zero-waste-and-litter-action-plan/>

²⁸ City of Cleveland <http://www.clevelandnp.org/circularcleveland/>

²⁹ City of Charlotte (2018) Circular Charlotte – towards a zero waste and inclusive city

[https://charlottenc.gov/SWS/CircularCharlotte/Documents/Circular%20Charlotte Towards%20a%20zero%20waste%20and%20inclusive%20city%20-%20full%20report.pdf](https://charlottenc.gov/SWS/CircularCharlotte/Documents/Circular%20Charlotte%20Towards%20a%20zero%20waste%20and%20inclusive%20city%20-%20full%20report.pdf)

³⁰ Eunomia Research & Consulting (2017) A Circular Economy / Zero Waste Strategy for Derry City and Strabane District Council

<https://www.eunomia.co.uk/reports-tools/a-circular-economy-zero-waste-strategy-for-derry-city-and-strabane-district-council/>

manufacturing, and construction. The strategy then offered policy options that will allow the local government to take advantage of the opportunities.

Regional Initiatives

Over the past few years, King County, Washington has invested in in-depth examinations of how Washington State can best improve its recycling system, manage plastic pollution, and create the framing conditions to lead to a circular future. The King County Responsible Recycling Task Force (RRTF) was created in 2018 and has pursued a coordinated approach to improving recycling in the region, commissioning studies to project the impacts of various policy options, including Extended Producer Responsibility (EPR) and Deposit Return Systems (DRS).

The RRTF has undertaken several studies to examine options for pursuing a circular economy in the state, including a Recommendations Report in January 2019, an Extended Producer Responsibility Policy Framework and Implementation Model: Residential Recycling of Packaging and Paper Products in Washington State,³¹ report in March 2020, and a three-phase study to develop a feasible model for beverage containers stewardship in Washington. The work included best-in-class best practice research, the development of innovative solutions to common downfalls of EPR and DRS and an extensive cost-benefit scenario analysis.

6.2 Reuse And Repair Policy and Programs

Recycling and Reuse of Construction Materials

The U.S. generates twice as much construction and demolition (C&D) waste than municipal solid waste (MSW).³² C&D waste is also less frequently recycled than MSW; only 22% of C&D waste is recycled into a new manufactured product. This creates opportunities for better recycling and reuse of material to establish environmental benefits. There are several municipalities that established local ordinances to encourage the recycling and reuse of C&D waste.

In Chicago, large construction and demolition projects are required to track the amount of C&D waste they generate on site and are then required to recycle at least 50% of this material.³³ San Francisco has even greater requirements; 100% of all C&D waste must be

³¹ Cascadia Consulting Group (2020) Extended Producer Responsibility Policy Framework and Implementation Model: Residential Recycling of Packaging and Paper Products in Washington State
<https://kingcounty.gov/~media/depts/dnrp/solid-waste/about/planning/documents/task-force-EPR-policy-framework-executive-summary.ashx?la=en>

³² U.S. EPA (2018) Advancing Sustainable Material Management: 2018 Fact Sheet.
https://www.epa.gov/sites/default/files/2021-01/documents/2018_ff_fact_sheet_dec_2020_fnl_508.pdf

³³ City of Chicago.
https://www.chicago.gov/city/en/depts/streets/supp_info/construction_anddemolitionsites.html

reused and recycled.³⁴ In Seattle, they do not require a specific percentage of C&D waste to be recycled or reused, but larger projects are required to complete a salvage assessment and several material streams are banned from landfills.³⁵ The city also provides support to find local organizations who can reuse the material.

There are also several examples of promoting the deconstruction of buildings rather than or prior to the demolishing of buildings. Deconstruction allows for better access to valuable materials and components as the buildings are more precisely stripped of materials. In Portland, Oregon all single-dwelling structures built before 1940 or designated a heritage site must be deconstructed.³⁶ As recently as this year, Pittsburgh established a pilot program that promotes deconstruction of blighted properties rather than demolition.³⁷

Though only a few formal studies have been conducted on deconstruction, promoting C&D to be reused or recycled has the potential to increase demand for reusable products and to establish a greater circular economy for construction.

A 2019 study in Oregon showed the following results regarding GHG emissions saved from C & D deconstruction:

- The average deconstruction of a single-family home in Portland, Oregon yielded 39,362 pounds of material (excluding the foundation), of which 10,587 pounds (27 percent) was salvaged.
- The average deconstructed home has a net carbon benefit of approximately 7.6 metric tons of CO₂eq per house compared to outright demolition.³⁸

Reuse in Philadelphia

Many single-use plastic products, such as takeaway food containers, are used for only a few minutes before being disposed of into the municipal waste stream. There are examples of businesses in Philadelphia who are working towards reducing their single use plastic waste generation through the reuse of takeaway containers.

Tiffin, a local Indian restaurant chain, allows customers to order takeout meals packaged in reusable and returnable containers.³⁹ Selecting reusable packaging comes without a monetary cost and can be returned by handing it to the delivery driver during the next delivery order or returned directly to the restaurant. Customers who do not return their container within 28 days are charged \$3.50 per container. Tiffin cleans the containers to ensure they meet FDA requirements.

³⁴ City of San Francisco. <https://sfenvironment.org/construction-demolition-requirements>

³⁵ City of Seattle. <https://www.seattle.gov/utilities/construction-resources/>

³⁶ City of Portland. <https://www.portland.gov/bps/decon/deconstruction-requirements>

³⁷ City of Pittsburgh. <https://www.cdrecycler.com/article/pittsburgh-deconstruction-blight/>

³⁸ Deconstruction vs. Demolition <https://www.oregon.gov/deq/FilterDocs/DeconstructionReport.pdf>

³⁹ Tiffin Restaurant/ <https://order.tiffin.com/Return2Tiffin.html>

Before 2021, restaurants in Philadelphia were required to apply for a variance if they wanted to use reusable containers due to a clause in the Health Department’s administrative code. It cost businesses \$255 to apply for the variance and created an administrative barrier, limiting businesses’ ability to provide reusable containers. Local circular economy advocates worked closely with City representatives to change the rules, remove the variance requirement, and support restaurants offering a container reuse system.⁴⁰

Recently, following Philadelphia’s lead, Pittsburgh City Council passed legislation to ban single use plastic bags⁴¹.

Right to Repair

A key tenant in the implementation of a circular economy is to keep resources in use for as long as possible. An effective way to keep resources in use is to repair products rather than purchase new ones. Many products, especially electronics, are designed to be obsolete after a few years and, due to intellectual property rights, companies have limited consumers’ ability to repair devices themselves or through third party services. By limiting opportunities for consumers to repair their products, consumers are incentivized to purchase new products, rather than repair the ones they own, as the first party repair service may be overpriced.

Right to repair legislation seeks to resolve this imbalance and give consumers greater ability to repair products that they own. This is accomplished through greater access to information such as product schematics and tools needed to repair the device. Right to repair also encourages products to be designed so they can be more easily repaired.

In July 2021, President Biden signed an executive order seeking to promote competition in the U.S. economy. One aspect of this order was to task the Federal Trade Commission to establish rules on when consumers can bypass manufacturers to make repairs of products that they own.⁴² In addition to this executive order, 27 states⁴³ and the federal government⁴⁴ have introduced right to repair legislation.

⁴⁰ Esposito, N. (2021) Our new nonprofit Circular Philadelphia had its first win last month. Here’s how we helped change city rules so restaurants could offer reusable to-go containers. <https://www.gridphilly.com/blog-home/2021/8/8/our-new-nonprofit-circular-philadelphias-had-its-first-win-last-month-heres-how-we-helped-change-city-rules-so-restaurants-could-offer-reusable-to-go-containers>

⁴¹ <https://www.post-gazette.com/news/politics-local/2022/04/12/pittsburgh-plastic-bag-ban-city-council-vote-erika-strassburger-grocery-stores-reusable-bags/stories/202204120078>

⁴² Nylén, L (2021) Biden launches assault on monopolies <https://www.politico.com/news/2021/07/08/biden-assault-monopolies-498876>

⁴³ Proctor, N (2021) Half of U.S. states looking to give Americans the Right to Repair <https://uspig.org/blogs/blog/usp/half-us-states-looking-give-americans-right-repair>

⁴⁴ Kan, M (2021) Congressman Introduces Federal 'Right to Repair' Bill <https://www.pcmag.com/news/congressman-introduces-federal-right-to-repair-bill>

Pennsylvania is one of those 27 states, having two active Right to Repair bills in the General Assembly. House Bill 1152⁴⁵ was introduced by Representative Russ Diamond in April 2021 and was referred to the House Commerce Committee. Senate Bill 998⁴⁶ was introduced in January 2022 by State Senator Elder Vogel and referred to the Senate Consumer Protection and Professional Licensure Committee. Both pieces of legislation enjoy significant bipartisan support, demonstrating that policies related to tackling waste issues can cross party lines. The bills require original equipment manufacturers to provide tools, replacement parts, and information manuals to any business, organization, or consumer for a fair and reasonable price.

6.3 Organic Waste Programs

Organic material makes up nearly 40% of municipal solid waste in the U.S. according to the U.S. EPA.⁴⁷ This includes food (21.59%), yard trimmings (12.11%), and wood (6.19%). When organic waste is sent to the landfill it undergoes anaerobic decomposition and generates methane, a potent greenhouse gas.⁴⁸ Organic waste can be better managed through both reduction and end of life management such as composting.

Organic Waste Programs in Pennsylvania

In Pennsylvania, there are multiple programs seeking to tackle organic waste management in both the public and private sector. In 2020, the DEP Food Recovery Infrastructure Grant Program aided nonprofit organizations to help them properly manage food to reduce waste.⁴⁹ Grant funding of up to \$200,000 was available to purchase equipment such as refrigerators to help nonprofits collect, repurpose, and redistribute food from retailers and wholesalers. This program had multiple benefits as it reduced the volume of organic waste generated and supported local community organizations helping those needing additional assistance.

There are also programs to better manage organic material when it becomes waste. After a one-year delay due to Covid-19, the Philadelphia Department of Parks and Recreation

⁴⁵ <https://www.legis.state.pa.us/cfdocs/billInfo/billInfo.cfm?sYear=2021&sInd=0&body=H&type=B&bn=1152>

⁴⁶ https://www.legis.state.pa.us/cfdocs/billInfo/bill_history.cfm?year=2021&sind=0&body=S&type=B&bn=998

⁴⁷ U.S. EPA. <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials>

⁴⁸ Many PA landfills collect methane gas and utilize it for energy generation, but not all gas is recovered. <https://www.dep.pa.gov/Business/Land/Waste/SolidWaste/MunicipalWaste/Landfill-Methane-Outreach-Program/Pages/PA-Landfill-Methane-Projects.aspx>

⁴⁹ Pennsylvania Department of Environmental Protection. <https://www.dep.pa.gov/Business/Land/Waste/Recycling/Municipal-Resources/FinancialAssistance/Pages/default.aspx>

communicated plans to open 12 community composting sites.⁵⁰ As originally reported, residents who lived near the sites would be able will be able to drop off food scraps and other organic waste without payment. While this plan may not come to fruition as first communicate, the City also plans to collect organic material at recreation centers on a weekly basis which will then be used for compost. The program intends to start with 30 rec centers and add 30 more yearly until all rec centers have organic waste pick up in 2026. In addition to large cities, smaller communities are also creating organic waste programs. Media Borough, a town of only a few thousand residents in Delaware County, launched a pilot program where all residents who use the Media Borough Public Works for their trash collection can have their food scraps collected.

Organic Waste Management in Connecticut

Connecticut is a leader among U.S. states in terms of organic waste management. According to a 2015 waste characterization study, more than 37% of waste sent to landfills was composed of organic material that can be composted, the largest share of which was food scraps.⁵¹ By 2015, Connecticut had already passed several organic waste management laws which mandated food scraps generated by large establishments to be recycled.⁵² The state took several steps to ensure the organic waste recycling program would be successful, as follows.

- First, they developed a GIS-based map of the largest generators of food waste in the state.⁵³ This map showed that processing facilities would have adequate feedstock for their business.
- Second, the state conducted an in-depth waste characterization study to understand the detailed composition of all waste in the state including organic waste.
- Third, the state prioritized organic waste recycling in the Solid Waste Management Plan.
- Finally, the state developed a Comprehensive Materials Management Strategy to achieve the goal of 60% waste diversion by 2024.⁵⁴

⁵⁰ Winberg, M. (2021) After a pandemic delay, Philly is finally opening 12 community composting sites. <https://why.org/articles/after-a-pandemic-delay-philly-is-finally-opening-12-community-composting-sites/>

⁵¹ Connecticut Department of Energy and Environmental Protection (2015) Statewide Waste Characterization Study https://portal.ct.gov/-/media/DEEP/waste_management_and_disposal/Solid_Waste_Management_Plan/CMMSFinal2015MSWCharacterizationStudy.pdf

⁵² Platt, B (2021) Connecticut – Organics Recycling Mandate https://ilsr.org/rule/food-scrap-ban/connecticut-organics-recovery/#_edn1

⁵³ Connecticut Department of Energy and Environmental Protection. <https://portal.ct.gov/DEEP/Waste-Management-and-Disposal/Organics-Recycling/Organics-Mapping-Project>

⁵⁴ Connecticut Department of Energy and Environmental Protection. <https://portal.ct.gov/DEEP/Waste-Management-and-Disposal/Solid-Waste-Management-Plan/Comprehensive-Materials-Management-Strategy>

6.4 Landfill Bans

There are several examples of U.S. states and Canadian provinces which ban certain materials from going to landfills to encourage the recycling of specific waste streams.

Vermont Recyclables and Organics Disposal Ban

Beginning with lead-acid batteries, waste oil, large appliances, and paint in the early 1990s, Vermont has banned many items from disposal at landfills.

In 2012, Vermont passed the Universal Recycling law (Act 148) to tackle the state's stagnating recycling rates, which had remained at 30-36% for nearly two decades. The state's Department of Environmental Conservation (DEC) estimated that nearly half of this waste could be recycled, composted, or donated, prompting a set of laws to progressively ban the disposal of materials at landfills that could be properly managed higher up the waste hierarchy. The Act created a phased approach to divert materials from the landfill from 2012 to 2020.⁵⁵

The first materials Vermont banned from disposal were mandated recyclables in 2015. These included: paper, cardboard, aluminum, steel cans, glass bottles and jars, and plastic containers with resin codes #1 or #2 (PET and HDPE). The Act extended to include leaf and yard debris and clean wood in 2016 and extended to food waste on July 1, 2020 (with earlier deadlines for institutions of varying sizes).⁵⁶

Vermont's program puts the onus for compliance on multiple parties:

- Haulers are required to provide multiple collections for recyclables, leaf and yard debris and food scraps to make recycling and composting as easy as trash disposal.
- Residents are required to sort their waste and are incentivized through a pay-as-you-throw pricing system, in which trash is charged by the bag, but recycling and composting are provided without a monetary cost.
- Municipalities are required to provide a recycling container next to every garbage container on all government buildings and land (including all parks, schools, town offices, etc.).

Vermont's DEC provides information to residents on what and how to recycle, including a "Recycle Like You Live Here" campaign, but outreach is limited by budget constraints.⁵⁷

⁵⁵ Vermont Department of Environmental Conservation. <https://dec.vermont.gov/waste-management/solid/materials-mgmt/trash>

⁵⁶ Vermont Department of Environmental Conservation. <https://dec.vermont.gov/waste-management/solid/materials-mgmt/trash>

⁵⁷ Vermont Department of Environmental Conservation. <https://dec.vermont.gov/waste-management/solid/materials-mgmt/recycling>

Following the implementation of the mandated recyclables ban, trash disposal decreased 5% statewide from 2014 to 2015 and recycling increased by 2% over the same time period.⁵⁸ However, Vermont is still not capturing 100% of the recyclable material, which calls into question the government’s ability to monitor and enforce the ban.

The implementation of the phased set of organics bans saw 53,254 tons of organic waste diverted from the landfill through composting and food rescue programs in 2015 and an increase in food donations by 40% from 2015 to 2016. Additionally, it is estimated that these laws, including the food waste portion implemented in 2020, will reduce GHG emissions by 37% by 2022.⁵⁹

PA Landfill Bans

Currently Pennsylvania bans a handful of items including but not limited to, whole tires and covered devices including computer monitors, CPUs, televisions, laptops, printers, and other computer peripherals, from landfills. These bans resulted from the 1996 Waste Tire Recycling Act and the Covered Device Recycling Act of 2010. These bans have created both positive and some unintended negative environmental consequences. The CDRA’s success lies in the fact it has kept over 300 million pounds of electronics out of Pennsylvania landfills. However, among other shortcomings, it has failed to address issues of free and convenient access to all Pennsylvania residents as well as manufacturers responsibility for collecting or providing collection options for the materials they sell. The current weight requirements and manufacture credit costs are not high enough, leaving many residents in the Commonwealth with no options for free or even any electronics recycling in their region.⁶⁰

6.5 Bans and Fees on Plastic

One common strategy for reducing the amount single use plastic waste and to promote the use of more reusable materials is to either ban certain types of plastic or set a fee for difficult-to-recycle materials.

Plastic Bag Fees in Pennsylvania

Starting in 2019, municipalities were unable to implement bans or fees on single use plastics due to a preemption law from the Pennsylvania General Assembly. Four municipalities joined by PennEnvironment and the Clean Air Council filed a motion in court seeking to

⁵⁸ Vermont Department of Environmental Conservation.

<https://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/Universal.Recycling.Status.Report.Dec.2016.pdf>

⁵⁹ NRDC (2017) Comprehensive legislation helps address food waste by banning the landfilling of food

<https://www.nrdc.org/resources/vermonts-universal-recycling-law>

⁶⁰ PA Environmental Digest <http://paenvironmentdaily.blogspot.com/2016/01/electronics-recycling-assn-of-pa-calls.html>

overturn the law.⁶¹ Soon after the case was filed, the Pennsylvania budget was passed by the General Assembly, and the preemption law was not extended. This created an opening for municipalities to implement bans and fees on single use plastics.

Philadelphia originally passed a law in 2019 banning single use plastic bags. Once the state preemption law expired, Philadelphia was free to move ahead and on October 1, 2021, retail establishments were prohibited from providing single use plastic bags and paper bags which do not meet specific requirements. All paper bags need to be made from at least 40% post-consumer recycled content.⁶² Consumers may also purchase reusable bags at the locations or use their own reusable bag.

Plastic Bag Fees in Washington DC

The Anacostia River is a major waterway that runs through Washington DC. A 2008 study found that single use plastic bags were one of the major sources of river pollution. Based on this result, the city government enacted the Anacostia River Clean Up and Protection Act of 2009,⁶³ which sought to both reduce the amount of plastic bag waste and generate revenue for river clean ups and maintenance.

The law was the first of its kind in the nation and required any business which sold food or alcohol to charge a \$.05 fee for any single use paper or plastic bag. Businesses are entitled to keep \$.01 of the fee while the remaining \$.04 goes to Anacostia River Clean Up and Protection Fund. Studies showed a 50% reduction in the number of plastic bags used at businesses and there were 72% less plastic bags found at river clean ups.

The Washington DC fee is unique as the revenue generated from the fee goes to a specific purpose directly related to plastic bag use. This allocation of funds helped build resident and business support as they could directly associate the fee to tangible results.

Plastic Bag Fees in Chicago

In February 2017, Chicago imposed a \$0.07 fee on the retail sale or use of plastic and paper carryout bags. Of the fee collected, \$0.02 is retained by the retailer and \$0.05 is remitted to the city for its general operating budget. Restaurants and families in the Supplemental Nutritional Assistance Program (SNAP) are exempt from the fee.

The decision to impose this fee came after a ban that was implemented in August 2015 but had unintended negative consequences, with many retailers providing thicker plastic bags and paper bags at no cost, negating the reduction of thinner single-use bags. The ban was repealed in November 2016 and industry met with government officials to craft an alternative. The result was the fee that applied to all carryout bags, regardless of material.

⁶¹ PennEnvironment (2021). <https://pennenvironment.org/news/pae/clean-air-council-and-pennenvironment-file-motion-join-lawsuit-overturn-pa-plastics>

⁶² City of Philadelphia . <https://www.phila.gov/programs/plastic-bag-ban/>

⁶³ City of Washington DC. <https://doee.dc.gov/node/7792>

According to a joint University of Chicago-New York University study, the \$0.07 fee resulted in a halving of the number of plastic bags being used at grocery stores in Chicago. Additionally, the number of people bringing reusable bags increased by 2.5 times, and the number of people who didn't use a bag nearly tripled.⁶⁴ Due to the overwhelming success of the city's bag fee, in 2020, bills in the state Senate and House were introduced to charge a fee on carryout bags across the entire state. Those bills, Senate Bill 3423, and House Bill 3335, would impose a \$0.10 fee on all bags and are still under consideration and have yet to receive a vote.⁶⁵

6.6 Extended Producer Responsibility and Deposit Return Systems

In the U.S., 119 producer responsibility laws have been adopted in 33 states, addressing 14 types of consumer products.⁶⁶ These programs range from managing mattresses in California to managing paint waste in Washington DC. Two trends that have received significant interest in recent years are deposit return systems (DRSs) for beverage containers and extended producer responsibility (EPR) for packaging. A detailed description of these programs with relevant examples is provided in the Appendix.

EPR is a policy approach that requires producers to take responsibility for the post-consumer management of its products and packaging. EPR policies have two related features: (1) shifting financial responsibility and sometimes operational coordination, with government oversight, upstream to the producer and away from the public sector; and (2) providing incentives to producers to incorporate environmental considerations into the design of their products and packaging, such as designing for recyclability and using recycled content.

A deposit return system is a legislatively designated EPR system that places a small monetary deposit on a product, paid by the consumer at the time of purchase, which is refunded when the consumer returns the product packaging to a designated return location for reuse and/or recycling.

⁶⁴ University of Chicago Energy & Environment Lab.

https://urbanlabs.uchicago.edu/attachments/4d5115b55b216984be9d0c3c20e3b0fc42096fa5/store/bc678f1fd91593abc69c737c5c8a6da925a2ba8bce03b1dade052e095e58/Bag-tax-results-memo-PUBLIC.FINAL_.pdf

⁶⁵ State of Illinois (2020) Carryout Bag Fee Act

<https://www.ilga.gov/legislation/BillStatus.asp?DocNum=3335&GAID=15&DocTypeID=HB&LegId=119837&SessionID=108&GA=101>

⁶⁶ Penn Environment (2020) Break the Waste Cycle Producer Responsibility Policies to Move the U.S. Toward Zero Waste

7.0 Recommendations

Based on the analysis conducted on Pennsylvania’s recycling ecosystem, Act 101 has established a solid foundation for the Commonwealth. More than 90% of the population has access to a recycling program and the reported recycling rate based on collection has averaged above 40% for the past decade. The analysis also shows that Act 101 created unintended impacts which limited growth in Pennsylvania’s recycling marketplace. There are also opportunities to move beyond Act 101 to identify new policy solutions for pursuing a circular economy.

The following section presents **15 recommendations as part of a roadmap for the improvement and modernization of Pennsylvania’s recycling system**. Each option identifies several pathways for enacting it, whether through legislation, regulations, or new programming. Each recommendation comes with challenges, but all of these recommendations have been implemented successfully in other jurisdictions.

7.1 Enforce Existing Act 101 Provisions

Act 101 provided a good foundation for creating a recycling system in Pennsylvania. There are still areas of Act 101 which are not fully implemented or enforced. The first step towards improving Pennsylvania’s recycling system can be to focus on areas of Act 101 that can be further enforced without the need for new legislation .

Recommendation 1: Require Additional Recycling by Commonwealth Agencies

Proposed Measure: All Commonwealth agencies should establish and implement a source-separated collection program for all eight Act 101 designated materials, if deemed marketable, as opposed to the three materials they are currently required to recycle. In addition, DEP should collect data on recycling from these agencies, which can be done through the GreenGov Council.

Reasoning: With 80,000 employees, Pennsylvania's Commonwealth government is a significant economic sector, so it has an opportunity to dramatically reduce its waste. Having government agencies source separate a wide set of materials sets a positive example for other organizations. In this way, Commonwealth agencies can lead by example.

Implementation method:

- Legislation is not required. Either a guidance document or executive order can have full effect.

1: Legend for Icons

Implementation Method	
	Act 101 Amendment
	New Legislation
	Guidance Document or Directive
	New Program
Benefit	
	Increased Coordination
	Improved Clarity
	GHG Reduction
	Increased Recycling
	Better Financing
	Job Creation

Benefit:



Not only will this increase the amount of material recycled by Commonwealth agencies, but through leading by example it may set a more widely used standard for business recycling. The GreenGov’s Products & Materials Focus Group, according to their 2021 Annual Report, is deployed its first recycling kiosk for use in State office buildings, as an effort to encourage more recycling and educate employees and the public on recycling.⁶⁷

Recommendation 2: Enforce Commercial Recycling Requirements of Act 101

Proposed Measure: Enforce the commercial recycling requirements of Act 101 to ensure that commercial, municipal, and institutional entities are recycling properly.

Reasoning: Act 101 Section 1501 (c)(iii) states “Persons to separate high grade office paper, aluminum, corrugated paper and leaf waste and other materials deemed appropriate by the municipality generated at commercial, municipal or institutional establishments and from community activities and to store the material until collection.” According to stakeholder interviews commercial separation of waste and collection is minimal and not well enforced.

Implementation method:



Legislation for this measure is not required. Either a guidance document or executive order urging municipalities to enforce this requirement should have full effect.

Benefit:



Increased commercial recycling will lead to direct increases in the amount of material recycled and the associated GHG and job benefits.

Considerations: The commercial requirements within Act 101 have been codified in legislation for decades. Simply stating that they should be enforced will not likely push commercial institutions to recycle, or municipal officials to enforce it. Additional outreach and support may be required, including potentially financial support. The City of Allentown serves as one successful example to achieve this goal: the city allows small commercial businesses to contract to receive the same curbside waste and recycling services as residential households, but for a fee⁶⁸.

⁶⁷ GreenGov Council 2021 Annual Report
<https://www.dgs.pa.gov/greengov/Documents/GreenGov%20Annual%20Report%202021%20-%20FINAL.pdf>

⁶⁸ <https://www.allentownpa.gov/Portals/0/files/Recycling/2018%20Business%20Requirements.pdf?ver=2018-01-18-112528-607>

Recommendation 3: Recommit to the Education Component of Act 101

Proposed Measure: Recommit to Act 101’s educational components through additional public awareness campaigns on waste management and recycling. This can be done through centralized campaigns that can focus on the correct types of materials to recycle to prevent contamination and further waste reduction. Additionally, DEP can designate more funds from grants to support education.

Reasoning: The waste stream has evolved and become more complex over the last 33 years since Act 101 was passed. Educated residents can help decrease contamination in recycling and become advocates for the recycling program.

Implementation method:



New educational campaigns do not require legislative change and can be done with new programming through funding with the existing Recycling Fund. A working group could be established consisting of the Recycling Coordinators and DEP to consider how to design a centralized, coordinated education campaign, drawing on the experience of other states, for example Vermont.⁶⁹

Benefit:



Consistent and coordinated messaging will increase the likelihood that residents will be educated and engaged and participate in services correctly, helping to improve capture rates and decrease contamination. Residents who are well educated on the benefits of recycling will be more likely to recycle. This can increase the recycling rate.

Considerations: Additional funding for educational programs would come from the Recycling Fund, which would reduce funding for other grant categories. DEP will need to consider the optimal distribution of resources to create the desired results.

7.2 Priority New Policies and Programs

Act 101 was designed to meet the challenges present in 1988, but to meet today’s challenges, the Commonwealth needs new policies to move toward a circular economy and a zero waste system. As shown in Section 6.0, there are various policy tools that can increase the recycling rate and reduce the volume of waste generated. The following section recommends new policy and program options, some of which may require new legislation.

Recommendation 4: Develop and Publish Success Metrics

Proposed Measure: The DEP can work with stakeholders to establish and publicize clear success metrics for Pennsylvania’s recycling program. These metrics can include but are not limited to:

- Annual tons of material actually recycled, not only the material delivered to MRFs;
- Recycling rate based on the above metric;

⁶⁹ <https://dec.vermont.gov/waste-management/solid/universal-recycling/schools>


- Number of jobs created;
- GHG emissions offset.

In consultation with stakeholders, the DEP can set long term goals, potentially updated every 10 years, and provide annual updates on these goals.



For each of these metrics, the DEP should establish and publicize a clear methodology for how they will be tracked. To calculate the tons of material recycled, DEP should base this on data reported by municipalities in addition to data submitted by haulers. The DEP already uses the EPA WARM model⁷⁰ for calculating GHG reductions and economic impacts. These should be tied to the 2021 Climate Action Plan.

Reasoning: Reporting to Pennsylvania residents provides transparency to whether the recycling program is achieving its goals. Tracking goals holds the system accountable, helps build stakeholder support, and can help attract additional funding.

Implementation Method:

 Under Act 101, DEP is required to promote recycling by “Developing and maintaining a data base on recycling and waste reduction in the Commonwealth and making the information in that database available to the public.” Based on this requirement, DEP can internally agree on a set of goals and publicize them through a directive or guidance document from the DEP Secretary.

Benefit:

  A new set of success metrics allows for better data tracking across the state regarding waste reduction numbers and can further reveal if the Commonwealth is reaching new higher reduction goals.

Considerations: Collecting and reporting data requires DEP and municipal resources, including but not limited to time and funding. DEP will need to consider what types of reporting requirements they can implement with current resources or if they need additional resources.

Recommendation 5: Streamline the data reporting process



Proposed Measure: The DEP can consolidate and streamline the data reporting process and require that both municipalities and waste management facilities submit data through Re-TRAC. This can be done once per year and the 904 Performance Grant Process can use this data. Additionally, facilities should be required report both inbound and outbound materials so local authorities can identify what is actually being recycled rather than what is merely being collected.

Reasoning: Currently, by February 15th of each year, municipalities are required to report to their respective county the weight or volume of materials that the program collected for



⁷⁰ U.S. EPA. www.epa.gov/warm

recycling in the preceding year. The deadline for 904 Performance Grants is much later in the year, recently falling at the end of December. Many municipalities report on the same information for the 904 grants as they do for February 15th deadline, but by this time have updated numbers. By consolidating these two data gathering processes into one annual reporting period, municipalities can save time and money on administrative costs.

Implementation method:

-  The February 15th deadline for municipal reporting is set in Act 101, therefore it can only be changed through legislation. Moving this deadline later will provide municipalities with time to acquire the necessary data.
-  As an alternative to the above, DEP can move the 904 Performance Grant deadline to February 15th to fall in line with the municipal reporting period. However, currently municipalities have several more months to acquire additional recycling data to increase their funding in the grant process. Therefore, if the grant deadline is moved to February, municipal awards for recycling may be reduced.

Benefit:

-   If all data is reported at the same time, it will improve clarity on what materials are being collected and actually recycled and, by reducing the reporting period from two times per year to one time per year, it will reduce administrative costs.

Considerations: To ensure the most accurate municipal recycling data is compiled and reported to the DEP, moving up the February 15th deadline would be the most efficient and cost-effective way, however that would require a change in the Act 101 legislation.

Recommendation 6: Establish Reporting Requirements for MRFs

Proposed Measure: Incentivize MRFs to report on the materials processed and marketed. MRFs can receive guidance to report both inbound and outbound materials so local government officials can better understand the true recycling rate.

Reasoning: Currently, the amount of material collected is reported as being recycled, but some of this material ends up being sent to landfill. If MRFs report on both the inbound and outbound material, then local authorities will have a better understanding of the true recycling rate.⁷¹ This is critical since loss rates can be as high as 22% for single stream recycling.⁷²

Implementation method:

-  This measure may require amending Act 101 or the Solid Waste Management Act.

⁷¹ Some municipal contracts require the MRF to report both the quantity of materials actually recycled and the amount of income received, which is credited to the municipality towards its cost of recycling and the contaminated material that the MRF sends to a landfill.

⁷² Collins, S. (2012) <https://www.leg.state.nv.us/App/InterimCommittee/REL/Document/8282?rewrote=1>

Benefit:



Having MRFs report on the outbound material as well as the amount of material collected for recycling will allow the Commonwealth to more accurately track the true recycling rate, not only the collection rate, which often includes materials that contaminate recycling streams and cannot be recycled and end up in landfills.

Considerations: Changing the reporting requirements to identify the real recycling rate most likely will show reduced recycling rates. DEP can consider publishing both the “collected for recycling” figure and the true recycling rate to educate stakeholders.

Recommendation 7: Establish a Standard of Materials to Be Collected

Proposed Measure: Establish a mandatory set of materials to be recycled.

The mandatory set of materials would be those that have the strongest markets: metals, cardboard, glass, PET, and HDPE or make all eight materials listed in ACT 101 required.

Reasoning: Since municipalities are only required to collect three of eight materials, there is little uniformity among municipalities in the types of materials they collect. It also allows municipalities to stop collecting valuable recyclable materials while still complying with Act 101. Establishing a required set of materials would allow for easier cooperation among municipalities to jointly contract with haulers and MRFs and would create economies of scale in the Pennsylvania recycling market. It will also protect against valuable commodities being landfilled.

Implementation method:



Establishing a mandatory, uniform list of materials to be recycled that would include metals, cardboard, glass, PET and HDPE would require a legislative change.



Another alternative is to establish a recommended list of recyclable materials based on market conditions. Before any legislative change, DEP could conduct a study to identify the most marketable set of materials for recycling. The DEP could then create a guidance document encouraging municipalities to collect this set of materials. Although this is not an enforceable measure, it will create a starting place for intermunicipal cooperation and contracting with haulers. This study can be conducted at an appropriate regularly scheduled interval and a mechanism can be developed to adjust the materials to be recycled based on markets.

Benefit:



Establishing one set of materials for collection will improve clarity for households across the Commonwealth on what is to be recycled. It will also make education easier, and in practice when someone moves to or works in a different municipality no reeducation will be required on how to recycle. Additionally, this option can facilitate increased coordination among municipalities, making it easier for municipalities to contract jointly and share hauler

services, as they will be collecting the same materials. Lastly, this measure keeps valuable commodities out of the landfill and puts them back into the economy.

Considerations: This recommendation may create a change in habits for the average Pennsylvania resident. Any change will need to coincide with a comprehensive education program to ensure the population knows what and how to recycle. Additionally, there are many stakeholders involved in the process in addition to residents such as haulers and recyclers. It is possible not everyone will support the materials added to the list.

Box 7-1: Case Study on Lancaster County Solid Waste Management Authority

The Lancaster County Solid Waste Management Authority (LCSWMA) manages waste and recyclable materials from the nearly 600,000 residents in Lancaster County. All collection is contracted to private haulers who then deliver the waste to LCSWMA transfer station. At this point, LCSWMA consolidates the waste and transports it to their disposal facilities, which include two waste-to-energy facilities and a landfill. LCSWMA is mainly funded through the tipping fees at their facilities.

Out of the 60 municipalities in Lancaster County, 28 are mandated to provide recycling under Act 101 and an additional 16 provide recycling voluntarily. The county-wide system allows for additional coordination among municipalities as LCSWMA manages much of the data reporting requirements under Act 101 and supports the grant writing process for 904 Performance Grants.

In 2018, LCSWMA focused on harmonizing the materials collected by recycling programs and encouraged residents to only recycle the “Big 4” which are corrugated cardboard, plastic bottles and jugs with a neck, metal food and beverage cans, and glass bottles and jars.

LCSWMA worked with haulers and municipalities to inform them of this effort to increase uniformity in the county. The City of Lancaster also provides additional drop off options for residents to recycle their newsprint, office paper, magazines, paperboard, and more.⁷³

The objective of the harmonization effort was to reduce contamination in recyclable streams and to focus on the most financially viable materials.⁷⁴ The recycling rate in 2017 before the harmonization effort was 44%,⁷⁵ indicating that the harmonization effort did not affect top line recycling rates.

This case study shows that a county wide system can support the coordination of different Act 101 processes such as data reporting and grant submissions in addition to advocating for a standard set of materials to be recycled. LCSWMA owns its own facilities which generate

⁷³ <https://www.cityoflanasterpa.com/recycling-center/>

⁷⁴ Interview with LCSWMA 8-11-21

⁷⁵ LCSWMA (2018) 2017 Annual Report. <https://www.lcswma.org/wp-content/uploads/2018/10/2017-annual-report.pdf>



revenue and is a corporate and political body organized under the Municipal Authorities Act of 1945. However, creating a similar structure in other counties may not be feasible.

Recommendation 8: Increase Incentives for Intergovernmental Agreements – Regional Planning



Proposed Measure: Increase incentives for municipalities to create or counties to lead intergovernmental agreements for solid waste management and recycling. This can be done through the encouragement of recycling commissions, joint contracting of recycling haulers, or the establishment of solid waste management authorities.

Reasoning: Greater cooperation among municipalities creates opportunities for efficiencies. For example, if several municipalities contract for services together -- noting that contract start dates might need to be staggered to accommodate existing contract end dates -- those municipalities will have greater buying power in the market, greater clarity for their customers and residents, likely attract more bidders, and benefit from economies of scale to reduce costs. A case study on regional cooperation can be found in Box 7-2.

Implementation method:

-  A guidance document outlining the benefits of cooperation may convince more municipalities to work together, setting out the financial and service benefits
-  Currently, grants priority goes to municipalities that cooperate on programs. This can at least remain in effect, but can also be expanded, for example, to support municipalities that procure services together with funding to support development of tender documents.

Benefit:

-   Increased coordination among municipalities can lead to cost efficiencies, service consistency, and operational improvements, and most importantly, greater recycling rates.

Considerations: Municipalities interested in cooperation should look to create efficiencies to build buy-in among those involved. This will increase the likelihood of the long-term sustainability of the agreement.

Box 7-2: Case Study on Northern Montgomery County Recycling Commission

The Northern Montgomery County Recycling Commission (NMCRC) is a coalition of 11 municipalities that coordinate to support the recycling programs in their communities.⁷⁶ One main function of this commission is the contracting of a local company to coordinate the 904 Performance Grant submissions process and to ensure that all municipalities within the commission are meeting their responsibilities outlined under Act 101.

⁷⁶ Norther Montgomery County Recycle Commission. <http://northmontcorecycle.com/>

The firm which manages the responsibilities of the commission collects all the 904 Performance Grant information which is then submitted as one grant for all 11 municipalities. In addition to grant reporting, the firm ensures that each municipality has an up-to-date website and sends out four articles on recycling each year.⁷⁷ This ensures that the municipalities are meeting their educational requirements under Act 101. The firm is funded through a percentage commission on the funding received through the 904 Performance Grants.

Although the commission does not mandate that all municipalities collect the same materials for recycling, it does encourage municipalities to do so. Several municipalities within the commission have contracted their recycling collection services as a group which creates efficiencies in the collection and ensures these municipalities are collecting the same materials. As these municipalities were already working together within the commission, there were fewer barriers for contracting services together.

The recycling rate in Commission municipalities prior to the formation of the Commission was less than 15%. One of the Commission's goals was to increase area recycling rates. Today, the recycling rate is over 20%.⁷⁸ While there is still the need for continued improvement, collaboration has led to an increase in recycling.

This case study provides a replicable example of coordination among municipalities to more easily meet the requirements of Act 101 and ensure timely grant submissions. The NMCRC contracts with a private company to provide this support, which is a workable structure, but it may also be feasible to create the same structure within local government. For example, a local staff member can coordinate the grant submissions and educational requirements for several nearby communities and their services can be covered by a percentage fee on the 904 grant submissions agreed upon by the other municipalities.

Recommendation 9: Conduct an Organics Waste Feasibility Assessment and Create Additional Incentives for Organic Waste Programs

Proposed Measure: DEP can consider carrying out an assessment following the completion of its waste characterization study to assess what infrastructure would be needed for a comprehensive organics recovery, reuse, and recycling program. This can build upon the Pennsylvania Climate Action Plan's goal to increase capture of biogenic methane from non-fossil sources, including animal manure, food waste, and landfill gas, for use in commercial and industrial properties.⁷⁹ Based on this study, incentives can be created to encourage additional organic waste management programs, including organic waste reduction and organic waste management.

Reasoning: Organic waste makes up one of the largest components of municipal solid waste and when it is sent to the landfill it slowly breaks down and creates methane, a potent



⁷⁷ Interview with NMCRC 8-12-21

⁷⁸ Northern Montgomery County Recycling Commission http://northmontcorecycle.com/?page_id=6


⁷⁹ [PA Climate Action Plan Summary Booklet 2021](#) page 6

greenhouse gas. Municipal solid waste landfills have been ranked the third-largest source of human-related methane emissions in the United States.⁸⁰ Food waste was one of the least collected items in Pennsylvania’s recycling programs; incentives may be required to help make food waste collection programs mainstream and to move food waste management as high up the waste hierarchy as possible.

Implementation method:

-  Several requirements currently constrain the approval of composting sites in urban areas due to the odor they may generate. Working on streamlining and approving these permits or identifying sites where waste can be composted can create capacity for additional organic waste management programs
-  More opportunities such as the Food Recovery Infrastructure Grant program – which aids registered nonprofit organizations such as food banks for the proper management of food to reduce waste⁸¹ -- can help start organic waste programs. Focusing on support of business and institutional food waste recovery may allow for greater impact.

Benefit:

-  Additional incentives for organic waste programs can increase diversion rates for this waste stream. Organic waste recycling also has significant GHG reduction benefits.


Considerations: Organic waste programs are not as well established as other material recycling programs and may be more expensive to ramp up. Thus, they may require more support may from municipalities, the Commonwealth, and expert agencies.

Recommendation 10: Increase/Update Grant Categories

Proposed Measure: Establish additional grant categories which can go towards more innovative programming such as organic waste collection, regional collaboration for public private partnership infrastructure, reuse initiatives, and C&D material recovery. Envision making grant opportunities available to 501(c)3 nonprofit organizations to foster innovation.


Reasoning: The grant categories listed in Act 101 have not been updated since 1988, but recycling technologies and needs have evolved. Providing periodic updates to the grant categories can ensure that funding is awarded to the best programming for the time.

Implementation method:


-  Updating the grant categories in Act 101 would require an amendment to the Act.

⁸⁰ USDA <https://www.usda.gov/foodlossandwaste/why>

⁸¹ PA Department of Environmental Protection Recycling Financial Assistance <https://www.dep.pa.gov/Business/Land/Waste/Recycling/Municipal-Resources/FinancialAssistance/Pages/default.aspx>
<https://www.governor.pa.gov/newsroom/wolf-administration-expands-food-recovery-infrastructure-grants-to-help-the-charitable-food-system/>

-  DEP can review the definitions of each grant category and update what types of projects can fit into each category, providing examples for each.

Benefit:

-  By expanding grant categories, municipalities can consider collection systems for a broader range of materials, helping reach zero waste goals and providing social and environmental benefits. For example, 904 grants could create incentives to provide more collection options by offering funds for the reuse and recycling of materials beyond those currently approved, such as electronics, construction and demolition materials.

Considerations: Adding additional grant categories will further stretch the Recycling Fund. Any additional programs will need to be compensated with reductions in current grant funding assuming stable revenue into the Recycling Fund. This would require exploration of new revenue streams.


Recommendation 11: Promote “Reduce” and “Reuse” for Materials

Single Use Plastics

Proposed Measure: Identify the single use plastics that are most prevalent in Pennsylvania litter, such as in the Pennsylvania Litter Research Study⁸², or that frequently contaminate recyclable collection streams, and either ban or implement a fee on these materials. These materials can include but are not limited to plastic bags, plastic straws, plastic foam take away containers, and single use utensils.

Reasoning: Many of these materials are not collected by municipal recycling programs and contaminate much of the recycling stream and clog machinery at MRFs. Additionally, there are cleaner alternatives to many of these materials, such as paper bags or compostable take away containers. Banning or implementing a fee on these materials businesses will incentive businesses and consumers to switch to cleaner alternatives.

Implementation method:

-  Philadelphia already passed legislation banning the use of plastic bags in certain stores⁸³ and legislation has been proposed at the state level⁸⁴ that would both ban

⁸² Pennsylvania DEP (2020) Pennsylvania Litter Research Study
<https://files.dep.state.pa.us/waste/Bureau%20of%20Waste%20Management/WasteMgtPortalFiles/Littering/Pennsylvania%20Litter%20Research%20Study%20Final%20Report%201.30.2020.pdf>

⁸³ McCrystal, L (2021) What to expect while you’re out shopping as Philly’s plastic bag ban begins.
<https://www.inquirer.com/news/philadelphia/philadelphia-plastic-bag-ban-enforcement-20210629.html>

⁸⁴ Commonwealth of Pennsylvania (2021) House Bill 1382
<https://www.legis.state.pa.us/CFDOCS/Legis/PN/Public/btCheck.cfm?txtType=PDF&sessYr=2021&sessInd=0&billBody=H&billTyp=B&billNbr=1382&pn=1496>

plastic bags and implement a fee on paper bags. These can be used as a starting point and a model for future legislation.

Benefit:



Plastics are made from fossil fuels. Reducing the number of single use plastics can lead to reduced GHG emissions and reduce the amount of waste generated across the state. The measure will also reduce litter.

Considerations: DEP may want to consider conducting a study on alternatives for single use plastics. When legislation is enacted DEP can use this study to recommend alternatives for businesses and consumers to use.

Construction and Demolition Waste

Proposed Measure: Develop a model ordinance or municipal strategies focused on promoting the recycling and reuse of C&D waste and the deconstruction of buildings. Many C&D related regulations are passed at the municipal level, so this model ordinance could be used by cities throughout Pennsylvania. Other strategies can include pre-demolition salvage surveys, access to properties before demolition, C&D material bans, material diversion requirements (percentage) by weight/volume, up to deconstruction ordinances (e.g., all properties built before 1940 must be deconstructed).

Reasoning: Construction and demolition waste makes up an estimated 23% of the national waste stream⁸⁵ and much of the material can be reused or recycled.

Implementation method:



New legislation set at the municipal level will create an enforceable route towards requiring the recycling of C&D waste. Section 6.2 outlines cities that have already enacted construction & demolition recycling legislation.

Benefit:



Enforcing reuse and recycling of C&D waste will increase the amount of material recycled and lead to GHG emission reductions. This may also lead to job creation as the reuse and of materials is understood to generate more jobs than landfilling⁸⁶.

Considerations: Creating model legislation or local government strategies will have minimal impact initially if municipalities do not pass the legislation. Stakeholders within the sector

⁸⁵ Bureau of Transportation and Statistic

https://www.bts.gov/archive/subject_areas/freight_transportation/faf/faf4/debris

⁸⁶ United States Environmental Protection Agency - <https://www.epa.gov/smm/sustainable-management-construction-and-demolition-materials#benefitsreducing>

Construction and Demolition Recycling Association - <https://cdrecycling.org/>



can use the model legislation to advocate for local legislation or guidelines to create more impact.

Recommendation 12: Enact a Landfill Ban for Select Materials



Proposed Measure: Ban the most recyclable materials such as aluminum and steel/bi metal cans, PET and HDPE bottles from landfills.

Reasoning: Highly recyclable materials such as aluminum cans are easily marketed and are endlessly recyclable. Offering recycling services alone may not be enough to capture an acceptable percentage of this waste stream.

Implementation method:

-  A landfill ban, through legislation, outlining specific materials would produce the most effective result, with the ability to add materials as markets are developed. This could, for example, at a later date include a ban on food waste.
- 

Benefit:

-   Both options will lead to increased capture and in turn greater recycling. Improved recycling will lead to reduced GHG emissions.

Considerations: Landfill bans require implementation of sorting systems, robust auditing of facilities, and penalty mechanisms.

7.3 Vision for Legislation


This section offers additional legislative recommendations to improve and modernize Pennsylvania’s recycling system. It presents policies that address not only increasing recycling rates, but expanding efforts for reuse, recycled content, and producer responsibility.

Recommendation 13: Develop Right to Repair Legislation


Proposed Measure: Enact statewide “right to repair” legislation so that consumers in Pennsylvania have access to the information, tools, and third-party services required to repair and refurbish modern technology.

Reasoning: Current limitations on consumers’ ability to individually repair or secure a third-party service to repair devices drives demand for the production, purchase and then disposal of virgin material made products. This is an inefficient use of resources and leads to increased resource extraction and waste generation.

Implementation method:

 Right to repair legislation⁸⁷ has already been proposed in Pennsylvania, which can serve as a starting point for implementing a statewide right to repair.

Benefit:

 If products are repaired at a higher rate, rather than disposed of and replaced through new purchases, less waste will enter landfills, less resources will be consumed, GHG emissions will be reduced, and ideally more local jobs will be created.


Considerations: Many of the world’s largest companies oppose “right to repair” legislation, claiming quality, intellectual property, and security concerns. Any proposed right to repair legislation may trigger substantial opposition from the affected industries.

Recommendation 14: Beverage Container Deposit Return System


Proposed Measure: Consider the development and implementation of a Deposit Return System (DRS) for all beverage container types based on principles detailed in the appendix.

Reasoning: Deposit return systems are a proven mechanism for maximizing the capture of beverage containers for recycling and can complement curbside recycling collection systems for other packaging material. In addition to higher overall packaging recycling rates, DRSs deliver decreased contamination levels and lower loss rates across the recycling system when compared to curbside collection systems, resulting in higher quality, more valuable secondary material output.

Implementation Method:

 A deposit return system for beverage containers requires new legislation. An alternative to a specific piece of legislation for a deposit system is to include beverage container specific recycling rate targets within EPR for packaging, which is what Ontario and Canada have done.

Benefit:

 Deposit systems for containers significantly reduce litter⁸⁸ and are the most effective mechanisms for capturing containers -- capturing more than 85% of

⁸⁷ Commonwealth of Pennsylvania (2021) House Bill 1152
https://www.legis.state.pa.us/cfdocs/billinfo/bill_history.cfm?year=2021&ind=0&body=H&type=B&bn=1152

⁸⁸ Register, K (2020) Littered Bottles and Cans: Higher in Virginia Than in States with Bottle Bills.
<http://www.longwood.edu/cleanva/images/REPORT%20%20by%20CVW,%20comparing%20bottle%20bill%20%20non-bottle%20bill%20states%20FINAL%2011-2020.pdf>

containers sold in a state. The average rate of recycling PET and HDPE plastic bottles sits around 29%⁸⁹

Considerations: Deposit return systems shift material from curbside recycling into a deposit return system. Deposit systems can also financially support curbside services during transition by allowing municipalities and MRFs to access unclaimed deposits to fund infrastructure investments. The value of the deposit is greater than the material value of the container.

Recommendation 15: Develop Extended Producer Responsible for Packaging and other materials

Proposed Measure: Consider the development and implementation of an extended producer responsibility system for packaging materials following the best-in-class principles set out in the appendix.

In this system, funding for the recycling of packaging materials shifts from municipalities and consumers to the producers of that packaging.

Reasoning: Most producers design packaging without prioritizing how the packaging will be managed at its end-of-life. EPR can both finance the management of packaging at its end-of-life and incentivize producers to produce more reusable and recyclable materials.

Implementation Method:



New legislation is required to implement EPR.⁹⁰ The appendix provides guidance to legislators and other stakeholders on the key features of best-in-class EPR for packaging and the roles and responsibilities of different players.

Benefit:



EPR programs create better financing for different waste streams. Through this financing, recycling rates can increase and GHG emissions can be reduced. EPR laws are in place throughout Europe, with the highest packaging recycling rate topping 80 percent compared to about 50 percent in the U.S.⁹¹

Best-in-class EPR systems for packaging result in:

- Recycling services provided to all households;
- A common set of materials collected;

⁸⁹ EPA <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/containers-and-packaging-product-specific-data>

⁹⁰ Senator Lisa M. Boscola (2021) <https://www.legis.state.pa.us/cfdocs/Legis/CSM/showMemoPublic.cfm?chamber=S&SPick=20210&cosponId=35997>

⁹¹ [Product Stewardship Institute Extended Producer Responsibility for Packaging and Paper Products](#)

- Producers covering the cost of recycling services and ensuring there is adequate infrastructure in place over time to meet material specific targets leading to higher recycling rates, less waste disposed, reduction in GHG and increase in the number of people employed in the recycling industry.
- Municipalities retain the option to continue to provide or contract for services with local haulers, however, producers pay for these services under the polluter pays principle.
- More material is recycled as a result of escalating targets.

Additional Stewardship Programs

Proposed Measure: Consider and develop additional stewardship programs for additional materials such as paint, mattresses, and carpets.

Reasoning: Targeted EPR programs can be effective at financing waste management services for difficult to manage products.


Considerations: Extended producer responsibility legislation can be complex as it can be used to support the collection and recycling of various types of materials. It is important that all stakeholders are part of the legislative process to minimize adverse unintended impacts.


Recommendation 15: Develop Recycled Content Requirements

Proposed Measure: Consider the development of recycled content requirements for plastic and other packaging materials.


Reasoning: Recycled content policies seek to stimulate market demand and drive use of recycled feedstocks produced from materials collected for recycling.

Implementation method:

 Recycled content requirements can be enacted with new legislation or be included in EPR legislation.

 Act 101 encourages the use of goods, supplies, equipment, materials, and printing with recycled content for Commonwealth agencies. An executive order can set specific recycled content targets for Commonwealth agencies. Additionally, guidelines can be produced for measuring recycled content similar to those developed for the European Commission.⁹²

Benefit:

 Through increased market demand for recycled feedstocks, the recycling rate can increase and GHG emissions can decline.

⁹² Eunomia Research & Consulting (2020) Developing Options for Measuring Recycled Content. <https://www.eunomia.co.uk/eunomia-to-explore-options-for-measuring-recycled-content-across-europe/>

Considerations: Key considerations when developing this policy include:

- Which products and materials should be included.
- What material-specific targets should be included in legislation, and whether to require progressively increasing targets.
- Whether to include a mechanism for producers to demonstrate that they have met the targets.
- The penalties for non-compliance.
- Are there sufficient post-consumer quantities to meet recycled content targets? Can the collected post-consumer materials be effectively used to make the desired end product (e.g., beverage containers)?
- Is there evidence that this policy measure successfully helps meet the goal of the legislation to reduce plastic packaging and/or other material types in the waste stream?

8.0 Conclusion

Act 101 transitioned Pennsylvania from a system where only 2% of material was recycled in 1988 to a system that estimates 37% of material was reported recycled in 2018⁹³. While it succeeded in growing the recycling rate, it did not meet all of its goals, and many provisions within the Act created unintended impacts limiting the growth of Pennsylvania’s recycling system and a pathway towards zero waste and a circular economy.

To meet current challenges, the authors reviewed best practices from jurisdictions around the Commonwealth, the country, and the world. Based on these best practices, the authors present 15 recommendations to modernize Pennsylvania’s recycling system and resolve some of the unintended impacts of Act 101. By implementing these best practices, Pennsylvania can dramatically improve Pennsylvania’s recycling system, reduce the waste it sends to landfills, reduce greenhouse gas emissions, and move towards a more circular economy.

Figure 8-1: Summary of Options Enforce Existing Act 101 Provisions

Recommendations to improve and modernize Pennsylvania’s recycling system PROPOSED MEASURE Enforce Existing Act 101 Provisions	IMPLEMENTATION METHOD				BENEFIT					
	Act 101 Amendment	New Legislation	Guidance Document or Directive	New Program	Increased Coordination	Improved Clarity	GHG Reduction	Increased Recycling	Better Financing	Job Creation
1. Require additional recycling of Commonwealth agencies so they can lead by example										
2. Enforce Commercial Recycling Requirements of Act 101										
3. Recommit to the education component of Act 101										

93 Multiple factors undermine the accuracy of this rate. While higher than 2%, the 37% figure likely overstates the reality on the ground.

Figure 8-2 Summary of Options Priority New Policy and Program Options

Recommendations to improve and modernize Pennsylvania's recycling system PROPOSED MEASURE Priority New Policy and Program Options	IMPLEMENTATION METHOD				BENEFIT					
	Act 101 Amendment	New Legislation	Guidance Document or Directive	New Program	Increased Coordination	Improved Clarity	GHG Reduction	Increased Recycling	Better Financing	Job Creation
4. Develop and publish success metrics on Pennsylvania's recycling program										
5. Streamline data reporting process for recycling collection to once per year										
6. Establish reporting requirements under material recovery facility to obtain both inbound and outbound materials										
7. Establish a standard set of materials to be collected by recycling programs to ensure uniformity of the materials collected										
8. Increase incentives for intergovernmental agreements to promote coordination between municipalities										
9. Create additional incentives for organic waste programs as organics makes up the largest share of the waste stream										
10. Increase grant categories to allow for more innovative programming										
11. Promote "reduce" and "reuse" for materials such as single use plastics and construction & demolition waste										
12. Enact a landfill ban for select materials or require disposal facilities to pre sort key materials										

Figure 8-3 Summary of Options Future Vision for New Legislation

Recommendations to improve and modernize Pennsylvania's recycling system PROPOSED MEASURE Future Vision for New Legislation	IMPLEMENTATION METHOD				BENEFIT					
	Act 101 Amendment	New Legislation	Guidance Document or Directive	New Program	Increased Coordination	Improved Clarity	GHG Reduction	Increased Recycling	Better Financing	Job Creation
13. Develop right to repair regulation so residents have access to the needed information, tools, and third party services for repairs										
14. Develop a deposit return system for beverages based on best in class principles										
15. Develop extended producer responsibility legislation for packaging and other materials										

Appendix

A.1.0 Additional Landscape Analysis

A.1.1 Reuse

Promoting Reuse of Containers in Berkeley California

Berkeley, California began piloting the first California-based cup rent-return system in September 2019, engaging in a nine-month pilot project with cup-lenders [Vessel](#). Berkeley's Ecology Center is working with 11 businesses participating in the pilot, which serve their customers in metallic, silicone-lidded cups which are reserved via an online app. Customers use the app to scan a QR code on the cup, which links it to their account. Upon return to the establishment, cups await collection by Vessel via bicycle cab, who washes and returns cups to shops for further use. If the cup is not returned to the establishment within 5 days, a \$15 fine is placed upon the user, via the app.

Besides Berkeley's new pilot program with Vessel, the recent addition of chapter 11.64 to Berkeley's Municipal Code has established a roadmap for the future of reusable utensils and food ware in the city. The ordinance was signed into effect January of 2019 and backed by a coalition of more than 1,400 local, national, and international organizations.⁹⁴

Effective January 1, 2020, all takeout foodware in the city must adhere to standards set by the municipal compost collection programs, and be free of all fluorinated chemicals, save for aluminum that is to be accepted by the city's recycling program. Reusable cups provided by customers are also to be accepted, with establishments reserving the right to refuse a reusable container that they deem to be unfit for use, contaminated, cracked or inappropriate for size.

If no cup is provided, the customer is to be charged twenty-five cents (\$0.25) for every disposable cup provided to them. Certain persons that can present a California Special Supplemental Food Program for Women, Infants, and Children (WIC) voucher or card are exempt from this surcharge.⁹⁵

⁹⁴ ABC News (2019) Berkeley City Council unanimously passes disposable foodware and litter ordinance <https://abc7news.com/politics/berkeley-unanimously-passes-disposable-foodware-and-litter-ordinance-/5102184/>

⁹⁵ City of Berkeley. https://www.cityofberkeley.info/uploadedFiles/Public_Works/Level_3_-_Solid_Waste/2019-02-19%20Item%2001%20Ordinance%207639.pdf

Food vendors will be responsible for their own dishwashing and sanitization of reusable dishware, in compliance with the California State Health Code. Those not able to/without access to dishwashing facilities on-site will be eligible to receive waivers.⁹⁶

A.1.2 Landfill Bans

Nova Scotia Landfill Disposal Ban for Recyclables

Nova Scotia enacted a beverage container deposit program in 1994 through its Solid Waste Resource Management Regulations. These regulations established the Resource Recovery Fund Board Inc. (operating as Divert NS), an industry-led non-profit organization, to manage the program.⁹⁷ These same regulations established a landfill ban on beverage containers covered under the program to mandate their recycling at end-of-life.⁹⁸ Under this ban, it is prohibited to dispose of beverage containers at the landfill and residents are responsible for adhering to this ban. The law also bans LDPE bags and packaging, #2 HDPE non-hazardous containers, such as ice cream containers, plastic jugs, detergent bottles, and other materials like newsprint, corrugated cardboard, etc. related to other recycling programs.⁹⁹

Residential garbage is put on the curb in clear garbage bags and will be rejected by haulers if beverage containers or other banned items are found. This process helps increase awareness of the deposit system and other recycling programs.

The complementary nature of the landfill ban and the beverage container deposit program have led to high levels of public awareness of both programs. According to a survey by Divert NS, public awareness was in the high-80% range.¹⁰⁰

Through the province's Environment Act and Environmental Goals and Sustainability Prosperity Act, the Government of Nova Scotia set a target of 50% waste diversion and waste disposal of no more than 300 kilograms per person per year by 2015. The deposit return program helps the province towards these targets and, as a result, Nova Scotians send 50% less trash to the landfill on a per capita basis than the Canadian national average (though the province missed its goal of 300kg per person by 2015).¹⁰¹ From 2018 to 2019,

⁹⁶ City of Berkeley (2019) https://www.cityofberkeley.info/uploadedFiles/Public_Works/Level_3_-_Solid_Waste/2019-02-19%20Item%2001%20Ordinance%207639.pdf

⁹⁷ Bottle Bill Resource Guide. <http://www.bottlebill.org/index.php/current-and-proposed-laws/canada/nova-scotia>

⁹⁸ Nova Scotia. https://www.novascotia.ca/just/regulations/REGS/envsolid.htm#TOC3_19

⁹⁹ Divert NS. <https://novascotia.ca/nse/waste/banned.asp>

¹⁰⁰ Interview with Jeff MacCallum, Divert NS, 4-17-19

¹⁰¹ Interview with Jeff MacCallum, Divert NS, 4-17-19

the redemption rate for beverage containers covered by the program was 82.9%.¹⁰² According to Divert NS’s annual report, this reduced GHG emissions by 413 tons of CO₂.¹⁰³

A.1.3 **Extended Producer Responsibility and Deposit Return Systems**

Extended Producer Responsibility

EPR programs are a means of ensuring that the “polluter pays” principle is applied to waste management. EPR is a policy approach that requires producers to take responsibility for the post-consumer management of its products and packaging. There are two related features of EPR policy: (1) shifting financial responsibility and sometimes operational coordination, with government oversight, upstream to the producer and away from the public sector; and (2) providing incentives to producers to incorporate environmental considerations into the design of their products and packaging, such as designing for recyclability and using recycled content. EPR is not a new policy for addressing packaging waste. EPR operates via government regulation and oversight that set rules and standards for producers to fund the end-of-life management of packaging that they produce. The most effective EPR programs are those where:

- The system outcome, both in the form of **material specific recycling targets** and defined deadlines for achieving those targets, is set clearly in policy.
- **All households, both single- and multi-family, are provided with curbside collection or equivalent mechanisms to ensure convenient and equitable access to recycling services.** Convenient and equitable access means that all households have recycling collection services equal to their garbage collection services for a state-wide standardized group of materials.
- **Clear requirements with respect to producer reporting are set to ensure cost and performance transparency and accountability and verification of material end markets.**
- There is a legislated **oversight authority** (either the government or a government-appointed organization) is put in place that **sets the requirements for producer reporting to ensure transparency** and has authority to monitor compliance and enforce legal requirements.
- **Producers through a Producer Responsibility Organization (PRO)¹⁰⁴ are required to create and consult on a plan that describes how the targets will be met, what**

¹⁰² Bottle Bill Resource Guide. <http://www.bottlebill.org/index.php/current-and-proposed-laws/canada/nova-scotia>

¹⁰³ Divert NS (2020) 2019 Annual Report <https://divertns.ca/sites/default/files/2021-09/2020.pdf>

¹⁰⁴ Defined by Washington HB 1118 as (a) A non-profit organization that qualifies for a tax exemption under 26 U.S.C. Sec. 501(c)(3) of the federal internal revenue code and is designated by a producer or group of

investments will be needed and how they will report on system finances and performance.

- **Producers through the PRO invest in new or existing infrastructure necessary to achieve the targets by working with municipalities and the waste industry.**
- Program costs and commodity price risk are transferred to producers.
- **Operational delivery or management of services can be retained by municipalities or transferred to the PRO.**
- **There is a state-wide uniform list of materials that must be collected for recycling.**
- There is **consistent and frequent education** to maximize participation and material capture and reduce contamination.
- **Producers are incentivized to design out waste, and transition to recyclable packaging through modulated producer fees** that are higher for packaging material that is harder to recycle and has a low value versus material that is easily recycled and has a high market value.

If implemented correctly, **EPR is an effective mechanism to improve recycling rates, incentivize efficiency, and reduce costs for end-of-life management of residential packaging waste.** An outcomes-based approach provides **flexibility on how to design and implement the system while encouraging innovation and continuous improvement** in striving to meet prescribed performance objectives in the most **cost effective and efficient** manner possible.

- Clearly defined roles and responsibilities for each stakeholder are necessary for a successful EPR program. The main stakeholders, including residents, municipalities, state legislature, waste management actors, producers (and their PRO), and a regulatory agency, are outlined along with their roles and responsibilities in Figure A-1.
- EPR for packaging is in its infancy and the two bills passed in Maine¹⁰⁵ and Oregon¹⁰⁶ are very different and comply only with some of the best practice principles outlined above.

producers to develop and carry out the activities required of producers by this chapter; or (b) A single producer that develops and implements a plan to carry out the activities for its own covered products.

¹⁰⁵ State of Maine (2021) LD 1541 <http://legislature.maine.gov/LawMakerWeb/summary.asp?ID=280080518>

¹⁰⁶ State of Oregon (2021) SB 582 A <https://olis.oregonlegislature.gov/liz/2021R1/Measures/Overview/SB582>

Figure A-1: Roles and Responsibilities in an EPR System



Source: Eunomia.

Box A-3: Maine Extended Producer Responsibility for Packaging

In July 2021, Maine became the first state to sign into law an extended producer responsibility (EPR) program for packaging. In this bill, Maine is required to enter a contract with a stewardship organization that would then oversee the operation of the program. Additionally, the bill allows for the state to determine the fees paid by the producers which would then go towards municipal costs for operating waste management systems for packaging materials.

The bill in Maine still leaves much to be determined as it did not include recycled content targets or recycling rate targets. The next steps for Maine will be to select a stewardship organization and determine the rules of the program.

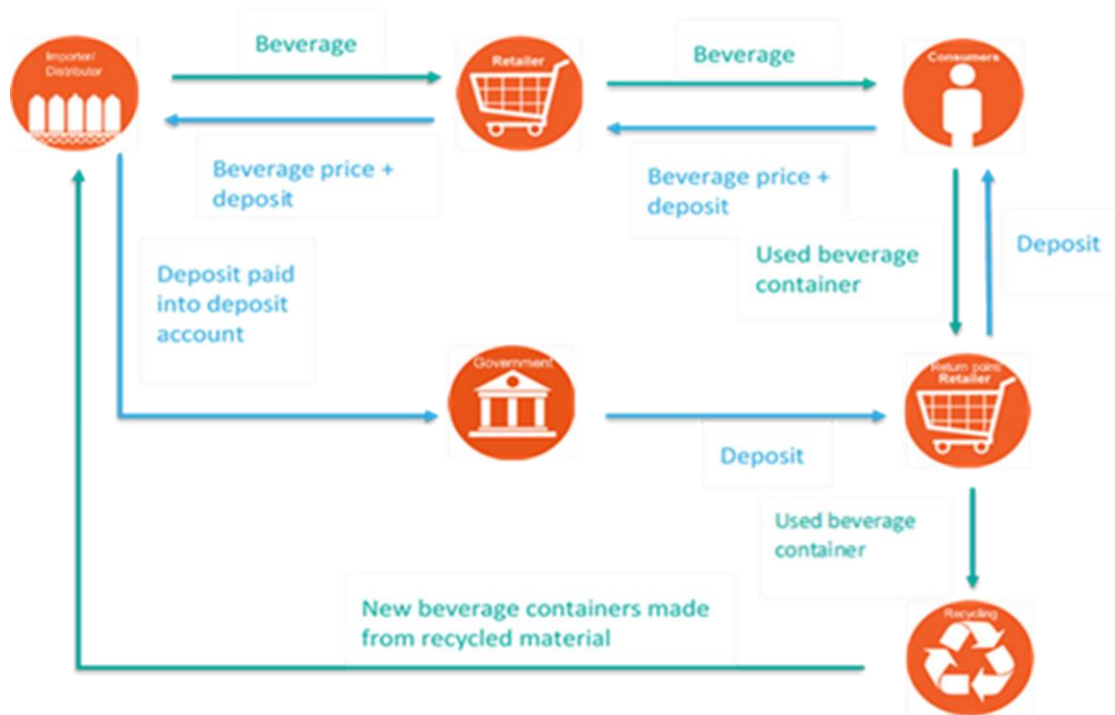
Deposit Return Systems – Bottle Bills

Ten states in the US have deposit return systems or bottle bills for beverage containers. While Bottle Bill legislation has historically been opposed by the beverage industry, the American Beverage Association¹⁰⁷, the Can Manufacturers Institute, National Association for PET Container Resources, and individual brands like Coca Cola, many of these institutions have all recently developed and publicized key principles for a deposit system. These entities see deposit systems as the main way that they will meet recycling content commitments, for example in PET bottles. Forty-six percent of all container packaging in the U.S. is recycled through the country's ten deposit states and the bottle bills in these states are responsible for collection and recycling 62% of the country's PET bottles, 51% of aluminum cans and 47% of glass bottles and jars.

A deposit return system is a legislatively designated EPR system that places a small monetary deposit on a product, paid by the consumer at the time of purchase, which is refunded when the consumer returns the product packaging to a designated return location for reuse and/or recycling. Bottle bills in the U.S. have elements of EPR in that they require producers to pay for the collection infrastructure. The bottle bills in the U.S. were put in place in the 1970s and 1980s and in many cases need modernization to ensure customer convenience and to enable collection rates in excess of 85%, which is seen in many best-in-class systems such as Oregon, Alberta, Canada, and in Europe.

¹⁰⁷ Plastic News (2020) <https://www.plasticsnews.com/news/aba-open-discussing-bottle-bills>

Figure A-2: Example of Financial and Material Flow in a DRS



Best-in-class DRSs from around the world adhere to the principles outlined in A-3.

Figure A-3: Principles of a Best in Class Deposit Return System

EFFECTIVE AND CONVENIENT
<ul style="list-style-type: none"> 90% minimum redemption rate target for producers to meet - setting the bar high 10¢ minimum deposit - incentivizing consumer redemption Comprehensive scope of beverages and packaging material included Minimum recycled content mandate – closing the loop on recycling Ensuring customer convenience & improved experience Comprehensive, technology-driven approach
WELL-MANAGED & REGULATED
<ul style="list-style-type: none"> Centralized system management Government plays an oversight and enforcement role Clear reporting from producers and auditing of system Barcode verification of all returned containers to reduce fraud Options for retailers – bag drop in parking lots, loyalty programs, return points to meet convenience standards – use of technology
PRODUCER FINANCED
<ul style="list-style-type: none"> Fair pay for service providers – handling fees should accurately reflect costs Unclaimed deposits off set system cost Mechanism to financially support improvements in municipal recycling programs in short term

Opposition to bottle bills often focuses on the impact on existing curbside services because of valuable material such as aluminum moving from curbside containers to the deposit. Under the best-in-class principles municipalities, counties and MRF operators would:

- Have access to a share of the unclaimed deposits in the initial years to pay for improvements in curbside infrastructure.
- Be paid the \$0.10 deposit for all containers that continue to be collected through curbside services. The value of the deposit is far greater than the weight of a material. For example, a ton of aluminum beverage cans has a value of approximately \$1,600¹⁰⁸, if a \$0.10 deposit was paid on the equivalent number of containers the value would be \$6,000, nearly four times greater.

Box A-3: Potential Impact of DRS in Washington State

A study was completed for Washington State that considered the potential impacts of introducing a deposit system alongside curbside services.¹⁰⁹ While they found a loss to the MRF from reduced tipping fees and material revenues, the value of the deposit containers passing through the MRF, which can be redeemed, can make up for some or all of this loss. The income associated with being paid \$0.10 for all containers collected through curbside services was \$70 million and access to a portion of unclaimed deposits was a further \$51 million. In total MRFS and municipalities would have access to \$73 million more funding in the three years following the introduction of a bottle bill under best-in-class system than if a bottle bill was not introduced and significantly more beverage containers would be recycled. Washington State has yet to pass EPR and DRS legislation; this study provided data to guide any discussions.

Box A-3: Oregon Beverage Container Deposit System

Oregon has one of the highest performing deposit systems for beverage containers in the U.S., and while it follows many of the best-in-class principles, not all are followed, in part because it was first introduced in 1971. Oregon was the first state to introduce a DRS. Initially, the system was limited to carbonated water and soft drinks, and beer and malt beverages. It charged a deposit of \$0.05 per container. Bottled water was added in 2009 and additional beverages in 2011, but the biggest change to the law was in 2017, when Oregon increased its deposit from \$0.05 to \$0.10. This followed an amendment to the legislation that required the deposit to be increased if the redemption rate fell below 80% for two

¹⁰⁸ [Recyclingmarkets.net](https://www.recyclingmarkets.net)

¹⁰⁹ King County, Department of Natural Resources and Parks, Seattle Public Utilities, “Container Deposit Study: Phase III: Costs and benefits of Residential Packaging and Paper Products in Washington State” November 2020 Eunomia Research & Consulting Inc. <https://www.eunomia.co.uk/reports-tools/king-county-container-deposit-study-phase-iii/>

consecutive years.¹¹⁰ This flexible approach recognizes the link between deposit values and return rates, and the need to keep the deposit value under review.

Oregon originally relied on a return-to-retail model for container redemption but began to open standalone redemption centers that are collectively owned by the Oregon Beverage Recycling Cooperative (OBRC) in 2010. OBRC is a cooperative corporation owned by Oregon beverage distributors and grocery retailers, formed in January 2009 to manage DRS operations.¹¹¹ As an industry operator, they have pioneered innovations to increase the efficiency and effectiveness of the DRS in Oregon. These include the BottleDrop program, where residents can be refunded their deposits via a mobile app after dropping off labeled bags of redeemable beverage containers. OBRC is also pioneering the return of refillable bottles in the state, introducing an industry standard bottle (ISB) that is redeemed through the same redemption system and is being adopted by local craft breweries, further reducing waste, and encouraging the management of material further up the waste hierarchy.

In 2019, Oregon passed SB 522, which institutes a fine of \$250 on those who return 50 or more out-of-state containers in one day at redemption locations. This bill was aimed specifically at fraud originating from Washington.¹¹²

Before the deposit value was increased, the return rate (from January to March 2017) was 59%.¹¹³ Following the increase in the deposit value from \$0.05 to \$0.10, Oregon achieved 82% redemption between April and December.¹¹⁴ As of the end of 2018, the DRS in Oregon had achieved an 85% redemption rate and diverted 181 million pounds of beverage containers from the landfill. In addition, a total of \$1 million has been raised for Oregon nonprofits through the BottleDrop Give program, where residents can donate their deposits to select organizations, since it began (in 2018 alone, over \$766,000 was raised).¹¹⁵

Additional Stewardship Models

Additional stewardship models to better manage specific waste streams exist. According to the Product Stewardship Institute (PSI), product stewardship “is the act of minimizing the

¹¹⁰ State of Oregon (2011) House Bill 3145

<https://olis.leg.state.or.us/liz/2011R1/Downloads/MeasureDocument/HB3145>

¹¹¹ Oregon Beverage Recycling Cooperative. <https://www.obrc.com/About/WhoWeAre>

¹¹² Rollins, M (2019) Bill fining people who redeem Washington bottles & cans in Oregon signed by governor. <https://www.kgw.com/article/news/local/bill-fining-people-who-redeem-washington-bottles-cans-in-oregon-signed-by-governor/283-fe60d3a7-0014-4cb3-a571-1b8942f36429>

¹¹³ Oregon Beverage Recycling Cooperative (2018) 2017 Annual Report. <https://www.obrc.com/Content/Reports/OBRC%20Annual%20Report%202017.PDF>

¹¹⁴ Oregon Beverage Recycling Cooperative (2018) 2017 Annual Report. <https://www.obrc.com/Content/Reports/OBRC%20Annual%20Report%202017.PDF>

¹¹⁵ Oregon Beverage Recycling Cooperative (2019) 2018 Annual Report. <https://www.obrc.com/Content/Reports/OBRC%20Annual%20Report%202018.PDF>

health, safety, environmental, and social impacts of a product and its packaging throughout all lifecycle stages, while also maximizing economic benefits.”¹¹⁶

Paint: In 2014, Washington DC passed the Paint Stewardship Act which requires all paint manufacturers to collect and reuse, recycle, or safely dispose of leftover paint.¹¹⁷ Each manufacturer or a representative must register with the Department of Energy and Environment. Every year they submit a management plan and report on their collection and recycling activities. In 2016, the stewardship organization (PaintCare), started drop off activities to collect used paint cans. PaintCare programs have now been implemented in 10 states in addition to Washington DC.¹¹⁸

Mattresses: Mattresses are bulky and difficult to dispose of which can lead to illegal disposal. California passed legislation in 2013 to create a stewardship program to better manage used mattresses.¹¹⁹ Based on this legislation, the State established a stewardship organization placed a fee on mattress sales to fund the program. After the law passed more accessible recycling locations for mattresses were created.

¹¹⁶ Product Stewardship Institute. <https://www.productstewardship.us/page/Definitions>

¹¹⁷ City of Washington DC. <https://doee.dc.gov/paint>

¹¹⁸ PaintCare. <https://www.paintcare.org/paintcare-states/>

¹¹⁹ Cal Recycle. <https://www.calrecycle.ca.gov/mattresses>

A.2.0 Examples of Education Materials

The following provide a sampling of educational materials for recycling programs across Pennsylvania. As noted in the report, the educational materials detail the differences in materials accepted in programs across the Commonwealth.

Figure A21: Centre County Recycling Poster



Figure A22: Media Borough Recycling Poster

		What to Recycle in Media			
		YES ✓	NO X		
Always	Put it all in the green bin—"Single Stream"		NO plastic bag liners for the bin	Never	
Always	Rinse all containers		Nothing with food waste or body fluids (greasy pizza boxes, diapers, pads)	Never	
Glass	Bottles, jars, & containers—broken is OK		Ceramics, chinaware, dishware, glassware, window glass, mirrors, light bulbs	Glass	
Plastics	Rigid containers with triangle # 1 through #7—But NOT Styrofoam and plastic bags		Plastic bags, Styrofoam, food wrap, or any plastic without a triangle	Plastics	
Metals	Bi-metallic and aluminum cans; metal lid; caps, foil, foil containers		Scrap metal, hangers, cooking pots & pans, syringes/needles, appliances, oil and paint cans	Metals	
Paper	Newspaper, magazines, catalogs, mail, paperback books, bags, office paper, file folders		Soiled paper towels or tissue paper, sheets of stickers or address labels, waxed paper	Paper	
Cardboard	Corrugated & non-corrugated, including food cartons		Cardboard lined with plastic (i.e. bubblewrap boxes), waxed/waterproof cardboard	Cardboard	
Other	Shredded office paper may be recycled if placed in a clear plastic bag next to green bin.		E-Waste	Other	
	Aseptic Packaging/TetraPak: Rinsed juice, broth boxes, etc.		Hazardous Waste	Other	
			Food, liquids, organic material	Other	
			Textiles, fabric	Other	

Figure A23: Lancaster County Recycling Image from Website



Figure A24: Souderton Borough Recycling Poster

RECYCLE

Thank you for recycling these **EMPTY** and **CLEAN** items:

Cans	Cartons	Glass	Paper	Plastic Containers
Aluminum and Steel Cans empty and rinse	Food and Beverage Cartons empty and replace cap	Bottles and Jars empty and rinse	Mixed Paper, Newspaper, Magazines, and Flattened Cardboard	Kitchen, Laundry, Bath: Bottles and Containers empty and replace cap

Figure A25: Pittsburgh Recycling Poster

CURBSIDE RECYCLING

The City of Pittsburgh provides single-stream recycling to single-family dwellings, duplexes, and apartments with 5 units or less. All recyclables can be placed in the same bin.

Mixed Paper:
White office paper, newspaper, magazines, hardcover/softcover books, catalogs, junk mail, phone books and paperboard.

What is NOT accepted: Coffee cups, shredded paper, greasy pizza boxes, paper plates or other food service ware items.

Metal Cans:
Empty aluminum, aerosol and steel cans. Rinse, leave labels on. Discard lid or leave attached to can.

What is NOT accepted: Loose metal lids and bottle caps, metal cookware, aluminum pans and foil.

Plastic:
Bottles, jugs and jars (3 gallons or less) #1 & #2. Rinse. Remove lid and dispose with regular trash.

What is NOT accepted: Plastics such as clamshell take-out containers, yogurt tubs, toys, buckets, swimming pools, Keurig Cups, to-go coffee cups, plastic lids, cups and garden hoses.

Cardboard:
Cardboard, free from food debris and grease, flattened and bunched, and placed into another box or bin for collection. Cardboard will not be collected on non-recycling weeks.

Glass:
Bottles, jugs and jars (3 gallons or less). Rinse. Remove lids and dispose with regular trash.

What is NOT accepted: Windows, Pyrex, dinnerware.