

# JOINT STATE GOVERNMENT COMMISSION

General Assembly of the Commonwealth of Pennsylvania

## RECYCLING STRATEGIES IN PENNSYLVANIA

*Staff Study*

June 2023



*Serving the General Assembly of the  
Commonwealth of Pennsylvania Since 1937*

**REPORT**

*Senate Resolution 285 of 2022  
Recycling Strategies in Pennsylvania*

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## JOINT STATE GOVERNMENT COMMISSION

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The Joint State Government Commission was created in 1937 as the primary and central non-partisan, bicameral research and policy development agency for the General Assembly of Pennsylvania.<sup>1</sup>

A fourteen-member Executive Committee comprised of the leadership of both the House of Representatives and the Senate oversees the Commission. The seven Executive Committee members from the House of Representatives are the Speaker, the Majority and Minority Leaders, the Majority and Minority Whips, and the Majority and Minority Caucus Chairs. The seven Executive Committee members from the Senate are the President Pro Tempore, the Majority and Minority Leaders, the Majority and Minority Whips, and the Majority and Minority Caucus Chairs. By statute, the Executive Committee selects a chairman of the Commission from among the members of the General Assembly. Historically, the Executive Committee has also selected a Vice-Chair or Treasurer, or both, for the Commission.

The studies conducted by the Commission are authorized by statute or by a simple or joint resolution. In general, the Commission has the power to conduct investigations, study issues, and gather information as directed by the General Assembly. The Commission provides in-depth research on a variety of topics, crafts recommendations to improve public policy and statutory law, and works closely with legislators and their staff.

A Commission study may involve the appointment of a legislative task force, composed of a specified number of legislators from the House of Representatives or the Senate, or both, as set forth in the enabling statute or resolution. In addition to following the progress of a particular study, the principal role of a task force is to determine whether to authorize the publication of any report resulting from the study and the introduction of any proposed legislation contained in the report. However, task force authorization does not necessarily reflect endorsement of all the findings and recommendations contained in a report.

Some studies involve an appointed advisory committee of professionals or interested parties from across the Commonwealth with expertise in a particular topic; others are managed exclusively by Commission staff with the informal involvement of representatives of those entities that can provide insight and information regarding the particular topic. When a study involves an advisory committee, the Commission seeks consensus among the members.<sup>2</sup> Although an advisory committee member may represent a particular department, agency, association, or group, such representation does not necessarily reflect the endorsement of the department, agency, association, or group of all the findings and recommendations contained in a study report.

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<sup>1</sup> Act of July 1, 1937 (P.L.2460, No.459); 46 P.S. §§ 65–69.

<sup>2</sup> Consensus does not necessarily reflect unanimity among the advisory committee members on each individual policy or legislative recommendation. At a minimum, it reflects the views of a substantial majority of the advisory committee, gained after lengthy review and discussion.

Over the years, nearly one thousand individuals from across the Commonwealth have served as members of the Commission's numerous advisory committees or have assisted the Commission with its studies. Members of advisory committees bring a wide range of knowledge and experience to deliberations involving a particular study. Individuals from countless backgrounds have contributed to the work of the Commission, such as attorneys, judges, professors and other educators, state and local officials, physicians and other health care professionals, business and community leaders, service providers, administrators and other professionals, law enforcement personnel, and concerned citizens. In addition, members of advisory committees donate their time to serve the public good; they are not compensated for their service as members. Consequently, the Commonwealth receives the financial benefit of such volunteerism, along with their shared expertise in developing statutory language and public policy recommendations to improve the law in Pennsylvania.

The Commission periodically reports its findings and recommendations, along with any proposed legislation, to the General Assembly. Certain studies have specific timelines for the publication of a report, as in the case of a discrete or timely topic; other studies, given their complex or considerable nature, are ongoing and involve the publication of periodic reports. Completion of a study, or a particular aspect of an ongoing study, generally results in the publication of a report setting forth background material, policy recommendations, and proposed legislation. However, the release of a report by the Commission does not necessarily reflect the endorsement by the members of the Executive Committee, or the Chair or Vice-Chair of the Commission, of all the findings, recommendations, or conclusions contained in the report. A report containing proposed legislation may also contain official comments, which may be used to construe or apply its provisions.<sup>3</sup>

Since its inception, the Commission has published over 450 reports on a sweeping range of topics, including administrative law and procedure; agriculture; athletics and sports; banks and banking; commerce and trade; the commercial code; crimes and offenses; decedents, estates, and fiduciaries; detectives and private police; domestic relations; education; elections; eminent domain; environmental resources; escheats; fish; forests, waters, and state parks; game; health and safety; historical sites and museums; insolvency and assignments; insurance; the judiciary and judicial procedure; labor; law and justice; the legislature; liquor; mechanics' liens; mental health; military affairs; mines and mining; municipalities; prisons and parole; procurement; state-licensed professions and occupations; public utilities; public welfare; real and personal property; state government; taxation and fiscal affairs; transportation; vehicles; and workers' compensation.

Following the completion of a report, subsequent action on the part of the Commission may be required, and, as necessary, the Commission will draft legislation and statutory amendments, update research, track legislation through the legislative process, attend hearings, and answer questions from legislators, legislative staff, interest groups, and constituents.

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<sup>3</sup> 1 Pa.C.S. § 1939.



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June 2023

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To the Members of the General Assembly of Pennsylvania:

We are pleased to release the report, *Recycling Strategies in Pennsylvania: Staff Study*, as authorized by Senate Resolution 285 of 2022. SR285 directed the Joint State Government Commission to “conduct an assessment and analysis of public and private recycling infrastructure and operations across the Commonwealth.” The report primarily focuses on recyclable materials commonly used for consumer packaging, including cardboard, paperboard, steel, aluminum, plastic, and glass.

After a thorough review of the literature, of policies and strategies in Pennsylvania, other states, and countries around the world, and having held discussions with recycling experts, Commission staff was able to compile a list of recommendations for the General Assembly’s consideration. These recommendations are for improved data collection, public education, and coordination between government entities, increased government procurement of recycled materials and supplies, and small increases in recycling fees.

The full report is available at <http://jsg.legis.state.pa.us>

Respectfully submitted,

Glenn J. Pasewicz  
Executive Director



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## INTRODUCTION

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Senate Resolution 285 of 2022, P.N. 1801, directs the Joint State Government Commission to “conduct an assessment and analysis of public and private recycling infrastructure and operations across the Commonwealth.” To fully grasp the nature of recycling operations, it must be understood what materials are being recycled and which of them fit within the scope of the resolution. The resolution notes the importance of packaging manufacturing to the Commonwealth’s economy, and the recyclable nature of this packaging. It also references the desire and need to mitigate the environmental impact of the use of resources for packaging by “decreasing our collective dependence on virgin materials and increasing the consumption of recycled materials.”<sup>4</sup>

When considering the recyclability of various materials, this report focuses primarily on those which are commonly found in and used for consumer packaging. These materials include cardboard, paperboard, steel, aluminum, plastic, and glass. To the extent such materials are also recycled from commercial or industrial use, they will not be discussed here, unless they are also recycled at the same facility or are part of the same recycling stream. For instance, the use and recycling of steel cans, scrap yards dealing in scrap iron and steel from cars, appliances, and construction sites are not relevant to this report and will be left out, scrap iron and steel will be discussed when it is used to make new steel, and there the report touches on industrial sources of the recycled metal.

Some materials which could be considered recyclable in the broadest sense of the word and are commonly produced by households are not included. These include municipal waste, solid human waste from wastewater treatment facilities and septic tanks, and food waste. Even though these materials could be recycled via use in a waste-to-energy facility, composted, or further processed into fertilizer, they are outside the scope of this report.

Tires — which the Joint State Government Commission reported on in 2007<sup>5</sup> — are also excluded. Scrap wood is excluded, as is any building material or scrap from construction or demolition sites. Materials or substances that would be regulated by the federal Environmental Protection Agency (EPA) under the Toxic Substances Control Act are generally excluded from this report. That would include materials such as lead, mercury, Polychlorinated Biphenyls (PCBs), and Per- and Polyfluoroalkyl Substances (PFAS).

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<sup>4</sup> Pennsylvania General Assembly, 2021-2022 Session, Senate Resolution 285.

<sup>5</sup> Joint State Government Commission, “Waste Tire Recycling and Reuse in Pennsylvania: An Analysis of the Industry, Markets, and State Use, Including Rubber Modified Asphalt,” Oct. 2007, <http://jsg.legis.state.pa.us/resources/documents/ftp/publications/2007-29-Tire%20Report%20III.pdf>.

Items subject to disposal bans and separate product stewardship efforts and recycling programs are also excluded. These items include car batteries, oil, appliances, e-waste, and the like.

To set the scene for a deeper discussion of the Commonwealth's recycling infrastructure, this report first briefly describes the materials being recycled, how they are grouped or classified by the recycling industry, and the processes available to recycle them. The report presents data on recycling in the Commonwealth. An overview of the laws and regulations governing recycling is given. The report then discusses the challenges facing the recycling industry and strategies pursued by other states (as well as Europe and Japan) to address these challenges. Finally, the report recommends eight statutory or regulatory changes to help improve the recovery of recyclable materials and their reuse.

To conduct the assessment of public and private recycling infrastructure and operations across the Commonwealth, the Commission drew from publicly available data from both industry and government sources. Additionally, the Commission reached out to representatives of the Department of Environmental Protection, county recycling coordinators, non-profit organizations, materials recovery facilities, retailers, and manufacturers that use recycled materials including aluminum and glass manufacturers.

# RECYCLING MATERIALS

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## *Plastics*

Plastic is perhaps the most ubiquitous material encountered in packaging and in day-to-day life. Plastics are chains of like molecules linked together resulting in a material that can be shaped or molded. They are typically derived from sources such as gas, oil, and coal, but can also be formed from minerals and plants. Rubber, for instance, is considered to be a plastic.<sup>6</sup>

According to the federal Environmental Protection Agency, in 2018 more than 35 million tons of plastics were generated in the United States and only 8.7 percent of that ended up being recycled.<sup>7</sup> In the Commonwealth, 4,886 tons of plastics were recycled from residential sources in 2020, the latest year for which data are available.<sup>8</sup> This is down from 6,358 tons in 2019.<sup>9</sup>

There are seven types of recyclable plastic, categorized by a resin identification code. See Table 1.

<b>Type of Plastic</b>	<b>Resin Identification Codes</b>
Polyethylene Terephthalate	1 PETE; 01 PET
High-Density Polyethylene	2 HDPE; 02 PE-HE
Polyvinyl Chloride	3 V; 03 PVC
Low-Density Polyethylene	4 LDPE; 04 PE-LD
Polypropylene	5 PP; 05 PP
Polystyrene	6 PS; 06 PS
Other resins	7 OTHER; 07 O

Source: ASTM International, “Standard Practice for Coding Plastic Manufactured Articles for Resin Identification.”

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<sup>6</sup> American Chemistry Council, “What are Plastics,” *Plastics Make it Possible*, Jun. 10, 2011, updated Oct. 29, 2018, <https://www.plasticsmakeitpossible.com/about-plastics/types-of-plastics/what-are-plastics/>.

<sup>7</sup> U.S. Environmental Protection Agency, “How do I Recycle?: Common Recyclables,” Dec. 21, 2021, <https://www.epa.gov/recycle/how-do-i-recycle-common-recyclables>.

<sup>8</sup> Pennsylvania Department of Environmental Protection, “2020 PA Recycled Materials Grouped by Material Categories per County,” *Statewide Recycling Data*, Dec. 16, 2022, [https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Documents/2023/2020\\_County\\_Recycling\\_Data.pdf](https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Documents/2023/2020_County_Recycling_Data.pdf).

<sup>9</sup> Pennsylvania Department of Environmental Protection, “2019 PA Recycled Materials Grouped by Material Categories per County,” *Statewide Recycling Data*, Jun. 1, 2022, [https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Documents/2019\\_PA\\_Recycled\\_Materials\\_Grouped\\_by\\_Material\\_Categories\\_PER\\_COUNTY.pdf](https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Documents/2019_PA_Recycled_Materials_Grouped_by_Material_Categories_PER_COUNTY.pdf).

These codes are maintained by the American Society for Testing and Materials (ASTM), an international organization that sets industrial standards.<sup>10</sup> Each of these types of plastics has different chemical properties and need to be separated before they can be recycled. Most of these are thermoplastics, meaning they can be melted down and reformed into new items. But plastics in the “other resins” classification cannot simply be melted and reformed, and these are more difficult to recycle. Further, because of the difficulty of separating the types of plastic and the market value of different plastics, not every facility that recycles plastic will accept all seven of the types of plastic. Likewise, some municipalities do not accept all types of plastic for recycling. Polyethylene Terephthalate.

### *Polyethylene Terephthalate*

Commonly referred to as PET, Polyethylene Terephthalate is a clear, strong, and lightweight plastic that is the most common plastic for beverage containers, cooking oil, liquid hand soap, and some food containers. The building blocks of PET are ethylene glycol and terephthalic acid, which are extruded and cut into small pellets which are then heated and molded into nearly any shape.<sup>11</sup>

PET is the most recycled plastic, both in the United States and globally. Approximately 31 percent of the PET used in the United States is recycled. Products made from recycled PET include new PET bottles and jars, carpet, clothing, industrial strapping, rope, automotive parts, fiberfill for winter jackets and sleeping bags, construction materials, and protective packaging. Polyester, a textile, is made from PET.<sup>12</sup>

### *High-Density Polyethylene*

Produced from the monomer ethylene, this plastic has a high strength-to-weight ratio due to its densely packed molecules. It is widely used for safety equipment, housewrap, plastic mailing envelopes, pipes (for both drinking water and wastewater), outdoor chairs and furniture, bottle crates, toys and playground equipment, bread and produce bags, cereal box liners, milk jugs, and wood-plastic composite lumber (used for outdoor decking).<sup>13</sup>

### *Polyvinyl Chloride*

Commonly known as “PVC,” this plastic is a hard, brittle, and rigid plastic. With the addition of plasticizing chemicals, it can become a more flexible material. In its more flexible form, it can be used as wire or cable insulation and a rubber alternative. It is commonly used in pipes for construction, agriculture, hospitals, schools, and homes. Siding for homes is made from

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<sup>10</sup> See ASTM International, “Standard Practice for Coding Plastic Manufactured Articles for Resin Identification,” standard manual, accessed August 12, 2022, [https://www.astm.org/d7611\\_d7611m-21.html](https://www.astm.org/d7611_d7611m-21.html).

<sup>11</sup> PET Resin Association, “An Introduction to PET,” accessed Aug. 10, 2022, [http://www.petresin.org/news\\_introPET.asp](http://www.petresin.org/news_introPET.asp).

<sup>12</sup> *Id.*

<sup>13</sup> American Chemistry Council, “High Density Polyethylene (HDPE): So Popular,” *Plastics Make it Possible*, May 21, 2015, (updated Oct. 29, 2018), <https://www.plasticsmakeitpossible.com/about-plastics/types-of-plastics/professor-plastics-high-density-polyethylene-hdpe-so-popular/>.

PVC. Very little PVC gets recycled because, among other reasons, items made from PVC have a long use life. The PVC that does get recycled tends to be made into new PVC pipes and siding.<sup>14</sup>

### *Low-Density Polyethylene*

Characterized by long branches of molecules that do not pack well into crystallites, this plastic is a tough and flexible polymer that is used to make processed food packaging, shopping bags, coated paperboard, liners, lamination films, specialty packaging, and other wraps and films. It is transparent and thin, easily formable, and has a high impact resistance, but is sensitive to heat and offers poor resistance to ultraviolet light.<sup>15</sup>

### *Polypropylene*

Polypropylene possesses a higher stiffness at lower density than other plastics, as well as better resistance to higher temperatures when not subjected to mechanical stress. It offers good fatigue resistance and is used on cases or packaging that have living hinges. In addition, it has good hardness and can be easily machined or molded. It is commonly used in household goods such as buckets, bowls, bottle crates, toys, bottles, and luggage. Some food packaging, such as yogurt cups, are made with polypropylene. It is also widely used in the automotive industry for bumpers, bumper covers, mud guards, battery cases, and some fittings. It can also be made into fabric, which is then used for sporting equipment, monofilament rope, woven carpet backing, packaging sacks, and tarpaulins.<sup>16</sup>

### *Polystyrene*

This plastic is formulated into either a foam, known as Styrofoam, or a rigid material. It is found in packaging and shipping materials for bulky or fragile items, disposable plates and trays, egg cartons, meat trays, carry-out containers, CD cases, and some medication bottles. It is notoriously difficult to recycle and some instances of its use, particularly in uses where it is rigid or contacts food, are being phased out in favor of PET.<sup>17</sup>

### *Other Resins*

Number 7 plastics are a catch-all of different plastics that do not fit into the other categories of plastics. These include multi-layer resins, rubberized plastic, and bio-plastic made from corn or soy. Many of these plastics contain bisphenol-A, or BPA, a chemical stabilizer that may pose a health risk to humans. While some municipalities and facilities accept “other resins,” some of the materials which are classified as number 7 resins are not recyclable or are more difficult to recycle due to having been layered or mixed with other types of plastic.

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<sup>14</sup> Creative Mechanisms, “What is Polyvinyl Chloride (PVC), and What is it Used For?,” Jul. 6, 2016, <https://www.creativemechanisms.com/blog/everything-you-need-to-know-about-pvc-plastic>.

<sup>15</sup> Cornelia Vasile and Mihaela Pascu, *Practical Guide to Polyethylene*, (Shropshire, UK: iSmithers Rapra Publishing, 2005), 15-16.

<sup>16</sup> Devesh Tripathi, *Practical Guide to Polypropylene*, (Shropshire, UK: Rapra Technology Ltd., 2002), 1-5.

<sup>17</sup> Brian Clark Howard and Amina Lake Abdelrahmin, “Exactly What Every Plastic Recycling Symbol Really Means,” *Good Housekeeping Institute*, Feb. 18, 2022, <https://www.goodhousekeeping.com/home/g804/recycling-symbols-plastics-460321>.

## *Glass*

Glass is a non-crystalline amorphous solid that exhibits a glass transformation behavior.<sup>18</sup> Commonly made up mostly of silica and lime, nearly all glass available commercially falls into one of six categories based on chemical composition. However, there are only two types which would be commonly found in a household or in packaging materials — soda lime and borosilicate. Glass is infinitely recyclable and can be melted limitless times.

Soda lime glass is the most common type of glass found in households. As packaging, it is used for beer, soda, and wine bottles, as well as jars and containers for things such as specialty cooking oils, jams and jellies, and condiments. It is comprised of between 60 to 75 percent silica, 12 to 18 percent soda, and 5 to 12 percent lime. It is not resistant to high temperatures and its resistance to corrosive chemicals is only fair.

Borosilicate glass is any glass that contains at least 5 percent boric oxide in its composition. It has a high resistance to temperature change.<sup>19</sup> In households, it would be most commonly found in bakeware, mugs and cups, and some candle jars. While borosilicate glass, just like the common soda lime glass, is infinitely recyclable, most facilities are not set up to handle it. Glass recycling furnaces are adapted to temperatures for recycling the more common soda lime glass bottles and jars, and borosilicate glass would not melt properly in these furnaces and could potentially damage equipment. As a result, borosilicate glass is not considered to be recyclable from a practical point of view, as there are few facilities that could process this material.<sup>20</sup>

## *Steel*

Steel is an alloy of carbon and iron. As packaging, a Pennsylvania consumer encounters steel in the form of cans for vegetables, fruits, soups, and pet food. The consumer may refer to these as “tin cans” but they are actually steel cans (with perhaps a small amount of tin alloyed into it) and internally coated with a plastic film to prevent corrosion of the metal.

Like glass, steel is infinitely recyclable. In fact, scrap steel is one of the three “elements” of steel (along with carbon and iron) represented by the three hypocycloids logo of the steelmark, a trade association logo used to promote steel and which is perhaps better known as the logo of the Pittsburgh Steelers football team.<sup>21</sup>

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<sup>18</sup> J.E. Shelby, *Introduction to Glass Science and Technology*, (Alfred, NY: New York State College of Ceramics at Alfred University School of Engineering, 2005), 2d Edition, 3.

<sup>19</sup> Corning Museum of Glass, “Types of Glass,” Dec. 8, 2011, <https://www.cmog.org/article/types-glass>.

<sup>20</sup> Pyrex, “Is it Possible to Recycle Borosilicate Glass?,” Pyrex Help Center, accessed Aug. 12, 2022, <https://international-cookware.zendesk.com/hc/en-gb/articles/360014984220-Is-it-possible-to-recycle-borosilicate-glass->.

<sup>21</sup> American Iron and Steel Institute, “History of the Steelmark,” <https://www.steel.org/about-aisi/history/history-of-the-steelmark/>.

## *Aluminum*

Aluminum has many uses in the building, automotive, aerospace, and home appliance industries and it is frequently encountered in the form of cans for beer and other beverages. It is also found in some other types of packaging, particularly as a liner in aseptic cartons. Aluminum is the most valuable recyclable material because of the high cost of processing bauxite (the ore from which aluminum is refined) and smelting the resulting alumina. Recycled aluminum only needs to be shredded, remelted, cast into ingots, and then pressed into sheets. This process can be repeated without affecting aluminum's properties.<sup>22</sup> According to the EPA, 34.9 percent of all aluminum containers, foil, and packaging was recycled in 2018, with roughly half of all aluminum cans being recycled.<sup>23</sup>

## *Cardboard*

Pennsylvanians are very familiar with the ubiquitous cardboard box, known in the industry as corrugated board. Used to ship goods from e-retailers and package larger items at brick-and-mortar retailers, corrugated packaging is the most recovered material for recycling. In 2018, the recovery rate for corrugated containers was 96 percent. Recycled corrugated boxes are a valuable resource and an integral part of the manufacturing of new corrugated boxes. The average corrugated box contains 50 percent recycled content.<sup>24</sup>

## *Paperboard*

Paperboard is used to package processed food items as well as other consumer goods. Paperboard is constructed of multiple plies of virgin fibers. It usually has a thin coating of clay to create a smooth, glossy, and printable surface.<sup>25</sup>

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<sup>22</sup> Tom Husband, "Aluminum Recycling," Apr. 2012, *American Chemistry Society*, <https://www.acs.org/content/acs/en/education/resources/highschool/chemmatters/past-issues/archive-2011-2012/aluminum-recycling.html>.

<sup>23</sup> U.S. Environmental Protection Agency, "Aluminum: Material-Specific Data," Jun. 22, 2022, <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/aluminum-material-specific-data>.

<sup>24</sup> Corrugated, "Recycling," accessed August 15, 2022, <https://www.corrugated.org/recycling/>.

<sup>25</sup> Paperboard Packaging Council, "4 Types of Paperboard," Jan. 21, 2019, <https://paperbox.org/4-types-of-paperboard/>.

## *Gabled and Aseptic Containers*

Gabled containers — the industry term for what many people know as milk or juice cartons — are similar to paperboard, but with an internal plastic layer to prevent leakage and spoilage of the product. Aseptic containers — used mostly in broth, evaporated milk, coconut water, and other shelf-stable liquids and food items — are also recyclable.<sup>26</sup>

Gabled cartons had at one time been considered a difficult material to process for recycling because of its paperboard-plastic hybrid construction. Aseptic cartons can be even more difficult to process because they are made of multiple layers of paper, plastic, and aluminum.<sup>27</sup> Nevertheless, recycling facilities' ability to handle gabled and aseptic containers has grown. Today, nearly 61 percent of households in the United States now have access to carton recycling, up from 6 percent of households in 2009.<sup>28</sup>

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<sup>26</sup> Leah Blunt, "Recycling Mystery: Milk and Juice Cartons," *Earth911*, Nov. 14, 2018, <https://earth911.com/home-garden/recycling-mystery-milk-and-juice-cartons/>.

<sup>27</sup> Natalie Jacewicz, "In the recycling world, why are some cartons such a problem?," NPR *The Salt*, Mar. 9, 2018, <https://www.npr.org/sections/thesalt/2018/03/09/591568093/in-the-recycling-world-why-are-some-cartons-such-a-problem>.

<sup>28</sup> The Carton Council, "About," accessed Aug. 15, 2022, <https://www.recyclecartons.com/about/>.



## RECYCLABLE DATA

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When looking at comparative recycling rates for packaging materials, the Commonwealth fares well. According to a study commissioned by Ball, an aluminum can manufacturer, Pennsylvania is a leader in recycling common container and packaging materials, ranking eighth among the states. Pennsylvania recycles roughly 60 percent of all containers and packaging generated in the Commonwealth.<sup>29</sup>

However, there is room for improvement. Although 44 percent of all glass bottles and jars entered the recycling stream, if end uses such as concrete aggregate and landfill cover are excluded only 23 percent of recycled glass is sent on to a glass processor. If cardboard is excluded from the calculation, Pennsylvania falls to 18<sup>th</sup> in container and packaging recycling. Residents of the Commonwealth recycle only 14 percent of their PET bottles, 48 percent of their aluminum cans, and 69 percent of their steel cans.<sup>30</sup>

Data from the DEP shows that over 4.99 million tons of recyclable materials were collected and processed in Pennsylvania in 2020. This is down from 5.25 million tons in 2019, 5.47 million tons in 2018, and 7.84 million tons in 2016. In 2012, the volume was 8.50 million tons. However, this data aggregates residential and commercial recycling, and includes materials such as food waste, scrap wood, yard and leaf waste, asphalt, rubber tires, materials from construction and demolition activities, clothing and textiles, furniture, mattresses, batteries, e-waste, and appliances.<sup>31</sup>

These data are also subject to large swings in total materials collected due to the inclusion of construction and demolition waste. In 2014, for instance, the total recycling volume was aided by an extra 7.72 million tons due to a demolition project in Scranton. The large volume of recycled materials collected in 2012 was also due to an increase in construction and demolition waste driven by cleanup from Superstorm Sandy.

The materials are sorted according to the EPA's Standard Materials Measurement. In addition, the Commonwealth collects data on a number of non-standard categories. The breakdown of the EPA standard materials and the Commonwealth non-standard materials is shown in Table 2.

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<sup>29</sup> Eunomia, "The 50 States of Recycling," *prepared on behalf of Ball Corporation*, Mar. 2021, p. 16, <https://www.ball.com/getattachment/37f5f87f-d462-44c5-913f-d3075754741a/50-States-of-Recycling-Eunomia-Report-Final-Published-March-30-2021-UPDATED-v2.pdf>.

<sup>30</sup> *Id.* p. 12.

<sup>31</sup> Pennsylvania Department of Environmental Protection, "Statewide Recycling Data," <https://www.dep.pa.gov/Business/Land/Waste/Recycling/Pages/Recycling-Reports-and-Studies.aspx>.

**Table 2**  
**EPA Standard and**  
**Pennsylvania Non-Standard Materials Recycled**

<b>Material</b>	<b>Type</b>
Paper	Corrugated
	Brown bags and sacks*
	Gabled/Aseptic Cartons*
	Magazines and Catalogs*
	Newsprint
	Office Paper
	Phone Books*
	Other
Metals	Steel Cans
	Aluminum Cans
	Other
	Mixed Cans*
	Aluminum Scrap*
	Ferrous metals*
	Non-ferrous metals*
	Copper*
	Brass*
	Lead*
	Stainless Steel*
	Nickel*
	White Goods*
Glass	Clear
	Mixed
	Green*
	Brown*
Plastics	HDPE
	PET
	#3 PVC*
	#4 LDPE*
	#5 Polypropylene*
	#6 Polystyrene*
	Mixed
	Film Plastic*
	Drum (Mixed Bulky Rigid)*

<b>Table 2</b> <b>EPA Standard and</b> <b>Pennsylvania Non-Standard Materials Recycled</b>	
<b>Material</b>	<b>Type</b>
Leaf/Yard	--
Commingled	
Wood	
Food Waste	
Car Batteries	
Other Household Batteries*	
Textiles	
Antifreeze	
HHW	
Florescent Tubes	
Consumer Electronics	
Circuit Boards	
Oil Filters	
Mattresses	
E-Waste*	
Used Oil*	
Paint and Varnish*	
Asphalt*	
Construction/Demolition*	

\*Pennsylvania-specific materials not included in the EPA’s standard recycling metric Source: United States Environmental Protection Agency; Pennsylvania materials are taken from the materials itemized in the County Recycling Data.

As can be seen, the EPA considers a wide range of items to be recyclable and includes them as part of its metric of accounting for recycling. Pennsylvania adds even more and separately accounts for more specific types of plastic and glass. Although only paper, metals, glass, and plastics are covered in this report, it is illuminating to see the variety of materials that are recycled throughout the Commonwealth.

The Pennsylvania Department of Environmental Protection collects data on the amount of residential recycled materials by weight, broken down by county and material. Commercial recycling — recyclable materials collected from offices, schools, industrial facilities, and government buildings — is accounted for separately. These detailed data are available going back to 2001.<sup>32</sup>

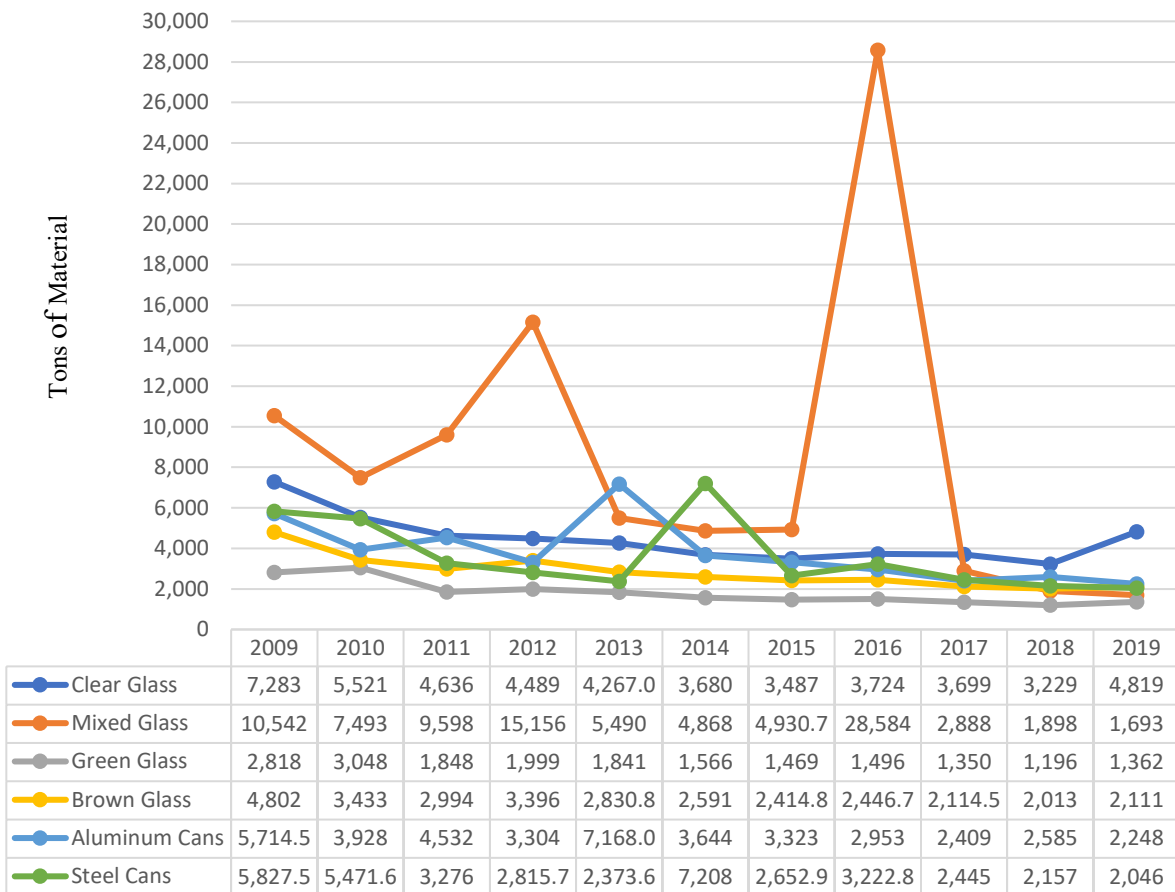
<sup>32</sup> Pennsylvania Department of Environmental Protection, “Statewide Recycling Data,” <https://www.dep.pa.gov/Business/Land/Waste/Recycling/Pages/Recycling-Reports-and-Studies.aspx>.

One major caveat to this information is that it is self-reported by the counties, who in turn receive data from each of their municipalities that offer recycling services. None of the information provided to the DEP is audited or verified. Further, these data reflect the materials that are *collected* by the municipalities within a county — not the materials that are actually recycled. As noted elsewhere in this report, some of the material collected for recycling ends up being discarded because of contamination, the lack of a downstream market or low market value for the material, diverted for non-recycling uses (such as glass used as landfill cover), or burned to generate electricity.

The data are presented below in Charts 1, 2, and 3. Each chart shows the weight of recyclables collected by material from 2009 to 2019.

**Chart 1**

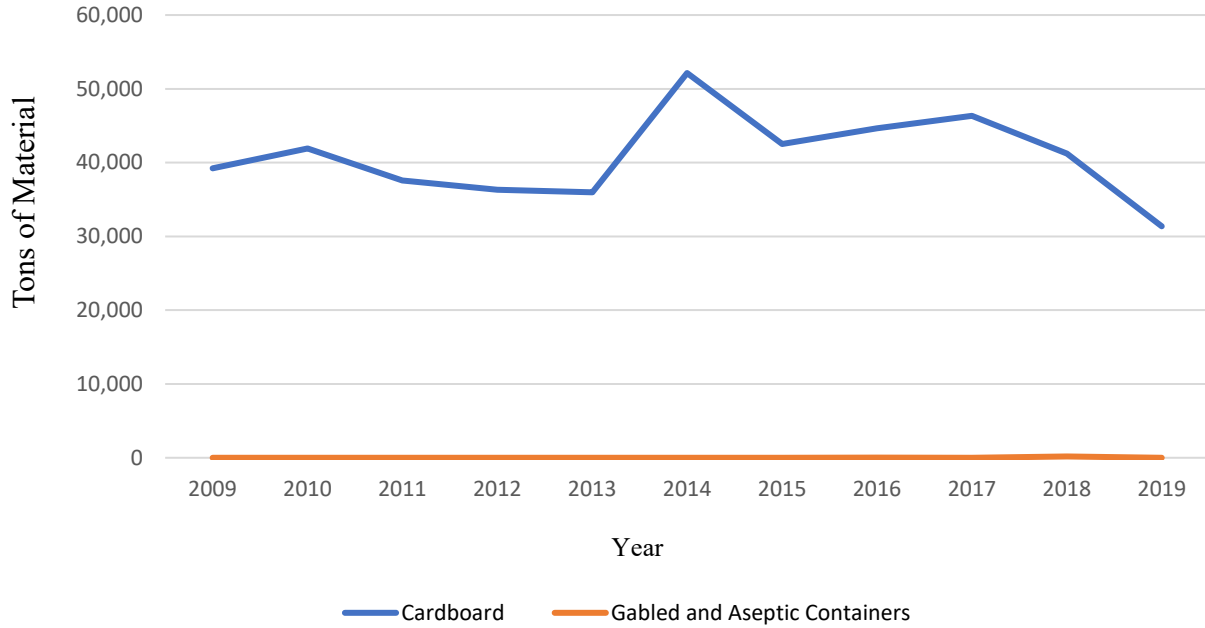
**Recycled Glass and Metal Containers  
by Weight in Tons, Pennsylvania, 2009-2019**



Source: Compiled by Commission Staff from Pennsylvania Department of Environmental Protection, “Statewide Recycling Data.”

**Chart 2**

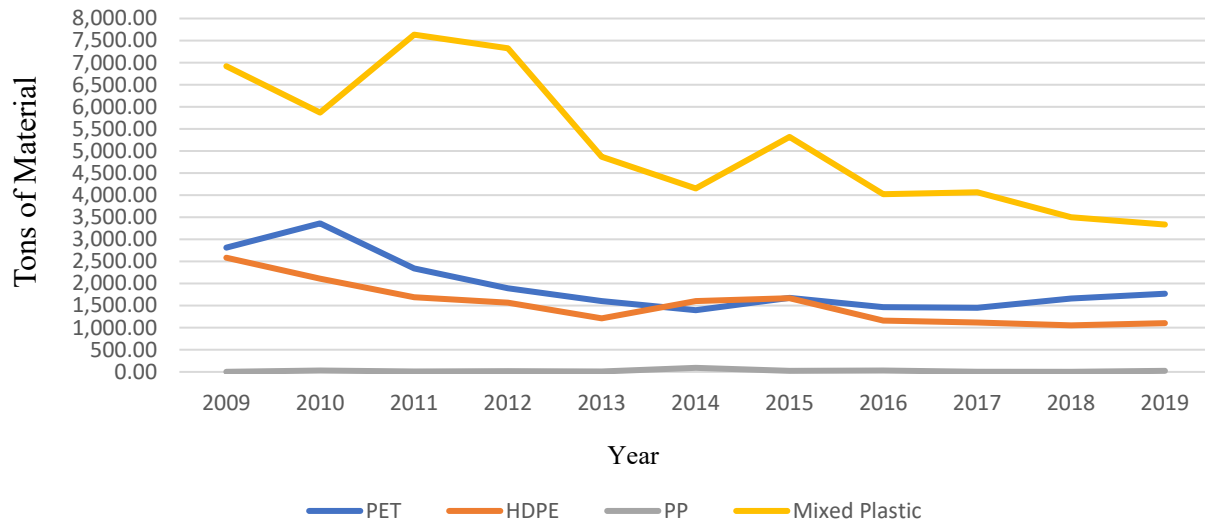
**Recycled Cardboard and Cartons  
by Weight in Tons, Pennsylvania, 2009-2019**



Source: Compiled by Commission Staff from Pennsylvania Department of Environmental Protection, “Statewide Recycling Data.”

**Chart 3**

**Recycled Plastics  
by Weight in Tons, Pennsylvania, 2009-2019**



Source: Compiled by Commission Staff from Pennsylvania Department of Environmental Protection, “Statewide Recycling Data.”

As can be seen from the charts above, recycling throughout the Commonwealth has shown a trend of no growth or slight decline in the past decade. For instance, in 2009 the counties collectively reported that 5,714.5 tons of aluminum cans were recycled. By 2019, that amount had fallen to 2,248 tons. Mixed glass, at 1,693 tons in 2019, is down sharply from its 2009 level of more than 10,000 tons recycled.

The surge in 2016 — when 28,584 tons of mixed glass was reported to have been recycled — is an outlier. That year Allegheny County alone reported that it collected 25,562 tons of mixed glass. Bear in mind that this volume of glass was from residential sources only. Allegheny County collected an additional 18,091 tons of mixed glass from commercial sources. It is unclear from the data how 2016 became such a banner year for glass collection in Allegheny County. However, there could be two phenomena accounting for this outlier.

Allegheny County sponsors county-wide glass collection efforts from time to time in partnership with the Pennsylvania Resources Council, a nonprofit environmental organization. At recent glass collection events at county parks PRC was able to collect 10.2 tons in Allegheny County in 2021<sup>33</sup> and 420 tons of glass in the first half of 2022<sup>34</sup> throughout southwestern Pennsylvania. It is unclear if the county sponsored a similar glass collection effort in 2016.

Another explanation is that Allegheny County simply has difficulty accurately assessing the amount and type of material that is purportedly being recycled. According to the county's 2018 solid waste plan, data on the amount of collected recyclables relies on the accuracy of municipalities, individual collectors, and facilities such as apartment complexes. Allegheny County has stated that improving data collection efforts is one of its objectives in pursuit of its goal to increase recycling.<sup>35</sup>

The data also brings to light other facets of recycling in the Commonwealth. Polypropylene recycling is minimal. Gabled and aseptic containers — used for things such as orange juice and broth — are rarely recycled. This may be because people are not placing them into recycling bins, the materials recovery facilities are not accounting for such items separately, or the materials recovery facilities are not recycling them and dispose of gabled and aseptic containers as contamination. Additionally, municipalities may not separately account for these items when they originate from a residential single-stream recycling program.

Although e-commerce grew by double digits every year from 2009 to 2019, resulting in an increase in the number of boxes delivered to homes across the Commonwealth, residential recycling of corrugated cardboard actually declined from nearly 40,000 tons in 2009 to just over 31,000 tons in 2019.

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<sup>33</sup> Taylor Spirito, "Allegheny County announced second year of glass collection events in county parks," Mar. 22, 2022, <https://www.wpxi.com/news/local/allegheny-county/allegheny-county-announced-second-year-glass-collection-events-county-parks/DVQPUYTTCGRCIJNLUBFL66EOFHU/>.

<sup>34</sup> Mary Beth Mueller, "August 'Traveling Glass Recycling Bin' schedule," Jul. 14, 2022, <https://prc.org/august-traveling-glass-recycling-bin-schedule/>.

<sup>35</sup> 2018 Municipal Solid Waste Management Plan, Allegheny County, Pennsylvania, Jul. 2018, [https://www.alleghenycounty.us/uploadedFiles/Allegheny\\_Home/Health\\_Department/Programs/Waste\\_and\\_Water-Related/Recycling/Allegheny-County-Municipal-Plan-Memo-and-Plan-Update-Final.pdf](https://www.alleghenycounty.us/uploadedFiles/Allegheny_Home/Health_Department/Programs/Waste_and_Water-Related/Recycling/Allegheny-County-Municipal-Plan-Memo-and-Plan-Update-Final.pdf).

## **PENNSYLVANIA RECYCLING AND WASTE COMPOSITION STUDIES**

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Although the counties collect data on the volume of recyclables their municipalities collect, it can be difficult to determine the exact amount of each kind of material that is collected. This is in part because the vast majority of municipalities that offer curbside recycling in the Commonwealth utilize single-stream recycling. All of the various materials are put in a truck and mixed together, then taken to a transfer station or a materials recovery facility where they are further mixed with loads from other trucks. The total weight or volume of materials may be known, but their exact makeup remains a mystery.

To get a better look at what materials are being recycled or disposed of across the Commonwealth, recycling and waste composition studies are conducted. Waste and recycling composition studies occur when either the DEP undertakes a Commonwealth-wide composition study (on its own — not mandated by any statute or regulation) or from an Act 101-mandated county municipal solid waste plan or a revision to such a plan.

Additionally, some municipalities regularly check the composition of their recyclables to monitor changes and identify contaminants. This is necessary because the per-ton processing cost is adjusted based on the market value of the material. Smaller-scale composition studies or reviews may be done to determine the composition of the recycling stream and the result is then multiplied by the market value of the various materials to arrive at the cost of processing for the municipality. The cost to the municipality for recycling services changes based on the composition of the collected material and its market value. This “shared risk” approach is a common feature of recycling contracts.

Recycling composition studies give the DEP, local and county governments, the General Assembly, recycling and waste management industry stakeholders, and the public more detailed data about what items residents and commercial establishments are recycling. Methodologically, composition studies involve sampling transfer stations in a county or the MRFs their municipalities utilize, or, in the case of larger Commonwealth-wide studies, a select number of MRFs around the Commonwealth. A specified volume of recyclables is examined, with the examination conducted at different times of the year to account for seasonality, to get the most accurate picture of what residents and businesses are recycling. Waste composition studies are similar in their methodology and the data they reveal about the waste stream.

Philadelphia conducted a recycling composition study as part of a revision to its municipal waste management plan in 2018. What it found was that residential recycling peaked in 2017 at 129,620 tons. For commercial recycling, volumes peaked in 2016 at 828,676 tons. That year was also the peak year for total amount recycled, at 947,043 tons. By 2018, it had dropped to 924,877 total tons. That year also saw municipal solid waste generation — garbage — increased to

2,220,720 tons, the highest amount since 2012. For residential customers, the volume of trash generated was 618,513 tons, the highest figure since 2014.<sup>36</sup>

In Philadelphia, the trend in waste management is a decreasing volume of recycling and an increasing volume of trash. However, the recent increase in trash is minor, and follows a decade-long trend of decreasing municipal solid waste volumes. This is also true of recycling, which had been on a decade-long upward trend until 2018.

Philadelphia, like other municipalities around the Commonwealth, has been negatively affected by several developments. First, as discussed elsewhere in this report, the city was impacted by the loss of China as an export market for most recyclables due to that country’s new policy to require bales of material with functionally no contamination.

Second, the composition of what consumers and businesses have been recycling has changed. In the past, more paper products were recycled. The market for recycled paper was stable and paper was considered a valuable material. However, with digitization, there has been less paper generated and thus recycled. And there has been more glass (a low or no-value material for recyclers) and plastics #3-7 (which have a low or even negative value) entering the recycling stream. The market price of recycled plastics, even the more valuable PET and HDPE bottles, changes frequently and is heavily influenced by the price of oil and natural gas. Table 3 shows the composition of Philadelphia’s residential recycling in 2018.<sup>37</sup>

<b>Table 3</b>		
<b>Philadelphia Residential Recycling Composition, 2018</b>		
<b>Material</b>	<b>Estimated Percentage of Single-stream Recyclables</b>	<b>Quantity Collected (tons, 2014-2018 avg.)*</b>
Residential Mixed Paper	25.4%	27,208
Old Corrugated Cardboard	17.8	19,067
Aluminum Cans	1.3	1,370
Steel Cans	2.3	2,464
PET	4.8	5,142
HDPE	2.4	2,571
Mixed Plastics	1.5	1,607
Mixed Glass	25.5	27,315
Rejects/Residue	19.0	20,352

\*Residential single-stream recyclables only.  
Source: 2018 MSW Consultants Recyclables Composition Study.

<sup>36</sup> City of Philadelphia Municipal Waste Management Plan 2019-2028, Oct. 2020, *MSW Consultants*, p. 1-11, <https://www.phila.gov/media/20210614135413/Municipal-Waste-Management-Plan-202010.pdf>.

<sup>37</sup> *Id.* p. 4-23



As can be seen, nearly 20 percent of Philadelphia’s recycling is contamination. Fully one quarter is glass, with mixed paper making up another quarter. Corrugated cardboard makes up more than one-sixth of the city’s residential recycling by weight. Aluminum, steel, and three categories of plastic round out the remainder.

The trend of less paper and more plastic and glass is national and is driven by nationwide changes in consumer habits and technological advances.

A statewide recycling composition study by the DEP was conducted in 2005. Data from that study merit review here. Newspapers alone composed 45.7 percent of all single stream recyclables collected in the Commonwealth. Table 4 presents a detailed breakdown of the recycling composition.<sup>38</sup>

<b>Table 4</b>		
<b>Pennsylvania Recovered Material Composition Study 2005</b>		
<b>Category</b>	<b>Commingled Containers Composition</b>	<b>Single-Stream Composition</b>
Newspapers	--	45.7%
Glossy Paper (Inserts)		7.6
Magazines (Subscription)		1.8
Corrugated Containers		1.4
Office Paper		0.5
Phone Books		0.7
Mixed (Other Recyclable) Paper		1.3
<b>Subtotal Paper</b>		<b>58.9%</b>
PET Bottles	12.9%	5.0%
HDPE Bottles	12.4	6.9
Clear Glass	21.9	7.0
Green Glass	11.9	3.5
Amber Glass	12.9	3.7
Mixed Cullet	9.6	7.2
Steel Cans	11.7	5.6
Aluminum Cans	6.4	2.0
Aluminum Other	0.4	0.2
<b>Subtotal Containers</b>		<b>41.1%</b>
<b>Total</b>	<b>100%</b>	<b>100%</b>

Source: Pennsylvania Department of Environmental Protection, “Pennsylvania Recovered Material Composition Study,” Feb. 2005.

<sup>38</sup> Pennsylvania Department of Environmental Protection, “Pennsylvania Recovered Material Composition Study,” p. ES-2, Feb. 2005, [https://files.dep.state.pa.us/waste/recycling/RecyclingPortalFiles/Documents/rec\\_mat\\_comp.pdf](https://files.dep.state.pa.us/waste/recycling/RecyclingPortalFiles/Documents/rec_mat_comp.pdf).

These data were exclusive of contamination. The report noted that there was “significant variation in composition ... observed from community-to-community and MRF-to-MRF.” There was also a notable difference in composition based on whether the studied material originated from a curbside sort, a two-stream, a single-stream, or a drop-off source. For instance, when looking at containers, curbside sort material was 70 percent glass on average while single-stream material was less than 50 percent glass. Single-stream programs generated the most plastic bottles, at nearly 30 percent on average, but also had the most rejected containers.<sup>39</sup>

There were even differences in the composition of the plastic bottles between collection methods. PET bottles made up nearly 60 percent of curbside sort material on average, while natural HDPE was more common in single-stream material, comprising nearly 30 percent of the plastic bottles collected via single stream. Interestingly, mixed plastics #3-7 were far less prominent in the composition of plastic bottles than other items such as bags and non-bottle plastics.<sup>40</sup>

The study also examined “rejects,” those materials that MRFs regard as contaminants and which they dispose of as waste, such as plastic bags and wet paper. Separate from rejects are residues, which are materials that are discharged from one or more points in the processing lines. Residue includes desired recyclables that were either missed while processing or are uneconomical to recycle, such as broken glass containers.<sup>41</sup>

Samples of single-stream material processed at an MRF showed that roughly 30 percent of rejects and residues consisted of contaminants — non-recyclable garbage — while nearly 50 percent of rejects and residues were made up of newspaper and other recyclable paper. Recyclable containers were another 15 percent and glass cullet made up the remainder. Curb-sort reject and residue samples were more than 70 percent contaminants.<sup>42</sup> The conclusion drawn from these data is that greater percentages of recyclable material are lost as rejects or residue and ultimately discarded as commingling increases.<sup>43</sup> Some materials are also more likely than others to end up as rejects or residue. For instance, small PET beverage bottles (such as single-serve bottles) were more likely than larger bottles to be found among the rejects and residue.

The 2005 recycling composition report also noted the impediments to collecting data on what items get recycled in the Commonwealth. According to the DEP’s report “it is not always possible to obtain complete and detailed data of the types of materials being recovered, particularly in instances where haulers or processing facilities obtain materials from many different communities” given “the large number of entities responsible for collecting and reporting recycled material quantities.”<sup>44</sup>

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<sup>39</sup> *Id.* p. ES-5, Fig. ES-4.

<sup>40</sup> *Id.* p. ES-6, Fig. ES-5.

<sup>41</sup> *Id.* p. ES-9.

<sup>42</sup> Curb-sort collection involves workers separating the recyclables at the curb and placing them into separate containers on the truck. The material thus arrives at the facility “pre-sorted.”

<sup>43</sup> Pennsylvania Recovered Material Composition Study, *supra* n. 38 at Fig. ES-9.

<sup>44</sup> *Id.* at p. 1-6.

The report concluded that the publicly owned MRFs produced better quality paper, for example, than the privately owned facilities. It was assumed that the elevated processing costs to produce high quality paper for end users disincentivized the private MRFs from producing a higher quality bale. The DEP recommended that technical assistance to MRFs to help minimize processing costs while meeting quality standards required by markets be continued.<sup>45</sup>

One big takeaway comparing Philadelphia's 2018 recycling composition study and the Commonwealth-wide 2005 report is that paper has indeed fallen dramatically as a share of recyclable materials. According to the DEP's 2005 recycling composition report, paper made up 63.3 percent of Philadelphia's recyclable materials, with newspapers alone comprising 37.6 percent of the city's total recycling. Rejects made up roughly 2 percent. That is vastly different from Philadelphia's 2018 figures, when rejects and residue made up nearly one-fifth of all recycling and paper composed just over one-quarter.

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<sup>45</sup> Id. at p. 5-2.



## **RECYCLING AND WASTE MANAGEMENT LAW**

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Laws and regulations governing recycling can be grouped into one of the following categories: residential, commercial, and industrial recycling mandates; grant or cost-sharing programs; technical and environmental regulation of recycling facilities; and policies to encourage use of recycled materials (e.g., mandatory recycled content laws) or discourage or prohibit the use of certain materials (e.g., laws banning the use of plastic shopping bags).

Waste management activities, including recycling, are principally the domain of state and local governments. There is no national recycling program and no federal statutes or regulations governing residential or commercial recycling of non-hazardous material. Thus, recycling in Pennsylvania is the product of state law, primarily the Municipal Waste Planning, Recycling, and Waste Reduction Act, also known as “Act 101.” In this section, an overview of the mechanics of this statute is given, along with several acts which have amended Act 101 since its initial passage, as well as overviews of several reports which were mandated either by Pennsylvania or federal law.

### *Pennsylvania Statutes*

In the Commonwealth, recycling began in 1988 with the passage of the Municipal Waste Planning, Recycling, and Waste Reduction Act, known as Act 101. It requires municipalities with populations of 10,000 or more people to establish and implement a source-separation and collection program. Municipalities with populations of more than 5,000 but fewer than 10,000 people and population densities of more than 300 people per square mile must also establish such a program. These municipalities must adopt an ordinance or regulation that requires persons to separate from household waste at least three recyclable materials from a menu of eight: clear glass, colored glass, aluminum, steel and bimetallic cans, high-grade office paper, newsprint, corrugated paper, and plastics. Commercial, institutional, and municipal establishments must also separate and store for recycling high-grade office paper, corrugated paper, and aluminum.<sup>46</sup>

The municipality’s ordinance must also require the municipality to collect the designated items for recycling on a scheduled day, provide for a system of trucks to collect materials, ensure compliance with the ordinance, including incentives and penalties, and provisions for the recycling of the collected materials. The municipality must also establish “a comprehensive and sustained public information and education program concerning recycling program features and

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<sup>46</sup> Act of July 28, 1988 (P.L. 556, No. 101, § 1501); 53 P.S. § 4000.1501 (hereinafter “The Municipal Waste Planning, Recycling, and Waste Reduction Act”). This statute will also be referred to as “Act 101” throughout the text of this report.

requirements,” and inform all persons within its boundaries of the requirements of the ordinance 30 days prior to the start of a recycling program and again every six months.<sup>47</sup>

Although the mandatory-ordinance provisions of Act 101 do not apply to counties, the counties have the power and duty to “insure [sic] the availability of adequate permitted processing and disposal capacity for the municipal waste which is generated within its boundaries.”<sup>48</sup> As such, a county may require a license to collect and transport municipal waste and adopt ordinances, resolutions, regulations, and standards for the recycling of municipal waste or source-separated recyclable material.<sup>49</sup> Additionally, counties must devise a municipal waste management plan and submit the plan for approval to the DEP. Plans must be revised at least three years prior to the time all remaining available permitted capacity for the county will be exhausted or when otherwise required by the Department.<sup>50</sup>

Act 101 also imposes several data collection requirements on the counties. It requires the county to submit a report to the DEP on or before April 1 of each year explaining progress it has made in implementing its municipal waste management plan and describing “weight or volume of materials that were recycled by municipal recycling programs in the county in the preceding calendar year...”<sup>51</sup> DEP regulation further requires that counties, as part of their municipal waste management plan, submit a description and evaluation of its “existing materials recovery operations and the kind and weight or volume of materials recycled by the operations...”<sup>52</sup>

Municipalities have several ways of complying with the requirements of Act 101. They can collect, transport, process, and market the recyclable materials themselves; they can contract with a third party to do so; they may contract with a landfill or waste disposal facility to handle its waste in lieu of a curbside recycling program, provided that at least 25 percent of all waste is recycled by such landfill or waste disposal facility; or they may utilize a recycling facility that demonstrates that the materials separated, collected, recovered, or created by the facility can be marketed as readily as materials collected through a curbside recycling program and the facility’s mechanical separation technology has been demonstrated to last for the life of the recycling facility.<sup>53</sup>

Act 101 provides that the Department of Environmental Protection shall, upon application by a county, award grants for:

- The cost of preparing municipal waste management plans in accordance with Act 101,
- Carrying out related studies, surveys, investigations, inquiries, and research and analyses, including those related by siting, and
- Environmental mediation.

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<sup>47</sup> The Municipal Waste Planning, Recycling, and Waste Reduction Act, § 1501(d); 53 P.S. § 4000.1501(d).

<sup>48</sup> *Id.* § 303.

<sup>49</sup> *Id.*

<sup>50</sup> *Id.* § 501.

<sup>51</sup> *Id.* § 303(f)(2).

<sup>52</sup> 25 Pa. Code § 272.226(a)(3).

<sup>53</sup> The Municipal Waste Planning, Recycling, and Waste Reduction Act, §§ 1501 (e) and (h); 53 P.S. §§ 4000.1501(e) and (h).

The DEP may also provide grant awards for “feasibility studies and project development for municipal waste processing or disposal facilities.” The funds awarded by such grants shall be 80 percent of the approved plans.<sup>54</sup> These grants are known as “901” grants, after the section of the Act creating them. There are other grant programs specified in Act 101.

Section 902 directs the Department to award grants to municipalities for the development and implementation of municipal recycling programs. The grant may be used to identify markets, develop a public education campaign, purchase collection and storage equipment, and for anything else necessary to establish a municipal recycling program. For both municipalities required to provide a recycling program and those that opt to have one, the grant available under this section shall be 90 percent of the “approved cost” of establishing a municipal recycling program.<sup>55</sup>

The use of this program was curtailed by a subsequent amendment which added several prerequisites to the awarding of any grant by the DEP as well as a requirement for providing a public notice and comment period when a municipality proposes to use some or all of the grant funds to purchase mechanical processing equipment. The amendment also provides that municipalities that received grant funds under the Pennsylvania Solid Waste Resource Recovery Development Act of 1974 may not receive funds under Section 902, except for costs that were not paid by that grant program.<sup>56</sup>

Section 903 directs the DEP to “award grants to reimburse counties for authorized costs incurred for the salary and expenses of recycling coordinators.” The grant may not exceed 50 percent of the approved cost of the recycling coordinator’s salary and expenses.<sup>57</sup>

The DEP is also directed to award performance grants to municipalities for their recycling programs under Section 904 of the Act. The DEP is given the latitude to decide what information is necessary to request the grants, including information pertaining to the details of the municipality’s recycling and composting programs. The DEP must base the award to a municipality on the type and weight of source-separated recyclable materials that were recycled in the previous calendar year and the population of the municipality. The amount of the award is also based on the amount of funds available in the recycling fund (established under Section 706).<sup>58</sup>

The Commonwealth’s recycling scheme also includes a \$2 per ton fee for all solid waste processed at resource recovery facilities and for all solid waste disposed of at municipal waste

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<sup>54</sup> Id. § 901.

<sup>55</sup> Id. § 902.

<sup>56</sup> Id. § 902(b)-(d).

<sup>57</sup> Id. § 903.

<sup>58</sup> Id. § 904.

landfills.<sup>59</sup> This money is then deposited in a separate fund with the Pennsylvania Treasury, called the Recycling Fund.<sup>60</sup> It is from the Recycling Fund that grants under Section 904 are made.<sup>61</sup>

***Recent Federal Law — Save Our Seas 2.0 Act  
and the Infrastructure Investment and Jobs Act***

Historically, waste management, including recycling, has been considered to be solely within the domain of state and local officials. However, that notion has been changing recently and the federal government has taken a keen interest in recycling. In 2020, the Save Our Seas 2.0 Act was enacted directing the federal Environmental Protection Agency (EPA) to “develop a strategy to improve post-consumer materials management and infrastructure for the purpose of reducing plastic waste and other post-consumer materials in waterways and oceans.”<sup>62</sup>

In addition to developing this strategy, the new law authorizes the EPA to provide grants to states to implement the EPA’s strategy and to “support improvements to local post-consumer materials management, including municipal recycling programs” and well as “to assist local waste management authorities in making improvements to local waste management systems.”<sup>63</sup> This grant program is now known as the Solid Waste Infrastructure for Recycling Grant Program, or SWIFR.<sup>64</sup>

The Save Our Seas 2.0 Act also establishes the Marine Debris Foundation, the Genius Prize for Save Our Seas Innovations, a pilot program for fishermen to collect and dispose of plastic waste found at sea, and a policy to enhance global engagement to combat marine debris to be implemented by the Secretary of State.<sup>65</sup>

The 2021 Infrastructure Investment and Jobs Act (IIJA) funded this grant program with a \$275 million appropriation for fiscal years 2022 through 2026.<sup>66</sup> An additional \$75 million is to be appropriated to the EPA to award grants focused on improving material recycling, recovery,

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<sup>59</sup> *Id.* § 701. A “resource recovery facility” is a “processing facility that provides for the extraction and utilization of materials or energy from municipal waste that is generated offsite, including, but not limited to, a facility that mechanically extracts materials from municipal waste, a combustion facility that converts the organic fraction of municipal waste to usable energy, and any chemical and biological process that converts municipal waste into a fuel product. The term also includes any facility for the combustion of municipal waste that is generated offsite, whether or not the facility is operated to recover energy. The term does not include: (1) Any composting facility. (2) Methane gas extraction from a municipal waste landfill. (3) Any separation and collection center, drop-off point or collection center for recycling, or any source separation or collection center for composting leaf waste. (4) Any facility, including all units in the facility, with a total processing capacity of less than 50 tons per day.” *Id.* § 103.

<sup>60</sup> *Id.* § 706.

<sup>61</sup> *Id.* § 904(c).

<sup>62</sup> Save Our Seas 2.0 Act, Pub. L. 116-224, 134 Stat. 1092; 33 U.S.C. § 4281 *et seq.*

<sup>63</sup> *Id.*

<sup>64</sup> U.S. Environmental Protection Agency, “Solid Waste Infrastructure for Recycling Grant Program,” Jul. 26, 2022, <https://www.epa.gov/rcra/solid-waste-infrastructure-recycling-grant-program>.

<sup>65</sup> Save Our Seas 2.0 Act, Pub. L. 116-224, 134 Stat. 1092; 33 U.S.C. § 4211 *et seq.*

<sup>66</sup> Infrastructure Investment and Jobs Act of 2021, Pub. L. 117-58, 135 Stat. 1404.



management, and reduction in accordance with Section 70402 of the IJJA, which establishes the Consumer Recycling Education and Outreach Grant.<sup>67</sup>

In June 2022, the EPA posted a public notice of a request for information, providing the public with the opportunity to share information to inform the development of the SWIFR grant program. While Congress has outlined the requirement for the EPA to administer a grant program, it left it to the agency to determine the details of such a program. As such, the agency “seeks information from a broad array of stakeholders such as industry, researchers, academia, state, territories, [and] local and tribal governments” for “information about needed improvements to post-consumer materials management” that will inform how the agency distributes the grant funds.<sup>68</sup>

By soliciting a request for information, the EPA was seeking to gain a better idea as to what activities grant money would best be used for, although it is unclear how any comments actually affected the EPA’s decision-making. In early 2023, the EPA released a list of objectives and projects for which political subdivisions such as counties and municipalities would be eligible for grant money. The objectives must achieve one or more of the following:

- Establish, increase, expand, or optimize collection and improve materials management infrastructure,
- Fund the creation and construction of tangible infrastructure, technology, or other improvements to reduce contamination in the recycled materials stream,
- Establish, increase, expand, or optimize capacity for materials management,
- Establish, improve, expand, or optimize end-markets for the use of recycled commodities, and
- Demonstrate a significant and measurable increase in the diversion, recycling rate, and quality of materials collected for municipal solid waste.

Eligible projects include, but are not limited to:

- Innovative solutions and/or programs that provide or increase access to prevention, reuse, and recycling in areas that currently do not have access; including development of and/or upgrades to drop-off and transfer stations (including but not limited to a hub-and-spoke model in rural communities), etc.,
- The purchase of recycling equipment, including but not limited to sorting equipment, waste metering, trucks, processing facilities, etc., and
- Upgrades to material recovery facilities (MRFs) such as optical sorters, artificial intelligence, etc.<sup>69</sup>

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<sup>67</sup> *Id.* § 70402, 135 Stat. 1262-1263.

<sup>68</sup> Solid Waste Infrastructure for Recycling Program; Request for Information, 87 Fed. Reg. 35200 (Jun. 9, 2022).

<sup>69</sup> U.S. Environmental Protection Agency, “Solid Waste Infrastructure for Recycling Grants for Political Subdivisions,” Apr. 14, 2023, <https://www.epa.gov/infrastructure/solid-waste-infrastructure-recycling-grants-political-subdivisions>.

## *Save Our Seas 2.0 Act and the National Recycling Strategy*

The recycling strategy mandated by the Save Our Seas 2.0 Act is known as the National Recycling Strategy. Although the National Recycling Strategy encompasses many disparate policies to encourage recycling, its focus on plastic waste means that it has a narrower focus than the Commonwealth's existing recycling program. The Commonwealth's recycling program encompasses material such as paper, tires, yard waste, and compostable food scraps, not to mention aluminum, steel, glass, and cardboard from residential and commercial sources.

Additionally, as one might surmise from the fact that the strategy was mandated as part of the Save Our Seas 2.0 Act, the EPA's strategy is primarily tailored to removing plastic from and preventing it from entering waterways. The Save Our Seas 2.0 Act specifically states that the strategy should be tailored to "improve post-consumer materials management and infrastructure for the purpose of reducing plastic waste and other post-consumer materials in waterways and oceans."<sup>70</sup> In contrast, the Commonwealth's Act 101 recycling program is focused on collecting and repurposing materials regardless of whether they are found in or threaten to pollute waterways.

In its report detailing its strategy, the EPA asserts that the nation's recycling activities need an overhaul. It identifies several drawbacks common to recycling programs across the country. First, there is consumer confusion or misunderstanding about what materials are recyclable. Second, in many areas of the country, recycling infrastructure and equipment is antiquated. Third, markets for recycled materials have declined and vary greatly. Fourth, there exists no standardized way to measure system performance.<sup>71</sup>

To respond to these challenges, the EPA outlines five broad objectives:

- Improve markets for recycled commodities,
- Increase collection and improve materials management infrastructure,
- Reduce contamination in the recycled materials stream,
- Enhance policies and programs to support circularity, and
- Standardize measurement and increase data collection.<sup>72</sup>

These are all laudatory objectives for any recycling system — and the discussion and recommendations in this report mirror them. But the recycling strategy put forth by the EPA recommends no new federal legislation or regulations to accomplish the EPA's stated objectives. What the EPA's National Recycling Strategy report does accomplish is proffer several policies that could be used to achieve the stated objectives.

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<sup>70</sup> Save Our Seas 2.0 Act, Pub. L. 116-224, 134 Stat. 1092; 33 U.S.C. § 4281(a).

<sup>71</sup> U.S. Environmental Protection Agency, "National Recycling Strategy Part One of a Series on Building a Circular Economy for All," p. 1, Nov. 15, 2021, <https://www.epa.gov/system/files/documents/2021-11/final-national-recycling-strategy.pdf>.

<sup>72</sup> *Id.* p. 2.

For instance, to improve markets for recycled commodities the report states that the federal government “is uniquely positioned to advance recycling via policies, procurement, and management of waste and recyclables generated at federal facilities.”<sup>73</sup> Thus, the federal government, as a consumer, can require certain items be manufactured from recycled inputs, and as a producer of waste can require recycling at its own facilities. Using government procurement as a market-development strategy is discussed in more depth on page 63 alongside a comparative table of state recycled-content procurement policies.

To increase collection and improve materials management infrastructure, the EPA recommends that it first create a national map of existing recycling infrastructure and conduct a needs assessment of such infrastructure. Then, it recommends improving the nation’s recycling infrastructure by increasing public and private funding opportunities. To implement this policy, the EPA recommends the federal government compile and share available funding resources as well as fund the research, development, and deployment of new recycling processes and technology.<sup>74</sup>

The EPA’s report also calls for an analysis of several policies that address recycling challenges, such as:

- Recycled content requirements,
- Taxes, increased landfill fees, and bans on landfilling certain materials,
- Bottle bills,
- Take-back programs,
- Extended producer responsibility laws,
- Pay-as-you-throw programs,
- Bans on producing certain materials,
- National recyclability standards,
- Minimum federal standards for MRFs and minimum federal quality and contamination standards for MRF output, and
- Data reporting requirements.<sup>75</sup>

Many of these policies are analyzed in this report in the section titled “Product Collection and Infrastructure Investment Strategies,” along with an examination of their implementation in other states.

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<sup>73</sup> Id. p. 29

<sup>74</sup> Id. at pp. 21-22.

<sup>75</sup> Id. at 30.

*Act 175 Report on Financial Self-Sufficiency  
for Municipal Recycling Programs*

Act 175 of 2002 required the DEP to develop a plan to assist municipalities in making recycling programs under Act 101 financially self-sufficient. The department was to submit the proposed plan to the General Assembly in 2003.<sup>76</sup> In 2005, it reported this plan to the General Assembly. The plan gave general guidance on how to implement several different strategies for reducing costs and generating revenue, with the goal of making recycling programs sustainable with little or no outside funding sources. These strategies were:

- Adopt integrated waste management planning and partnership practices,
- Expand multi-jurisdictional cooperation,
- Improve bidding and contracting practices,
- Consider privatization and managed competition when multiple competitors and public/private partnership opportunities exist,
- Implement risk and revenue sharing in recycling contracts,
- Charge a service fee for recycling on utility bills, property tax bills, or through bag or sticker sales,
- Increase property tax millage rates,
- Charge private disposal facilities a host fee,
- Charge a tip fee at publicly owned disposal or materials recovery facilities, and
- Consider supplemental funding options such as grants, general funds, license fees, and franchise fees.<sup>77</sup>

An accompanying survey of authorities, counties, and municipalities revealed that authorities have the largest solid waste management budgets and the highest recycling budgets. Municipalities have the largest share of recycling dollars as a percentage of their total solid waste management budget at 26.8 percent. Nearly half of all surveyed jurisdictions reported a need for additional recycling facility capacity and 80 percent of jurisdictions used at least one type of state grant to fund their recycling programs.<sup>78</sup>

An earlier “working draft” of a document authored by the DEP entitled “Act 175 Recycling Program Plan” measured the state of recycling in Pennsylvania at the time and provided market development initiatives, recommendations to county recycling coordinators, and recommendations for legislative action, including developing financial incentives and tax credits for Pennsylvania businesses and industry to promote the use of recycling materials. The market development

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<sup>76</sup> Act of December 9, 2002 (P.L. 1404, No. 175, § 3), amending the Act of July 28, 1988 (P.L. 556, No. 101, § 1513); 53 P.S. § 4000.1513.

<sup>77</sup> Pennsylvania Department of Environmental Protection, “Building Financially Sustainable Recycling Programs: Technical Report for Pennsylvania Local Governments,” Apr. 2005, [https://files.dep.state.pa.us/waste/recycling/RecyclingPortalFiles/Documents/fin\\_sust\\_rec.pdf](https://files.dep.state.pa.us/waste/recycling/RecyclingPortalFiles/Documents/fin_sust_rec.pdf).

<sup>78</sup> *Id.*

initiatives recommended by the DEP included a “buy recycled” promotion to increase the purchase of recycled products by government, business, private entities, and consumers.<sup>79</sup>

Additionally, the DEP identified solutions to perceived market inefficiencies. One solution was to provide information to market participants such as market assessments, recycling business directories, technical information on how to utilize recycled materials, procurement training, customer education, developing and distributing materials specifications, and providing permitting assistance. Another idea was to facilitate the marketplace for recycled goods by bringing market players together through stakeholder forums, attending trade shows, and facilitating relationships between trade organizations, material collectors, processors, and end users. Providing financial assistance in the form of grants, investments, and tax credits to influence market behavior was also proposed by the DEP.<sup>80</sup>

Act 101 required the DEP to submit a report to the General Assembly on market development for recyclable materials that describes:

- The current and projected capacity of existing markets to absorb materials generated by municipal recycling programs in this Commonwealth
- Market conditions that inhibit or affect demand for materials generated by municipal recycling programs,
- Potential opportunities to increase demand for and use of materials generated by municipal recycling programs,
- Recommendations for specific actions to increase and stabilize the demand for materials generated by municipal recycling programs, including, but not limited to, proposed legislation, if necessary, and
- Specific recommendations on markets for recycled materials for each region of this Commonwealth.<sup>81</sup>

It is unclear whether this report was actually produced, as no record of it was available on the DEP’s website. However, the non-profit Pennsylvania Recycling Markets Center was established by the DEP to provide market analysis, start-up assistance, and business strategy as well as environmental services to businesses in the recycling space or manufacturers who could use recycled material in their production.<sup>82</sup> The Act also requires the DEP to produce annual reports to the General Assembly on the Recycling Fund and the Commonwealth’s progress in achieving Act 101’s goals.<sup>83</sup> However, the DEP has ceased producing these annual reports. The

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<sup>79</sup> Pennsylvania Department of Environmental Protection, “The Future of Recycling in Pennsylvania: Act 175 Recycling Program Plan,” Jul. 2004, [https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Documents/recycling\\_plan7-8-04.pdf](https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Documents/recycling_plan7-8-04.pdf).

<sup>80</sup> *Id.*

<sup>81</sup> The Municipal Waste Planning, Recycling, and Waste Reduction Act, § 508; 53 P.S. § 4000.508.

<sup>82</sup> Recycling Today, “Pennsylvania Creates Recycling Markets Center,” Nov. 7, 2003, <https://www.recyclingtoday.com/news/pennsylvania-creates-recycling-markets-center/>.

<sup>83</sup> The Municipal Waste Planning, Recycling, and Waste Reduction Act, § 706(f); 53 P.S. § 4000.706(f).

most recent such annual report by the DEP to the General Assembly uncovered by Commission staff dates from 2001-2002.<sup>84</sup>

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<sup>84</sup> Pennsylvania Department of Environmental Protection, "Recycling in Pennsylvania, Act 101 Annual Report to the General Assembly of Pennsylvania for 2001 & 2002," n.d., <https://archive.epa.gov/wastes/conservation/tools/rmd/web/pdf/2520-bk-dep2586.pdf>.

## CHALLENGES FACING THE RECYCLING INDUSTRY IN PENNSYLVANIA

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To get a complete assessment of the Commonwealth's recycling infrastructure and operations across the Commonwealth, an analysis of the challenges, big and small, facing the recycling industry is vital.

### *Diminished International Markets*

One of the most well-publicized issues in the recyclable materials market is the closure of a major overseas market for recyclables. In 2018, China functionally banned the import of plastics and other recycled materials from the United States as a result of contamination in the bales of material it imported. A total of 24 materials were banned entirely, and the allowable contamination rate — the percentage of non-recyclable material permitted in a shipment of recyclables — for plastics and textiles was set at 0.5 percent. This low level of contamination in recyclable plastic is considered by those in the recycling industry to be a standard that is impossible to meet.

Unfortunately, material recovery facilities had fine-tuned their operations for the Chinese market. Knowing that China had a large and growing appetite for raw materials, including recyclable plastics, they ran their facilities at a high capacity to push through a large volume of material, resulting in bales of mixed rigid plastics and mixed paper with limited sorting and quality control.<sup>85</sup>

Recyclers are having to adjust their business models and are taking one of several approaches. Some are slowing down their processing to improve quality and adding new equipment with more modern technology to eliminate more of the unwanted materials that contaminate the recycling stream. This strategy, however, requires that MRFs invest capital into new equipment, decreases the volume of material they can sell, and increases operating costs.

Others are sending their material to other countries, such as Vietnam, Turkey, and India. Volumes exported to these countries have risen in the past few years, even as the total amount of plastic scrap exported from the United States has fallen.<sup>86</sup> However, these countries do not possess the ability to absorb the volume of material that China once did. Further, once these countries receive the recycled plastic, it is not clear that it ends up being used to make new products. A series of middlemen broker the material and it is sifted through by local workers who separate the

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<sup>85</sup> Katie Pyzyk, "With China's 'nearly impossible' contamination standard, where are MRFs looking now?", *Waste Dive*, Apr. 4, 2018, <https://www.wastedive.com/news/china-contamination-standard-MRFs/519659/>.

<sup>86</sup> Jared Paben, "US scrap plastic exports continue years-long decline," *Plastics Recycling Update*, Mar. 2, 2022, <https://resource-recycling.com/plastics/2022/03/02/us-scrap-plastic-exports-continue-years-long-decline/>.

valuable recyclable materials, which are then sold back to local facilities which can recycle them. Contamination and low-value materials are discarded in makeshift landfills.

In addition to exploring foreign markets, new MRFs and processing facilities are opening domestically. This additional processing capacity is not only absorbing material that would have been sent to China but is putting pressure on the facilities that collect and sort the material to provide less-contaminated bales. Previously, China's acceptance of bales of recycled plastic that contained up to 50 percent trash made it uneconomical for the sorting facility to provide less contaminated bales, which in turn made it uneconomical for domestic recycling facilities to accept them and caused domestic recycling infrastructure to fall behind. This cycle now works in the opposite direction — more pressure for less contaminated bales of scrap plastic creates more demand for such bales from domestic recycling facilities.<sup>87</sup>

China's ban on importing America's recycled plastic is also reverberating through the supply chain down to the curbside recycling programs. Some communities are limiting the material they will collect as part of their curbside recycling programs, while others are still collecting the same number of materials but are stockpiling it in hopes of a market turnaround or are discarding the recycled material in landfills. Some communities are increasing the collection cost for recyclables in an attempt to cover higher operating expenses and lower scrap prices.

Although the Chinese market closure had a more direct impact on western states' recycling programs, which sent more recycled plastic overseas than other parts of the country, Pennsylvania was not unaffected. Crawford County suspended its drop-off program after facing a \$200 penalty from Waste Management, the contracted waste hauler, for each contaminated load, as residents continued to place non-recyclable items in the collection bins and Waste Management could no longer simply ship them to China.<sup>88</sup> Mercer, Monroe, and Lawrence Counties also cut back their recyclable drop-off programs. Bradford Township in McKean County eliminated drop-off bins. And Clearfield County stopped accepting mixed paper at its drop-off site.<sup>89</sup>

In Erie County, Waste Management stopped accepting paper, cardboard, and glass at drop-off sites.<sup>90</sup> Glass, plastic bags, shredded paper, and mixed plastics were cut from Erie's curbside collection program.<sup>91</sup> In Lancaster County, the waste management authority increased the price of curbside recycling for households and eliminated some plastics and non-corrugated cardboard from its recycling program.<sup>92</sup> In Penn Hills, Shaler, and Wilkins Townships (all in Allegheny

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<sup>87</sup> Where are MRFs looking now, *Waste Dive*, *supra* n. 85.

<sup>88</sup> "What's your recycling plan now that countywide blue bins are going away?," *Meadville Tribune*, Dec. 24, 2017, [https://www.meadvilletribune.com/news/what-s-your-recycling-plan-now-that-countywide-blue-bins/article\\_a489256c-e792-11e7-990d-a76446059ef6.html](https://www.meadvilletribune.com/news/what-s-your-recycling-plan-now-that-countywide-blue-bins/article_a489256c-e792-11e7-990d-a76446059ef6.html).

<sup>89</sup> Cole Rosengren et al., "How recycling has changed in all 50 states," Nov. 15, 2019, *Waste Dive*, <https://www.wastedive.com/news/what-chinese-import-policies-mean-for-all-50-states/510751/>.

<sup>90</sup> *Id.*

<sup>91</sup> *Id.*

<sup>92</sup> Ad Crable, "China-caused recycling crash will mean slightly higher trash bills for Lancaster County Residents," *Lancaster Online*, Jun. 22, 2018, [https://lancasteronline.com/news/local/china-caused-recycling-crash-will-mean-slightly-higher-trash-bills/article\\_6036c478-7586-11e8-a957-6bca0b607c4f.html](https://lancasteronline.com/news/local/china-caused-recycling-crash-will-mean-slightly-higher-trash-bills/article_6036c478-7586-11e8-a957-6bca0b607c4f.html).



County), a new contract with Republic Services to collect and process recyclables will cost more and drop glass and mixed plastics.<sup>93</sup>

As of 2018, half of Philadelphia’s recyclables are now going directly to an incinerator.<sup>94</sup> Philadelphia also shut down its Philacyle community engagement and recycling rewards program. This program allowed residents to drop off recyclables for points which could then be traded for gift cards. However, the program ended because recycling no longer generates revenue and now costs the city of Philadelphia.<sup>95</sup>

### *Value Tied to Petroleum Commodity Markets*

The closing of the Chinese market led to a decrease in demand for recycled plastics and a decrease in price in 2018 and 2019. However, the lowered demand due to the loss of China as a market has not been the only factor driving demand lower for recycled plastics. Commodity prices for oil and natural gas — which provide the chemical building blocks for plastics — also affect the marketability of recycled plastic. When the price for oil and natural gas is high, it becomes more economical to process recycled material into new plastic. When the price of these commodities is lower, plastic manufacturers will simply make new material from petroleum feedstock.<sup>96</sup>

### *Certain Plastics Are Difficult to Recycle*

Different plastics have different chemical compositions that give each of them their unique properties and functional uses. However, this also means that some are easier to recycle or are more valuable to product manufacturers. For instance, PET and HDPE plastics (the plastics labelled #1 and #2, respectively) have a large market for reuse. PET soda and water bottles and HDPE milk jugs and detergent containers can be reformed into new bottles, jugs, and containers. PET can also be recycled into textiles and carpeting.<sup>97</sup>

However, plastics numbered 3 through 7 are the least recyclable. One reason they are not as recyclable is because they are not valuable to downstream purchasers of recycled plastic bales. According to a recycled plastics broker, as of June 2022 the price of “#3-7 Bottles and Other Rigid Plastic” was zero and the price of “#3-7 Bottles and Small Rigid Plastic” was \$0.038 per pound.<sup>98</sup>

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<sup>93</sup> How recycling has changed in all 50 states, *supra*, n. 89.

<sup>94</sup> Chad Pradelli, “Investigation: Some of Philly’s recyclables are being burned, not reused,” *6ABC*, Oct. 24, 2018, <https://6abc.com/recycling-in-the-city-of-philadelphia-trash-collection/4544357/>.

<sup>95</sup> Katie Pyzyk, “Philadelphia cancels recycling rewards program,” *Waste Dive*, Jun. 5, 2019.

<sup>96</sup> See Marissa Heffernan, “Global tensions drive high oil prices,” *Plastics Recycling Update*, Jan. 26, 2022, <https://resource-recycling.com/plastics/2022/01/26/global-tensions-drive-high-oil-prices/>.

<sup>97</sup> Pang-Chieh Ho, “Smarter: Which plastics are actually recyclable?,” Mar. 1, 2022, <https://www.consumerreports.org/recycling/smarter-which-plastics-are-actually-recyclable-a4433898936/>.

<sup>98</sup> Recycle More Plastic, “Sort for Value,” accessed September 9, 2022, <https://www.recyclemoreplastic.org/view/sortforvalue>.

Sewickley Borough and 14 other municipalities in Allegheny County, for instance, stopped collecting plastics #3-7 because there was no market for those types of plastic.<sup>99</sup>

Polypropylene, or number 5 plastic, is generally more recyclable and has a larger market demand than plastics 3, 4, 6, and 7, but less than PET and HDPE. However, prior to 2018 and China's closing its shores to less-sorted bales of American material, the vast majority of polypropylene was exported as part of bales of mixed material. According to the Sierra Club, there are only five recycling facilities in the entire United States which can process recycled polypropylene into new polypropylene.<sup>100</sup> An industry source counts 12 recyclers that process polypropylene in the United States, 10 of which are east of the Mississippi River.

Regardless of whether there are 5 or 12 processing facilities for polypropylene, because this type of plastic typically used to be exported the development of a market for domestic recyclers was constrained. As a result, the American market for recyclable polypropylene is still in its infancy. Polypropylene has been recycled domestically for less than a decade, and reclamation processes for this material are still maturing. The Association of Plastics Recyclers notes that Canadian material processors also purchase recycled polypropylene from California, so at least some of the number 5 plastic that is collected and exported is still processed according to modern standards.<sup>101</sup>

***Shrink Sleeves on PET and HDPE Bottles  
Make Recycling More Difficult and Lower Their Value***

Some manufacturers include shrink sleeves — plastic wrappers that are tightly affixed to the bottle — on the otherwise recyclable PET and HDPE bottles that hold their product. This is done for marketing and branding purposes but can make the bottles difficult or impossible to recycle and turns an otherwise recyclable item into contamination. The shrink sleeves cannot be separated in water “sink-float” tanks. They are not sortable by optical scanners. And the labels, which are made from glycol-modified PET, PVC, or polystyrene, have a lower melting point than PET. This causes the shrink sleeves to clump and damage drying equipment. Specialty equipment exists to remove these labels, but they are an added cost and only about one third of PET recyclers have them.<sup>102</sup>

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<sup>99</sup> Sam Bojarski, “Edgeworth addresses recycling changes,” *Trib Live Sewickley Herald*, Jan. 6, 2020, <https://neighborhoods.triblive.com/sewickleyherald/edgeworth%20addresses%20recycling%20changes/bidb580973b437f880b6f0ce40434063693>.

<sup>100</sup> James Steinbauer, “California reckons with the hard truth about plastics recycling,” *Sierra Club*, Nov. 22, 2021, <https://www.sierraclub.org/sierra/california-reckons-hard-truth-about-plastic-recycling-2>.

<sup>101</sup> The Association of Plastic Recyclers, “The growing market for recycled polypropylene,” *Recycling Partnership*, Dec. 2, 2020, pp. 18-19, [https://recyclingpartnership.org/wp-content/uploads/dlm\\_uploads/2021/01/TRP-APR-Polypropylene-1.pdf](https://recyclingpartnership.org/wp-content/uploads/dlm_uploads/2021/01/TRP-APR-Polypropylene-1.pdf).

<sup>102</sup> Jared Paben, “Commercialization conundrum,” *Plastics Recycling Update*, May 1, 2018, <https://resource-recycling.com/plastics/2018/03/06/commercialization-conundrum/>.

## ***Rising Cost of Single-Stream Processing of Materials***

One emerging issue that the Commonwealth faces is the growing cost of processing material collected via a single-stream operation. Single-stream recycling refers to comingling all recyclable materials (glass, plastics, aluminum, etc.) in one container that the consumer places curbside. They are then collected and taken to an MRF where they are sorted and baled before being sold to facilities which can further process the materials into a usable form. Single stream recycling was promoted as a cost-savings option for municipalities as well as a solution to convince consumers to recycle and thereby generate larger volumes of recycled materials. The consumer does not have to spend time sorting different materials into different bins — they just place everything into one bin.

However, single-stream recycling has its downsides. This method tends to collect more contamination than either source-separated recycling or dual stream recycling. More contamination means greater expenditures by material recovery facilities to produce a marketable product. The more stringent import standards for the Chinese market alongside lower market prices for recycled plastics necessitates greater expenditures by material recovery facilities to reduce contamination to better position their collected materials for downstream markets, regardless of whether the markets are domestic or foreign.

In Pennsylvania, the DEP has reported that material recovery facilities have increased the fee charged to municipalities to process the collected materials by approximately 50 percent. This in turn has entailed increased educational efforts by municipalities in an effort to reduce the amount of contamination their residents introduce into the recycling stream. This is a cost to the municipalities, for which they have historically relied on the DEP to offset through recycling grants. However, according to the DEP, “the Recycling Fund is in a position where it cannot sustain the support necessary to alleviate these forces.” Municipalities must either raise the cost to their residents for curbside recycling or discontinue recycling altogether.<sup>103</sup>

### ***Glass is Difficult to Separate in Single-Stream Operations***

Ancillary to the issues common to single stream recycling discussed above, glass can pose its own set of problems for material recovery facilities. In particular, broken glass can become enmeshed with other materials, such as corrugated cardboard, making those materials more difficult or time consuming to process. Dust particles from grinding glass creates substantial wear and tear on equipment, and the resulting glass pieces — known as “cullet” — can become difficult to handle if they get wet.

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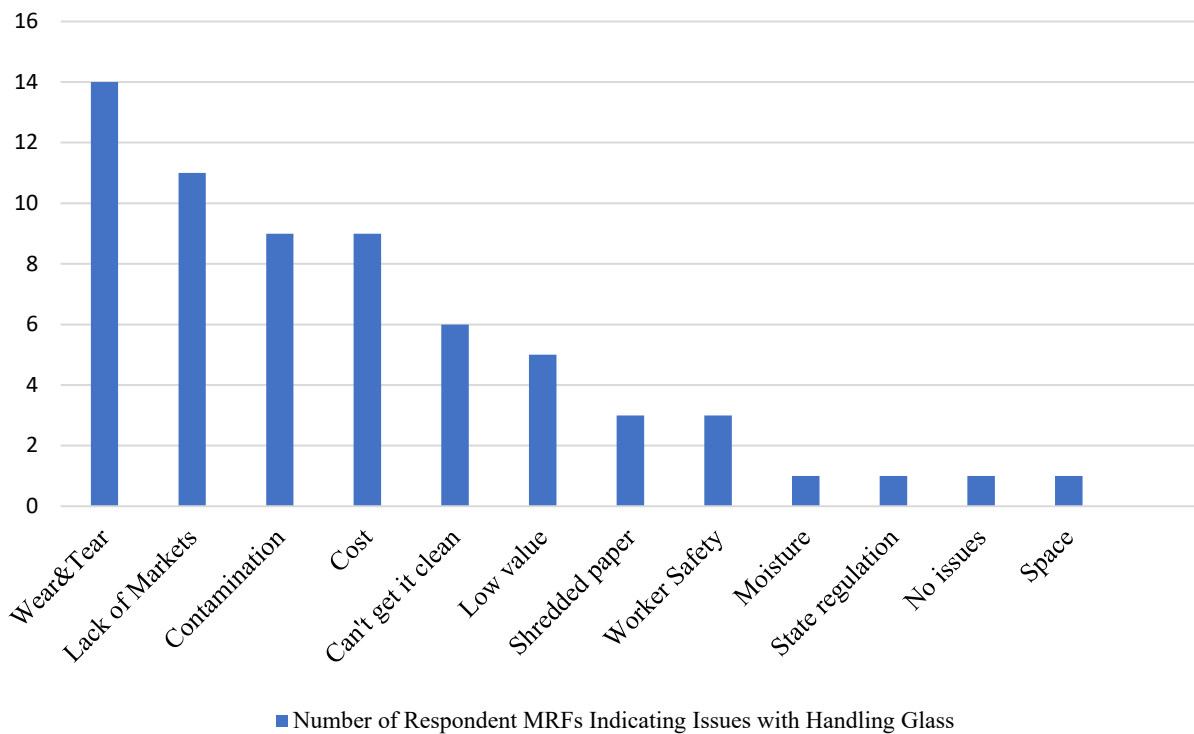
<sup>103</sup> Pennsylvania Department of Environmental Protection, Solid Waste Advisory Committee, “Act 101 Program Review,” Dec. 16, 2020, [https://files.dep.state.pa.us/PublicParticipation/Advisory%20Committees/AdvCommPortalFiles/SWAC/2021/Dec16/Act101\\_WhitePaper\\_SWAC-RFAC\\_12-16-2021.pdf](https://files.dep.state.pa.us/PublicParticipation/Advisory%20Committees/AdvCommPortalFiles/SWAC/2021/Dec16/Act101_WhitePaper_SWAC-RFAC_12-16-2021.pdf).

Additionally, glass is one of the heavier materials collected by curbside recycling programs. Because material recovery facilities generally charge a fee per ton of material deposited by the municipalities, glass contributes a significant portion of that cost to the municipalities that recycle glass in a single stream operation. Compounding this issue is the fact that glass has a relatively low value and transportation to processors and manufacturers can be costly depending on their distance from the MRF.

A 2018 report by the Northeast Recycling Council (NERC), a nonprofit consortium of northeast states to collaborate on recycling initiatives, found that wear and tear on equipment, lack of markets, contamination, cost, inability to clean the glass, and the low value of recycled glass were the primary concerns MRFs had with recycling glass. See Chart 4 from NERC’s report for a visual representation of the responses of 41 material recovery facilities through the northeast.<sup>104</sup>

**Chart 4**

**NERC MRF Glass Survey Report, 2018**



Source: NERC, Northeast MRF Glass Survey Report, Oct. 2018.

<sup>104</sup> Northeast Recycling Council, “Northeast MRF Glass Survey Report,” Oct. 2018, <https://nerc.org/documents/Glass/Northeast%20Recycling%20Council%20-%20MRF%20Glass%20Survey%20Report.pdf>.

In 2016, Uwchlan Township in Chester County undertook a study to determine if it would be feasible to remove glass from its single stream curbside recycling program, as its collection system costs were on the rise. The study determined that the township would lose grant money from the Performance Award under Section 904 (\$20,901) as well as face increased disposal fees of \$27,783 for the yearly amount of glass (441 tons) hypothetically diverted to a landfill. This meant that the cost savings from not recycling glass would have to be in excess of \$48,500 for the township to viably remove glass from the recycling stream.

This calculation assumed that there would be no glass contamination in the single-stream operation after the township halted glass collection. However, the township determined that this would be an unlikely reality. Households are now used to recycling glass containers and it would be “difficult and socially unacceptable to require residents to stop recycling glass bottles.” The township ultimately concluded that any cost imposed on the township by recycling glass was offset by Section 904 grant money and avoided disposal tipping fees. Although recycling glass may be a cost to the municipality, it would cost more to not collect and recycle this material.<sup>105</sup>

Another Recycling Technical Assistance Report commissioned by the Montgomery County Recycling Consortium after the consortium experienced a large increase in the cost of collection by its contracted hauler also identified glass as a major net loss for material recovery facilities. According to the report, “it is not possible to economically separate clear and brown glass collected in a single stream program as the material is typically broken. The three-mix glass material (clear, brown, green) from single stream programs has a negative market value of \$27.50 per ton.” In order to offset the cost of handling glass, the Consortium had to pay a \$135 tip fee per ton of glass to the current material recovery facility its contracted hauler was utilizing. It was noted that because some of the glass is diverted to be used as cover for a landfill, the Consortium does not receive Section 904 grant money for glass collection.<sup>106</sup>

A Recycling Technical Assistance Report for Harrisburg noted that by weight 30 percent of its residential recycling is glass, and that the cost to transport it to a Penn Waste facility in York County exceeded the value of the glass as a recyclable material.<sup>107</sup> Harrisburg eventually eliminated curbside glass collection and re-started glass collection in 2018 with drop-off locations spread across the city.<sup>108</sup>

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<sup>105</sup> Pennsylvania Department of Environmental Protection, “Preliminary Assessment Eliminating Glass from Curbside Single Stream Collection, Uwchlan Township, Chester County, Pennsylvania, Recycling Technical Assistance Project #600,” Aug. 2016, [https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/RecyclingTechnicalAssistance/RTA-600\\_Uwchlan\\_Township\\_final\\_102816.pdf](https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/RecyclingTechnicalAssistance/RTA-600_Uwchlan_Township_final_102816.pdf).

<sup>106</sup> Pennsylvania Department of Environmental Protection, “Recycling Market and Processors Review,” Mar. 10, 2021, [https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/RecyclingTechnicalAssistance/Final\\_Report\\_Cheltenham\\_Township\\_Recycling\\_Markets\\_V2.0.pdf](https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/RecyclingTechnicalAssistance/Final_Report_Cheltenham_Township_Recycling_Markets_V2.0.pdf).

<sup>107</sup> Pennsylvania Department of Environmental Protection, “Solid Waste System Benchmark and Recycling Program Expansion, City of Harrisburg, Dauphin County, Pennsylvania, Recycling Technical Assistance Project #538,” Jun. 2013, [https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Harrisburg\\_538.pdf](https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Harrisburg_538.pdf).

<sup>108</sup> Lawrence Binda, “Glass Recycling Returns to Harrisburg,” *The Burg*, Apr. 16, 2018, <https://theburgnews.com/news/glass-recycling-returns-to-harrisburg>.

### ***Difficulty in Obtaining Clear Data***

Collecting materials is not the same as recycling them. Not every item placed in a curbside bin is recycled. However, the DEP does not collect data on what happens to this material once it is collected. Data are effectively obtained on the “front-end” — how much material is collected that is received by an MRF. Further, the DEP’s best data is aggregated by county and material type. This aggregated data only informs the reader how much of each material was collected county-wide. For some counties, the data is not broken down by material type. This is because, with single-stream collection, it is difficult to determine how much of each material is collected.

### ***Diversion of Recycling Fee to Other Causes***

Since its inception in 1988, the Recycling Fee on waste disposed at Pennsylvania municipal landfills and waste-to-energy facilities has been \$2 per ton. This amount does not have the same value today as it did over 30 years ago, and consequently the money available to underwrite recycling grants does not stretch as far. The Recycling Fund receives around \$39 million per year from this fee, but the cost to collect, sort, and process recyclable materials has increased precipitously. Additionally, money from the Recycling Fund has been diverted for other uses such as waste tire remediation, the growing greener program, forest lands beautification, and even general fund augmentation.<sup>109</sup> In the Fiscal Year 2021-2022 budget, \$50 million was diverted from the Recycling Fund to the General Fund.<sup>110</sup>

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<sup>109</sup> Act 101 Program Review, *supra* n. 103 at p. 52.

<sup>110</sup> Commonwealth Budget, p. H99,  
<https://www.budget.pa.gov/Publications%20and%20Reports/CommonwealthBudget/Documents/2021-22%20Proposed%20Budget/2021-2022%20Executive%20Budget%20Book.Web%20Version.UPDATED.030421.pdf>.

## **PRODUCT COLLECTION AND INFRASTRUCTURE INVESTMENT STRATEGIES**

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Senate Resolution 285 directs the Commission to review “recycling infrastructure investment strategies adopted by other states, including public-private partnerships,” and “industry-managed product collection strategies and other legislative approaches to the management of plastics and other recyclable products, particularly packaging.” The report reviews two separate facets of recycling: Financing recycling infrastructure and solutions to the challenges identified in the recycling industry, including collection strategies, finding end uses for the recycled material, and legislative enactments of other states.

As has been mentioned in the section of this report discussing challenges facing the recycling industry, collecting the recycled materials is the relatively easy part. Finding markets for the material, particularly recycled plastic and glass, is the hard part. Finding solutions to the high cost of collecting and sorting make up the bulk of the strategies discussed in this section.

### *Pay-As-You-Throw*

Most municipalities in the Commonwealth that offer curbside trash and recycling collection operate on a standard fee per month or quarter, regardless of how much or how little waste each household generates. An alternative to this arrangement, known as “pay-as-you-throw,” charges each household based on the weight of trash that is generated. Some also charge on a per-bag basis. The goal of this policy is to encourage households to be more conscientious about what they throw away and to recycle more of the items that make their way into the trash bin.

Although most of the difficulty faced by the recycling industry lies in how to transform the recycled materials into new products in a cost-effective manner, more efficient collection is still a valuable goal. Overall, the Commonwealth has collected less recyclable material from residential sources in the past few years than it did in the early part of the 2010s, when household recycling volumes peaked. Pay-as-you-throw, or “PAYT,” policies could be part of the solution to increase recycling volume. Although there are drawbacks, PAYT programs do have the effect of marginally increasing recycling volume and decreasing waste sent to landfills. According to one study, PAYT programs had a synergistic effect when the implementing municipality also had a voluntary curbside recycling program.<sup>111</sup>

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<sup>111</sup> David H. Folz and Gacqueline Giles, “Municipal Experience with “Pay as You Throw” Policies: Findings from a National Survey,” University of Tennessee, n.d., <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.521.9324&rep=rep1&type=pdf>.

According to EPA data from 2006, there were 7,095 communities across the United States with PAYT waste management programs, with 253 such communities in the Commonwealth. The most common PAYT programs in the United States are the pay-per-bag and sticker or tag methods. Under these modifications, the consumer pays not by weight but by unit of trash — typically by household-sized trash bag.<sup>112</sup>

The EPA report cites data showing that PAYT programs had decreased residential solid waste disposal by 17 percent by weight. It was estimated that five to six percent were attributable to increased recycling, four to five percent to yard waste removal programs, and another six percent to household source reduction strategies, such as buying in bulk and buying items with less packaging. According to studies cited by the EPA, PAYT programs were remarkably effective at both reducing the amount of household solid waste thrown away and increasing the number of items recycled.<sup>113</sup>

The states with the largest share of communities implementing PAYT programs are Washington, Oregon, and Minnesota, where PAYT is mandated at the state level and 100 percent of local jurisdictions have PAYT systems. Other states with high PAYT usage include Wisconsin, New Hampshire, and Massachusetts with 81 percent, 75 percent, and 59 percent of their respective communities utilizing PAYT. Approximately ten percent of Pennsylvania's 2,560 municipalities have PAYT programs.

Pay-As-You-Throw programs are more common in Europe, Japan, and South Korea than in the United States. Studies of such policies in these nations have shown that they result in a decrease in per capita production of solid waste and an increase in the rate of recycling. Closer to home, a municipal waste system in Minnesota revealed a four percent reduction in household waste after the introduction of a PAYT policy. A study in Massachusetts showed an almost 20 percent correlation between PAYT and recycling rates, although other aspects of that state's waste policy also played a role.<sup>114</sup>

It has been suggested that PAYT programs could result in more illegal dumping of trash. While data correlating illegal dumping with PAYT waste management schemes is scant, one municipality in The Netherlands moved to a flat fee system after it was discovered that households were illegally disposing of waste to lower their trash bills. Although it could not be established that these households were dumping their waste in a vacant lot somewhere, the number of homes reporting no waste at all was much larger than in non-PAYT municipalities, leading to speculation that some households were burning their trash or disposing of it in dumpsters in other neighborhoods.<sup>115</sup>

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<sup>112</sup> U.S. Environmental Protection Agency, "Pay as you Throw (PAYT) in the US: 2006 update and analyses," Final Report, Dec. 30, 2006, <https://archive.epa.gov/wastes/conservation/tools/payt/web/pdf/sera06.pdf>. The EPA no longer provides data on municipal-level PAYT adoption and 2006 is the most recent year for which such data is available.

<sup>113</sup> *Id.* at p. 7.

<sup>114</sup> See Raymond Gradus *et al.*, "Which US Municipalities Adopt Pay-As-You-Throw and Curbside Recycling?," *Public Administration Faculty Scholarship* 46, (2019), pp. 3-4, Binghamton University, [https://orb.binghamton.edu/cgi/viewcontent.cgi?article=1048&context=public\\_admin\\_fac](https://orb.binghamton.edu/cgi/viewcontent.cgi?article=1048&context=public_admin_fac) (citing studies).

<sup>115</sup> *Id.* at pp. 5-6.



One consideration when contemplating a PAYT scheme to increase recycling rates is that there is a finite amount of household waste that is recyclable. An observed increase in recycling tonnage does not necessarily mean an increase in plastic, glass, and paper products being recycled. As discussed throughout this report, contamination in the recycling stream has been a persistent problem for the recycling industry. If households were required to pay for trash disposal by weight or by bag, they may be tempted to place items into the recycling bin that the recycling facility would view as unwanted contamination — even when the item is made from a material that is theoretically recyclable. This was also a concern in Germany, which has implemented a policy of mandatory recycling and weight-based trash collection fees. There, it was noted that households attempted to decrease their trash collection costs by disposing of non-recyclable items in recycling bins.<sup>116</sup>

### *Alternative Reducing Agent in Metallurgical Processes*

One unique use for plastic — particularly the difficult to recycle plastic that is often considered contamination and ends up in a landfill — is to use it to as a reducing agent in blast furnaces. Plastic has the chemical capacity to take up the excess oxygen atoms from hematite and magnetite as well as sufficient energy to drive the endothermic reduction of iron.

This is not a novel or radical concept. JFE Steel in Japan has been using plastic scrap as a reducing agent in its blast furnaces since 1996.<sup>117</sup> According to the Japan Iron and Steel Foundation, this use of plastic scrap has been recommended industry-wide since 1997. In 2004 the steel industry utilized 410,000 tons of plastic, up from 70,000 tons in 1999.<sup>118</sup>

Nippon Steel has recently begun using pyrolysis to enable it to effectively use 100 percent of the waste plastic collected in its steelmaking process. After municipalities collect all the material, it is transported to Nippon Steel which removes any remaining contaminants and crushes it into smaller pieces. These pieces are then reformed into pellets by heat. Then, these pellets of reformed plastic are put into a coke oven chamber alongside coal and carbonized in a superheated oxygen-free atmosphere to produce tar, light oil, coke, and coke oven gas. Oil is 40 percent of the output, which can be further processed into new plastic, paint, or other chemicals, coke is 20 percent of the output, which is put into the blast furnace and used as an iron ore reducing material. Coke oven gas makes up the remaining 40 percent of the waste plastic's output and is used to generate electricity.<sup>119</sup>

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<sup>116</sup> See *Infra* p. 58.

<sup>117</sup> Asanuma Minoru *et al.*, “Development of Waste Plastics Pulverization and Blast Furnace Injection,” JFE Technical Report No. 19, (Mar. 2014), <https://www.jfe-steel.co.jp/en/research/report/019/pdf/019-22.pdf>.

<sup>118</sup> Japan Iron and Steel Federation, “Current State of Plastic Waste Recycling and Future Tasks,” n.d., <https://www.jisf.or.jp/en/activity/warm/commit/plastic.html>

<sup>119</sup> Masahiro Sekiya *et al.*, “Aiming to Become a Steelworks that plays a role in recycling-oriented society,” Jan. 2022, *Nippon Steel Technical Report No. 127*, <https://www.nipponsteel.com/en/tech/report/pdf/127-13.pdf>.

Nippon Steel uses 200,000 tons of waste plastics in this manner every year, accounting for one-third of the plastic used in metallurgical processes annually across Japan. Using this method, Nippon Steel has recycled (or rather, repurposed) a total of 3.28 million tons of waste plastics into coke, gas, and chemical feedstock.<sup>120</sup>

Japan is not the only country to have steel mills use plastic in the metallurgical process. Acciaierie d'Italia in Italy, ThyssenKrupp in Germany, and Voestalpine in Linz, Austria use plastic in some form as a reducing agent. The latter injects the plastic into the furnaces in the form of granules, as does JFE Steel. The Italians and Germans use the plastic to create syngas which is then pumped into the blast furnace.<sup>121</sup>

It may be counter-intuitive to see plastics being “recycled” by being consumed in a process to make metal, but the use of plastic in this manner keeps it out of landfills, vacant lots, and waterways and reduces the factories’ need for coal, which is the traditional material utilized in this manner in the ironmaking and steelmaking processes. This may be the best use for many of the plastics that end up in the recycling stream and have little to no value on the secondary market. In fact, using plastic other than PET in the steelmaking process is a recognized and promoted activity in Japan’s national recycling scheme.<sup>122</sup>

### ***Fuel for Cement Kilns***

Similar to using plastic as a reducing agent in metallurgical processes, using plastic as a fuel to manufacture cement is a common and accessible way to get rid of plastic waste. Although it is not technically recycling, it is putting unwanted plastic that would otherwise sit inert in a landfill for thousands of years to a higher purpose and, in the process, displacing other fossil fuels that would ordinarily be used.

If the primary policy around plastics recycling is to avert pollution, particularly the plastic bags and bottles that end up in waterways, then using waste plastics as a fuel source can be a piece of the recycling puzzle. As with its use in metallurgical processes, incineration to generate electricity, or pyrolysis to generate liquid fuels, using discarded plastic to generate energy for cement kilns is not technically recycling — the plastic does not get reused in a circular way, becoming a plastic bottle or textile again. However, it does meet its end with a beneficial use and displaces other fuel sources which are typically used in cement kilns such as coal and natural gas.

Critics, however, note that this practice simply swaps one fossil fuel (usually coal) for another (as plastic is derived from oil or natural gas). These critics also emphasize that using plastic instead of coal as a fuel in cement kilns also has little impact on greenhouse gas emissions.

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<sup>120</sup> *Id.*

<sup>121</sup> Daneilla DiMaggio, “Steel made from plastics – projects in the steelmaking industry,” *ExpoMetals*, (Jan. 26, 2022), <https://www.expometals.net/en-gb/news/news-in-detail/steel-made-from-plastics-projects-in-the-steelmaking-industry-id28875>.

<sup>122</sup> The Japan Containers and Packaging Recycling Association, “Recycling Process,” n.d., [https://www.jcpra.or.jp/Portals/0/resource/eng/jcpra/image/03\\_img.gif](https://www.jcpra.or.jp/Portals/0/resource/eng/jcpra/image/03_img.gif).

Proponents, on the other hand, point out that it is a productive use for a waste material that, in many cases, would end up in a landfill.

Large consumer brands, under pressure to recycle, are finding that using cement kilns to dispose of plastic waste is a more economical solution than having to collect, sort, grind, and reform the plastics that are used in their product packaging. This is particularly true in developing countries, where extended producer responsibility laws, higher costs for coal, and ample plastic waste converge to make using plastic as an energy source in cement kilns the ideal solution.

In these countries, consumer goods manufacturers are teaming up with cement manufacturers to put the plastic waste to a more beneficial use. Unilever, Coca-Cola, Nestle, and Colgate-Palmolive are some of the consumer brands teaming up with cement manufacturers in Indonesia, Mexico, and the Philippines to dispose of waste plastic, according to an investigation by *Reuters*.<sup>123</sup>

In developing countries, finding a way to effectively dispose of plastic waste is a larger concern than ensuring plastic be reused in a circular economy. However, using plastic in cement kilns is also a commonplace occurrence in the developed world as well. In the European Union, for instance, 31.6 percent of all cement kiln fuel is from alternative sources, of which 37 percent is waste plastic.<sup>124</sup>

As with other large-scale industrial uses for plastic waste, logistics and supply are key issues. According to a survey of cement industry professionals and regulators conducted by the EPA, the top concerns with using plastics are generating and securing an adequate long-term supply of the material and ensuring the quality of the material — i.e., making sure that the plastic secured as a fuel source is not contaminated with non-plastic items or commingled with general municipal waste.<sup>125</sup>

The feasibility of using an alternative fuel source such as waste plastics is also linked to the cost of coal, the most commonly used fuel source for cement kilns. When the price of coal is high, the incentive to use of alternative materials is similarly high. But when coal is inexpensive, it may not be economical to switch fuel sources. The cost of transportation of the fuel — whether it is coal or waste plastic — is also an issue. For instance, if the plastic a kiln is considering using as a fuel source needs to be transported a great distance, this adds to the cost of the material and disincentivizes its use.<sup>126</sup>

According to the same EPA survey discussed above, Lehigh Cement in York experimented with using waste plastics as an alternative fuel source but initially could not get enough of the material for full-scale introduction. Lehigh needed to organize 10 separate suppliers to obtain

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<sup>123</sup> Joe Brock et al., “Big brands stoke cement kilns with plastic waste as recycling falters,” Oct. 28, 2021, *Reuters*, <https://www.reuters.com/investigates/special-report/environment-plastic-cement/>.

<sup>124</sup> International Finance Corporation, “Increasing the Use of Alternative Fuels at Cement Plants: International Best Practice,” 2017, [https://www.ifc.org/wps/wcm/connect/33180042-b8c1-4797-ac82-cd5167689d39/Alternative\\_Fuels\\_08+04.pdf?MOD=AJPERES&CVID=IT3Bm3Z](https://www.ifc.org/wps/wcm/connect/33180042-b8c1-4797-ac82-cd5167689d39/Alternative_Fuels_08+04.pdf?MOD=AJPERES&CVID=IT3Bm3Z).

<sup>125</sup> U.S. Environmental Protection Agency, “Cement Sector Trends in Beneficial Use of Alternative Fuels and Raw Materials,” Revised Draft, Oct. 2008, <https://archive.epa.gov/sectors/web/pdf/cement-sector-report.pdf>.

<sup>126</sup> *Id.*

adequate waste plastic for fuel. As of the publication date of the EPA's report on its survey of alternative fuels use at cement kilns, Lehigh resolved its sourcing issues and was working on resolving technical issues such as upgrading its conveyor system and fixing delivery feed systems. Additionally, this plant manufactures white cement and so it cannot accept any material that would affect the final color of the product.<sup>127</sup>

Another issue identified by a manufacturer of alternative fuels for cement kilns and steel mills noted that some states regulate the use of unrecyclable plastics as municipal solid waste and require solid waste facility permits or charge fees for its use.<sup>128</sup> In Pennsylvania, such a use would likely be covered under a general permit for processing and beneficial use of plastic-derived fuel.<sup>129</sup>

However, the federal government also regulates "solid waste" when used as a fuel under its non-hazardous secondary material rule. Under this rule, the EPA will treat all non-hazardous secondary materials that are combusted as solid waste requiring a petition to the EPA unless it is a material which is either a "categorical non-waste" or a material which is managed within the control of the generator, managed as a valuable commodity, has a meaningful heating value, and contains contaminants comparable to or lower than the traditional fuel the unit is designed to burn.<sup>130</sup> Plastic would appear to fit this definition and may be considered exempt from regulation as a fuel source under the non-hazardous secondary material rule.

### ***Bottle Deposit Laws***

A minority of states have enacted what are known as bottle deposit laws. Sometimes called bottle bills or container deposit laws, these statutes require a retailer to pay a distributor a deposit of a set amount (such as 10 cents) per plastic, glass, or aluminum bottle. The deposit is added to the cost of the product and ultimately paid by the consumer. The consumer can get back their bottle deposit when they return their empty container to the retailer or redemption center. The retailer is then reimbursed by the distributor. Unreimbursed deposits are used to fund the administration of the program or go to the state general fund.

Bottle deposit laws are used to encourage consumers to recycle beverage containers and discourage littering or landfilling of bottles and cans. Ten states currently have some variation of a bottle deposit law. The amount of deposit and the beverages and containers covered vary by jurisdiction. See Table 5 for more details.

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<sup>127</sup> *Id.* at pp. 88-89.

<sup>128</sup> *Id.* at p. 99.

<sup>129</sup> Pennsylvania Department of Environmental Protection, General Permit WMGR155, Processing and Beneficial Use of Plastic Derived Fuel, Oct. 12, 2016, [https://files.dep.state.pa.us/Waste/Bureau%20of%20Waste%20Management/WasteMgtPortalFiles/SolidWaste/Residual\\_Waste/GP/2016-10-12\\_WMGR155.pdf](https://files.dep.state.pa.us/Waste/Bureau%20of%20Waste%20Management/WasteMgtPortalFiles/SolidWaste/Residual_Waste/GP/2016-10-12_WMGR155.pdf).

<sup>130</sup> 40 CFR § 241.3(b)(1).

**Table 5**  
**State Bottle Deposit Laws**  
**United States, 2023**

<b>State</b>	<b>Statute</b>	<b>Deposit</b>	<b>Beverages</b>	<b>Containers</b>	<b>Unclaimed Deposits</b>
California	Cal. Pub. Res. Code §§ 14501 – 14599	5 cents <24 oz, 10 cents >24 oz	Beer or malt, water/fruit/soft drinks, coffee/tea, fruit juice <46 oz, vegetable juice <16 oz, Wine and liquor (Beginning January 2024)	Aluminum, Plastic, Glass, Bi-metal	Property of program and used for program administration
Connecticut*	Conn. Gen. Stat. §§ 22a-243 – 22a-246	5 cents	Beer or malt, water, any carbonated or uncarbonated beverage excluding >3L in size or HDPE	Glass, metal or plastic; incl. bottle, can, jar, or carton	Remitted to state general fund
Hawaii	Haw. Rev. Stat. §§ 342G-101 – 342G-122	5 cents	Beer, malt, mixed spirits, wine, all non-alcoholic drinks except dairy products	Any containers up to 68 oz. composed of aluminum, bi-metal, glass, or plastic	Property of the state, used for program administration
Iowa	Iowa Code §§ 455C.1 – 455C.17	5 cents, plus one cent handling fee paid to retailers by distributors	Beer, wine coolers, wine, liquor, carbonated soft drinks, mineral water	Any sealed bottle, can, jar, or carton made of glass, metal, or plastic	Retained by distributor and bottlers
Maine	Me. Rev. Stat. Ann. tit. 38, §§ 3101 – 3118	15 cents (wine/liquor), 5 cents (all other)	All beverages except dairy products and unprocessed cider	Any sealed container of four liters or less composed of glass, metal, or plastic	Property of the state
Massachusetts	Mass. Gen. Laws Ann. ch. 94, §§ 321-327	5 cents	Beer, malt, water, soda, or similar carbonated drinks, mineral water; excludes dairy, juices, and wine	Any sealable bottle, can, jar, or carton composed of glass, metal, plastic, or a combination thereof	Property of state, used for state general fund

<p style="text-align: center;"><b>Table 5</b></p> <p style="text-align: center;"><b>State Bottle Deposit Laws</b></p> <p style="text-align: center;"><b>United States, 2023</b></p>					
<b>State</b>	<b>Statute</b>	<b>Deposit</b>	<b>Beverages</b>	<b>Containers</b>	<b>Unclaimed Deposits</b>
Michigan	Mich. Comp. Laws §§ 445.571 – 445.576	10 cents	Beer, wine coolers, canned cocktails, soft drinks, carbonated and mineral water	Any airtight container under one gallon composed of metal, glass, paper, or plastic	75% to state for environmental programs; 25% to retailers
New York	NY Env'tl. Cons. Law §§ 27-1001 – 27-1019	5 cents	Beer, malt, wine, carbonated soft drinks, soda water, water (not containing sugar)	Any sealed bottle, can, or jar less than one gallon composed of glass, metal, aluminum, steel, or plastic	80% to the state general fund; 20% retained by distributor
Oregon	Or. Rev. Stat. §§ 459A.700 – 459A.740	10 cents; 2 cents on refillable containers	Nearly any beverage except distilled liquor, wine*, dairy or plant-based milks, infant formula	Any individual, separate, sealed glass, metal, or plastic bottle or can	Retained by the Oregon Beverage Recycling Cooperative (not statutory)
Vermont	Vt. Stat. Ann. tit. 10 §§ 1521 – 1529	15 cents (liquor); 5 cents (all other)	Beer, malt, mixed wine, liquor, carbonated soft drinks	Any bottle, can, jar, or carton composed of glass, metal, paper, plastic, or a combination	Remitted to the Commissioner of Taxes

Source: Joint State Government Commission staff research.

\*See further explanation below

Connecticut recently enacted new legislation altering its bottle bill with the changes phased-in beginning in January 2023. As of 2023, the deposit requirement now applies to more types of beverages and containers. Containers for hard seltzer, hard cider, plant water, juice, juice drink, tea, coffee, kombucha, plant infused drink, sports drink, and energy drink now require a deposit. Further, HDPE containers are no longer excluded. However, the bill explicitly excludes any container that contains less than 150 milliliters.

In 2024 the value of the bottle deposit will increase from five cents to ten cents. Also in 2024, a five-cent surcharge — which is not a refundable deposit — will be placed on bottles containing spirit or liquor of 50 milliliters or less. The funds collected from this surcharge will go to municipalities.<sup>131</sup> The goal is to fund the clean-up of single shot “mini” liquor bottles which have grown in popularity over the last decade and contributed to Connecticut’s litter problem.<sup>132</sup> Finally, the new law will gradually allocate smaller percentages of any unclaimed deposit funds to the state general fund, leaving more to distributors. By 2026, Connecticut will only take a 45 percent share of the unclaimed deposit money.<sup>133</sup>

In Oregon, the list of acceptable canned beverages was expanded to include canned wine, although glass bottles of wine will still be excluded. This inclusion of canned wine will not take effect until July 1, 2025, however.<sup>134</sup>

Many individuals are motivated to recycle by environmental or social considerations, but studies have shown that an even greater number of people would be more conscientious and diligent recyclers if there was an economic incentive to do so.<sup>135</sup> Seven of the top ten states for recycling plastic, aluminum, steel, and glass containers are bottle bill states.<sup>136</sup> When Oregon increased its bottle deposit to ten cents (up from five cents) in 2017, it saw an increase in the percentage of beverage containers being recycled.<sup>137</sup> This indicates that consumers are ultimately responsive to economic incentives. See Chart 5.

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<sup>131</sup> 2021 Conn. Legis. Serv. P.A. 21-58 (S.B. 1037) (West).

<sup>132</sup> Megan Quinn, “Connecticut governor signs bottle bill updates into law, doubling deposit value,” *Waste Dive*, Jun. 17, 2021, <https://www.wastedive.com/news/connecticut-bottle-bill-update-governor-lamont/601376/> (noting the litter problem the state has had with mini liquor bottles).

<sup>133</sup> 2021 Conn. Legis. Serv. P.A. 21-58 (S.B. 1037) (West).

<sup>134</sup> Oregon SB 1520 § 7 (amending Or. Rev. Stat. 459A.702).

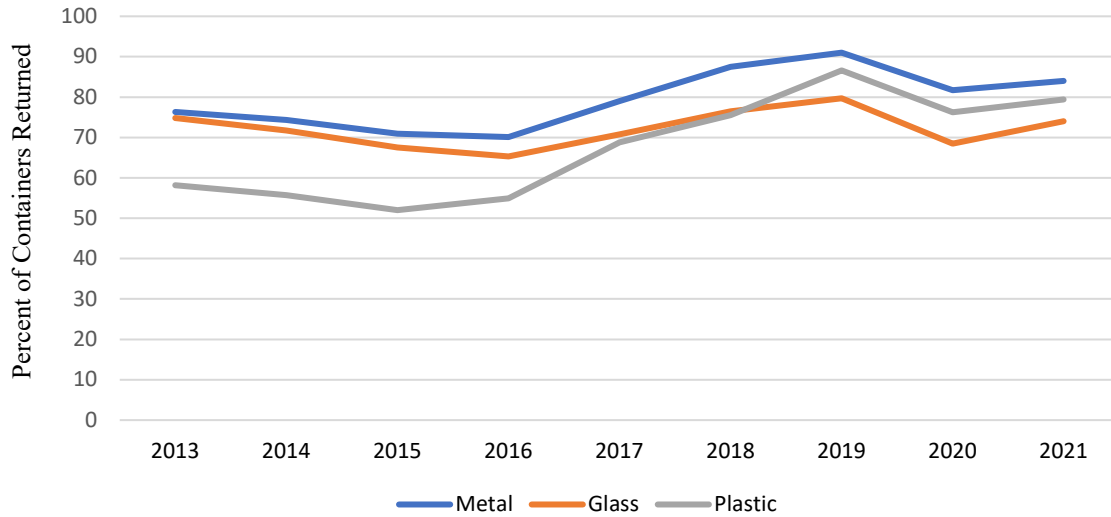
<sup>135</sup> Xueyu Cheng and Chiou-nan Yeh, “An Economic Analysis of the Effectiveness of Bottle Bills,” *ASBBS eJournal*, Vol 9 No. 1, Summer 2013, <https://www.proquest.com/openview/5984507bdf3e0a73939a2372ef3ded72/1?pq-origsite=gscholar&cbl=2030640>.

<sup>136</sup> Ball, 50 States of Recycling, <https://www.ball.com/getattachment/37f5f87f-d462-44c5-913f-d3075754741a/50-States-of-Recycling-Eunomia-Report-Final-Published-March-30-2021-UPDATED-v2.pdf>.

<sup>137</sup> Oregon Liquor and Cannabis Commission, Beverage Container Return Data, <https://www.oregon.gov/olcc/Pages/Beverage-Container-Return-Data.aspx>.

Chart 5

**Oregon Beverage Container Return Rate  
2013 - 2021**



Source: Oregon Liquor and Cannabis Commission, Beverage Container Return Data, <https://www.oregon.gov/olcc/Pages/Beverage-Container-Return-Data.aspx>.

However, a bottle bill is not a silver bullet for managing recyclables. Delaware ended its long-standing bottle bill in 2010, replacing a five-cent deposit with a four-cent non-refundable fee. In addition to the fee, which will eventually be phased out, Delaware mandated universal curbside recycling. Several factors contributed to Delaware ending its bottle deposit program. Unlike other states, only a minority of bottles were returned for a deposit refund. Retailers saw handling bottle returns as a hassle, with some complaining that their establishments did not contain space to store returned glass, plastic, and aluminum containers. And some consumers saw having to return their bottles and cans at a retailer as a hurdle to recycling.<sup>138</sup>

Other states have seen issues with bottle bills as well. A report by a professor of economics at Iowa State University on Iowa's bottle deposit program noted that the five-cent deposit on containers is becoming insufficient to compensate for consumers' effort to clean, collect, and return their bottles. Iowa's deposit return rate was 93 percent in 2000 but had fallen to 71 percent by 2018. The report noted that retailers are increasingly turning against the deposit system, as the one-cent handling fee they receive from distributors is now exceeded by the cost of handling the returns. If adjusted for inflation, the deposit would be 17 cents and the handling fee paid to retailers would be 3 cents.<sup>139</sup>

<sup>138</sup> WHYY, "Recycling fee replaces bottle bill," Nov. 30, 2010, <https://whyy.org/articles/bottle-bill-thrown-away-in-del/>.

<sup>139</sup> Dermot Hayes, Iowa State University, "Modernizing the Iowa Bottle Bill," 2018, <https://www.legis.iowa.gov/docs/publications/ID/1069662.pdf/>.



The professor's report also criticizes the "windfall profits" that accrue to distributors, which get to keep any unredeemed amount as well as the value of any recyclable materials. In Iowa, distributors keep 100 percent of the unredeemed deposits. This leaves bottlers and distributors with a profit from the bottle deposit policy but retailers with a loss. This anomaly could be resolved by increasing the handling fee to two cents, expanding the types of bottles requiring a deposit to non-carbonated beverages (sports drinks, coffee, teas, etc.), increasing the deposit to 10 cents, or a combination of those approaches.<sup>140</sup>

It was calculated that increasing the deposit and the handling fee to 10 cents and 2 cents respectively would result in \$28.5 million being paid to retailers to cover handling costs and \$23.4 million for distributors. Expanding the bottle bill to cover non-carbonated beverages (which are typically made of plastic) with a two-cent handling fee and a five-cent deposit would result in \$29.4 million paid to retailers and \$28.6 million to distributors.<sup>141</sup>

In July 2022, Iowa tripled the fee paid to retailers by distributors (from one cent to three cents). The deposit will remain the same (five cents) and distributors will still keep all unclaimed deposits. However, the newly amended law will permit retailers to cease taking back containers if they are a licensed food establishment or are located within 10 to 15 miles of a redemption center (depending on the population of the county).<sup>142</sup>

How unclaimed deposits are used is an issue facing other bottle bill states as well. Some states are less generous to distributors. New York, for instance, imposes a 3.5 cent handling fee to be paid by distributors to retailers and bottle redemption centers upon receipt of the returned bottles.<sup>143</sup> Further, New York keeps 80 percent of the unredeemed deposits with the remaining 20 percent provided to distributors.

Oregon, on the other hand, allows a private consortium of distributors — the Oregon Beverage Recycling Cooperative (OBRC) — to keep all unclaimed deposits. The unredeemed deposit money is used to fund bottle redemption centers, known as BottleDrop, across the state as well as the logistics and handling of the returned bottles.<sup>144</sup> There are no separate per-bottle handling fees provided to retailers under Oregon's law, but OBRC and its BottleDrop stations are located inside many retail establishments and shoulder the burden of accepting and sorting the bottles. According to OBRC, there are over 2,500 BottleDrop kiosks at retail locations in addition to stand-alone storefronts.<sup>145</sup>

Like Delaware and Iowa, Oregon has its share of issues surrounding its bottle bill. There have been instances of vagrants loitering in or near BottleDrop locations, causing consternation among residents and other businesses in those areas. At one business adjacent to a BottleDrop in Beaverton, a man forced his way into the building, locked himself in the bathroom, and used drugs

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<sup>140</sup> *Id.*

<sup>141</sup> *Id.*

<sup>142</sup> Senate File 2378, Gen. Assemb. 89, 2022 Reg. Sess., (Ia. 2022).

<sup>143</sup> N.Y. Envir. Conser. § 27-1007.

<sup>144</sup> Oregon Beverage Recycling Cooperative, "What's Special About the 'Oregon Model'," accessed Oct. 20, 2022, <https://obrc.com/oregons-bottle-bill/whats-special-about-the-oregon-model/>.

<sup>145</sup> BottleDrop, "Retailer Services," accessed October 20, 2022, <https://www.bottledropcenters.com/for-retailers/>. Only Oregon and Michigan do not have separate handling fees in their bottle deposit systems.

while in there. These locations have a tendency to attract homeless persons or drug users who collect cans and bottles to return as a source of income.<sup>146</sup>

Fraud is a concern, too. Oregon has had issues with people bringing cans and bottles from Washington State to Oregon for redemption, even though out-of-state bottles are not eligible for a refund.<sup>147</sup> Notably, Oregon has been afflicted with “water dumping” fraud. This is a scheme where federal Supplemental Nutritional Assistance Program recipients purchase bottled water with their benefits, dump the water on the ground, and return the empty bottles for cash.<sup>148</sup>

California’s bottle deposit system is also riddled with problems. Because of California’s unusual manner of reimbursing the recycling centers where customers return their bottles and cans and requiring the recycling centers to accept the risk of market price fluctuations, recycling centers are facing financial difficulty and many have simply closed their doors. According to the Container Recycling Institute, a nonprofit organization which advocates for bottle bill adoption and reform, between 2013 and 2022 California has lost more than 1,300 recycling centers for bottle redemption, representing half of all such locations in the state.<sup>149</sup>

Under California law, supermarkets with more than \$2 million in gross sales are required to have a nearby recycling center take back bottles. The area near where the recycling center is located is known as a “convenience zone.” If the supermarket is not in a convenience zone, then the supermarket must take back the containers themselves. The Beverage Container Recycling Fund (BCRF) handles all program payments, including receiving and refunding deposits. The BCRF keeps any unclaimed deposits and uses that money to support various supplemental recycling programs and for the administration of the bottle deposit program.<sup>150</sup>

Unique to California, the state’s recycling centers are funded by keeping and selling the material that they collect, plus a small subsidy that is paid to them. These payments are funded from “processing fees” paid by beverage manufacturers and the BCRF supplemental program, which are known as “processing fee offsets.” The payments from the BCRF supplemental program are designed to offset what the manufacturers must pay to the recyclers and processors.<sup>151</sup>

The processors are paid the refund value, plus 2.5 percent of the refund value for administrative costs, plus the processing payment for each empty beverage can they receive from a recycling center or drop off or collection program.<sup>152</sup> The processors are those who buy the

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<sup>146</sup> Reed Andrews, “Neighbors object to Beaverton BottleDrop can return,” *KATU*, Nov. 20, 2017, <https://katu.com/news/local/neighbors-object-to-can-return-store>.

<sup>147</sup> Jake Thomas, “Oregon senator to introduce bill to thwart return of bottles, cans bought in Washington,” *The Columbian*, Dec. 4, 2018, <https://www.columbian.com/news/2018/dec/04/oregon-senator-to-introduce-bill-to-thwart-return-of-bottles-cans-bought-in-washington/>.

<sup>148</sup> United States Department of Agriculture, “USDA Announces Additional Steps to Reduce Fraud and Misuse in Supplemental Nutrition Assistance Program,” Press Release, Feb. 21, 2013, <https://www.fns.usda.gov/pressrelease/2013/fns-000213>

<sup>149</sup> Container Recycling Institute, “California’s Container Deposit System Crisis,” accessed Nov. 28, 2022, <https://www.container-recycling.org/index.php/issues/the-california-crisis>.

<sup>150</sup> Cal. Pub. Res. Code § 14580.

<sup>151</sup> California Assembly, Legislative Analyst Office, “An Analysis of the Beverage Container Recycling Program,” Apr. 2015, <https://lao.ca.gov/reports/2015/res/recycling/beverage-container-042915.pdf>.

<sup>152</sup> Cal. Pub. Res. Code § 14573(a).

containers from the recycling center “for recycling” and who “cancel the refund value ... in any manner which the department may prescribe.” They need not actually recycle the material, but from the perspective of the California bottle deposit program they are the finish line for the recycled material. A processor may be a scrap dealer.<sup>153</sup>

Because the recycling centers are responsible for selling the collected containers to processors and are therefore dependent on the value of the material that is returned, their financial viability rises and falls with the market value of the various materials. Although the recycling centers receive processing payments from the BCRF, the way the payments are calculated leave the recycling centers without sufficient financial backing. These payments are intended to cover the difference between a container’s scrap value and the cost of recycling it. However, the payment is calculated quarterly based on a 12-month rolling average of scrap values. And scrap values can fluctuate within that timeframe.<sup>154</sup>

An analysis by the California Assembly’s Legislative Analysts’ Office estimated that the BCRF faced a \$60 million structural deficit in 2015-2016 as a result of higher recycling rates and spending on supplemental programs. A high recycling rate means fewer unclaimed deposits and less money for the BCRF to provide to recyclers. Supplemental programs were funded when the BCRF had a surplus, but since that time the money in the fund has been spent faster than it is being replenished.<sup>155</sup>

Declining scrap value and payments to recyclers that fluctuate with market prices for recycled materials, combined with insufficient processing payments to recyclers, has led to recycling centers closing their doors in California in recent years. This, in turn, has resulted in reduced consumer convenience, higher costs for retailers who must now handle the containers themselves, and ultimately fewer containers being recycled.

Unlike other states with bottle bills, California places the financial burden of the program on the recyclers — not distributors. In all other states, the distributor is the party who takes the risk that the scrap material will decline in value, and this risk is offset in some states by giving distributors all or a portion of the unclaimed deposits. Distributors are in a better position than recycling centers to absorb and pass on the costs of recycling.

The California Assembly’s Legislative Analysts’ Office has recommended changes to California’s bottle bill program. They advised that California statutorily set a processing or handling fee per container that the recyclers receive when bottles are returned for deposit. The existing handling fees are set based on a survey of average cost and are intended to cover the higher costs associated with operating as a “convenience zone” recycler. The practical impact of the survey-based handling fee payment is that some recyclers receive more in handling fees than their actual costs while others do not receive enough to cover their costs. By setting this fee at a fixed amount per container, recycling centers will be better positioned to manage their costs and

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<sup>153</sup> Cal. Pub. Res. Code § 14518.

<sup>154</sup> California Assembly, Legislative Analyst’s Office, “Lessons from Other States to Address California’s Redemption Center Closures.” Apr. 10, 2017, *Budget and Policy Post*, <https://lao.ca.gov/Publications/Report/3649>.

<sup>155</sup> An Analysis of the Beverage Container Recycling Program, *supra* n. 151.

anticipate revenues. It was also noted that the formula to determine the processing fee could be changed to better reflect market prices for the recycled materials.<sup>156</sup>

Regulatory flexibility was another solution identified to cure California's container recycling ails. To qualify as a recycling center in a convenience zone, a facility must meet specific operating requirements. For instance, they must be located within a certain radius of a supermarket and in some cases must be located within the parking lot of a supermarket, be the only recycler in the area, and be open a certain number of hours per week and at certain times.

Other states do not impose as many requirements on operations to collect containers. This results in more creative bottle return modalities. For instance, one company that operates in Maine and New York allows customers to return bottles and cans in bags deposited through a chute located at partnering retail locations. The customers get credits for the bottles deposited which they can cash out, apply towards groceries, or donate to charity. New York and Hawaii also have mobile container collection whereby a truck visiting certain communities on certain days will collect bottles and cans from residents.

These alternatives are not permitted in California because of the rigid requirements of state regulation defining what is a recycling center and when they are entitled to processing payments from the BCRF. The Legislative Analysts' Office concluded that loosening these requirements to allow new and innovative methods to collect bottles and cans could increase the rate of recycling and allow the state's recyclers to achieve financial stability.<sup>157</sup> Since the Legislative Analysts' Office made these recommendations, California amended its bottle bill statute to permit bag drop recycling centers and bag drop machines to receive bottles and cans from consumers and pay the deposit refund via electronic means.<sup>158</sup>

### *Extended Producer Responsibility Statutes*

Grappling with how to handle packaging waste, some states have considered enacting — and four states have already enacted — extended producer responsibility laws. Extended producer responsibility, or EPR, statutes aim to hold the manufacturer of recyclable packaging materials responsible for the cost of managing their material in the waste stream.

There are different EPR models that can be employed. The most commonly proposed model is municipal reimbursement. Under this framework, a municipality continues to collect recyclables and household waste from residents but receives compensation to partially offset the cost of collection from a consortium of brands that use certain packaging. Generally, the harder the packaging is to recycle or the less value the material has when it is recycled the greater the fee that the producer must pay. Under this model, producers of recyclable packing have less control over the material but also less responsibility.

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<sup>156</sup> Lessons from Other States to Address California's Redemption Center Closures, *supra* n. 154.

<sup>157</sup> *Id.*

<sup>158</sup> 2022 Cal. Legis. Serv. Ch. 574 (AB 211) (amending Cal. Pub. Res. Code § 14538).

Another model is full producer responsibility. This model requires companies that use packaging for their products (such as Coca-Cola and Unilever) to take back the material and recycle it. This puts the responsibility on product manufacturers not only for collection but also for finding recycling facilities and downstream markets for their plastic, glass, metals, and cardboard. This puts the onus on these companies to come together and collect material, contract with haulers, material recovery facilities, and downstream processors, and generally run the day-to-day recycling operation.<sup>159</sup>

Within the full producer responsibility model, there are two frameworks that can be employed — individual or collective responsibility. Individual take-back requirements consist of requiring a manufacturer or a retailer to take back the product (or its packaging) at the end of its lifecycle. Collective responsibility requires all producers of a product to come together to either collect the items or fund municipalities or third parties to do so for them. This collective framework is used in all four of the states which have passed EPR legislation, as well as in the European Union. Packaging is well-suited to the collective framework because there is a lot of it and there are many producers of it across many industries (e.g. beverage containers, other food items, shampoo, cosmetics, housewares, etc.).

#### *EPR Rules for Items other than Packaging*

Producer responsibility laws have a long history for materials that are more difficult to dispose of, such as mattresses, paint, tires, and batteries. These laws require the producer or retailer to handle the waste and impose a fee paid by the consumer at the time of purchase or disposal. Act 101 included a producer responsibility policy for lead acid batteries. Disposal of lead acid batteries in municipal waste was prohibited, and any retailer offering lead acid batteries for sale is now required to accept at the point of transfer used lead acid batteries from customers. Retailers themselves must turn over the batteries to an approved recycler or lead smelter.<sup>160</sup> Although the manufacturer of the battery is not required to take back its used or discarded batteries and does not bear the cost of recycling (the responsibility is placed on the retailer) this aspect of Act 101 successfully introduced a structure for managing the recycling of an item many people used to discard with their household trash.

The treatment of lead acid batteries under Act 101 is just one example. Other localities have found success targeting other products with producer responsibility retail take-back provisions. In San Luis Obispo County, California, a local product stewardship ordinance resulted in increased collection or diversion rates for several difficult-to-dispose items. The rate of collection for household sharp medical instrument disposals went from zero to 73 percent. For fluorescent lamps it climbed to 36 percent and to 21 percent for household batteries.<sup>161</sup>

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<sup>159</sup> Megan Quinn, “2021 could be a year for packaging EPR, nearly a dozen state bills in play,” *Waste Dive*, Feb. 11, 2021, <https://www.wastedive.com/news/2021-state-extended-producer-responsibility-recycling/594873/>.

<sup>160</sup> Municipal Waste Planning, Recycling, and Waste Reduction Act § 1510; 53 P.S. § 4000.1510.

<sup>161</sup> Leslie Nemo, “Getting manufacturers to help pay for recycling,” *Bloomberg*, Sept. 7, 2021, <https://www.bloomberg.com/news/articles/2021-09-07/who-pays-to-recycle-our-waste-u-s-states-have-a-new-answer>.

These ordinances not only resulted in more materials being collected for proper disposal, but they also saved counties money. In nearby Santa Clara County, California, a local ordinance requiring retailers to accept and dispose of household paint saved the county \$1.66 million in costs it would have incurred to handle the waste paint itself.<sup>162</sup>

### *Summary of Other States' EPR Statutes*

In the past several years, the concept of producer responsibility has expanded to include packaging. The concept is the same as that for mattresses, tires, and car batteries but is extended to include packaging and in some cases other types of plastic. Hence, *extended* producer responsibility. Bills creating extended producer responsibility for packaging materials have been introduced in a number of states. California, Oregon, Maine, and Colorado have already enacted extended producer responsibility requirements into law. However, none of the statutes are in full force and effect yet, as their various provisions phase in over a number of years.

In California, Senate Bill 54, also known as the Plastic Pollution Producer Responsibility Act, aims to reduce single-use plastics by requiring product manufacturers to jointly form a product responsibility organization to handle plastic waste and ensure compliance with other aspects of the bill. One chief component of the bill is to require that the plastic either be biodegradable or that at least 30 percent of the covered plastic be recycled by 2028, with the amount rising to 40 percent by 2030 and 65 percent by 2032. The objective is to reduce the overall use of plastic in California. The producer responsibility organization must file a detailed plan with the state along with reports. It was signed into law on June 30, 2022.<sup>163</sup>

It should be noted that beverage containers are excluded from the definition of “packaging,” as are containers of pesticides, infant formula, packaging for medications or medical items, and architectural paint. Covered producers are required to form the Producer Responsibility Organization by January 2024. California’s Plastic Pollution Producer Responsibility Act will also require local recycling programs to collect the single-use plastics subject to the law, so long as they are suitable for curbside collection.

The California legislature acknowledges that “in some circumstances, recycling is cost-prohibitive and an ineffective means to handle the end-of-life of a covered material. In these circumstances ... some material types cannot effectively meet the requirements of this chapter and producers will be required to eliminate, redesign, or shift packaging or food service ware to a covered material category that can more efficiently meet the requirements of this chapter.” In other words, California is intending not only to make single-use packaging producers responsible for the cost of their product’s end-of-life, but also force changes in the products they make and how they make them.<sup>164</sup>

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<sup>162</sup> *Id.*

<sup>163</sup> California SB 54. [https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill\\_id=202120220SB54](https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB54).

<sup>164</sup> *Id.*; Cal. Pub. Res. Code § 42040.

Under Oregon’s law, each producer must register with and be a member of a producer responsibility organization that administers a producer responsibility program. A “producer” is “the person that manufactures the packaged item” or their licensee if “the item is manufactured by a person other than the brand owner.” Importers of foreign-made products that are packaged in a covered packing material are responsible for the imported item’s packaging.<sup>165</sup>

The law applies to “covered products” which consist of “packaging,” without further definition, printing and writing paper, and food service ware. It explicitly excludes beverage containers already covered by the state’s existing bottle bill, bound books, napkins and paper towels, rigid pallets, specialty packaging used exclusively in industrial or manufacturing settings, a material that the producer can demonstrate is exempt, or any item that is “not ultimately discarded inside [Oregon], whether for purposes of recovery or disposal.” Oregon’s statute applies to a very broad range of “packaging” but has two major exceptions — anything a producer can convince the Department of Environmental Quality should be exempt, and packaging that is exported out of state.<sup>166</sup>

Oregon requires that the producer responsibility organization work with recycling system participants in order to ensure that covered products collected by a recycling collection service are recycled by responsible end markets.<sup>167</sup> Under Oregon’s new law, the Department of Environmental Quality will complete a statewide needs assessment by July 1, 2023. A producer responsibility organization program plan must be filed with the Department of Environmental Quality by March 31, 2024, and the plan must be implemented by January 1, 2025.<sup>168</sup>

Maine’s extended producer responsibility law was enacted in July 2021. It was the first state to enact such legislation for plastics and packaging materials. Maine requires its Department of Environmental Protection to enter into a contract with a packaging stewardship organization to operate the packaging stewardship program. Maine’s product stewardship organization will be required to keep track of items for sale in Maine by keeping a list of the UPC code for every product whose packaging is compliant with the state’s packaging requirements. Goods producers must report to the stewardship organization the volume or weight of packaging materials sold, offered for sale, or distributed in Maine.<sup>169</sup>

Maine allows producers to be exempted from including some packaging from the framework of the extended producer responsibility law if the producer has its own reuse or recycling program for the item or if the packaging is incinerated with the approval of the department. Municipalities are responsible for collecting the recyclable items and the stewardship organization is obligated to pay the municipality for the cost of the collection. The stewardship organization also must make investments in recycling infrastructure and education from funds that are not distributed to municipalities.

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<sup>165</sup> S.B. 582, 81<sup>st</sup> Legis. Assemb., 2021 Reg. Sess. (Or. 2021).

<sup>166</sup> Id.

<sup>167</sup> Id.

<sup>168</sup> Id.

<sup>169</sup> L.D. 1541, 2022 Leg. (Me. 2022).

The Department of Environmental Protection must create rules governing producers' required payment to the stewardship organization. Low volume producers cannot be required to pay more than \$500 per ton of packaging, with a total cap of \$7,500 per year. For all other producers, the payment to the stewardship organization must be based on the actual volume or weight of the packaging sold or distributed in Maine, modulated by the use of recycled content in the material and the recyclability of the packaging, the labeling of packaging material to reduce consumer confusion, and several other metrics enumerated in the statute.<sup>170</sup>

Packaging is broadly defined, but beverage containers, architectural paint, and several other categories are explicitly excluded. A producer is defined as any owner of a brand of a product or the importer of a brand if the importer is the only entity responsible for bringing that product into the state and if the brand has no physical presence in the United States. The definition excludes franchisees and makes any franchisor the party responsible for its packaging.<sup>171</sup>

According to the Maine Department of Environmental Protection, implementation of the extended producer responsibility program will begin in January 2025 when the Department submits its major substantive rules to the legislature for approval. By the fall of 2025, a request for proposal will be issued for a stewardship organization, selection of the stewardship organization will occur the following year, and producers will begin to make payments to the stewardship organization.<sup>172</sup>

Colorado also recently enacted a producer responsibility law for packaging. Under Colorado's statute, producers of products that use covered materials (which are packaging materials and paper products) must pay annual dues to a non-profit organization that will implement and manage a statewide program that provides recycling services to residences, public places, businesses, schools, and government buildings. The act also creates an advisory board to conduct a needs assessment and review plan proposals from the non-profit organization, among other duties. By June 2023 the Department of Public Health and Environment must select a non-profit organization to implement and manage the program, and by February 2025 the organization must submit a plan proposal to the advisory board on how the program will function.<sup>173</sup>

Other states' extended producer responsibility bills have either failed to become law or are currently still wending their way through the legislature. While the framework of these statutory schemes may be common across all EPR bills, the details as to how they are implemented and enforced vary and some states have proposed unique rules. For instance, Hawaii HB 1419 called for the *packaging* producers to file a stewardship plan with the state. As in other states' proposals, producers may come together to form a stewardship organization. However, this bill deviated from other states' similar legislation in that it put the impetus for collection and recycling on the manufacturer of the packaging and not the companies which use the packaging for their product. It would have required the producer to recycle covered materials as well as use post-consumer recycled material in their packaging. It also would have permitted local governments to request

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<sup>170</sup> Id.

<sup>171</sup> Id.

<sup>172</sup> Maine Department of Environmental Protection, "Extended Producer Responsibility Program for Packaging," accessed Dec. 6, 2022, <https://www.maine.gov/dep/waste/recycle/epr.html>.

<sup>173</sup> H.B. 22-1355, 73<sup>rd</sup> Gen. Assemb., 2<sup>nd</sup> Reg. Sess. (Colo. 2022).



reimbursement for waste management activities from the producers or their stewardship organization. Producers or their stewardship organization would have been required to submit annual reports on plans to fulfill these requirements.<sup>174</sup> The bill did not become law.

Another Hawaii bill, HB 2399, would have required producers to file a report with the state tallying the volume of packaging produced or introduced into the state along with a fee of \$150 per metric ton. It also requires the state treasury to establish a fund for these monies and directs the counties to develop needs assessments related to waste management. The counties would be paid from the fund.<sup>175</sup> The bill died in a Senate committee after passing the House.

Maryland, Massachusetts, Vermont, Washington, New York, and New Hampshire, have also had bills introduced to create similar extended producer responsibility programs.<sup>176</sup>

*EPR Policy Choices*

As can be seen from the four states which have enacted EPR laws, a collective approach using a mandated producer responsibility organization to oversee compliance and administer the rules is the preference of states which have embarked on EPR as an environmental measure. But whether or not to take a collective approach or an individual-responsibility approach is just one of a number of features of an EPR system. There is a myriad of design elements that can be tailored to the material or item targeted, the particularities of the market, and the goal of the policymakers. These include defining the material to include or exclude certain packaging, setting targets for reducing the use of certain materials, for increasing the use of recycled materials, setting fees, and monitoring and enforcement methods. See Table 6 below for an idea of what features an EPR system can or should have and the options available to policymakers to tailor the program to their particular needs.

<b>Table 6</b>		
<b>Extended Producer Responsibility Policies</b>		
<b>Feature</b>	<b>Description</b>	<b>Options</b>
Product Definitions	Define which products will qualify as being covered. Be specific and also provide description of items that will be excluded.	California, Maine, and Oregon exclude beverage containers from their EPR programs. California will require plastic cutlery to be recycled. Commonly included are non-bottle plastics and, where residents do not have access to curbside recycling, cardboard.

<sup>174</sup> H.B. 1316, 31<sup>st</sup> Leg. (Haw. 2021). [https://www.capitol.hawaii.gov/session2021/bills/HB1316\\_HD1\\_.pdf](https://www.capitol.hawaii.gov/session2021/bills/HB1316_HD1_.pdf)

<sup>175</sup> H.B. 2399, 31<sup>st</sup> Leg. (Haw. 2022). [https://www.capitol.hawaii.gov/session2022/bills/HB2399\\_SD1\\_.pdf](https://www.capitol.hawaii.gov/session2022/bills/HB2399_SD1_.pdf)

<sup>176</sup> 2021 could be a year for packaging EPR, *Waste Dive*, *supra* n. 151.

**Table 6****Extended Producer Responsibility Policies**

<b>Feature</b>	<b>Description</b>	<b>Options</b>
Producer Definitions	Define who is a “producer” of packaging. Also consider defining whether the EPR statute applies to residential, commercial, or industrial packaging.	Producer is usually the owner of the brand using the packaging, and not the manufacturer of the packaging itself. EPR statutes are generally targeted toward retail products where the consumers discard the packaging at their residences. Redundant producer definitions to include importer or retailer where manufacturer is foreign, cannot be identified, or is retail-branded.
Individual Producers Responsibility vs. Collective Producer Responsibility	Individual producers responsible for taking back their packaging; Collective responsibility requires a producer responsibility organization.	With IPR, individual producers will have a direct hand in waste management; Collective responsibility framework more common and efficient but has additional administrative burden and collection duties may be placed on municipalities.
Setting Targets and Defining Producer Responsibility	Clearly defined and measurable targets for collection and management are set; take into consideration technical and economic feasibility as well as existing infrastructure (e.. curbside collection), geographic issues (rural vs. urban).	Some EPR frameworks set targets based on product weight, as it is easier to measure for most packaging. Example: Require 50% of all plastic PET bottles by weight introduced into commerce be collected for recycling by 2025.
Setting Fees	A Producer Responsibility Organization should set fees to cover the net costs of collecting, sorting, and storing the covered packaging.	An annual fee for the administration of the PRO, plus fees established per product category or material. Fees can be fixed and weight based or modulated based on material. See below for further discussion.
Communication	Information on the EPR framework should be given to the public and to affected producers. Dialogue between stakeholders (producers, state government, municipalities, waste management/recycling industry, consumer organizations, environmental organizations).	Communication with the public can include what an EPR is, how it will work, what items are covered, how they will be affected, why this policy was chosen, and how their community and the public at large will benefit. Information to stakeholders can include informal guidance documents, networking, business roundtables, conferences, and formal regulations.

<b>Table 6</b>		
<b>Extended Producer Responsibility Policies</b>		
<b>Feature</b>	<b>Description</b>	<b>Options</b>
Enforcement	EPR requirements should be monitored via data collection and the rules should be enforced. As much information as possible should be made public.	Data should be taken from MRFs or wherever the covered material is deposited at the end of its lifecycle. Data on volume of the covered material introduced into commerce in the jurisdiction should be submitted by the producers. Monitoring and enforcement should catch “free riders” who introduce packaging into commerce but are not part of the PRO.

Source: Joint State Government Commission staff research. Daniel Kaffine and Patrick O’Reilly, “What Have we Learned about Extended Producer Responsibility in the Past Decade? A Survey of the Recent EPR Economic Literature,” Jan. 21, 2015, Organization for Economic Cooperation and Development, Working Party on Resource Productivity and Waste.

Fee modulation is an important aspect of any EPR system and merits further discussion, as it is one of the more effective tools to drive real world outcomes in packaging material, use, and design. Policymakers decide on a goal, such as reducing the total weight of plastic packaging, increasing the recyclability of plastics, and incentivizing using recycled plastic in their products are examples. Typically, difficult to recycle plastics are charged a higher fee to enter the stream of commerce and easier-to-recycle packaging or packaging made with recycled plastic is given a discount from the base fee.

Fee modulation in jurisdictions with EPR policies has the result of incentivizing certain materials or packaging styles. This, in turn, spurs industry to use certain materials and redesign packaging to reduce the amount of material in a package (known in the industry as light-weighting) or increase its recyclability. In fact, EPR policies are mentioned again in the section of this report that discusses packaging redesign as a strategy to reduce the weight of packaging and thus reduce the volume of packaging that would need to be recycled.

A report by the Organization for Economic Cooperation and Development (OECD) noted that all EPR systems for packaging in Europe contain some form of fee modulation. Fees for plastic and composite packaging are higher than for glass, paper, cardboard, and metal. In some countries or sub-national regions, the EPR system of the jurisdiction modulates fees based on the type of plastic used. For instance, Belgium, Spain, and Slovenia have lower fees for PET and HDPE than other plastic packaging. Germany, Austria, Latvia, and The Netherlands have lower fees for biodegradable plastic. Hungary and Croatia have much higher fees on plastic bags than for other plastic packaging. In some cases, beverage containers have a lower fee than other types of plastic packaging. Differences in how fees are modulated across jurisdictions likely reflects the

ability of local processors to handle particular items and the availability of markets for the recycled material.<sup>177</sup>

One literature review of studies examining various aspects of various EPR policies across Europe and East Asia concluded that EPR policies are more effective if they are implemented alongside other complementary policies aimed at reducing, reusing, or recycling material.<sup>178</sup> A number of economic issues with EPR policies were also assessed. One problem is that, with packaging at least, there are a large number of producers and not all of them will comply with the requirements of the EPR scheme. These are known as “free riders,” as they benefit from the EPR system without having to pay their share of the costs. Within any EPR framework, careful monitoring and enforcement is needed to combat this phenomenon.

There may also be unintentional free riders in the form of producers who go out of business and thus cannot pay into the producer responsibility organization or otherwise take responsibility for the return and recycling of their packaging. A requirement to post a yearly bond was suggested as a solution to this aspect of the free rider problem.<sup>179</sup>

This report also cautioned against giving producer responsibility organizations free reign to set fees and implement rules. Producer responsibility organizations concentrate market power, and if left unchecked could be used to set fees at a rate which discourages new market entrants or devise rules so complex or overbearing that only existing firms could comply with them.<sup>180</sup> However, with plastic packaging, the gains from economies of scale probably outweigh the risks from market power concentration in a producer responsibility organization.

Aside from risking a concentration of market power, another risk inherent in EPR systems is the difficulty in obtaining an accurate cost-benefit analysis. Measuring the “upstream” benefits of less waste in dollar terms can be tricky, as many of those benefits are intangible and are by nature difficult to measure in pecuniary terms. These benefits include less litter, less noise, and less odor from landfills and other waste industry activities. Many items for which producer responsibility take-back rules have been enacted have large social costs for disposal but are widely consumed, such as batteries or car tires.

Reducing the need for virgin materials by reusing discarded materials is a more tangible benefit, but this needs to be measured against the cost of resources expended to recover and process the recycled material. The cost of administering the EPR system is an additional consideration. The effort to collect data, monitor compliance, and enforce the new regulations established to support the EPR framework can be difficult to anticipate and budget for before the policy is effective.

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<sup>177</sup> Emma Watkins et al., “EPR in the EU Plastics Strategy and the Circular Economy: A Focus on Plastic Packaging,” *Institute for European Environmental Policy*, pp. 11-12, Nov. 9, 2017, <https://wm.turkmenistan.ecoline-int.org/wp-content/uploads/2021/08/EPR-and-plastics-report-IEEP-9-Nov-2017-final.pdf>.

<sup>178</sup> Daniel Kaffine and Patrick O’Reilly, “What Have we Learned about Extended Producer Responsibility in the Past Decade? A Survey of the Recent EPR Economic Literature,” Jan. 21, 2015, Organization for Economic Cooperation and Development, Working Party on Resource Productivity and Waste, [https://www.colorado.edu/faculty/kaffine/sites/default/files/attached-files/oecd\\_epr\\_ko.pdf](https://www.colorado.edu/faculty/kaffine/sites/default/files/attached-files/oecd_epr_ko.pdf).

<sup>179</sup> *Id.* at pp. 20-21.

<sup>180</sup> *Id.* at pp. 15-16.

### *Germany's "Green Dot" System*

It was noted in the preceding section that EPR policies are a common phenomenon in Europe. But that was not always the case. Germany was one of the first countries to experiment with a private-public partnership for collecting, sorting, and recycling packaging waste materials. In 1991, the Bundestag enacted the Avoidance of Packaging Waste Ordinance, known as the Toepfer Decree after German Environmental Minister Klaus Toepfer. It established an aggressive series of recycling goals, including the collection of 80 percent of all packaging by July 1995, of which 90 percent of glass, tin, and aluminum and 80 percent of cardboard and plastic would have been required to be recycled.

It could be considered the first EPR system for packaging in Europe, as it placed the burden of recycling primarily onto industry by imposing a mandatory "take back" of packaging materials. The system functioned by allowing consumers to leave their packaging at a retail establishment or a designated collection site. The retail establishment then sends the material back to the supplier. Suppliers must arrange for the reuse or recycling of the returned packaging materials. In fact, the law required manufacturers and distributors of packaged goods to provide suitable collection containers at the point of sale for all packaging materials.

In response to the law's mandates, a group of over 600 companies formed the Duales System Deutschland, or DSD, to work with local governments to collect recyclable packaging materials. DSD maintained the infrastructure for collection and sorting of these packaging materials and contracted with third parties to handle the recovery and delivery of these materials to sorting plants. Recyclers are paid to take the sorted materials.

The companies which comprise DSD differentiate their packaging by putting a Green Dot sticker on their items, letting consumers know that the packaging can be returned to the store and that the material will be recycled. Companies who wish to participate in the DSD system and comply with the Toepfer Decree must apply for permission to use the Green Dot on their packaging. In practice, this means that retailers who do not want to handle recycling of packaging themselves will only stock products from companies that are part of the DSD consortium.

However, problems arose for DSD. Costs were greater than expected and DSD eventually ran a deficit, requiring a bailout from the German government. The system was efficient at collecting materials but it failed to achieve its recycling goals. Additionally, the volume of collected materials exceeded what could be processed at its sorting facilities, requiring DSD to store the material in warehouses — an unforeseen added cost. DSD was also slow to collect licensing fees from all companies who used the Green Dot, and some companies were using the Green Dot logo even though they were not authorized to do so and did not pay a licensing fee. Foreign companies continued to sell their products into Germany and were packaged differently. Another contributing factor to DSD's distress was that some consumers placed unrecyclable items in the collection bins intended only for DSD-approved packaging.

Of all the materials collected, plastic was the biggest hurdle for end market recycling. DSD initially sent plastic waste to France where it was incinerated to generate electricity. After complaints by the French, the collected plastic was then shipped to developing nations. However, this practice also ceased after public outcry. Eventually, handling plastic packaging became too much for DSD. It received permission from the German government to restrict the types of plastic materials industry would be responsible for. DSD also spun off its plastic recycling operation into a separate company, DEKUR Kunststoff Recycling GmbH.<sup>181</sup>

As of 2023, DEKUR Kunststoff is no longer in business and the system now operates under the name “Der Grüne Punkt” as a constituent member of the larger Packaging Recovery Organization (PRO) Europe. Yet Germany still struggles with plastic waste. Consumers still place trash and unrecyclable material into the plastic collection bins at the take-back locations, and sorting facilities dispose of the trash and items that are too difficult to recycle, such as packaging made from several different types of polymers. This material is incinerated to generate electricity. Although Germany may collect all plastic waste, half of it is disposed of by incineration rather than being recycled into a new product.<sup>182</sup>

Although the Green Dot program had plenty of setbacks, it also had some successes. One consequence of the German government’s requirement that product manufacturers take back their packaging was that manufacturers got creative in attempting to market products with minimal packaging. It also propelled Germany toward greater investment in recycling technology. For instance, the German government supported research and development projects focusing on converting plastic waste into usable petrochemical feedstock for use by the German chemicals industry.

One key takeaway from the German experience is that supply of recyclable materials does not equal demand for them. DSD was efficient at collecting recyclables but had difficulty finding end markets for them, particularly plastic. To this day, half of all plastic collected in Germany is incinerated. The Germans based their program on a belief that all plastic can and should be recycled, and not on realistic technical and economic factors. Recycling all plastic packaging is probably not a realistic policy goal.<sup>183</sup>

Today, 29 EU countries plus Turkey and Israel have adopted Germany’s Green Dot system in some form, placing the responsibility for recycling onto industry which forms a consortium to handle all recyclable waste.<sup>184</sup> No such system has been devised in the United States, but four states will see similar arrangements forcing industry to be accountable for their packaging when their recently enacted extended producer responsibility statutes come into force. How well these statutory schemes work to reduce packaging waste remains to be seen. Whether Germany’s system could work in the United States is more questionable, as the country is much larger with many

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<sup>181</sup> Steven P. Reynolds, *The German Recycling Experiment and its Lessons for United States Policy*, 6 Vill. Envtl. L. J. 43 (1995).

<sup>182</sup> Katharina Wecker, “Plastic waste pollution and the recycling myth,” *Deutsche Welle*, Dec. 10, 2018, <https://www.dw.com/en/plastic-waste-and-the-recycling-myth/a-45746469/>.

<sup>183</sup> Reynolds, *supra* n. 181.

<sup>184</sup> Wecker, Plastic waste pollution, *supra* n. 182.

areas featuring low population densities and, unlike Europe, possesses a strong sense of individual freedom and a more market-oriented economy.

### ***Required Recycled Content in Government Procurement Policy***

To develop and encourage end markets for goods made from recycled material, many states have required a minimum of recycled content in certain items as part of their procurement policies. The most common type of procurement policy is providing a price preference for vendors who use recycled materials. Another common policy is to require a certain percentage of paper purchased by state agencies to be manufactured from recycled material. Although state governments must be mindful of costs, it is not unheard of for social policy to be woven into procurement rules. Preferences in government contracting for minority-owned businesses and made-in-America component requirements are two examples.

The Commonwealth is one of the states that have a recycled materials procurement policy. By statute, the Department of General Services must give a price preference of five percent for recycled materials used in projects for which it solicits bids. Additionally, at least 40 percent of the paper it procures must be made from recycled material.<sup>185</sup> Commonwealth agencies must also review and revise their existing procurement procedures and specifications for the purchase of goods, supplies, equipment, materials, and printing to eliminate procedures and specifications that discriminate against recycled materials as well as encourage the use of goods, supplies, materials, and printing with recycled content. Commonwealth agencies must review and revise their procedures and specifications on a continuing basis.<sup>186</sup>

Pennsylvania also encourages recycled content to be used in its procurement process in certain circumstances. In 2014, then-Governor Wolf issued a management directive to the executive branch agencies to “procure environmentally preferable products whenever practical and economically feasible, including in the construction or renovation of facilities owned by the agency.” “Environmentally preferable products” are those that “have a lesser or reduced effect on human health and the environment,” or products with recycled content.<sup>187</sup>

Other states have written recycled content procurement requirements into their statutes or administrative codes. The degree of recycled material requirements varies widely, and include following federal procurement statutes, rules, and guidelines and mandating specific recycled content under some circumstances. However, many of the statutes require only the use of recycled paper or provide a price preference in contracting for products made from recycled material. See Table 7 below for a state-by-state accounting of relevant procurement laws.

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<sup>185</sup> The Municipal Waste Planning, Recycling, and Waste Reduction Act § 1511; 53 P.S. § 4000.1511.

<sup>186</sup> The Municipal Waste Planning, Recycling, and Waste Reduction Act § 1504; 53 P.S. § 4000.1504.

<sup>187</sup> Governor Tom Wolf, Management Directive 205.22, Sept. 19, 2014, [https://www.oa.pa.gov/Policies/md/Documents/205\\_22.pdf](https://www.oa.pa.gov/Policies/md/Documents/205_22.pdf).

**Table 7**  
**Recycled Content Procurement Statutes by State**  
**as of June 2023**

State	Statute	Description
Alaska	Alaska Stat. § 36.30.337	Agency evaluating a bid for procurement shall give 5% price preference to recycled products; department shall establish a minimum percentage of recycled content that will qualify a product as a recycled product under this section
	Alaska Stat. § 29.71.050	Recycled products shall be used in municipal procurements when products are of comparable quality and cost
	Alaska Stat. § 36.30.332	Commissioner of Commerce shall adopt regulations defining “recycled Alaska product”; shall publish a list of products annually
Arizona	Ariz. Rev. Stat. Ann. § 41-2533	“If the price of a recycled paper product that conforms to specifications is within five per cent of a low bid product that is not recycled and the recycled product bidder is otherwise the lowest responsible and responsive bidder, the award shall be made to the bidder offering the recycled product”
California*	Cal. Pub. Cont. Code §§ 22150 <i>et seq.</i>	Local public entities shall purchase recycled products whenever available; must require businesses to certify the minimum percentage of postconsumer materials in the products offered
	Cal. Pub. Cont. Code §§ 12200 <i>et seq.</i>	State agency shall purchase recycled products instead of nonrecycled products whenever recycled products are available at same or lesser cost than nonrecycled products; at least 50% of reportable purchased must be recycled products before Jan. 2020.
Colorado	Colo. Rev. Stat. § 24-103-903	“[A]ny procurement agent shall, whenever the price is competitive and the quality adequate for the purpose intended, purchase recycled paper.”
Connecticut	Conn. Gen. Stat. Ann. § 4a-59(c)	10% price preference for recycled goods
	Conn. Gen. Stat. Ann. § 4a-67a	Commissioner of Administrative Services shall make efforts to increase state procurement of goods that contain recycled materials and products
Delaware	Del. Code Ann. tit. 29 § 6938	State procurement goal of “maximum feasible purchase of recycled content products, reusable or recyclable products, and the maximum feasible percentage of postconsumer recycled content in its purchases,” up to a 5% price preference for such materials



**Table 7**  
**Recycled Content Procurement Statutes by State**  
**as of June 2023**

State	Statute	Description
Florida	Fla. Rev. Stat. § 403.7065	Any state agency or agency of a political subdivision of the state which is using state funds, or any contractor, is required to procure products or materials with recycled content if the Department of Management Services determines them to be reasonably available
Hawaii	Haw. Rev. Stat. § 342G-41	“It shall be the policy of all state and county public agencies to give preference to the purchase of products made from recycled materials, that are themselves recyclable”
	Haw. Rev. Stat. § 103D-1005	Preference shall be given to products with recycled material in state contracts; Procurement Policy Board shall devise regulations governing preferences; State Procurement Office and Office of Solid Waste shall develop a recycled product procurement program
Illinois	415 Ill. Comp. Stat. 20/3	Each state agency must adopt procurement procedures to require the agency to seek out products and supplies that contain recycled materials; the Department of Central Management Services shall procure recycled products; by 2000 at least 50% by dollar value of paper products procured must be recycled paper
Indiana	Ind. Stat. § 21-37-5-2	State educational institutions shall procure recycled paper products if available and economically feasible
	Ind. Stat. § 5-22-5-7	Governmental bodies shall procure recycled paper products if available and economically feasible
	Ind. Stat. § 5-22-15-16	Price preference for recycled materials in state and local government procurement
	Ind. Stat. § 4-13-1.4-8	State shall produce and distribute a recycled products guide for use by all state and local government purchasing agents
Iowa	Iowa Code § 8A.315	Department of Administrative Services shall purchase recycled printing and writing paper such that 90% of such paper procured by the state is recycled; Other paper products procured shall be recycled paper when price is reasonably competitive; recycled paper means at least 30% post-consumer material

**Table 7**  
**Recycled Content Procurement Statutes by State**  
**as of June 2023**

State	Statute	Description
Kansas	Kan. Stat. Ann. § 75-3740b	State shall procure recycled newsprint and printing paper totaling not less than 25% of all such paper, with a 5% price preference
Kentucky	Ky. Rev. Stat. Ann. § 45A.520	Every state agency shall require a minimum recycled material content for goods, supplies, equipment, and materials that it procures; minimum amount shall be established by regulation
	Ky. Rev. Stat. Ann. § 45A.530	Every project within Kentucky financed 50% or more by bonds issued by a state agency be undertaken with recycled materials in compliance with § 45A.520
Louisiana	La. Rev. Stat. § 30:2415	The Division of Administration shall adopt rules to require the use and purchase of goods with recycled content by all state agencies and political subdivision
	La. Rev. Stat. § 30:2415.1	The Division of Administration shall give preference to the purchase of recycled paper products
Maine	Me. Rev. Stat. Ann. § 5656	Each municipality “may” encourage procurement of items with recycled content and “may” consider the recyclability of goods when they are discarded in procurement process
	Me. Rev. Stat. Ann. § 1812-A	Report to Legislature by State Purchasing Agent on efforts to procure goods with recycled content and any procurement policies, incentives, educational programs, promotional efforts or other activities undertaken by the Bureau of Purchases to encourage the purchase of those supplies and materials
Maryland	MD. Code Ann., State Fin. & Proc. § 14-402	To the extent practicable, Secretary of General Services shall buy or approve only supplies that are produced from recycled paper; 90% total volume of paper products shall be recycled paper
	MD. Code Ann., State Fin. & Proc. § 14-405	Maryland Green Purchasing Committee shall establish preferences to be adopted by State agencies to encourage the maximum purchase of environmentally preferable products, including products made with recycled material
Michigan	Mich. Comp. Laws § 18.1261a	20% of all supplies, materials, and equipment must be from recycled materials, if there is a readily identifiable source, and the cost does not exceed 110% of supplies, materials, and equipment not containing recycled materials

**Table 7**  
**Recycled Content Procurement Statutes by State**  
**as of June 2023**

State	Statute	Description
	Mich. Comp. Laws § 18.1261b	All paper products purchase or contracted for by the department shall be made from recycled paper if the cost is not greater than 110% of the cost of nonrecycled paper; 50% of all paper purchases must be at least 50 percent recycled content by 1991
Minnesota	Minn. Stat. § 16C.0725	State shall procure recycled products when feasible and the price of recycled products does not exceed price of nonrecycled products by 10%
	Minn. Stat. §16C.073	Whenever practical, a public entity shall purchase recycled copy paper with at least 30% postconsumer material by weight and recycled office paper with at least 10% postconsumer material by weight
Missouri	Mo. Rev. Stat. § 34.032	Each department and agency of the state government shall purchase recycled paper if the price is competitive (within 10% of the price of paper from virgin material)
Montana	Mont. Code Ann. § 75-10-806	Department of Administration must write procurement specifications requiring the purchase of materials and supplies made from recycled materials, including specifically recycled paper, plastic, and glass
Nevada	Nev. Rev. Stat. § 333.4609	Administrator shall adopt regulations encouraging the maximum purchase of recycled paper products; regulations must give preference to recycled paper products with highest percentage of recycled material
New Hampshire	N.H. Rev. Stat. Ann. § 9-C:3	It shall be the policy of each state agency to purchase materials, supplies, and products that have the highest content of recycled materials
	N.H. Rev. Stat. Ann. § 9-C:9	Printing and writing paper purchased by or for state agencies shall contain not less than 30 percent recycled material and not less than 10 percent for printing paper
New Jersey	N.J. Stat. Ann. § 13:1E-99.24	Preference shall be given to recycled paper, paper products, and recycled products with the highest percentage of post-consumer waste material
New Mexico	N.M. Stat. § 13-1-21	Any bid under a formal bid process that include recycled content goods shall be deemed to be 8% lower than the bid actually submitted
New York	N.Y. Jud. Law § 40-a	All products purchased by the courts shall be recycled products, provided that it does not exceed a cost premium above non-recycled products of 10%.

**Table 7**  
**Recycled Content Procurement Statutes by State**  
**as of June 2023**

State	Statute	Description
North Carolina	N.C. Gen. Stat. § 136-28.8	Department of Transportation shall use recycled materials in road pavements, guard rial posts, fence posts, sign supports, and road maintenance
	N.C. Gen. Stat. § 143-58.2	All state departments, institutions, agencies, community colleges, and local school administrative units shall, to the extent economically practicable, procure products with recycled content
	N.C. Stat. § 143-58.3	Each department, institution, agency, community college, and local school administrative unit purchase paper and paper products with recycled content, in an amount of at least 50% by 1997
North Dakota	N.D. Cent. Code § 54-44.4-08	“When practicable, the office of management and budget, and any state agency or institution...should specify at least twenty-five percent recycled material” when purchasing paper.
Ohio	Ohio Rev. Code Ann. § 125.082; Ohio Admin. Code 123:5-1-09	All departments, state officers, boards, commissions, agencies, institutions, state-supported institutions of higher education, the courts may purchase recycled products when economically feasible
Oklahoma	Ok. Stat. tit. 74 § 85.53	State agencies “shall give preference to the suppliers of recycled paper products and products manufactured from recycled materials”; By 1999 not less than 40% of all purchased paper shall be recycled paper
	Okla. Stat. tit. 74 § 85.54	The Purchasing Division “shall establish purchasing practices which, to the maximum extent economically feasible, assure purchase of recycled paper products”
Oregon	Or. Stat. § 279B.025	Agencies shall establish procurement practices that ensure the procurement of goods that are recyclable or reusable when discarded
	Or. Stat. § 279B.280	Department of Administrative Services shall develop procurement specifications that encourage use of recycled products whenever economically feasible
	Or. Stat. § 279A.125	“A contracting agency charged with the procurement of goods for any public use shall give preference to the procurement of goods manufactured from recycled materials”

**Table 7**  
**Recycled Content Procurement Statutes by State**  
**as of June 2023**

State	Statute	Description
Pennsylvania	53 P.S. § 4000.1500	Every bidder for the purchase of goods, supplies, equipment, materials and printing which certifies that the goods, supplies, equipment, materials and printing contain the minimum required recycled content shall be afforded a 5% price preference; Department of General Services shall set the minimum percentage of recycled content to qualify for the preference.
	53 P.S. § 4000.1504	Agencies shall review and revise existing procurement procedures and specifications for the purchase of goods, supplies, equipment, materials, and printing to eliminate procedures and specifications that discriminate against recycled materials; encourage the use of goods, supplies, materials, and printing with recycled content. Must review and revise their procedures and specifications on a continuing basis.
	53 P.S. § 4000.1511	Department of General Services shall purchase or approve for purchase only paper or paper products manufactured from recycled paper; recycled paper purchases must constitute 40% of the volume of all paper purchases by 1993
Rhode Island	R.I. Pub. Laws § 37-2-76	Department of Administration required to devise timetable requiring increased utilization by the State of recycled products; at least 50% of office paper by expenditure must be recycled paper
South Carolina	S.C. Code Ann. § 44-96-140	General Assembly, Office of Governor, Judiciary, and all state agencies and political subdivisions shall procure products and materials with recycled content and products/materials that are recyclable
Tennessee	Tenn. Stat. § 68-211-865	Department of General Services shall revise product procurement specifications to require, to the extent economically feasible, the procure of recycled products and products with recycled content
Texas	Tex. Health & Safety Code Ann. § 361.426	State agency, courts, counties, municipalities, and school districts “shall give preference in purchasing to products made of recycled materials if the products meet applicable specifications”
	Tex. Gov’t Code § 2052.303	A state agency that issues publications or reports shall use recycled paper to extent possible when such use is cost effective

<b>Table 7</b>		
<b>Recycled Content Procurement Statutes by State as of June 2023</b>		
<b>State</b>	<b>Statute</b>	<b>Description</b>
	Tex. Gov't Code § 2155.445	Comptroller and state agencies shall give preference to recycled, remanufactured, or environmentally sensitive products, so long as the product is not more than 10% greater in price than comparable nonrecycled products
Virginia	Va. Code Ann. § 2.2-4326	Department of General Services shall procure recycled paper products for use by agencies so long as the bid price is not more than 10% greater than the bid price of non-recycled paper
	Va. Code Ann. § 2.2-4313	Preference for goods or products with recycled content if functionally equivalent to same goods/products from virgin materials
Washington	Wash. Rev. Code § 43.19A.020	Vendors must follow federal product standards for procuring recycled products
	Wash. Rev. Code § 43.19A.022	State agencies shall purchase 100% recycled content paper used in office printers and copiers
West Virginia	W. Va. Code § 22-15A-21	Directs all agencies and instrumentalities of the state purchase recycled products to the maximum extent possible; price preference for recycled paper products
Wisconsin	Wisc. Stat. Ann. § 16.72	Department of Administration shall require procurement of recycled products if their use is technically and economically feasible

Source: Compiled by Joint State Government Commission Staff.

\*Newly enacted statute yet to take effect

Some state procurement laws on the use of recycled material direct an agency or department to review its procurement policies and remove any language that would discriminate against recycled materials. These laws are meant to encourage the use of recycled materials, but they are not requirements or incentives to procure recycled materials by the government. For instance, Florida directs its Department of Transportation to review and revise bid procedures to eliminate any procedures that explicitly discriminate against products and materials with recycled content, and encourage the use recycled materials and products. This “encouragement” relates to allowing, but not requiring, the Department of Transportation to undertake a demonstration project to determine the feasibility of using recycled materials such as tires, ash residue from coal combustion, mixed plastic, scrap steel, and glass in road pavement.<sup>188</sup>

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<sup>188</sup> Fla. Rev. Stat. § 336.044.

Some states require reports to their legislature by a state procurement agency or a specific department on the procurement and use of recycled materials. South Carolina, for example, requires its Department of Transportation to submit a report to the General Assembly on its use of recycled materials in its projects, particularly the use of compost in projects requiring soil amendment, the use of fly ash, recycled tires, plastic, and glass in road surfacing or concrete, and recycled plastic in guardrail posts, right-of-way fence posts, and sign supports.<sup>189</sup>

California recently overhauled its government procurement recycling standard, known as the State Agency Buy Recycled Campaign. Starting in January 2026, agencies must purchase recycled products whenever they are available at no more than a 10 percent premium. Current procurement law does not require the purchase of recycled products when they are more expensive than non-recycled counterparts — only when they are available at the same or lower cost. The new law will include reporting requirements for state agencies to follow. Further, state agency procurement and contracting officers from all agencies will be required to participate in annual mandatory training conducted by CalRecycle on how to implement the requirements of the Buy Recycled Campaign and how to comply with the new reporting responsibilities.<sup>190</sup>

### ***Mandatory Recycled Content Laws***

Separate from mandatory recycled content laws for government procurement, a few states also require (or will require in the coming years) a minimum amount of recycled content in certain packaging materials. California's recently enacted AB 793 will phase in minimum recycled content for plastic bottles beginning in 2022. Between January 2022 and December 2024, plastic bottles sold by a manufacturer in California must contain on average at least 15 percent post-consumer recycled plastic. Between 2025 and 2030, the percentage of post-consumer recycled plastic mandated in plastic bottles will increase to no less than 30 percent, and by 2030 and thereafter to no less than 50 percent.<sup>191</sup>

The new statute contains some flexibility for manufacturers. The recycled content requirement is structured so that the total number of bottles produced by a manufacturer averages out to 15, 30, and 50 percent within the designated time frames. This means that until 2025 a manufacturer may produce, for instance, 85 percent of its bottles from virgin plastic and 15 percent from 100 percent recycled plastic, rather than making 100 percent of its bottles from a mix of virgin and recycled plastic.<sup>192</sup>

Another flexibility built into California's mandatory recycled content law is that a beverage container manufacturer association may petition the director of the enforcing agency to review and revise downward the required post-consumer material based on changes in market conditions, recycling rates, the availability of recycled plastic suitable for manufacturing bottles, the capacity of recycling or processing infrastructure, and the progress made by beverage container

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<sup>189</sup> S.C. Code Ann. § 44-96-140(E).

<sup>190</sup> 2022 Cal. Legis. Serv. Ch. 517 (AB 661) (amending various provisions of the Public Contract Code).

<sup>191</sup> Cal. Pub. Res. Code §§ 14547(a)(1)-(3).

<sup>192</sup> Id.

manufacturers at incorporating recycled content into their products. They may only petition once per year. This provision will take effect in 2025.<sup>193</sup>

California is the first state to require post-consumer recycled plastic in bottles. The goal of California AB 793 is supported by major product manufacturers such as Coca-Cola and Nestle (which own well-known bottled water labels). These industry players are largely supportive of minimum recycled content rules because they create market demand for recycled plastics and therefore greater willingness on the part of material recovery facilities, scrap plastic processors, and bottle manufacturers to handle plastic.<sup>194</sup>

AB 793 is not the first recycled content law in California. The California Department of Resources, Recycling, and Recovery had previously promulgated a regulation requiring rigid plastic containers to contain at least 25 percent recycled material.<sup>195</sup> California also requires that glass containers manufactured in California be at least 35 percent recycled glass, or 25 percent if they use mixed-color cullet.<sup>196</sup>

New Jersey enacted a law in 2020 which will require minimum recycled content in plastic containers, glass containers, paper and plastic carryout bags, and plastic trash bags. New Jersey's new law will also ban polystyrene packing fill (such as "foam peanuts"). The New Jersey Department of Environmental Protection will have the authority, on application by a manufacturer, to review and adjust any recycled content requirement based on changing market conditions, availability of recycled material, and capacity of recycling infrastructure.

New Jersey's recycled content requirement law is more extensive than the statutes contemplated or enacted by other states because it applies to glass containers, paper and plastic bags, and plastic trash bags. Even California, which requires a minimum amount of recycled content for glass containers *manufactured* in that state, is less stringent than New Jersey's statute, which will require a minimum amount of recycled glass in all glass containers sold there, regardless of the location of their manufacture.

The New Jersey bill became effective in December 2022. As of that date, all rigid plastic containers sold in that state are required to contain on average at least 10 percent postconsumer recycled content. Beginning five years after the effective date of the new law, and for every three years thereafter, the recycled content requirement will increase by 10 percent, until the recycled content required reaches 50 percent. The law also contains labelling requirements and several exemptions. The phased-in required recycled content percentage differs for non-rigid plastic beverage containers (i.e., cups from restaurant take-out), paper and plastic bags, glass, and plastic trash bags.<sup>197</sup>

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<sup>193</sup> Cal. Pub. Res. Code § 14547(a)(4).

<sup>194</sup> Rachel Arthur, "California's 50% Recycled Content Goal: Ambitious — but obtainable, say Coca-Cola, Nestle, KDP," *Beverage Daily*, Oct. 7, 2022, <https://www.beveragedaily.com/Article/2020/10/02/California-s-50-rPET-plastic-bottle-goal-Coca-Cola-Nestle-respond>.

<sup>195</sup> Cal. Code Regs. tit 14 § 17942 *et seq.*

<sup>196</sup> See CalRecycles, "Glass Recycling," accessed Oct. 27, 2022, <https://calrecycle.ca.gov/Glass/>.

<sup>197</sup> SB 2515, 219<sup>th</sup> Legis., N.J. 2021.



Industry reaction to the new law was mixed. The Institute for Scrap Recycling Industries told *Recycling Today* that this legislation will “ensure plastics are responsibly manufactured, collected and recycled into new products.” However, the Glass Packaging Institute opposes the law, as it sees mandatory recycled content requirements as a solution for issues that are specific to plastics.<sup>198</sup>

Connecticut is also moving towards a mandatory recycled content law. Passed into law in 2021, Senate Bill 928 requires the Connecticut Commissioner of Energy and Environmental Protection to develop recommendations for recycled content requirements for products sold in the state by December 1, 2022.<sup>199</sup> As of the publication of this report, the Commissioner’s report was not yet available.

Washington State’s recycled content requirement for plastic beverage containers, home and personal care products, and trash bags was enacted in 2022 and became effective January 2023. Similar to New Jersey, this new law also bans some expanded polystyrene products such as clamshell takeout containers, cups, plates, coolers, and packing peanuts. To provide flexibility, the Washington State Department of Ecology, which will oversee the implementation of the law, will have the authority to review and adjust the minimum recycled content percentage for a given type of product or category based on market conditions, recycling rates, the availability of suitable recycled plastic material, the capacity of recycling infrastructure, the technical feasibility of achieving the minimum recycled content requirements, and past progress in achieving the goals of the legislation.<sup>200</sup>

From January 2023, plastic beverage containers must be made of 15 percent recycled material and this percentage will increase through 2031 when the minimum recycled content will be 50 percent. Plastic bottles containing wine and dairy are excluded initially, but they too will fall under the recycled content requirement beginning in 2028. Household cleaning and personal care products will fall under the minimum recycled content law beginning in 2025. In effect as of January 2023 is a requirement that plastic trash bags must be made of at least 10 percent recycled content.<sup>201</sup>

### ***Landfill Bans***

One policy that is complementary to mandatory recycling laws are landfill or disposal bans. In many (but not all) cases a ban on placing an item into the municipal waste stream is accompanied by a take-back program or a requirement to recycle it. However, it is also common to find a disposal ban for a given product but not a requirement to recycle it. For instance, Arizona bans

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<sup>198</sup> Megan Smalley, “Update: New Jersey Governor signs recycled-content bill into law,” *Recycling Today*, Jan. 18, 2022, <https://www.recyclingtoday.com/news/new-jersey-recycled-content-requirements-plastic-glass-paper-packaging/>.

<sup>199</sup> Raised Bill 928, January Session 2021 (Ct. 2021).

<sup>200</sup> S.B. 5022, 67<sup>th</sup> Leg., 2021 Reg. Sess. (Wash. 2021).

<sup>201</sup> *Id.*

lead-acid car batteries from landfills but does not require that they be recycled. Massachusetts bans cardboard from its landfills but does not require it to be recycled.<sup>202</sup>

Most items targeted by a landfill ban are items that are hazardous to the environment, such as motor oil, tires, and medical waste. Some states have banned recyclable materials such as paper products, cardboard, aluminum, and steel from landfills. However, the bans are difficult to enforce. Massachusetts has discovered that 40 percent of its 5.5 million tons of municipal waste is made up of items that are banned from disposal, such as glass and metal containers, cardboard and paperboard, plastic containers, wood waste, and tires.<sup>203</sup>

Massachusetts is not alone. San Francisco enacted a similar disposal ban on hard plastics, paper, cardboard, glass bottles, aluminum and tin cans, plastic bags, and film plastics in 2009. The city also mandated a separate curbside container for compostable materials. However, in 2022, more than 50 percent of what San Francisco residents disposed of were items that are banned from disposal.<sup>204</sup> Vermont and Seattle, Washington, have similar rates of non-compliance with their landfill bans.

In each case, better enforcement strategies were recommended, such as requiring clear bags and penalizing waste haulers for not policing residents' trash to ensure banned items were not headed to the landfill or incinerator.

### *Advanced Recycling — Depolymerization of Recycled Plastic*

The most common way for plastic to be recycled currently is to sort and bale it at a materials recovery facility and then send it on to another facility where the plastics are ground into flake and then remelted into a useable form, usually pellets. Finally, the pellets are sent to a manufacturer who will turn them into new products such as new PET bottles, textiles, or other items. However, there are other methods of recycling the growing volume of plastic waste that are becoming more prevalent. These methods break down plastics at the molecular level and are known as “advanced recycling.”

Pyrolysis is the most basic form of advanced recycling. Using pressure or heat in a low-oxygen environment, plastics are reformed into a liquid or gas that can then be used to make feedstock for new plastic or fuel. By using pyrolysis to reform old plastic into new feedstock, the manufacturer is finding a use for some recycled plastics that may have been discarded or not considered by an end user because they need a virgin plastic for their product.

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<sup>202</sup> Earth 911, “Landfill Bans,” <https://earth911.com/business-policy/landfill-bans/>.

<sup>203</sup> Ryan Proulx et al., “Need to Enforce: Waste Bans in Massachusetts,” *Public Interest Network*, Sept. 2022, [https://publicinterestnetwork.org/wp-content/uploads/2022/09/The-Need-To-Enforce\\_-Waste-Ban-Regulations-in-Massachusetts-9.7.22-2.pdf/](https://publicinterestnetwork.org/wp-content/uploads/2022/09/The-Need-To-Enforce_-Waste-Ban-Regulations-in-Massachusetts-9.7.22-2.pdf/).

<sup>204</sup> *Id.* at pp. 6-7.

Pyrolysis facilities that make feedstock for new plastic produce three main products. About 80 percent of the pyrolyzed waste plastic is turned into feedstock that displaces crude oil or ethane to produce new plastic. Ten percent becomes a hydrocarbon gas, such as propane, which is then burned to generate electricity. And the remaining 10 percent is char that can be added to asphalt or further refined to produce carbon black, a material used in tires, pigments, and lithium-ion batteries.

Pyrolysis is not a new process. It has been used to produce charcoal for as long as humans have been burning wood. Its application to turn plastic into fuels or chemicals is also not a new development. Large oil and chemical companies have been using pyrolysis to generate new petrochemical feedstock from discarded plastics since the 1990s, although with minimal commercial success. BASF, BP, and Texaco all had such facilities and either shut them down or did not expand them due to technical and commercial factors, according to an investigation by *Reuters*.<sup>205</sup>

Still, advanced recycling has been garnering momentum since 2018, when China shut its borders to most plastic waste originating from the United States. In September 2022, Dow opened a facility in Bohlen, Germany to convert mixed plastic waste into hydrocarbon liquids which will then be further processed at an ethylene cracker — another type of petrochemical processing facility — so that it can be made into new plastics. A similar facility is under construction by Dow in England. According to *Chemical & Engineering News*, every large chemical company is in the process of creating a plastic pyrolysis facility either on its own or jointly with a smaller company.<sup>206</sup>

Another example closer to home, Nexus Circular, uses plastic films from pallet wrap to produce various petrochemicals. A plant near Atlanta is currently producing 13,000 tons of naphtha, gasoline, diesel, and wax that is used by Shell and Chevron Phillips Chemical in their petrochemical crackers. Dow has committed to take the output of a facility that will be twice as large as the Atlanta plant. And Nexus states that it plans to open another facility in Chicago which will supply Braskem, a Brazilian chemical conglomerate.

Because of an increase in demand for fully circular plastics — plastics that are recycled and reused as plastic rather than burned as a fuel — industry may be more committed to seeing pyrolysis through and will not mothball plants and shelve plans for expansion when operations hit a financial rough patch. However, plants that can only pyrolyze sorted and clean polyolefin films will not be enough to tackle the existing plastic waste from residential consumers, who use and recycle a large number of different resins. BASF, the large German chemical company, is developing catalysts and adsorbents that eliminate contaminants so pyrolysis plants can handle contaminated mixed plastics. Using catalysts and other technology, such as transferring heat

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<sup>205</sup> Joe Brock, Valerie Volocovici, John Geddie, “Special Report — The Recycling Myth: Big Oil’s solution for plastic waste littered with failure,” *Reuters*, Jul. 21, 2021, <https://www.reuters.com/article/us-environment-plastic-oil-recycling/special-report-the-recycling-myth-big-oils-solution-for-plastic-waste-littered-with-failure-idUSKBN2EZ1EF>.

<sup>206</sup> Alexander H. Tullo, “Amid controversy, industry goes all in on plastics pyrolysis,” *Chemical & Engineering News Magazine*, Oct. 10, 2022, [https://cendigitalmagazine.acs.org/2022/10/10/amid-controversy-industry-goes-all-in-on-plastics-pyrolysis-2/content.html?utm\\_email+=94BAD530740DE5594485F5728F](https://cendigitalmagazine.acs.org/2022/10/10/amid-controversy-industry-goes-all-in-on-plastics-pyrolysis-2/content.html?utm_email+=94BAD530740DE5594485F5728F); <https://archive.ph/4jkmnd>.

directly with supercritical steam, facilities can reduce the amount of energy needed for the process and produce a more desirable end product.<sup>207</sup>

Honeywell UOP has a facility in Europe that selects plastics for the plant and melts them down before they are pyrolyzed. It is able to manufacture naphtha, diesel, and a heavier feedstock that can be sent to a fluidized catalytic cracker to make propylene. The company has touted that the scale of its plant — capable of processing 30,000 tons of waste plastics per year — is ideal for the amount that can be gathered in a midsized city. The smaller scale of Honeywell UOP's facilities allow it to avoid the pitfall of not being able to collect enough material, which is a concern for larger projects. Honeywell UOP is planning on forming joint ventures for facilities in Spain and Texas, as well as licensing its process for plants in China and Turkey.<sup>208</sup>

As can be seen, there has been significant investment in advanced recycling by large chemical and oil companies in recent years. But advanced recycling facilities face the same challenges that current recycling infrastructure contends with — namely, the logistical hurdles and expense of collecting and sorting the recycled plastic on the front end and, on the back end, having a product that can compete with plastics from virgin feedstock. While some facilities can produce feedstock to make virgin-quality plastic, whether it can be done economically remains to be seen.

Advanced recycling facilities also encounter hurdles that traditional mechanical plastic recyclers do not face. For instance, some advanced recycling facilities may need to avoid PET and PVC plastics, as PET will contribute oxygen to the reaction leading to the creation of carbon dioxide and PVC will create unwanted chlorinated compounds that contaminate the final product.<sup>209</sup> Advanced recycling facilities also require a great deal of energy to break the chemical bonds of the plastic scrap and turn it into smaller molecules.

Even when advanced recycling plants overcome technical barriers, commercial barriers still remain and there are a number of failed advanced recycling projects that took off with great fanfare and ended with a fizzle. Renewlogy, a Salt Lake City-based start-up, partnered with Boise, Idaho and Hefty, the garbage bag manufacturer, to turn residents' hard-to-recycle plastic waste into diesel fuel. Residents were told to put items such as yogurt containers and cereal box liners in orange Hefty bags which would then be trucked to Salt Lake City where Renewlogy would turn it into diesel fuel via pyrolysis.

However, Renewlogy was never able to get its facility in operation and none of Boise's plastic that was shipped to Salt Lake City was processed into diesel. Renewlogy claimed that there was too much contamination in the orange Hefty bags sent by the city. Boise claimed that the project failed because Renewlogy could not process plastic films, as it had promised. Boise still collects miscellaneous plastics in the Hefty orange bags, but instead of being turned into diesel fuel at a Renewlogy plant, they are used for energy in a cement kiln outside of Salt Lake City.<sup>210</sup>

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<sup>207</sup> Id.

<sup>208</sup> Id.

<sup>209</sup> Id.

<sup>210</sup> Big Oil's solution for plastic waste, *supra* n. 205.

PureCycle, a newly formed company that states that it will license technology from Procter & Gamble to generate new polypropylene from discarded polypropylene, went public in a SPAC<sup>211</sup> deal in 2020 and garnered a market capitalization of \$3.1 billion despite producing no product and having no revenue. Its stock price has declined from roughly \$33 to just over \$6 since going public via the SPAC<sup>212</sup> but its executives cleared \$7 million in cash bonuses for closing the SPAC deal and another \$40 million in compensation — before the company has even generated any revenue.<sup>213</sup> Although PureCycle is still in business, it does not yet have an operational facility and the company generates no revenue.

In addition to technical and commercial challenges, legal and regulatory issues may inhibit nascent advanced recycling ventures. In order to facilitate advanced recycling, 18 states — including Pennsylvania — have enacted laws to regulate advanced recycling facilities as manufacturing rather than as solid waste handling.<sup>214</sup>

In 2021, the General Assembly amended the Solid Waste Management Act to provide for a definition of “Advanced Recycling,” which consists of:

A manufacturing process for the conversion of post-use polymers through processes including pyrolysis, gasification, depolymerization, catalytic cracking, reforming, hydrogenation, and other similar technologies, into ... basic hydrocarbon raw materials, feedstocks, chemicals, liquid fuels, waxes and lubricants ... [and] other products including but not limited to monomers, oligomers, plastics, crude oil, naphtha, liquid transportation fuels, and other basic hydrocarbons.<sup>215</sup>

The bill also removed from the definition of “municipal waste” any “post-use polymers” that are “converted through advanced recycling.” Post-use polymers, in turn, are defined as any plastic that would not otherwise be recycled and which is from a residential, municipal, or commercial source and includes source-separated recyclable plastics from a materials recovery facility.<sup>216</sup>

The reason for creating a category of “advanced recycling” within the Solid Waste Management Act is to allow for advanced recycling facilities to be regulated as manufacturers and not as handlers of solid waste for disposal. Although this will remove a regulatory hurdle to the

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<sup>211</sup> SPAC is an acronym for special purpose acquisition company. Also known as a “blank-check company,” it is a maneuver to take a company public by having a shell corporation that is already a publicly traded company buy the target company, thus avoiding the traditional initial public offering process and its attendant regulations.

<sup>212</sup> NASDAQ, PCT, Jan. 3, 2023, *MarketWatch*,

[https://www.marketwatch.com/investing/stock/pct?mod=search\\_symbol](https://www.marketwatch.com/investing/stock/pct?mod=search_symbol).

<sup>213</sup> Hindenburg Research, “PureCycle: The Latest Zero-Revenue ESG SPAC Charade, Sponsored by the Worst of Wall Street,” May 6, 2021, <https://hindenburgresearch.com/purecycle/>.

<sup>214</sup> Cheryl Hogue, “Chemical recycling of plastic gets a boost in 18 US state — but environmentalists question whether it really is recycling,” *Chemical & Engineering News*, (May 15, 2022), <https://cen.acs.org/environment/recycling/plastic-recycling-chemical-advanced-fuel-pyrolysis-state-laws/100/i17>.

<sup>215</sup> Act 127 of 2020 (P.L. 1233, No. 127); 35 P.S. § 6018.103.

<sup>216</sup> *Id.*

creation of advanced recycling facilities, it should be noted that some of the technologies employed are untested, are proprietary and therefore not known to the public or environmental regulators, and have uncertain economic grounding.

Already, one company has proposed an advanced recycling facility to be sited in the Commonwealth. Houston-based Encina is planning a \$1.1 billion investment in a facility at which it plans to create benzene, toluene, and xylene from end-of-life HDPE, polypropylene, and polystyrene. Encina states that these chemicals will be feedstock for resin producers to make new plastics with recycled content and that the facility will be fully operational in 2025. Americas Styrenics has signed a memorandum of understanding for the purchase of up to 250,000 tons per year of these feedstock chemicals, according to Encina.<sup>217</sup> The facility will handle up to 450,000 tons per year of recycled plastic.<sup>218</sup>

However, several contacts in the recycling industry who communicated with the Commission for this report expressed skepticism that Encina would be able to find such a large volume — 450,000 tons — of sorted and cleaned HDPE, polypropylene, and polystyrene to achieve its ambitious goals. Other projects, including the examples discussed above, operate on a much smaller scale and are associated with other companies which will use the resulting feedstock chemicals. Encina would likely have to ship the material in from other states to accumulate that volume of cleaned and sorted recycled material. Additionally, there have been incidences in the past in other jurisdictions where other companies planning to recycle plastic have used advanced recycling facilities as transfer stations or storage for bales of sorted plastic, effectively operating as a broker or dealer of scrap plastic rather than as a recycler. The Clean Air Council appealed the DEP’s approval of a permit exemption under the new advanced recycling law to the Environmental Hearing Board.<sup>219</sup> On April 28, 2023, Encina moved to dismiss the appeal.<sup>220</sup> A decision has not yet been reached.

In communication with the Commission, Encina responded to these criticisms by explaining that it plans to take more “end of line” plastics from MRFs. These are the plastics that could be sorted by MRFs but which are ejected from sorting machinery and which are either uneconomical to re-sort or cannot be re-sorted because the MRF has already exceeded its capacity to handle material. The MRF will collect and bale these materials — often referred to as residue — and then send them to Encina’s planned facility, where they will again be sorted for unusable items (such as PET or aluminum). There will be some storage, sorting, and re-sale of materials that Encina cannot use in its advanced recycling facility, but it is not planning on using its site as a transfer station or warehouse for materials. As for the volume of material, it is anticipated that Encina will source its needed plastics from neighboring states, with improved local collection in the Danville area also accounting for a small portion of its source material.<sup>221</sup>

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<sup>217</sup> Encina Point Township, “Latest News and Updates,” <https://encinapointtownship.com/updates/>.

<sup>218</sup> Encina Point Township, “Advancing the Circular Economy,” <https://encinapointtownship.com/learn-more/>.

<sup>219</sup> *Clean Air Council v. DEP*, Clean Air Council Notice of Appeal, EHB Docket No. 2022-093-C, *available at* <https://ehb.courtapps.com/efile/documentViewer.php?documentID=57918>.

<sup>220</sup> *Clean Air Council v. DEP*, Permittee Encina Development Group, LLC’s Motion to Dismiss, EHB Docket No. 2022-093-C, *available at* <https://ehb.courtapps.com/efile/documentViewer.php?documentID=60006>.

<sup>221</sup> Telephone Conference Call between Commission staff and Encina, Feb. 21, 2023.

## *Educating Consumers About Recycling*

Much of the recycling that takes place in Pennsylvania, and across the country, relies on citizens who want to and know how to recycle their bottles, cans, and boxes. Consistent and frequent messaging by municipalities, waste management companies, and civic organizations is necessary to educate consumers about recycling in their locality along with what materials are recyclable and how to prepare the item for recycling.

There are two aspects of recycling education. First, consumers should be educated about the environmental and economic benefits of recycling. Recycling helps to conserve resources, whether they are aluminum, plastic, steel, or paper, keeping them out of landfills and reducing the amount of virgin material that needs to be produced. It helps to keep materials, particularly plastic, from becoming litter. And it provides employment and raw materials for various industries. Consumers should also be convinced that recycling is “worth it” — that the items they place in their bin for collection actually get recycled and that it makes a difference. One study discovered that being knowledgeable about recycling is the factor most closely correlated with a propensity to recycle.<sup>222</sup>

Second, consumers must know the practical aspects of recycling — when recycling is collected in their neighborhood, how to prepare the recyclables (e.g., rinse containers and flatten boxes), and what materials are collected in their neighborhood are important pieces of information. It is also helpful to give examples of what is not recyclable to ensure that consumers are only placing recyclable items in their bins. Some consumers, eager to recycle everything, place items such as plastic grocery bags, single-serve coffee pods, and disposable takeaway cups in their recycle bins. Sometimes called “wishcycling,” this aspirational recycling is more harmful than helpful, as it results in items that the MRF considers contamination entering the recycling stream.

### *Consumer Confusion*

The desire of consumers to recycle items that cannot be recycled is largely responsible for the increase in contamination that has been seen by MRFs across the country. The use of recycling bins as a type of dump for any and all refuse is also another factor. Waste Management has told the *New York Times* that, across the country, their facilities have seen Christmas lights, animal carcasses, an artillery shell, and — on a frequent basis — bowling balls. These items, and other less obvious contamination, destroy the value of the recyclable items they come in contact with or slow down the process of sorting the materials. Some items, particularly those containing lithium-ion batteries, can present a fire hazard.<sup>223</sup> One county that the Commission spoke to for this study stated that it receives propane tanks in its recycling stream — an item that cannot be recycled at the facility and can pose a danger if it is still filled with propane.<sup>224</sup>

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<sup>222</sup> Hornik, J., Cherian, J., Madansky, M., & Narayana, C. (1995). *Determinants of recycling behavior: A synthesis of research results*. The Journal of Socio-Economics, 24(1), 105–127. doi:10.1016/1053-5357(95)90032-2

<sup>223</sup> Livia Albeck-Ripka, “Your Recycling Gets Recycled, Right? Maybe, or Maybe Not,” May 29, 2018, *New York Times*, <https://archive.ph/zNLCm>.

<sup>224</sup> Joint State Government Commission communication with Centre County Recycling Authority.

Aspirational recycling is being driven, in turn, by consumer confusion over what is recyclable, particularly when it comes to plastic items. It is widely — and incorrectly — believed that the “chasing arrows” symbol on packaging means that it can be tossed in the recycle bin and will be turned into a new product. Although there has been headway in educating the public that that symbol does not signify recyclability (and on plastic simply designates what type of plastic an item is made from), many people still believe that if it has a “chasing arrow” symbol it is recyclable.

To remedy this issue, the packaging industry has been using a more informative label created by the non-profit organization How2Recycle. The now ubiquitous How2Recycle label is conspicuously printed on the package’s label and has several features, vertically configured, instructing the consumer how to recycle the item. At the top is an instruction on how to prepare the material for recycling — for instance, by rinsing and removing the cap. Next is an icon — a “chasing arrows” icon to indicate that an item is recyclable, the same icon with the words “check locally” or “return to store” if the item is accepted in some curbside pick-ups or if retailers accept that type of material, or the chasing arrows with a slash to indicate that the item is not recyclable. If the item is plastic, the resin identification number is omitted. At the bottom the type of material and packaging is specified.<sup>225</sup>



*Example of a  
How2Recycle label*

The standard used by How2Recycle for what constitutes a “recyclable” item is whether there is a substantial likelihood that a product or package can be collected, separated, or otherwise recovered from the waste stream for reuse in manufacturing a new item.<sup>226</sup> This definition comes from the Federal Trade Commission’s “Green Guides” regulations which govern environmental marketing claims.<sup>227</sup> Four hundred companies now use the How2Recycle guide on their products across a myriad of brands, for which they pay a fee to the non-profit.<sup>228</sup>

There has been some criticism of How2Recycle. The structure of allowing its recyclability guide takes the responsibility away from manufacturers to determine whether their packaging is recyclable and compliant with FTC regulation. It also leaves open the incentive for manufacturers to “capture” the labeling organization, pressuring it to deem recyclable materials which, in practice, are not widely recycled.

This concern is front and center in a dispute between some environmentalists and How2Recycle over the non-profit’s recent move to upgrade polypropylene from “check locally” to “widely recyclable.” The concern is that while polypropylene may be collected by many MRFs,

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<sup>225</sup> How2Recycle, Homepage, <https://how2recycle.info/>.

<sup>226</sup> How2Recycle, “Recycling Guide,” <https://how2recycle.info/guide>.

<sup>227</sup> 16 CFR § 260 *et seq.* (pursuant to 15 U.S.C. § 45 (prohibiting unfair or deceptive acts or practices in or affecting commerce)).

<sup>228</sup> How2Recycle, “About,” <https://how2recycle.info/about>.



the material is not widely recycled in practice. Environmentalist critics also take issue with the methodology used by How2Recycle to determine whether an MRF accepts a material.<sup>229</sup>

There are no peer reviewed studies in the literature examining the effect the How2Recycle label has had on consumer behavior. Nevertheless, the How2Recycle label is an attempt by industry to cut back on contamination and alleviate consumer confusion with a standardized label that provides sufficient information to educate the consumer over what the item is, whether it is recyclable, and if so how to recycle it.

There is another factor contributing to consumer confusion over what is recyclable — inconsistency of what materials are accepted for recycling across municipalities and even within the same municipality over time. As was noted earlier in this report, during the height of the COVID-19 pandemic some municipalities stopped accepting glass and certain kinds of plastic. Although those municipalities returned to accepting glass in their recycling programs, consumers need to be habituated to recycling in a certain way. Changing consumer habits is not like turning on a light switch. If a municipality changes what can be recycled or stops accepting certain materials, it may be difficult to get residents to cease placing those items into the recycling bin.

Similarly, it may be confusing to consumers if a neighbor can recycle items they cannot because their municipality has not contracted to have certain material hauled away. Consistency across municipal programs may alleviate this aspect of consumer confusion and may be easily achievable if the municipalities utilize the same hauler and MRFs. Differences in acceptable materials across municipalities within a county was one complaint the Commission heard during its communication with county recycling coordinators.

Commonwealth-wide standards and requirements on what items should be accepted for recycling could be problematic. In fact, it would be advantageous for each municipality to continue determining for itself what items should be recycled, as they are in a better position to know their residents' habits regarding recycling, community needs, and vendor capabilities best. Additionally, given the size of the Commonwealth, some municipalities may be nearer to MRFs than others. And those MRFs may be nearer to end markets for their sorted material than others. However, better coordination between neighboring municipalities may yield better results if such coordination creates a consistency in the materials collected for recycling.

### *Education Component of Act 101*

In communications with the Commission for the preparation of this report, local government administrators emphasized the importance of outreach, communication, and education for communities where recycling is mandated or where the municipality has opted to provide curbside collection. Recognizing that better information about recycling programs leads to more participation and greater volumes of recycled materials, the General Assembly required as part of their Act 101 responsibilities that municipalities with mandated recycling must inform their

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<sup>229</sup> Joseph Winters, “Inside the industry push to label your yogurt cup ‘recyclable,’” Oct. 13, 2022, *Grist*, <https://grist.org/accountability/inside-the-industry-push-to-label-your-yogurt-cup-recyclable/>.

citizens every six months about the requirement to recycle, how to recycle, and what days the materials will be hauled away.<sup>230</sup>

In addition to Act 101's requirement for municipalities to inform their residents about their local recycling program every six months, the DEP has the power to administer and distribute money in the Recycling Fund for public education programs as well as to promote and emphasize recycling and waste reduction through public education programs.<sup>231</sup> Act 101 also mandates that the county waste management plan include “[a] public information and education program that will provide comprehensive and sustained public notice of recycling program features and requirements.”<sup>232</sup>

However, according to the Pennsylvania Recycling Coalition, a non-profit organization that seeks to promote recycling in the Commonwealth, the focus on education within the framework of Act 101 has been diminishing since the passage of that legislation. It is within the DEP's discretion to spend Recycling Fund monies on education programs, and enforcement of the requirement that counties engage in recycling education has not been a priority. Even if enforcement were robust, the statutory requirement only mandates that the counties' plans include information regarding “recycling program features and requirements.” Broader education regarding how, what, and why to recycle is not a requirement.

### *Cart-tagging*

Education about what can be recycled is necessary for preventing contamination of recyclables with non-recyclable materials. To this end, some jurisdictions engage in a more aggressive form of “education” for consumers — cart-tagging. Cart-tagging is when recycling hauler crews visually inspect consumers' recycling bins and leaves a note or “tag” if the consumer has placed anything in the recycling bin that is not accepted for recycling. This way, those who recycle get feedback on their recycling behavior.

According to a survey of local ordinances by the National Conference of State Legislatures, Chicago, Illinois; King County, Washington; Flagstaff, Arizona; Charlotte, North Carolina; and Greensboro, North Carolina have cart-tagging programs. Chicago and Charlotte use colored tags to let customers know if they are recycling properly, and Greensboro uses a camera system to detect contaminants in recycling which then sends out tags virtually through an app.<sup>233</sup>

Although some cart-tagging programs have existed for years, renewed pressure to generate recyclable materials with less contamination is driving increased interest in the policy. Other smaller jurisdictions are beginning to implement such policies. In Centerville, Ohio a public-private partnership launched a campaign to have specially trained staff and volunteers conduct curbside bin investigations. This program follows an earlier pilot program that was funded by a grant from The Recycling Partnership. The Recycling Partnership, a non-profit organization, has

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<sup>230</sup> The Municipal Waste Planning, Recycling and Waste Reduction Act, § 1501(d); 53 P.S. § 4000.1501(d).

<sup>231</sup> *Id.* §§ 301 (13) and (14)

<sup>232</sup> *Id.* § 501(e)(1)(xii).

<sup>233</sup> National Conference of State Legislatures, “State Recycling Resources,” Apr. 14, 2020, <https://www.ncsl.org/research/environment-and-natural-resources/state-recycling-resources637224558.aspx>.

also funded cart-tagging operations in Akron, Ohio; Lafayette, Louisiana; and Tucson, Arizona. Under The Recycling Partnership's strategy, recycling inspectors go from house-to-house inspecting recycling bins before crews arrive to haul them away and leave notes detailing what items are not recyclable.<sup>234</sup>

Drawbacks to cart-tagging include the labor-intensive nature of having an inspector observe each bin, as well as negative responses from some households that would prefer not to have anyone peeking into their bins. To mitigate these downsides, Olympia, Washington has introduced a program where the workers collecting curbside recyclables note on a tablet which households' bins have contamination. If there are any households with substantial contamination, they are contacted about it through the mail. In this manner the recycler is able to reduce the amount of labor needed to observe the contents of the recycling bins and eliminates any potential interaction between consumers and a bin inspector.<sup>235</sup>

While cart-tagging could be an effective solution to educating consumers about what and how to recycle, better communication at the six-month intervals required by Act 101 may be a simpler and more cost-effective answer for most communities. Currently, it is standard for municipalities to tell residents what items are or are not accepted but some leave common questions about how to recycle unanswered and consumers unsure of what to place in their bins or how to prepare the materials.

In some cases, consumers receive conflicting information on how to recycle. For instance, Penn Waste's recycling guidelines instructs that it accepts cardboard that has had "no food contact." Ostensibly, this would exclude pizza boxes even though there is no explicit prohibition on pizza boxes.<sup>236</sup> However, one township that is served by Penn Waste informs its residents that pizza boxes are in fact accepted — even though all pizza boxes have some food contact.<sup>237</sup>

Complicating matters, Domino's Pizza has begun a campaign to raise awareness about the recyclability of pizza boxes and encourage more of their boxes to be recycled, citing a study showing that the grease that is inevitably left behind on pizza boxes does not interfere in the process of recycling cardboard given the large volumes of cardboard collected and recycled.<sup>238</sup> Both the township and Penn Waste provide more detailed information on how to recycle, including instructing households to crush aluminum cans and all plastics, remove and dispose of caps or lids, rinse bottles and cans to ensure they are free from contaminants, and breakdown cardboard and paperboard boxes. Consumers are also given a list of items that are unacceptable, such as hoses, Christmas lights, and clothes hangers.<sup>239</sup>

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<sup>234</sup> Colin Staub, "Cart tags: A growing force in fight against contamination," *Resource Recycling*, Aug. 24, 2021, <https://resource-recycling.com/recycling/2021/08/24/cart-tags-a-growing-force-in-fight-against-contamination/>.

<sup>235</sup> *Id.*

<sup>236</sup> Penn Waste, "2018 Penn Waste Recycling Guidelines," Jun. 2018, <https://www.pennwaste.com/wp-content/uploads/2018-Penn-Waste-Recycling-Guidelines.pdf>.

<sup>237</sup> Susquehanna Township, "Susquehanna Township Recycling Guide," accessed Nov. 18, 2022, [https://www.susquehannatwp.com/sites/g/files/vyhlf3896/f/uploads/resguidelines\\_11-26-14-web.pdf](https://www.susquehannatwp.com/sites/g/files/vyhlf3896/f/uploads/resguidelines_11-26-14-web.pdf).

<sup>238</sup> Dominos Pizza, "Unboxing the Facts," accessed Nov. 18, 2022, <https://recycling.dominos.com/facts/>.

<sup>239</sup> Susquehanna Township Recycling Guide, *supra* n. 237.

In summary, consumers need knowledge not only of their municipality's recycling program (such as day and frequency of collection, where to obtain a recycling bin, and what materials are acceptable for recycling) but also of the benefits of recycling in general. Better communication by counties, municipalities, recyclers, trade groups, and non-profits to the public at large is part of the solution to increasing the quantity of recyclables and their quality.

### ***Encourage Innovation in Packaging Design to Reduce Volume and Increase Recyclability***

One solution to reduce the amount of recyclable packaging waste is to redesign packaging to reduce the volume of material used and to increase its recyclability. This is an approach some other jurisdictions have chosen to take. Packaging redesign can come from the government in the form of mandates, materials bans, or fee-based incentives as part of an EPR system.

In France, which has implemented an EPR system similar to Germany's "Green Dot" program, the government has devised a policy to reduce the volume of packaging as well as increase the recyclability of the packaging that is produced. Under France's system, formerly known as Eco Emballages and now known as CITEO, producers pay a fee to municipalities to handle the collection of recyclables, rather than create a separate collection system. The fees are modulated based on the quantity and properties of the packaging. Producers can receive up to a 24 percent discount from the base fee or a 100 percent penalty. Between 2007 and 2012, packaging waste was reduced by 106,000 tons. Between 1994 and 2012, the weight of a 1.5-liter plastic bottle declined by 40 percent (from 47g to 28g), 23 percent for 750ml glass bottles (from 545g to 418g), and 18 percent for 330ml aluminum cans (from 31g to 25.5g).

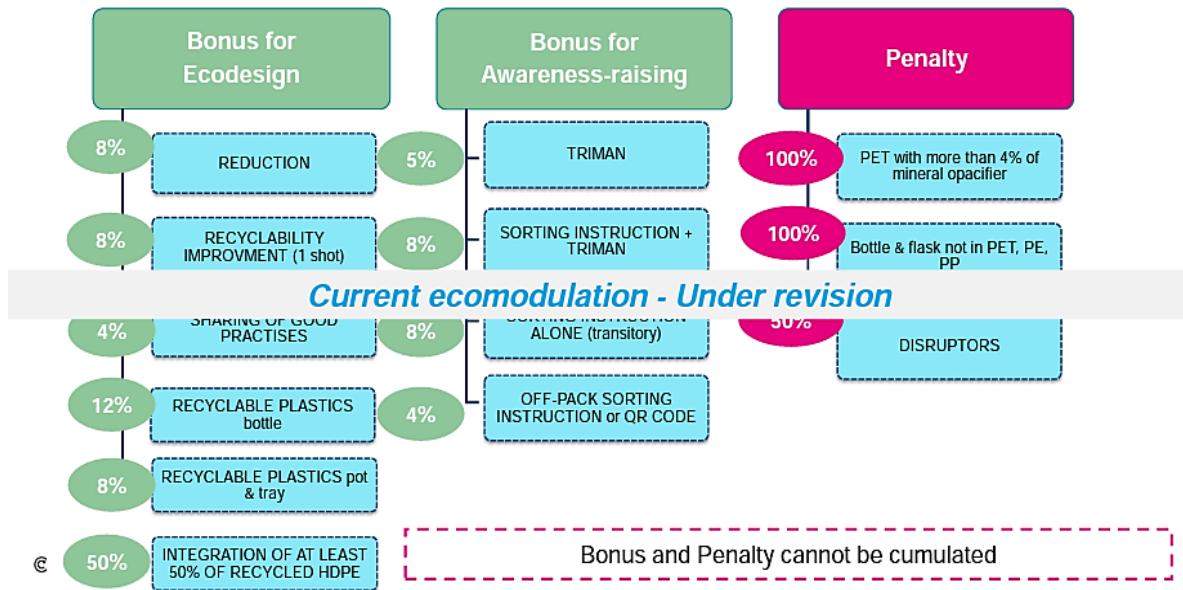
CITEO's fee moderating system has also changed the way producers design packaging. For instance, manufacturers have ceased using ceramic caps on glass bottles, as they are not recyclable and result in a penalty. Another notable feature is that plastic other than PET, HDPE or PP (plastics #1, 2, and 5, respectively), are considered "packaging with no recycling route." If a manufacturer does not use PET, HDPE, or PP for their packaging, they will be charged a 100 percent penalty. However, the system extends beyond a mandatory fee with incentives and penalties. Producers are provided with a number of tools and services to support them in changing their packaging, including joint research and development projects.<sup>240</sup>

As noted above, EPR systems with fee modulation are a common feature of European recycling policy and have been used as a tool to shift packaging from difficult to recycle materials and design to those that are more amenable to recycling. Although all European EPR schemes have fee modulating policies, France's CITEO is mentioned because of its complexity and the verve with which it pursues the goal of packaging redesign. The figures below demonstrate the complexity of CITEO's fee modulation.

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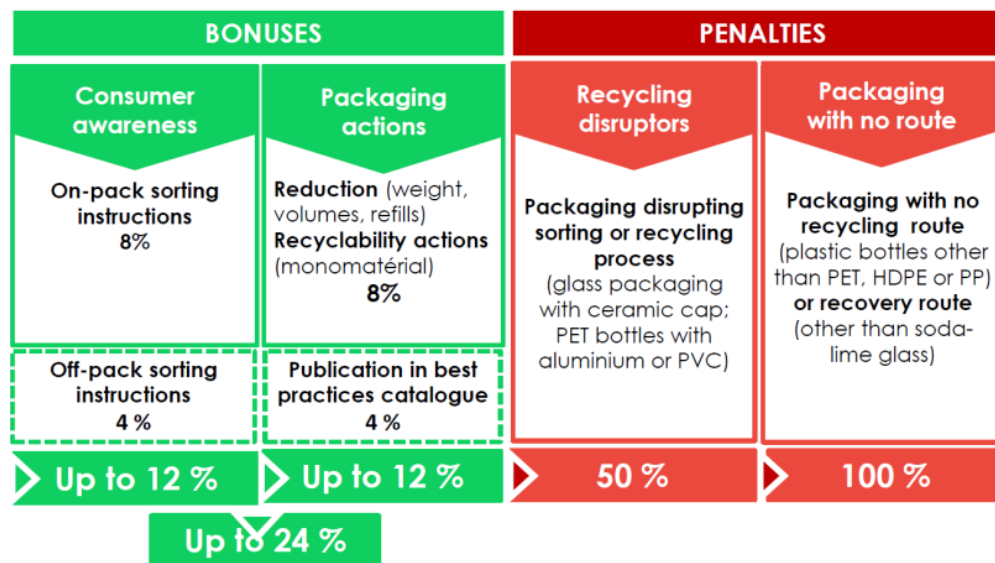
<sup>240</sup> European Commission, Green Best Practice Community, "Eco-Emballages (France)," accessed Oct. 11, 2022, <https://greenbestpractice.jrc.ec.europa.eu/node/193>.

## Current ecomodulation for packaging



Source: Axel Darut, Workshop on Essential Requirements and New EPR Rules, CITEO.<sup>241</sup>

## FEE MODULATION: IN PRACTISE FOR 2016



Source: European Commission, Green Best Practice Community, Eco-Emballages (France).

As can be seen comparing the two figures, from 2016 to today the modulation of fees became more complex.

<sup>241</sup> Axel Darut, Workshop on Essential Requirements and New EPR Rules, CITEO, n.d., [http://www.pcci.gr/evpeimages/0703\\_F5260.pdf](http://www.pcci.gr/evpeimages/0703_F5260.pdf).

Although no jurisdiction in the United States has mandated reducing the volume of packaging, the packaging industry is already reducing the total weight of packaging by reducing the amount of material used in each package. This process, known as “light weighting,” is being undertaken by packaging manufacturers using cardboard, aluminum, plastic, and glass. For example, Coca-Cola has reduced the weight of its 500ml PET bottles by 30 percent since 2008. And recently, the company has altered the neck design of its bottles in Europe to further reduce the amount of plastic needed to produce its PET bottles.<sup>242</sup>

Light weighting has already taken place in the beer industry. O-I, a large glass manufacturer, states that it has been light weighting the glass containers that it manufactures for decades, and it has set a goal to further reduce the weight of glass packaging by up to 30 percent by 2025.<sup>243</sup> A glass beer bottle today is 30 percent lighter than it was 20 years ago.<sup>244</sup> This trend is now taking hold in the wine industry, with even some premium winemakers opting to bottle their product in lower-weight glass. Historically, winemakers were reluctant to use lighter bottles, fearing the perception that a lighter bottle would indicate a cheaper product to consumers.<sup>245</sup>

Aluminum cans have decreased in weight by 38 percent since the 1970s.<sup>246</sup> Ball, a major manufacturer of aluminum cans, has developed a new design that reduces the weight of a standard can by a further three to eight percent, depending on customer specifications. At the end of 2021, these new lighter cans accounted for 23 percent of the company’s global volume of aluminum beverage cans it produced, saving 6,100 metric tons of aluminum that year.<sup>247</sup>

While using less material in packaging is not itself recycling, it reduces the amount of material that needs to be used and ultimately reduces the amount of material that needs to be recycled. In the United States, this process has been happening quietly and at the initiative of various consumer goods brands and the packaging manufacturers. Light weighting should be encouraged, but any attempt to force manufacturers to redesign packaging to use less material could result in increased costs to make packaging and unforeseen consequences, such as negatively impacting packaging integrity. For instance, cardboard is tested for tensile strength and crush values, and aluminum and glass containers must be able to withstand internal and external pressures from carbonated beverages.

Although light weighting has been happening for years behind the scenes and has had a positive effect on reducing the amount of material needed for boxes, bottles, and cans, one MRF that the Commission consulted for this report stated that the move toward lighter bottles —

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<sup>242</sup> Joshua Poole, “Coca-Cola lightens environmental impact with new neck design and attached caps for PET bottles,” May 18, 2022, *Packaging Insights*, <https://www.packaginginsights.com/news/coca-cola-lightens-environmental-impact-with-new-neck-design-and-attached-caps-for-pet-bottles.html>.

<sup>243</sup> O-I Glass, O-I 2022 Sustainability Report, Sept. 2022, p. 65, [https://www.o-i.com/wp-content/uploads/2022/09/O-I\\_Sustainability\\_Report\\_2022\\_EN.pdf](https://www.o-i.com/wp-content/uploads/2022/09/O-I_Sustainability_Report_2022_EN.pdf).

<sup>244</sup> Kate Galbraith, “Making wine bottles lighter ... and greener,” Mar. 10, 2009, *The New York Times*, <https://archive.nytimes.com/green.blogs.nytimes.com/2009/03/10/making-wine-bottles-lighter-and-greener/>.

<sup>245</sup> Betsy Andrews, “The shrinking footprint of glass wine bottles,” Jul. 18, 2022, *SevenFiftyDaily*, <https://daily.sevenfifty.com/the-shrinking-carbon-footprint-of-glass-wine-bottles/>.

<sup>246</sup> The Aluminum Association, Aluminum.org, accessed Jan. 5, 2023, <https://www.aluminum.org/product-markets/aluminum-cans>.

<sup>247</sup> Ball, “2021 Combined Report – Business & Sustainability Update,” p. 24, <https://www.ball.com/getattachment/03cb556b-9ace-4d8d-9b96-94c68079e06b/Ball-2021-Combined-Report.pdf>.

particularly the plastic single-serve water bottles which now use a very thin, light PET — has increased their labor costs. This is because it takes more time to process the large volume of these thin single-serve water bottles but the scrap value is low due to the low weight of the plastic collected.<sup>248</sup>

While this may not be the case for every MRF, it serves as an example that proposed solutions sometimes are a double-edged sword. In the case of light weighting, less material is used and so the potential for waste is reduced — but at the same time, the scrap value per item recovered is depreciated because of the lower weight of material that can be collected and recycled.

### ***Grant Money for Capital Equipment and other Recycling Facility Costs***

The equipment used to collect, sort, and transform recyclables into new products can be quite expensive. Bailers, compactors, sorters, separators, conveyors, and shredders are some of the equipment that a materials recovery facility would need to have, not to mention the building itself and the trucks to collect the material (if the MRF is also the hauler). To offset this cost and encourage the development of recycling facilities, many state governments have created grant programs or offered subsidized loans to material recovery facilities or local governments.

Pennsylvania offers several grant programs, discussed earlier in the report, to municipalities for project development for municipal waste processing or disposal facilities and related feasibility studies, for the development and implementation of municipal recycling programs (including the purchase of equipment), for up to 50 percent of the costs incurred for the salary and expenses of recycling coordinators, and “performance grants” for the ongoing costs of municipalities’ recycling programs. These grants are funded by a \$2 per ton fee on solid waste disposed of at landfills or processed at resource recovery facilities.<sup>249</sup>

Other states take different approaches. In California, all local agencies receive some funds from the California Beverage Container Recycling and Litter Reduction Act — California’s bottle bill — to help pay for local recycling programs. California’s bottle bill statute created the Recycling Infrastructure Loan Guarantee Account as a revolving account in the California Beverage Container Recycling Fund, and the funds in the account are “continuously appropriated to the department to issue loan guarantees for capital expenditures for new recycling infrastructure located in the state.” The department may only issue a loan guarantee from the account if it determines that the new recycling infrastructure “adds recycling capacity, results in remanufacturing and reuse of beverage containers into new products, and complies with all applicable laws and regulations.”<sup>250</sup>

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<sup>248</sup> Joint State Government Commission, Telephone call with Centre County Recycling Authority, Dec. 16, 2022.

<sup>249</sup> See *supra*, p. 23.

<sup>250</sup> Cal. Pub. Res. Code § 14582.

Recently, California created three new grant programs. One provides up to \$4 million per year to encourage the use of recycled glass in new bottles, another provides the same amount for a regional pilot program to collect glass at restaurants and other retail locations, and one grant program provides \$1 million annually to encourage transporting empty glass containers to processing facilities by rail.<sup>251</sup>

California's Greenhouse Gas Reduction Grant and Loan Programs also provide some funds for supporting recycling infrastructure. Funded by carbon dioxide Cap-and-Trade auction proceeds, the Recycled Fiber, Plastic, and Glass Grant Program is designed to "lower greenhouse gas emissions by expanding existing capacity or establishing new facilities in California that use California-generated postconsumer recycled fiber (old corrugated cardboard, paper board, or textiles), plastic, or glass to manufacture products."<sup>252</sup>

California also offers subsidized loans, technical assistance, and free product marketing to businesses that use materials from the waste stream to manufacture new products in designated areas. This is known as the Recycling Market Development Zone Program.<sup>253</sup>

In addition to these grant and loan programs, California directly subsidizes recycling centers. Under California's bottle bill, any unredeemed deposit becomes property of California, which ordinarily appropriates those funds to support the state recycling centers that accept bottles from consumers for a deposit return. However, reduced financial support over the past few years is weighing on the state's recycling infrastructure. These financial issues were discussed in more detail beginning on page 50.<sup>254</sup>

Some states offer grant money to underwrite the cost of equipment. Each state's program is different but the usual arrangement is to leave to the discretion of the state's environmental agency the exact use of the funds. Colorado, for instance, offers its Recycling Resources Economic Opportunity Program to provide grant funding to support recycling, composting, anaerobic digestion, source reduction, and beneficial use or reuse. Examples of grant recipient uses include upgrading composting equipment at a landfill and increasing capacity at a facility that shreds old tires.<sup>255</sup>

In Arkansas, the Recycling Distribution Program distributes grant money to regional solid waste management districts, with each district determining the best use for their allotted funds. The funds can be used for recycling equipment, education, administrative costs, underwriting the operations of a material recovery facility, or e-waste collection, to list a few uses.<sup>256</sup> Ohio also has a competitive grant program that is open to private sector recycling businesses and allows funding

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<sup>251</sup> Cal. SB 1013 (amending § 23661.3 of the Business and Professions Code).

<sup>252</sup> CalRecycle, "Recycled Fiber, Plastic, and Glass Grant Program," accessed Oct. 26, 2022, <https://calrecycle.ca.gov/climate/grantsloans/FPG/>. See also Cal. Pub. Res. Code § 42999.

<sup>253</sup> CalRecycle, "Recycling Market Development Zone (RMDZ) Program," accessed Oct. 26, 2022, <https://calrecycle.ca.gov/rmdz/>.

<sup>254</sup> See *supra* p. 50.

<sup>255</sup> Colorado Department of Public Health & Environment, "Recycling Resources Economic Opportunity Program," Jun. 27, 2022, <https://drive.google.com/file/d/1HyqJjyOhRJgAdis4KkTPDOfpCjoe3sXS/view>.

<sup>256</sup> Arkansas Department of Energy and Environment, "Recycling Distribution Program," <https://www.adeq.state.ar.us/poa/recycling/financial/distribution.aspx>.



to be used toward the purchase of recycling equipment, processing facilities, and other recycling infrastructure improvements.<sup>257</sup>

Some recycling programs are reliant on non-profit and private sector grant money. The Nebraska Recycling Council offers grants to municipalities, other government entities, non-profits, and recycling companies for the purchase of recycling equipment up to \$20,000 over a two-year period.<sup>258</sup> New Hampshire municipalities are eligible for funding from New Hampshire the Beautiful, an environmental non-profit, to assist with the purchase of recycling equipment. Grants are considered on an individual basis and funding may constitute one-half of the purchase price of the equipment. The purpose of the grant is to help fund the purchase of curbside collection bins, balers, crushers, and other similar equipment necessary for a community to achieve higher recycling rates.<sup>259</sup>

Some states directly help fund the cost of equipment used in the recycling process by providing targeted loans. For instance, Florida offers a recycling loan program for the purchase of equipment and machinery to expand recycling capacity in Florida. The program offers long-term fixed-rate loans two percentage points below prime lending rates. The maximum loan amount is \$200,000 and the program is limited to small for-profit businesses operating in Florida, start-ups, or out-of-state firms expanding into Florida. Florida also exempts resource recovery equipment from state sales tax when it is owned or operated by or on behalf of any county or municipality.<sup>260</sup>

When it comes to the cost of recycling equipment itself, most states appear to engage in a *de facto* public-private partnership, underwriting the cost of equipment for private recyclers as well as municipalities. As the Institute for Local Government recognized, financing the cost of recycling facilities is “an evolving practice that often combines public and private financing resources and has to respond to changing conditions.”<sup>261</sup>

However, Pennsylvania’s grant programs do not apply to private sector entities. The relevant grant program provides that the awards from the Department shall be “for development and implementation of municipal recycling programs, upon application from any municipality.”<sup>262</sup> There is no provision permitting grants for privately run establishment, whether they are for-profit or non-profit, nor is there statutory authority for funding public-private partnerships.

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<sup>257</sup> <https://epa.ohio.gov/divisions-and-offices/environmental-financial-assistance/recycling/grants/recycling-grants>

<sup>258</sup> Nebraska Recycling Council, “Recycling Equipment Grants,” accessed Oct. 26, 2022, <https://nrcne.org/recycling-equipment-grants/>.

<sup>259</sup> New Hampshire the Beautiful, “Municipal Recycling and Storage Equipment Grants,” accessed Oct. 26, 2022, <https://nhthebeautiful.org/municipal-recycling-and-storage-equipment-grants/>.

<sup>260</sup> Florida Department of Environmental Protection, “Recycling Loan Program,” updated Dec. 13, 2021, <https://floridadep.gov/waste/waste-reduction/content/recycling-loan-program>.

<sup>261</sup> Institute for Local Government, “Financing Recycling Programs and Facilities: Understanding Options and Resources,” 2014, [https://www.ca-ilg.org/sites/main/files/file-attachments/financing\\_recycling\\_infrastructure\\_final\\_formatted.pdf](https://www.ca-ilg.org/sites/main/files/file-attachments/financing_recycling_infrastructure_final_formatted.pdf).

<sup>262</sup> The Municipal Waste Planning, Recycling, and Reduction Act, § 902; 53 P.S. § 4000.902.

Other states studying this issue have recommended public funding of private recycling infrastructure. New Jersey’s Recycling Market Development Council, an advisory council created to provide recommendations on changes to state laws, rules, and regulations to better facilitate recycling, recommended in 2019 that the New Jersey legislature establish a low-interest recycling equipment and infrastructure loan program. The goal would be to entice privately-owned facility to invest in upgrades such as retrofitting a facility to enable it to process recyclable materials collected from dual stream systems.<sup>263</sup>

### *Encouraging the Use of Larger Wheeled Carts*

Depending on the municipality, households that are required to recycle either use small bins or larger wheeled carts. The Recycling Partnership, a non-profit organization that promotes recycling to governments, advocates the adoption of wheeled carts over the smaller bins.<sup>264</sup> And not without reason — wheeled carts present a number of advantages over their smaller non-wheeled counterpart when it comes to the efficiency of municipal recycling programs.

To start, wheeled carts are able to hold more materials. Small bins may only have enough space for one week’s worth of household recyclables, and for some households may not be sufficient to hold all of the recyclable cans, bottles, papers, and boxes they generate in that time frame. They are not large enough to hold many corrugated cardboard boxes, even when broken down. And they are not protected from the surrounding environment, allowing rain, dirt, and leaves to contaminate the materials. This is particularly problematic for paper and cardboard, which can be difficult or impossible to recycle when wet.

In contrast, a wheeled cart has a lid that can be closed to protect the contents from the elements. They can hold more materials (including larger boxes if broken down properly) allowing a household to wait several weeks until the cart is full before placing the cart out for pick up. Additionally, a wheeled cart could be picked up by a truck with an automated lifting arm, reducing the amount of time needed to deposit the materials into the truck and saving on the amount of labor needed to collect recyclables. These factors allow for a more effective collection of materials.

However, it should be noted that carts may not provide the same benefits to all communities. Urban areas with narrow streets may not be able to accommodate the larger carts, and areas with more dense housing may not allow for residents to appropriately store recycling carts. Additionally, municipalities should bear in mind that some people with disabilities may struggle with moving carts and may need to be accommodated.

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<sup>263</sup> New Jersey Recycling Market Development Council, “2022 Recycling Market Development Council Report to the Governor and Legislature,” Apr. 2022, p. 14, <https://www.nj.gov/dep/dshw/recycling/RMDC.pdf>.

<sup>264</sup> The Recycling Partnership, “A Guide to Implementing a Cart-Based Recycling Program,” 2015, <https://recyclingpartnership.org/wp-content/uploads/2018/05/implementing-carts-guide.pdf>.

## CONCLUSION

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Over the past two decades, the volume of recyclables collected in the Commonwealth has increased dramatically, as evidenced by data from the DEP. While this is a great achievement, recycling has not been without problems. Contamination in the recycling stream has been a persistent issue. While contamination has been an issue for recycling from the start, the problems it causes have been magnified by other factors, such as an increase in household waste generation and a withering of foreign markets for recyclables, which have emerged since Act 101 was first passed.

The decline of foreign markets, especially China, has been particularly difficult for the recycling industry. It has spurred some municipalities to discard items collected as recycling, as well as incentivized some MRFs to increase investment in their equipment and in developing domestic end markets. According to the Pennsylvania Waste Industry Association, MRFs are projecting over \$150 million in capital expenditures for collection equipment and MRF construction and upgrades over the next three years.<sup>265</sup>

Increased costs for MRFs and haulers has been an issue in the past several years. These costs, in large part, are passed on to municipalities and their residents. Compounding the problem is that the scrap value of the collected materials has fallen and the money in the Recycling Fund for grants is insufficient to keep up with costs. Recycling is not free — it comes at a cost and the revenue streams that offset that cost, such as materials' scrap value and Recycling Fund grants, have declined relative to the increase in costs.

Additionally, some items which are accepted for recycling are difficult to recycle or have a low scrap value and a high cost of processing. These materials include various types of plastic packaging and glass. While it may be tempting to simply jettison them from Act 101's requirements, such a solution would defeat the purpose of having a recycling program in the first place. There are uses for end-of-life plastics and glass that cannot be recycled in a traditional sense.

A number of those uses are available now and could be explored further. These include using plastic as a fuel source and input in cement kilns and steel factories and utilizing advanced recycling technologies to break plastic down into other petrochemicals for use as fuel or feedstock for new plastic. Glass can be used as an aggregate in concrete or manufactured into other building materials. While not recycling per se, these beneficial uses displace fossil fuels and other materials and contribute to reducing the use of other resources.

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<sup>265</sup> Joint State Government Commission Staff communication with David Buzzell of the Pennsylvania Waste Industry Association, Jan. 18, 2023.

The recycling policies available to the Commonwealth are broad. They range from those that would require sweeping changes to the Commonwealth's recycling system, such as a bottle bill and extended producer responsibility programs, to more modest proposals such as increasing the availability of wheeled carts, subsidized loans or grants to private sector recyclers, incentivizing or requiring packaging redesign to use less material or more recyclable material, and procurement standards for government to include the purchase of more products manufactured from more recycled material.

Also discussed were minor changes to the existing Act 101 system, such as restricting Recycling Fund monies to Act 101 recycling grants, increasing the scope of Act 101 to include more municipalities or more materials, and increasing the recycling fee.

Better education surrounding recycling could help improve the volume of recyclables and decrease the amount of contamination in bins. The DEP, counties, municipalities, and the MRFs all have a role to play in educating consumers about the benefits of recycling and how to recycle properly. Industry-sponsored education programs, such as How2Recycle, were mentioned. Cart tagging was also discussed as a potential solution to educate consumers about what can be recycled, although this practice has some drawbacks.

Recycling in the Commonwealth has had two decades of increased material collection and many successes. The face of recycling has changed, from a greater volume of newspaper and office paper to more plastics and corrugated cardboard. More municipalities are recycling and of the municipalities that do recycle more are moving toward single-stream collection. However, volumes of recycled material collected have been falling in recent years.

The headwinds that recycling is facing in the present age are a result of forces outside the direct control of government, such as the declining value of scrap material, the closure of foreign markets to recycled material, and an increase in the cost of collecting and processing recyclables. There is no clear, easy solution to these problems but the challenge can be met with many smaller changes to the recycling ecosystem and will require the thoughtful participation of all involved. Households need to know what and how to recycle properly and be incentivized to do so. Local governments must faithfully carry out their duties pursuant to Act 101. For its part, the General Assembly can implement the recommendations on the following page to improve recycling in the Commonwealth.

## RECOMMENDATIONS

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Based on the research conducted and stakeholder feedback collected throughout this report, the Joint State Government Commission staff make the following recommendations:

### **1. Implement Better Data Collection Methods Commonwealth-wide to Increase Accuracy of Recycling Reporting**

Data on recycling in the Commonwealth originates from county reports to the Department of Environmental Protection.<sup>266</sup> Counties must report to the DEP the “weight or volume of materials that were recycled by municipal recycling programs in the county in the preceding calendar year, and the weight or volume of materials that were recycled by the county in the preceding calendar year.”<sup>267</sup> However, as discussed in the section on Pennsylvania’s recycling data, the county receives these data from its municipalities that offer curbside recycling and the municipalities are not always certain how much material gets recycled or the composition of the material.

Currently, many counties are not reporting a detailed collection of materials. For instance, Cumberland County did not report any tonnage for PET or HDPE plastics — but collection of these materials in large quantities is almost a certainty because the county reported nearly 18,000 tons of “single stream material” from residential sources to the DEP.<sup>268</sup> Collecting better data on what and how much is being recycled from the “single stream material” category should be a goal for the Department of Environmental Protection.

Better data collection will give all stakeholders and the public more information on which to base their recycling decisions — whether a hauler altering its curbside collection route, a municipality expanding what materials its residents can recycle, or a purchasing agent for a manufacturer looking for recycled material. More accurate information as to what is contained in all of the “single-stream material” data sets can be used to set new recycling goals (such as collecting and recycling more plastics), help identify counties or municipalities that have suboptimal results from their recycling programs, help waste management companies determine best practices or alter management strategies, support market development by clarifying what materials are available for manufacturers, and help the DEP allocate grant funding.

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<sup>266</sup> The Municipal Waste Planning, Recycling, and Reduction Act, § 303; 53 P.S. § 4000.303.

<sup>267</sup> *Id.* § 303(f)(2).

<sup>268</sup> Pennsylvania Department of Environmental Protection, “2020 County Recycling Data,” [https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Documents/2023/2020\\_County\\_Recycling\\_Data.pdf](https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Documents/2023/2020_County_Recycling_Data.pdf).

This report acknowledges that obtaining detailed information on recyclables is difficult once they are mixed together in a single-stream system. However, better data can be collected at transfer stations and materials recovery facilities (MRFs) with a concerted effort by transporters and the MRFs to estimate a breakdown of materials collected in a single-stream program. The Environmental Protection Agency provides a working paper outlining steps municipal governments can take to collect better data.

The EPA recommends that states looking to collect more data on recycling programs should ascertain what authority the state has to require local governments and private parties to provide data.<sup>269</sup> As it stands now, Pennsylvania regulation requires only that counties provide a description of “the kind and weight or volume of materials recycled by the [material recovery] operation” in the municipal waste management plan.<sup>270</sup> This regulation should be revised to specify that tonnages of the eight Act 101 materials and a breakdown of plastics into PET, HDPE, and other mixed plastics will be required to be reported by the counties to the DEP.

The statutory provision governing mandatory recycling should also be amended to empower the counties, pursuant to their reporting requirement to the DEP, to require material recovery facilities to provide data on the material that they process from the municipalities. For instance, instead of receiving and reporting 15,000 tons of “single stream material” received from a given county, an MRF should also create and process data on how much aluminum, glass, plastic, cardboard, and other material was part of that single stream collection after it has been sorted. Doing so will allow the DEP to obtain data from the “backend” after the materials have been sorted, in addition to the “front end” reporting from municipalities. This kind of “backend” count can also be used to determine how much contamination is found in single-stream material by subtracting the total of all individual material categories leaving the MRF and subtracting that from the “single-stream” volume that the MRF receives. It would also permit a comparative analysis among the counties as to who has the “cleanest” recycling streams.

The EPA notes that several states require facilities to report the quantity of waste handled as a condition of holding a permit, and suggests that incorporating reporting requirements into the permitting process could be an avenue to obtaining data from processing facilities.<sup>271</sup> However, Pennsylvania does not require permits for facilities handling source-separated recyclables.<sup>272</sup> Instead, a regulation governing source-separated program elements (25 Pa. Code § 272.421) should be amended to require that any MRFs or transfer stations that accept source separated materials to make a record of the weight or volume of the components of single-stream recyclables accepted at the facility and, if possible, what municipality they originated from.

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<sup>269</sup> Environmental Protection Agency, “Measuring Recycling: A Guide for State and Local Governments,” Sept. 1997, <https://archive.epa.gov/wastes/conservation/tools/recmeas/web/pdf/guide.pdf>.

<sup>270</sup> 25 Pa. Code 272.226(a)(3).

<sup>271</sup> EPA, Measuring Recycling, *supra* n. 269 at p. 33.

<sup>272</sup> Act of July 11, 1990, (P.L. 450, No. 109, § 1), amending the Solid Waste Management Act; 35 P.S. § 6018(2)(ii); 25 Pa. Code §271.101(b)(2) (“A person...is not required to obtain a permit ... for a source separation and collection program for recycling municipal waste ... or collection or processing centers for source separated recyclable materials.”).

## 2. Increase the Recycling Fee Paid on Municipal Solid Waste Disposal

Act 101 imposed a fee on the disposal of municipal waste with the money collected being deposited into the Recycling Fund. The recycling fee was statutorily set at \$2 per ton and has never been increased to keep up with inflation. According to the Department of Labor, Bureau of Labor Statistics the two-dollar fee would, if adjusted for inflation from 1988 to 2023, be worth \$5.22.

One of the concerns Commission staff heard regarding raising the recycling fee is that, since the passage of Act 101 in 1988, two other fees have been added to the cost of disposing municipal waste. Act 68 of 1999 established the Environmental Stewardship Fund with a \$0.25 per ton surcharge on waste received at a landfill.<sup>273</sup> Act 90 of 2002, known as the Waste Transportation Safety Act, placed a \$4 per ton fee on all solid waste disposed of at a landfill.<sup>274</sup>

However, as it currently stands, the \$2 Recycling Fee is insufficient to cover the grants from the DEP to the municipalities to cover the rising costs of operating a curbside recycling program and the expenses related to providing technical assistance to the municipalities. The start of this decade for the recycling industry and municipal curbside recycling programs has been defined by rising costs for collection, processing, and administration and stagnant or falling prices for the recycled materials.

The Solid Waste Advisory Council (SWAC) of the DEP has also noted that the current Recycling Fee falls short of providing adequate funding for recycling programs. Although they stopped short of recommending that the fee be increased, it was stated that the decreasing value of the fund's revenue combined with the use of Recycling Fund fees for non-recycling purposes "has greatly impeded DEP's ability to implement new plans and new ideas."<sup>275</sup> The SWAC recommended keeping funds derived from the \$2 Recycling Fee in the Recycling Fund, and cease diverting money from the Recycling Fund to the General Fund or for other causes.<sup>276</sup>

At this point in time, to provide adequate grant funding to cover the increasing expenses of recycling, provide technical assistance to municipalities, and implement the recommendations in this report, the Recycling Fee should be increased to \$5 per ton. A period of phased increases in the Recycling Fee could be used to implement this change. Gradually raising the fee over a period of years would give all stakeholders time to adjust to the change and assess the impact of a higher Recycling Fee.

If increasing the Recycling Fee is not feasible, then alternatively money from the Environmental Stewardship Fund should be allocated to the Recycling Fund to ensure that the existing Act 101 grant programs are adequately funded and that municipalities applying for those grants are able to be awarded funding.

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<sup>273</sup> Act of Dec. 15, 1999 (P.L. 949, No. 68); 27 Pa. C.S. § 6101 *et seq.*

<sup>274</sup> Act of Jun. 29, 2002 (P.L. 596, No. 90, § 2); 27 Pa. C.S. § 6201 *et seq.*

<sup>275</sup> Solid Waste Advisory Committee, "Act 101 Program Review," *supra* n. 103 at p. 1.

<sup>276</sup> *Id.* at p. 3.

### **3. Revise Statutes Encouraging Recycled Content in Government Procurement to Better Incentivize the Use of Products Manufactured with Recycled Materials**

Pennsylvania law requires that the Department of General Services must give a price preference of five percent for recycled materials used in projects for which it solicits bids. Additionally, at least 40 percent of the paper it procures must be made from recycled material. These provisions should be amended to permit a price preference of up to 10 percent for recycled materials and require a greater percentage of paper be made from recycled materials.<sup>277</sup> Additionally, the procurement rules for Commonwealth agencies<sup>278</sup> should be updated and expanded to require them to purchase a recycled version of whatever they are procuring, if it is available and does not result in a reduction in quality or usability, and so long as the item with recycled content is not more than 10 percent of the cost of a version that is not made from recycled material.

Recycled materials were less commonly used when this provision was enacted in 1988. Now, many items include recycled content and it is common to find things such as tissue paper and office paper made from recycled fiber. Recycled content requirements in government procurement create markets for goods made from recycled material and in turn help support demand for the material collected, sorted, and bailed by material recovery facilities. Pennsylvania should lead by example and bring its recycled content procurement statute into the 2020s.

### **4. Use Recycling Fund Money to Provide Drop-off Recycling Programs with a Focus on Communities That Do Not Have Curbside Recycling**

While Pennsylvania does a good job of recycling, there remains plenty of room for improvement. Although the most populous municipalities provide curbside recycling and more than 90 percent of the Commonwealth's residents have access to recycling, large swaths of the state are left without such access, largely due to their rural character. (See the maps in the Appendix for a visual representation of municipal recycling programs).

To expand access to recycling without imposing the costs and requirements of curbside recycling onto small municipalities, Act 101 should be amended to require counties with limited curbside recycling to establish drop-off or convenience centers in designated areas that do not have access to curbside recycling or extant drop-off programs. The cost of operating these newly established recycling convenience centers should be borne, at least partly, by the Recycling Fund. Alternatively, or in addition to requiring convenience centers or drop-off locations for recyclables, the DEP Bureau of Waste Management should sponsor convenience centers or drop-off locations for residents of areas with limited recycling access.

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<sup>277</sup> See The Municipal Waste Planning, Recycling, and Reduction Act, §§ 1505 and 1511; 53 P.S. §§ 4000.1505 and 400.1511.

<sup>278</sup> The Municipal Waste Planning, Recycling, and Reduction Act, § 1504; 53 P.S. § 4000.1504.



## 5. Ban Disposal of Metal and Cardboard from Commercial Sources

Disposal bans for certain materials have been used in the past to steer unwanted items toward recycling or other proper channels for dismantling items. These bans have generally been applicable to environmentally hazardous items such as car batteries or electronic waste. However, to increase the volume of recyclable materials that stay out of landfills or are burned for energy and are made into new products, Act 101 should be amended to prohibit the disposal of cardboard and metal by commercial enterprises.

A substantial amount of cardboard and metal (particularly aluminum) is discarded, even though these materials are readily recyclable, have a high scrap value, and are in high demand by manufacturers. A 2021 waste composition study conducted by the DEP concluded that 24.1 percent of all disposed municipal solid waste is composed of Act 101 recyclables. However, this figure drops to 13.9 percent if the categorization of Act 101 recyclables is the same, narrower one used in the DEP's 2001 waste composition study. If the earlier, narrower categorization of Act 101 recyclables is used, the percentage of municipal solid waste consisting of recyclable materials has fallen since 2001, when such recyclables made up 22 percent of waste.<sup>279</sup>

Nevertheless, recyclable materials still make up a substantial proportion of the waste stream in the Commonwealth. Counting both residential and commercial sources, approximately 685,000 tons of cardboard, 126,000 tons of PET, 75,000 tons of steel cans, 54,000 tons of aluminum cans, 32,000 tons of other aluminum, and 156,000 tons of other ferrous metals were estimated to have been discarded — sent to a landfill or incinerator.<sup>280</sup>

Commercial sources of metals and cardboard, rather than households, should be targeted by a disposal ban. The commercial sector was responsible for most of the disposed cardboard in the DEP's waste composition study, with roughly 500,000 tons of cardboard in the municipal waste stream originating from commercial sources.<sup>281</sup> Aluminum and cardboard are higher-value recyclable materials and commercial sources of these materials tend to be large generators that provide better sorting of materials than residential single-stream.

The Solid Waste Advisory Committee of the Department of Environmental Protection has also recommended a disposal ban targeted at metals and cardboard. To support the enactment of this policy, the DEP has created a permit-by-rule for rural transfer facilities to allow collected materials to be stored and ensure that solid waste disposal regulations do not interfere with recycling.<sup>282</sup> To further support a disposal ban, the DEP recommended modifying Act 101 to require drop-off facilities for aluminum, other metals, and cardboard. The Commission also recommends such an amendment to Act 101 — Recommendation 4 — and specifically recommends targeting areas without access to curbside recycling or already extant drop-off programs.

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<sup>279</sup> Pennsylvania Department of Environmental Protection, "Waste Characterization Study, Final Report," Sept. 2022, fig. 4-6, p. 4-5, [https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Documents/2022/PA\\_DEP\\_Report\\_FINAL\\_10-04-2022.pdf](https://files.dep.state.pa.us/Waste/Recycling/RecyclingPortalFiles/Documents/2022/PA_DEP_Report_FINAL_10-04-2022.pdf).

<sup>280</sup> *Id.* at p. 4-7, Table 4-1.

<sup>281</sup> *Id.* at p. 4-13, Table 4-4.

<sup>282</sup> 25 Pa. Code §§ 271.103(i) and 279.1(a).

The Solid Waste Advisory Committee of the Department of Environmental Protection also recommended modifying municipal waste regulation to require additional processing at landfills and resource recovery facilities to support a disposal ban. The Commission does not propose such a recommendation because it is recommending a disposal ban only for certain materials that originate from a commercial establishment. Additionally, cardboard that is mixed with municipal solid waste is likely to be destroyed or significantly degraded in the process of collection, transportation, and storage. It would be more effective to prohibit the disposal of cardboard in the first place by commercial establishments.

The Commission is not recommending additional processing at landfills for another reason. This report discusses the failure of disposal bans in Vermont and Massachusetts and the cities of San Francisco, California, and Seattle, Washington. Those jurisdictions embarked on an ambitious policy of prohibiting many common household items from being disposed of, including compostable food scraps. The bans encompassed too much and included lower-value and harder-to-recycle items such as plastic film. Additionally, they were targeted toward hundreds of thousands or millions of small-scale generators — that is, households — ensuring that enforcement would be a virtual nullity.

Conversely, the disposal ban recommended here is targeted toward large generators who are either already required to recycle in accordance with Act 101 or who will be supported by additional collection capacity funded by a reinvigorated Recycling Fund. And the ban targets only a few items which are higher in value and have a robust post-consumer market.

## **6. Improve Education about Recycling in the Commonwealth**

Act 101 currently requires the municipalities inform their residents every six months about their recycling program. And counties must include information about their education and outreach efforts in their solid waste management plan. However, many people are still confused about what to recycle and how.

Additionally, some question the value of recycling, and “anti-recycling” campaigns have emerged in some corners of society in the past few years. Greenpeace, for instance, released a paper in 2022 arguing that plastic recycling is a failure because most plastic is not recyclable and even the plastics which can be recycled ultimately are recycled at very low rates when looking at nationwide data. That organization advocates for a system of reuse and refill and moving away from single-use plastics.

These “anti-recycling” campaigns, which provide some criticism and insight into the problems facing recycling, may cause some people to question whether the items they place in their curbside bin or cart are even being recycled. Some may not be affected by such information but may not recycle simply because they do not want to go through the trouble of cleaning bottles or jars or breaking down cardboard boxes. In the end, it is easier to throw everything in the trash can instead of cleaning and separating recyclable items, and many people will just follow the path of least resistance.

Educating Pennsylvanians about recycling is one of the powers and duties of the DEP under Act 101. To educate consumers on the value of recycling, the DEP should develop a campaign to promote recycling, explain that it is worthwhile, that the materials placed at the curb each week are in fact recycled, and that recycling plays an important role in helping residents to be good stewards of the environment, reducing the amount of virgin materials used, as well as providing manufacturers in the Commonwealth with a source raw material for their products. Municipalities, in turn, should be required to distribute this content to their residents alongside their mandated notification to residents concerning recycling program features and requirements.<sup>283</sup>

Additionally, Act 101 should be amended to require that the municipalities' semi-annual notification to residents include information on how to recycle correctly — such as rinsing out bottles, whether to leave caps on plastic bottles, whether pizza boxes are accepted, and so forth. This way, residents will be appraised of the “why,” “how,” and “where” of recycling in the Commonwealth.

## **7. Improve Coordination between Adjacent Municipalities and Between Counties and their Municipalities**

One of the issues that the Commission heard from county recycling coordination staff was that municipalities are largely left to their own devices regarding what material gets recycled. Currently, the counties are required to submit a municipal waste management plan to the DEP. The counties are required to describe and evaluate aspects of recycling that will give a clearer picture of what materials to collect and how the municipalities' recycling programs should function. For instance, the county must analyze the “existing materials recovery operations and the kind and weight or volume of materials recycled,” the “compatibility of recycling with other municipal waste processing or disposal methods, giving consideration to and describing anticipated and available markets for materials collected through municipal recycling programs,” and the “potential benefits of recycling.”

However, these plans are generally updated infrequently as the statute only requires plan updates in certain circumstances. One of those circumstances is when a plan update is “otherwise required by the Department” of Environmental Protection.<sup>284</sup> The Department is also permitted to require a municipal waste management plan to “include any other information” that the Department requests.<sup>285</sup>

The Department should require a plan update for counties to reevaluate their recycling programs, analyze if municipalities are coordinating with each other in developing recycling programs, to what degree, and how they are doing so, and to request that the counties address how they are coordinating or plan to coordinate recycling programs within the county.

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<sup>283</sup> The Municipal Waste Planning, Recycling, and Reduction Act § 1500(d); 53 P.S. § 4000.1500(d).

<sup>284</sup> The Municipal Waste Planning, Recycling and Waste Reduction Act § 501; 53 P.S. § 4000.501(c)(3).

<sup>285</sup> Id. at § 502; 53 P.S. § 4000.502(n).

Additionally, Section 304 of Act 101, describing the powers and duties of municipalities other than counties, should be amended to include the power and duty to coordinate recycling programs with other municipalities that offer curbside recycling, whether they are mandated by Act 101 or are voluntarily providing recycling services.<sup>286</sup>

## **8. Increase the Items Act 101 Municipalities are Required to Recycle**

One of the more frustrating aspects of making recycling the responsibility of municipal government is that some communities will choose different items to accept for recycling. This could be due to a number of factors, but in most cases is usually the result of acceptance or non-acceptance by an MRF or whether the cost to accept certain items is worth the price local residents pay for recycling. However, with the exception of glass — which has a relatively low scrap value and is heavy and therefore costly to transport — and certain plastics, there is little reason an MRF or hauler would not accept all Act 101 recyclable materials.

Instead of requiring the municipality to choose three of the eight materials listed, Act 101 should be amended to require the municipality to require its residents to recycle all items that are accepted by a contracted hauler or MRF. Exceptions should be made for some materials. The amended statute suggested here would allow for municipalities to determine whether it is cost-effective to recycle glass. Some municipalities, such as the city of Harrisburg, do not accept glass in their single-stream curbside programs due to the cost of transporting the glass to an MRF.

Additionally, plastic films and plastic other than PET, HDPE, and polypropylene bottles, tubs, and containers should be exempt from any expanded recycling requirement. Even if an MRF technically accepts other plastics, they may be treated as contamination or otherwise separated from more valuable materials and ultimately discarded. In short, Act 101's recycled materials requirement should be amended from "no less than three" to any of the eight mandated materials (with plastic being further broken down into PET, HDPE, Polypropylene, and "other mixed plastic") accepted by the hauler or MRF ultimately receiving the materials, with the exception of glass and "other mixed plastic."

This recommendation is similar to one recommended by the Solid Waste Advisory Committee report. That Committee recommended that Act 101 be amended to "require all communities to collect all eight mandated materials."<sup>287</sup> Here the Commission is recommending a narrower, more focused policy — only communities that have curbside recycling programs should be required to collect all materials that are accepted by the hauler or MRF that the materials are destined for, with the exception of glass and the new category of "other mixed plastics."

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<sup>286</sup> See *Id.* at § 304; 53 P.S. 4000.304(a) (describing powers and duties of municipalities other than counties).

<sup>287</sup> Solid Waste Advisory Committee, Act 101 Program Review, *supra* n. 103 at p. 53.

## PROPOSED LEGISLATION

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### AN ACT

Amending the Act of July 28, 1988 (P.L. 556, No. 101), entitled

“An act providing for planning for the processing and disposal of municipal waste; requiring counties to submit plans for municipal waste management systems within their boundaries; authorizing grants to counties and municipalities for planning, resource recovery and recycling; imposing and collecting fees; establishing certain rights for host municipalities; requiring municipalities to implement recycling programs; requiring Commonwealth agencies to procure recycled materials; imposing duties; granting powers to counties and municipalities; authorizing the Environmental Quality Board to adopt regulations; authorizing the Department of Environmental Resources to implement this act; providing remedies; prescribing penalties; establishing a fund; and making repeals,” in amending the responsibility of municipalities other than counties, altering procurement by Commonwealth Agencies, increasing the price preference for bidders whose bids contain recycled materials, increasing the percentage of recycled paper to be purchased by the Department of General Services, amending the materials required to be collected by municipalities with curbside recycling programs and recognizing different plastic types as separate materials, banning disposal of cardboard and metal by commercial establishments within the jurisdiction of a municipality that has an ordinance mandating a source-separated recycling program, providing public information and education on recycling, and increasing the Recycling Fee.

The General Assembly of the Commonwealth of Pennsylvania hereby enacts as follows:

Section 1. Subsection 304(a) of the act of July 28, 1988 (P.L. 556, No. 101), known as the “Municipal Waste Planning, Recycling and Waste Reduction Act” is amended to read:

Section 304. Powers and duties of municipalities other than counties.

(a) Responsibility of other municipalities.-- Each municipality other than a county shall have the power and its duty shall be to assure the proper and adequate transportation, collection and storage of municipal waste which is generated or present within its boundaries, to assure adequate capacity for the disposal of municipal waste generated within its boundaries by means of the procedure set forth in section 1111, and to adopt and implement programs for the collection and recycling of municipal waste or source-separated recyclable materials as provided in this act, which shall include coordinating with neighboring municipalities for the purpose of carrying out its responsibilities as set forth in this Act and, if feasible, devising joint bids, plans, and programs for source-separated recycling.

\*\*\*

Section 2. Subsection 701 of the act is amended to read:

Section 701. Recycling fee for municipal waste landfills and resource recovery facilities.

(a) Imposition.--There is imposed a recycling fee [of \$2] per ton for all solid waste processed at resource recovery facilities and for all solid waste except process residue and nonprocessable waste from a resource recovery facility that is disposed of at municipal waste landfills. Such fee shall be paid by the operator of each municipal waste landfill and resource recovery facility. The recycling fee shall be as follows:

(1) On January 1, 2024 and for two years thereafter, the recycling fee shall be \$3 per ton;

(2) On January 1, 2026 and for two years thereafter, the recycling fee shall be \$4 per ton;

(3) On January 1, 2028 and thereafter, the recycling fee shall be \$5 per ton.

\*\*\*

Section 3. Subsections 1501(c) and (d) of the act are amended and a new subsection (c.1) is added to read:

Section 1501. Municipal implementation of recycling programs.

\*\*\*

(c) Contents.--The source-separation and collection program shall include, at minimum, the following elements:

(1) An ordinance or regulation adopted by the governing body of the municipality, requiring all of the following:

(i) Persons to separate [at least three] any materials deemed appropriate by the municipality from other municipal waste generated at their homes, apartments and other residential establishments and to store such materials until collection. The [three] materials shall be [chosen from] determined by whether the material is accepted for processing by the materials recovery facility (MRF) that the municipality utilizes to accept the materials, and include the following: [clear glass, colored glass,] aluminum, steel and bimetallic cans, high-grade office paper, newsprint, corrugated paper, and PET, HDPE, and PP [and] plastics. Clear glass, colored glass, and other mixed plastics may be deemed appropriate by the municipality if the material is accepted for processing by the materials recovery facility (MRF) that the municipality utilizes but in any event will not be deemed appropriate by this provision solely on the basis of their acceptance by the materials recovery facility (MRF). Nothing in the ordinance or regulation shall be deemed to impair the ownership of separated materials by the person who generated them unless and until such materials are placed at curbside or similar location for collection by the municipality or its agents.

\*\*\*

(c.1) Disposal Ban.--Any commercial establishment within the jurisdiction of a municipality that is required to have a source-separated recycling program pursuant to subsections (a) or (b) of this section, or is otherwise located within the jurisdiction of a municipality that has an ordinance mandating a source-separated recycling program, shall not dispose of cardboard, aluminum cans,

bottles, or containers, or steel cans, bottles, or containers, with municipal waste or in any municipal waste landfill or resource recovery facility, and shall recycle the same.

(1) Exception.--If an item of cardboard is soiled, waterlogged, or otherwise damaged to the point where it cannot be recycled or would become a contaminant if recycled, a commercial establishment may dispose of it.

\*\*\*

(d) Notice.--Each municipality subject to this section shall establish a comprehensive and sustained public information and education program concerning recycling program features and requirements. The public information and education shall include instructions on what items are recyclable, how to prepare items for recycling, days of the week on which recycling is collected, and any educational material developed by the department that explains or promotes the value of recycling. As a part of this program, each municipality shall, at least 30 days prior to the initiation of the recycling program and at least once every six months thereafter, notify all persons occupying residential, commercial, institutional and municipal premises within its boundaries of the requirements of the ordinance. The governing body of a municipality may, in its discretion as it deems necessary and appropriate, place an advertisement in a newspaper circulating in the municipality, post a notice in public places where public notices are customarily posted, including a notice with other official notifications periodically mailed to residential taxpayers or utilize any combination of the foregoing.

\*\*\*

Section 4. Subsection 1504 of the act is amended to read:

Section 1504. Procurement by Commonwealth Agencies.

\*\*\*

(c) Recycled materials.--

(1) Commonwealth agencies shall review and revise their procurement procedures and specifications for the purchase of goods, supplies, equipment, materials and printing to ensure, to the maximum extent economically feasible, that such agencies purchase goods, supplies, equipment, materials and printing that may be recycled or reused when such goods, supplies, equipment, materials and printing are discarded.

(2) Commonwealth agencies shall review and revise their procurement procedures and specifications on a continuing basis to encourage the use of goods, supplies, equipment, materials and printing that may be recycled or reused.

(3) Commonwealth agencies shall also, in developing new procedures and specifications, encourage the use of goods, supplies, equipment, materials and printing that may be recycled or reused.

(4) Commonwealth agencies shall purchase goods, supplies, equipment, materials, and printing that is manufactured from recycled materials if such goods, supplies, equipment, materials, and printing is available and does not result in a reduction in quality or usability, and so long as the item with recycled content is not more than 10 percent of the cost of a version that is not made from recycled material.

(i) The minimum amount of recycled content to qualify as goods, supplies, equipment, materials, and printing with recycled material shall be the same as that

determined by the Department of General Services in accordance with Section 1505 of this Act.

\*\*\*

Section 5. Subsection 1505(b) of the act is amended to read:

Section 1505. Procurement by Department of General Services.

(b) Preference.--Every bidder for the purchase of goods, supplies, equipment, materials and printing which certifies that the goods, supplies, equipment, materials and printing subject to the bid contain the minimum percentage of recycled content that is set forth in the invitation for bids shall be granted a preference equal to [5%] 10% of the bid amount against any bidder that has not so certified. The Department of General Services shall waive this requirement for paper products purchased for State-owned hospitals.

\*\*\*

Section 6. Section 1511(b) of the Act of July 28, 1988 (P.L. 556, No. 101), known as the Municipal Waste Planning, Recycling and Waste Reduction Act, is amended to read:

Section 1511. Recycled paper products.

(b) Implementation.--The provisions of subsection (a) shall be implemented by the Department of General Services so that, of the total volume of paper purchased, recycled paper composes at least 10% of the volume in 1989, at least 25% of the volume in 1991 and at least 40% of the volume in 1993. Recycled paper must compose at least 50% of the volume in 2025.

\*\*\*

Section 7. Effective Date.

(a) With the exception of subsection 1501(c.1), this act shall take effect in 60 days from the date of enactment.

(b) Subsection 1501(c.1) shall take effect June 1, 2024.



**APPENDICES**

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**Appendix A:** 2022 Senate Resolution 285 ..... 107  
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THE GENERAL ASSEMBLY OF PENNSYLVANIA

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SENATE RESOLUTION

No. 285 Session of  
2022

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INTRODUCED BY GORDNER, FONTANA, KEARNEY, LANGERHOLC, KANE,  
ARGALL, MENSCH, J. WARD, BREWSTER, PITTMAN AND STEFANO,  
MAY 3, 2022

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AS AMENDED, JUNE 21, 2022

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A RESOLUTION

1 Directing the Joint State Government Commission to conduct an  
2 assessment and analysis of public and private recycling  
3 infrastructure and operations across the Commonwealth.  
4 WHEREAS, Investment in a Statewide recycling strategy through  
5 programs that encourage uniform, life-cycle-focused product  
6 stewardship efforts at the producer level is essential; and  
7 WHEREAS, Pennsylvania has a vibrant and robust economy  
8 related to the production of packaging, which supports thousands  
9 of good-paying jobs across our communities; and  
10 WHEREAS, Many, if not all, of these products can be recycled  
11 at the end of their life, decreasing our collective dependence  
12 on virgin materials and increasing the consumption of recycled  
13 materials, ideally moderating environmental impacts in the  
14 process; and  
15 WHEREAS, Operations necessary to collect, sort and process  
16 some of these materials lag behind the volume of materials  
17 consumers use, resulting in their unfortunate diversion to  
18 landfills; and

1 WHEREAS, Increased investment in recycling infrastructure  
2 assists in reversing the trend toward using landfills; and

3 WHEREAS, Education of consumers on recycling and new  
4 recycling operations create good-paying jobs and promote  
5 increased circularity in the interest of sustainability;  
6 therefore be it

7 RESOLVED, That the Senate direct the Joint State Government  
8 Commission to conduct an assessment and analysis of public and  
9 private recycling infrastructure and operations across the  
10 Commonwealth, including:

11 (1) consulting with representatives from a diverse array  
12 of backgrounds, including, but not limited to, State agency  
13 officials, COUNTY OFFICIALS, nongovernmental organizations <--  
14 and industry experts from both the recycling and  
15 manufacturing communities;

16 (2) a review of recycling infrastructure investment  
17 strategies adopted by other states, including public-private  
18 partnerships, industry-managed product collection strategies  
19 and other legislative approaches to the management of  
20 plastics and other recyclable products, particularly  
21 packaging; and

22 (3) providing suggestions for statutory provisions to  
23 promote environmental stewardship across this Commonwealth  
24 through public policy while avoiding unintended consequences  
25 experienced by other jurisdictions;

26 and be it further

27 RESOLVED, That the Joint State Government Commission issue a  
28 report of its findings, along with any statutory or regulatory  
29 recommendations, to the General Assembly within 12 months of the  
30 adoption of this resolution.

*Pennsylvania Materials Recovery Facilities* (MRFs)

**Materials Recovery Facilities in the Commonwealth,  
as determined by Pennsylvania Department of Environmental Protection  
as of 2017**

<b>Facility Name</b>	<b>Address</b>	<b>County</b>	<b>Service Area</b>	<b>Materials Accepted</b>	<b>Form of Materials Accepted</b>
Adams Rescue Mission	2515 York Rd. Gettysburg, PA 17325	Adams	Adams County	Aluminum and tin cans, scrap metal, newspaper, cardboard, magazines, office paper, 1 and 2 plastics, clothing	Source Separated
Dluback Glass Company	1600 Saxonburg Rd. Natrona Heights, PA 15065	Allegheny	East Coast, Ohio, WV, VA	3 colors glass, clean florescent light bulbs, car windshields, plate glass	Source Separated and clean
Recycle Source LLC	50 Vespuscius St. Pittsburgh, PA 15207	Allegheny	Allegheny, Butler, Westmoreland Washington Counties	Plastics 1 and 2, 3 colors glass, tin and aluminum cans, newspaper, office paper, magazines, cardboard, hardback books, phone books, scrap metal	Conversion to Single Stream
Waste Management (Greenstar)	4100 Grand Avenue, Pittsburgh, PA 15225	Allegheny	Western PA	Plastics 1 and 2, 3 colors glass, tin and aluminum cans, newspaper, magazines, office paper, cardboard, gabled/aseptic containers	Single Stream
Armstrong County Recycling Center	139 Armsdale Rd. Kittaning, PA 16201	Armstrong	Armstrong County	Plastic bottles 1-6, 3 colors glass, tin and aluminum cans, office paper, cardboard, newspaper, waste oil	Source Separated
Leechburg Borough Recycling Center	260 Market St. Leechburg, PA 15656	Armstrong	Leechburg Borough and surrounding areas	3 colors glass, plastic 1 and 2, aluminum and tin cans, newspaper, chipboard, corrugated cardboard, office paper, magazines, telephone books	Source Separated
Beaver County Recycling Center	Recycling Center Bradys Run Park Brighton Township, PA 15009	Beaver	Allegheny, Butler, Beaver counties	Plastics 1 and 2, 3 Color glass, newsprint, magazines, office paper, phone books	Source Separated
Cogle's Recycling Inc.	1000 S. 4 <sup>th</sup> St. Hamburg PA 19526	Berks	Approx. 100-mile radius	any paper products, non-ferrous, plastics 1 & 2, 3 colors of glass, aluminum, tin cans, tablet bindings and aseptic/gable top cartons	Conversion to single stream

**Materials Recovery Facilities in the Commonwealth,  
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<b>Facility Name</b>	<b>Address</b>	<b>County</b>	<b>Service Area</b>	<b>Materials Accepted</b>	<b>Form of Materials Accepted</b>
TotalRecycle, Inc	1270 Lincoln Rd. Birdsboro PA 19508	Berks	Berks, Bucks, Carbon, Chester, Delaware, Lancaster, Lehigh, Montgomery, and Philadelphia counties	aluminum, steel and tin cans; cardboard, magazines, mixed paper, newspaper, 3 colors of glass, plastics 1 -7, aseptic containers and electronics	Single and dual stream
IRC Buckhorn Recycling & Compost Facility	1860 Blacksnake Rd., Dysant, PA 16636	Blair	Mainly Altoona area in Blair County	aluminum and tin cans, books, cardboard, catalogs, magazines, newspaper, office paper, paperboard, phone books, 3 colors of glass, plastics 1 & 2	Source separated
Northern Tier Solid Waste Authority Bradford Facility	West Burlington Twp P.O. Box 10 Burlington PA 18814	Bradford	Tioga, Bradford and Sullivan Counties	aluminum and tin cans, cardboard, junk mail, magazines, mixed paper, newspaper, office paper, textbooks, 3 colors of glass, textiles, office paper, foil, computers, plastics 1 & 2	Source separated
Republic Bucks Montgomery Recyclers	1510 Swamp Rd., Fountainville, PA 18923	Bucks	--	newspaper, cardboard, aluminum cans, plastics 1 & 2	--
Otter Recycling Center	Tullytown Resource Recovery Facility 200 Bordentown Rd. Tullytown, PA 19067	Bucks	Lower Bucks County	office paper, newspaper, plastics 1 & 2, aluminum and tin cans, 3 colors of glass and cardboard	Commingled with fiber separate
Tri-County Recycling LLC	120 Hutchman Rd P.O. Box 1167 Mars, PA 16046	Butler	Western PA	plastics 1 & 2, news and office paper, corrugated cardboard, aluminum and tin cans.	Single stream

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Centre County Recycling & Refuse Authority	253 Transfer Rd. Bellefonte PA 16823	Centre	Center, Cambria, Mifflin, Blare, Clearfield, and Huntingdon Counties	plastic bottles 1 through 7; rigid plastics, three colors of glass, aluminum and tin cans; catalogs, phone books, magazines, newspaper, office paper, mixed paper, paperboard and cardboard	Source separated
B.D.S.I. Recycling Center	P.O. Box 392 Elverson, PA 19520	Chester	Chester, Berks, Montgomery Counties	office paper, mixed paper, cardboard, plastics 1-7, aluminum and tin cans, 3 colors of glass	commingled with fiber separated or source separated
Clinton County Solid Waste Authority	P.O. Box 209 264 Landfill Lane, McElhattan, PA 17748	Clinton	Clinton County	aluminum and tin can, cardboard, magazines, newspaper, office paper, and junk mail, 3 colors of glass, plastics 1 - 7	Source separated
Bloomsburg Recycling Center	901 Patterson Dr. Bloomsburg, PA 17815	Columbia	Bloomsburg, Columbia County	3 colors of glass, aluminum and tin cans, mixed paper (newspaper, magazines, catalogs, junk mail, books, office paper, paper bags, cardboard) and plastic 1 - 7	Source separated
Harrisburg Waste Paper Company	4200 Industrial Rd. Harrisburg, PA 17110	Dauphin	Depends on Material; sourced from as far away as California	Any type of paper, paper fiber, some plastics and aluminum cans.	Source separated
Accurate Recycling Corp.	508 E. Baltimore Ave., Lansdowne, PA 19050	Delaware	30-to-40-mile radius	scrap metals, aluminum and tin cans, cardboard, newspaper and various fibers, plastics 1&2	Source separated
Republic Services	10 Reaney St. Chester, PA 19013	Delaware	50-mile radius	cardboard, newspaper, aluminum, 3 colors of glass	Source separated
Elk County Community Recycling Center	850 Washington St. St. Marys, PA 15857	Elk	Elk County	Aluminum and tin cans, mixed paper (newspaper, magazines, catalogs, junk mail, books, office paper, paperboard, cardboard) and plastic 1, 2 and 5.	Source separated



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CAP Glass, Inc	1005 Modulus Rd. MT Pleasant PA 15666	Fayette	PA and neighboring states	Clear, amber, cobalt and green glass and plate glass	separated and mixed cullet
Goodwill Recycling	105 Romeo Lane Uniontown, PA 15401	Fayette	Fayette County	plastics 1 & 2, 3 colors of glass, tin & aluminum cans, office paper, magazines, cardboard, newspaper, used motor oil	commingled with fiber separated
Chambersburg Waste Paper Co. Inc.	P.O. Box 975 2047 Loop Road, Chambersburg, PA 17201	Franklin	250-mile radius	aluminum cans and any grade of paper and cardboard, plastics 1&2; film	Commingled and source separated
Washington Township Recycling Center	12725 Buchanan Trail, East Waynesboro, PA 17268	Franklin	Adams and Franklin Counties	cardboard, newspaper, aluminum and tin cans, 3 colors of glass, plastics 1&2	commingled with fiber source separated
Greene Arc Inc.	197 Dunn Station Rd. Prosperity, PA 15329	Greene	Greene County and surrounding areas	3 colors of glass, tin & aluminum cans, books, cardboard, catalogs, magazines, office paper, newspaper, plastics 1 & 2	Commingled and source separated
Indiana County Solid Waste Authority	1715 Route 119 South Homer City, PA 15748	Indiana	Indiana, Cambria, and Armstrong Counties	plastics 1 & 2, 3 colors of glass, tin & aluminum cans, magazines, newspaper, office paper, and cardboard	source separated at drop off sites and at curb
Cocolamus Creek Disposal Service	31109 Route 35 North BOX 660 McAlisterville, PA 17049	Juniata	Juniata, Mifflin, Perry, Snyder, and Union counties	aluminum & tin cans, cardboard, catalogs, junk mail, magazines, newspaper, office paper, paperboard and phone books, 3 colors of glass, plastics 1 & 2	Commingled and source separated
Lackawanna County Recycling Center	3400 Boulevard Avenue, Scranton, PA 18512	Lackawanna	Lackawanna, Luzerne, Pike, Monroe and Wyoming Counties; New York state	3 colors of glass, plastics 1 & 2, office paper, news paper, magazines, phone books, cardboard, aluminum & tin cans, leaf waste	Commingled and source separated

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Good's Disposal Service	4361 Oregon Pike Ephrata, PA 17522	Lancaster	Lancaster County	Plastics 1&2, aluminum and tin cans, 3 colors of glass, cardboard, magazines, newspaper, telephone books, ferrous metals, including appliances, non-ferrous metals, sorted office paper, junk mail	Source separated
Gordon Waste Company	199 Bridge St. Columbia PA 17512	Lancaster	200-mile radius of Columbia PA	all grades of paper, cardboard, magazines, newspaper and books	commingled, and loose
CSR Brandywine Recyclers	328 North 14 <sup>th</sup> St. Lebanon, PA 17046	Lebanon	Lancaster, Dauphin, Cumberland, Berks, and Lebanon Counties	ferrous and nonferrous metals, aluminum cans, cardboard, office paper, newspaper, and computer paper. Plastics (commercial customers only)	Source separated
Lehigh Valley Recycling	3947 Portland St., Coplay, PA 18037	Lehigh	Allentown, Lehigh & Northampton Counties	cardboard paper, newspaper and office paper	source separated by type
J.P. Mascaro & Sons Wyoming Valley Division	871 E. Main St. Nanticoke, PA 18634	Luzerne	Lackawanna, Luzerne, Carbon, Schuylkill, and Columbia Counties	aluminum & tin cans, 3 colors of glass, cardboard, magazines, newspaper, office paper, plastics 1 through 7	Commingled glass, tin, aluminum, and plastics fiber separated
Louis Cohen & Son Inc.	9 Fellows Ave. Wilkes-Barre, PA 18702	Luzerne	Wilkes-Barre area	Cardboard, newspaper, office paper and other grades of fiber	Commingled and source separated
Municipal Recovery	495 Stanton St. Wilkes-Barre, PA 18702	Luzerne	Luzerne County and surrounding area	aluminum & tin cans, cardboard, magazines, newspaper and office paper, 3 colors of glass, plastics 1 & 2	single stream, commingled and source separated

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Northeast Cartage and Recycling Solutions	50 Breaker Rd., Hanover Township, PA 18704	Luzerne	Luzerne County and surrounding area	aluminum and steel cans, fiber (aseptic/gable top cartons, cardboard, magazines, milk cartons, newspaper, office paper, paperboard, phone books), glass (clear, amber and green) plastics (PET, HDPE, PVC, LDPE, PP, PS)	single stream and dual stream
Lycoming County Recycling Center	P.O. Box 187 Montgomery, PA 17752	Lycoming	Lycoming, Northumberland, Montour, Snyder, and Union Counties	aluminum and tin cans, aluminum foil, cardboard, catalogs, junk mail, magazines, newspaper, office paper, paper bags, paperboard, phone books, 3 colors of glass,	single stream and source separated
Penn Recycling Inc.	2525 Trenton Ave Williamsport, PA 17701	Lycoming	200-mile radius	aluminum cans, cardboard, office paper and computer paper	Source separated
Staiman Recycling	201 Hepburn St. Williamsport, PA 17701	Lycoming	Tioga, Clinton, Centre, Montour, Northern Tier, Snyder and Union Counties	aluminum cans, ferrous and nonferrous metals, cardboard, magazines, newspaper, office paper	Source separated
RecycALL	4832 Route 155 Port Allegany, PA 16743	McKean	up to a 400-mile radius	3 colors of glass, mixed cullet, wooden pallets	Source separated
Paul's Recycling Yard	24 Henderson St. Lewistown PA 17044	Mifflin	Lewistown area	aluminum and tin cans, ferrous and non-ferrous metals and cardboard	Source separated
Pheasant Valley Recycling	301 Pheasant Valley Rd., Lewistown, PA 17044	Mifflin	Approx. 50-mile radius, Huntingdon, Center, Snyder, Union and Juniata Counties	aluminum & tin cans, office paper, cardboard, magazines, catalogs	Source separated

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Chestnuthill Township Recycling Center	Hillcrest Drive P.O. Box 243 Brodheads ville PA 18322	Monroe	Chestnuthill Twp.	3 colors of glass, office paper, newspaper, catalogs, magazines, junk mail, books, plastics 1 & 2, plastic bags, rigid plastics, Styrofoam	source separated at the site by residents
Polk Township Recycling/Transfer Station	Polk Township Road, P.O. Box 137, Kresgeville, PA 18333	Monroe	Polk Twp residents that are part of PAYT program	aluminum and tin cans, tin foil, scrap iron, 3 colors of glass, cardboard, office paper, newspaper, waste oil, 1 & 2 plastics	source separated at the site by residents
Twin Boroughs Recycling Center	P.O. box 303 (mailing address) 365 Lincoln Ave. East Stroudsburg, PA 18301	Monroe	East Stroudsburg and general area	3 colors of glass, plastics 1&2, office paper, newspaper, magazines, cardboard, junk mail, and aluminum & tin cans.	source separated at the site by residents
Allied Waste Recyclery (Owned by Republic)	215 E. Dekalb Pike King of Prussia, PA 19406	Montgomery	Montgomery County and southeastern PA	office paper, newspaper, plastics 1 & 2, aluminum and tin cans, 3 colors of glass and cardboard, pet strapping and plastic film	Single stream
Great Valley Recycling	315 W. Sixth St. Bridgeport, PA 19405	Montgomery	Montgomery County	aluminum & tin cans, 3 colors of glass cardboard, magazines, newspaper, plastics 1 through 7	commingled with fiber source separated
ReCommunity Upper Dublin	1030 Fitzwatertown Road, Willow Grove, PA 19090	Montgomery	Montgomery County	office paper, newspaper, plastics 1 & 2, aluminum and tin cans, 3 colors of glass and cardboard	commingled with fiber separated or single stream

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Red Hill Borough Recycling Center	56 West Fourth Street, Red Hill, PA 18076	Montgomery	Red Hill, East Greenville, and Pennsburg Boroughs and surrounding area	3 colors of glass, aluminum and tin cans, plastic bottles 1 & 2, newspaper, magazines, catalogs, junk mail	Source separated and commingled
J.A.W.S Recycling Inc.	411 Railroad St. Danville, PA 17821	Montour	Borough of Berwick, Union, Snyder, Lycoming and Northumberland Counties	aluminum & tin cans, scrap metal, cardboard, chipboard, hardbound books, magazines, newspaper, office paper, 3 colors of glass, plastics 1 & 2	single stream and source separated
Waste Management (GREENSTAR)	799 Smith Street P.O. Box 95 Northampton PA, 18067	Northampton	SE, SC, NE regions & NJ	3 colors of glass, newspaper, office paper, ferrous/non ferrous metal, tin & aluminum cans, cardboard, plastics 1 through 7. Aseptic/gable top cartons	Single Stream and Dual Stream
CAP Glass Allentown, LLC	799 Smith Lane, Northampton, PA 18067	Northumberland	PA and neighboring states	3 colors of glass, mixed cullet, automotive/windshield glass	Source separated and mixed
Coal Township Recycling Center	261 Venn Access Rd., Coal Township, PA 17866	Northumberland	Coal Township and general area	plastics 1 & 2, 3 colors of glass, aluminum and tin cans, magazines, newspaper, office paper, and cardboard	Source separated
Jeff's Auto Body & Recycling Center, Inc.	5446 Snyderstown Rd., Paxinos, PA 17860	Northumberland	Northumberland County	mixed paper, cardboard, magazines, newspaper, plastics 1 & 2, aluminum and tin cans, ferrous and nonferrous metals	Source separated
Northumberland Borough Recycling Center	221 Second St. Northumberland, PA 17857	Northumberland	Point Township and Northumberland Borough	3 colors of glass, plastics 1 & 2, aluminum and tin cans, newspaper, magazines and catalogs	Source separated
John D'Orazio & Sons Inc.	2900 E. Bridge St. Philadelphia, PA 19137	Philadelphia	Philadelphia, Delaware, and Bucks Counties, State of Delaware	aluminum and tin cans, cardboard, mixed paper and office paper	Source separated

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Newman & Company Inc.	6101 Tacony St. Philadelphia, PA 19135	Philadelphia	Philadelphia and Bucks Counties and South New Jersey	newspaper, chipboard, mixed paper, cardboard, hard and soft white paper	Source separated
Philadelphia Transcyclery Co. (Owned by Republic Services)	2209 South 58 <sup>th</sup> St. Philadelphia, PA 19143	Philadelphia	Philadelphia, Smurfit-Stone, Waste Management and BFI haulers in area	office paper, newspaper, plastics 1 & 2, aluminum and tin cans, 3 colors of glass and cardboard	commingled with fiber source separated
ReCommunity Philadelphia	2904 Ellsworth St Philadelphia, PA 19146	Philadelphia	Philadelphia, Delaware County, S. New Jersey, Delaware	aluminum and steel cans, 3 colors of glass, plastics 1 - 7 and aseptic/gable top cartons, cardboard, junk mail, magazines, office paper, newspaper, paperback books, paperboard boxes, paper towel rolls, and phone books	Single stream
West Rock (formerly RockTenn)	5000 Flat Rock Rd. Philadelphia, PA 19127	Philadelphia	20-mile radius	newspaper, office paper and cardboard	Source separated
Waste Management	5245 Bleigh Ave., Philadelphia, PA 19136	Philadelphia	Philadelphia, Bucks, and Montgomery Counties; DE, NJ	mixed paper, newspaper and cardboard	commingled with fiber source separated
Waste Management Philadelphia Recovery Facility	5201 Bleigh Ave Philadelphia, PA 19136	Philadelphia	Philadelphia, Bucks, and Montgomery Counties; DE, NJ	recyclable grades of paper (cardboard, junk mail, magazines, newspaper, office paper, telephone books, etc.) aluminum and steel cans, glass, plastics #1-7. Aseptic/gable top cartons	Single stream
Potter County Solid Waste Authority	2504 SR 49 W. Ulysses, PA 16958	Potter	Potter County	clear, brown glass, aluminum cans cardboard plastics 1 & 2, newspapers, catalogs and magazines	Source Separated
Harsco Minerals International	49 Pinedale Industrial Rd., Orwigsburg, PA 17961	Schuylkill	DE, MD, NJ, PA	3 colors glass, triple mix container glass, window glass	Commingled and Source Separated

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Weiner Iron & Metal Co.	133 Ellsworth Dr. Montrose, PA 18801	Schuylkill	Schuylkill County and surrounding area	Office paper, newspaper, cardboard, aluminum and tin cans, ferrous and nonferrous metals	Source separated
Susquehanna County Recycling Center	133 Ellsworth Dr., Montrose, PA 18801	Susquehanna	Susquehanna and Wyoming Counties and NY	3 colors of glass; plastic bottles #1 & 2; cardboard, chipboard, magazines, newspaper, office paper, soft covered books, aluminum cans, tin cans, scrap metal.	Source separated
Northern Tier Solid Waste Authority Tioga Facility	P.O. Box 10 Burlington, PA 18814	Tioga	Tioga, Bradford, and Sullivan Counties	aluminum and tin cans, cardboard, junk mail, magazines, mixed paper, newspaper, office paper, textbooks, 3 colors of glass, textiles, office paper, foil, computers, plastics 1 & 2	Source separated
Wayne County Recycling Center	66 Volunteer Drive, Honedale, PA 18431	Wayne	Wayne and Pike Counties and some from NY	3 colors of glass, plastics 1 & 2, office paper, newspaper, magazines, chipboard, cardboard, catalogs, junk mail, phone books aluminum cans, tin cans, Christmas trees and scrap metal, textiles	source separated by residents
Bradish Glass	444 Willow Crossing Rd., Greensburg, PA 15601	Westmoreland	--	clear and brown glass, plate glass and over runs (will de-box) and other colors of clean glass	Source separated
Penn Waste, Inc.	P.O. Box 3066 York PA 17402	York	Cumberland, Lancaster and York Counties	3 colors of glass; plastics 1 through 7; aluminum, tin and steel cans; cardboard; catalogs; junk mail; magazines; newspaper; office paper; paperback books; paper bags; paperboard; and phone books. Aseptic/gable top cartons	single stream, commingled and source separated

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RCA - York	4455 Mt. Pisgah Rd. York, PA 17402	York	Approx. 100 mile radius	3 colors of glass, plastics 1&2, aluminum and tin cans, newspaper, office paper, magazines, catalogs, telephone books, cardboard.	Single stream

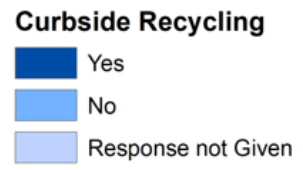
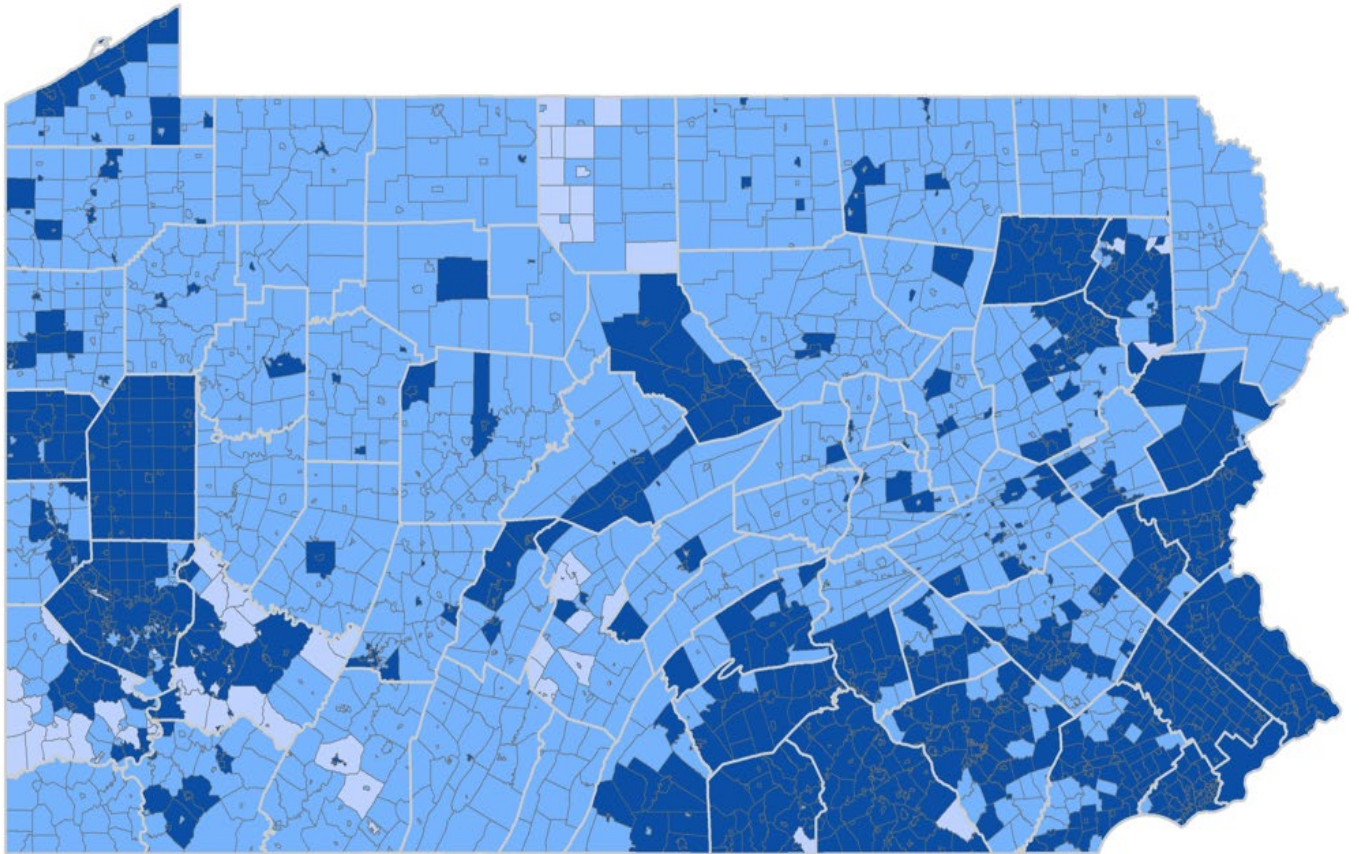
Source: Pennsylvania Department of Environmental Protection, Material Recovery Facilities in Pennsylvania, Feb. 17, 2017,  
<https://files.dep.state.pa.us/waste/recycling/recyclingportalfiles/Documents/MRFs.pdf>.



**MAPS - *Communities that recycle in Pennsylvania***

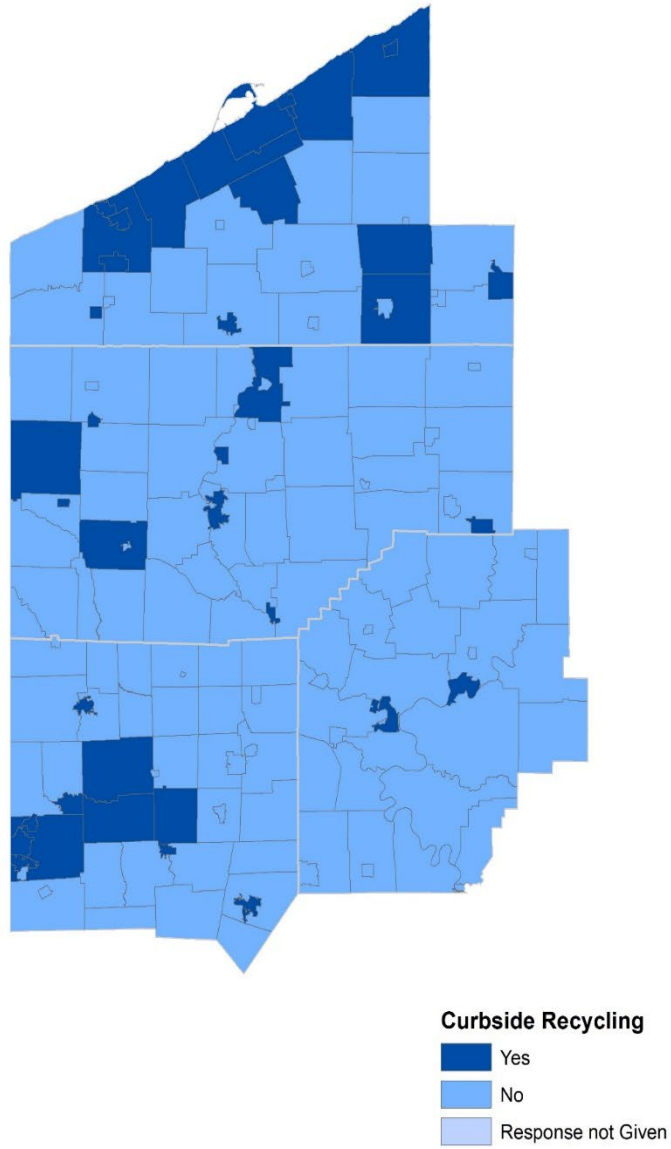
# Map 1

## Pennsylvania Municipalities with Curbside Recycling



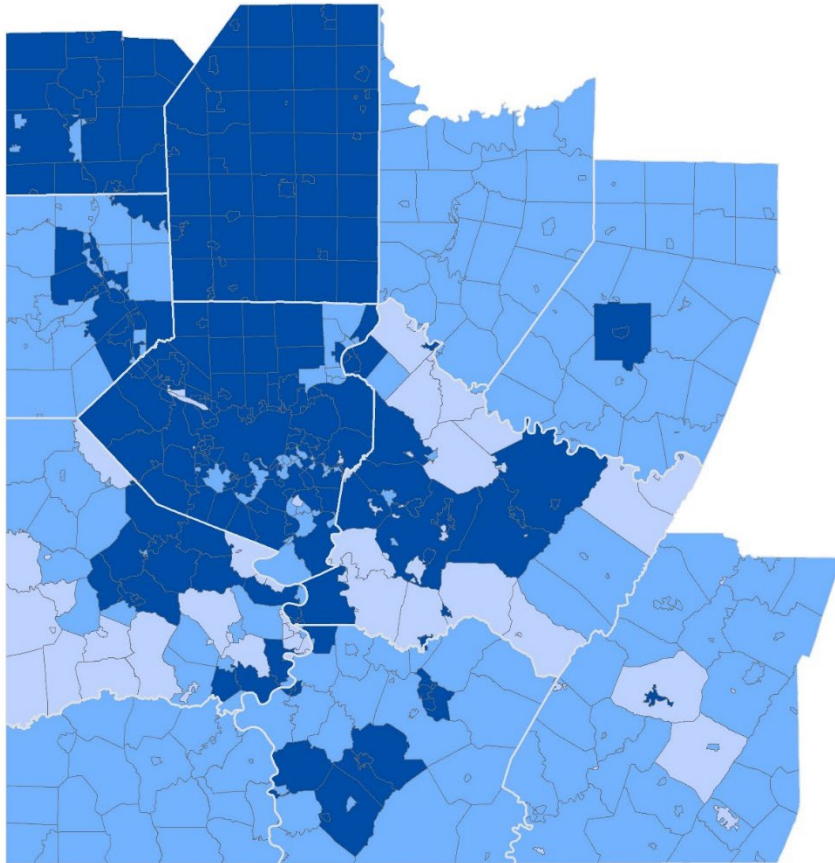
## Map 2

### Erie, Crawford, Mercer, Venango



### Map 3

**Lawrence, Butler, Indiana, Armstrong, Beaver,  
Allegheny, Westmoreland, Washington, Greene, Fayette, Somerset**



#### Curbside Recycling

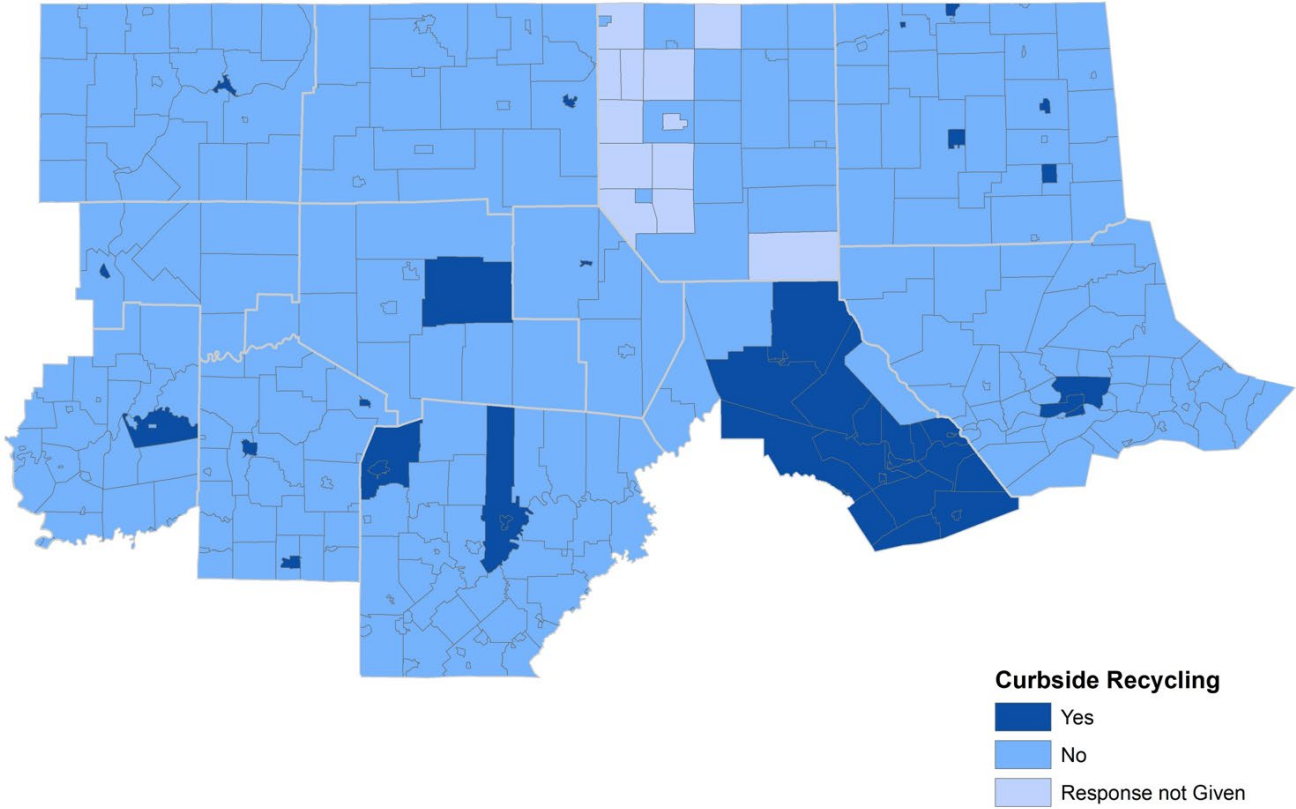
Yes

No

Response not given

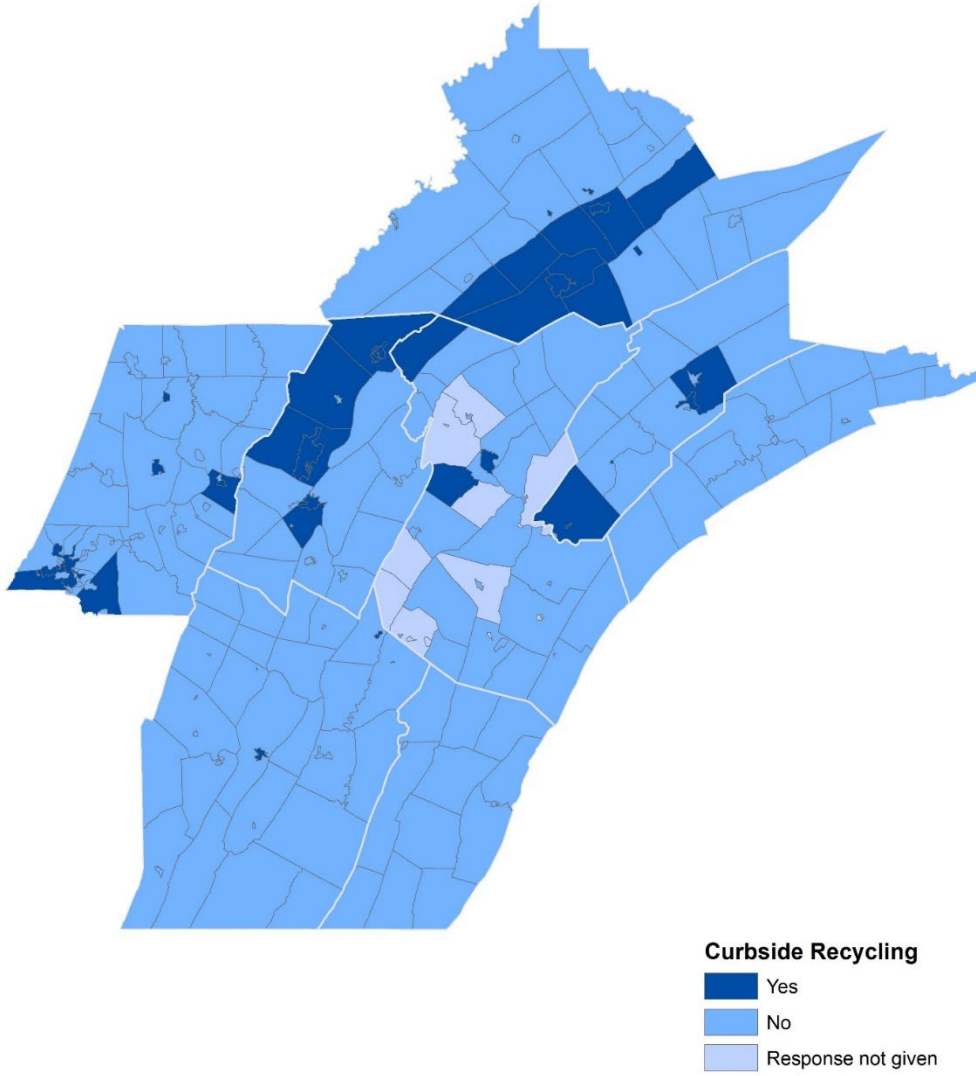
## Map 4

**Warren, McKean, Potter, Tioga, Forest, Elk, Cameron,  
Clinton, Lycoming, Clearfield, Jefferson, Clarion**



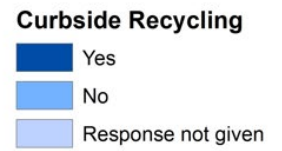
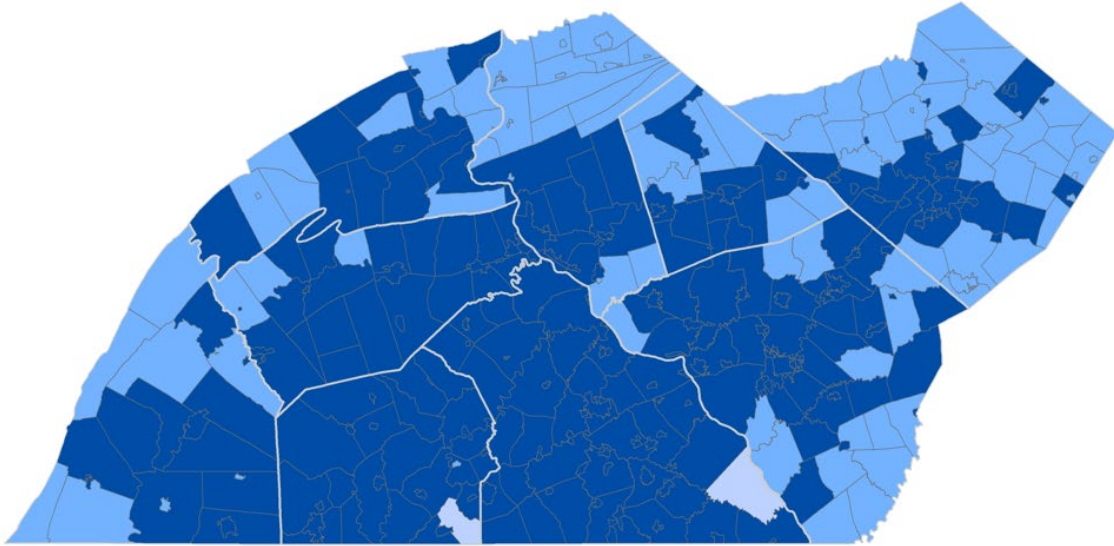
## Map 5

**Centre, Mifflin, Juniata, Huntingdon,  
Fulton, Bedford, Blair, Cambria**



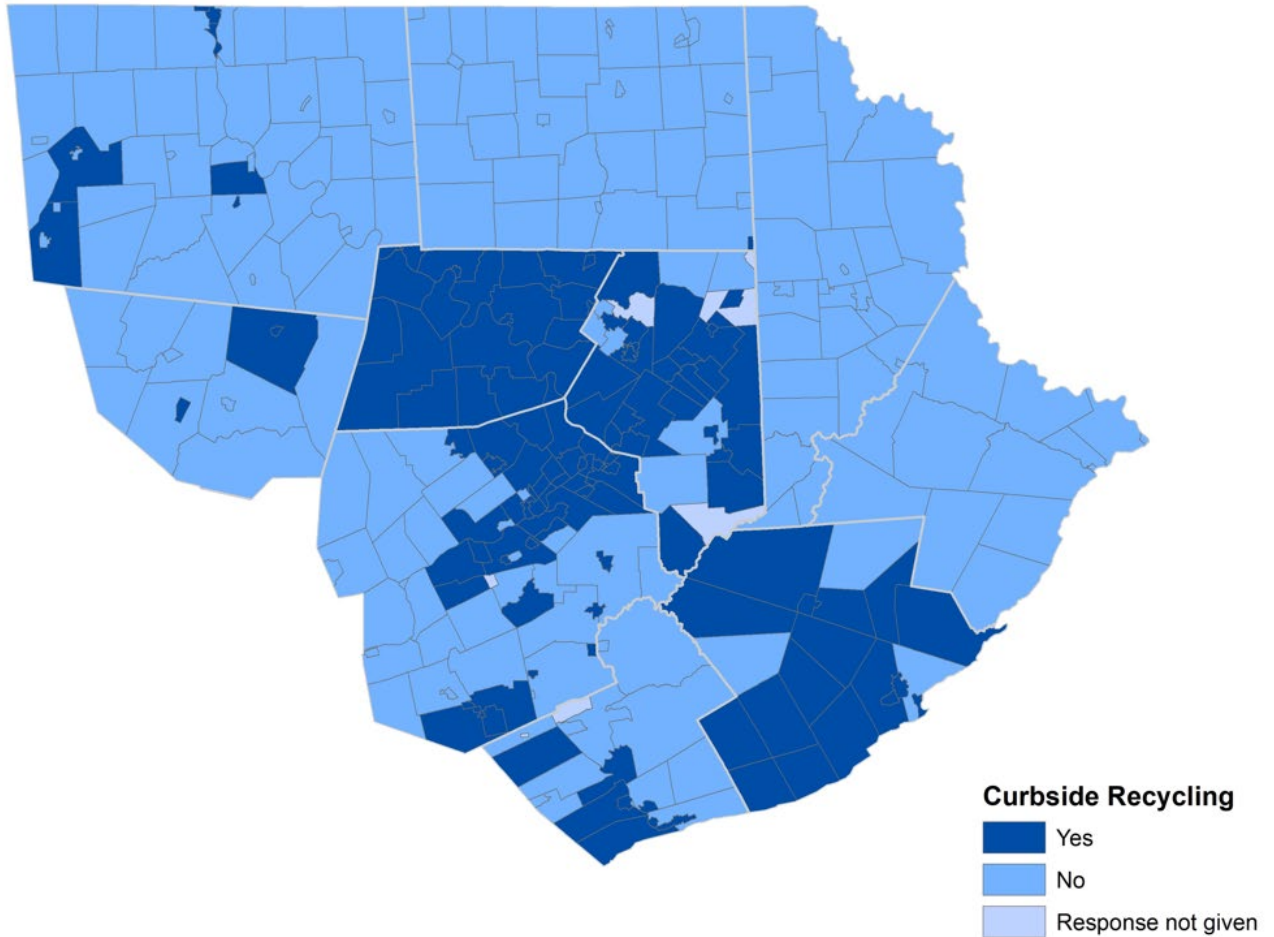
## Map 6

Dauphin, Perry, Cumberland, Franklin,  
Adams, York, Lancaster, Lebanon, Berks



**Map 7**

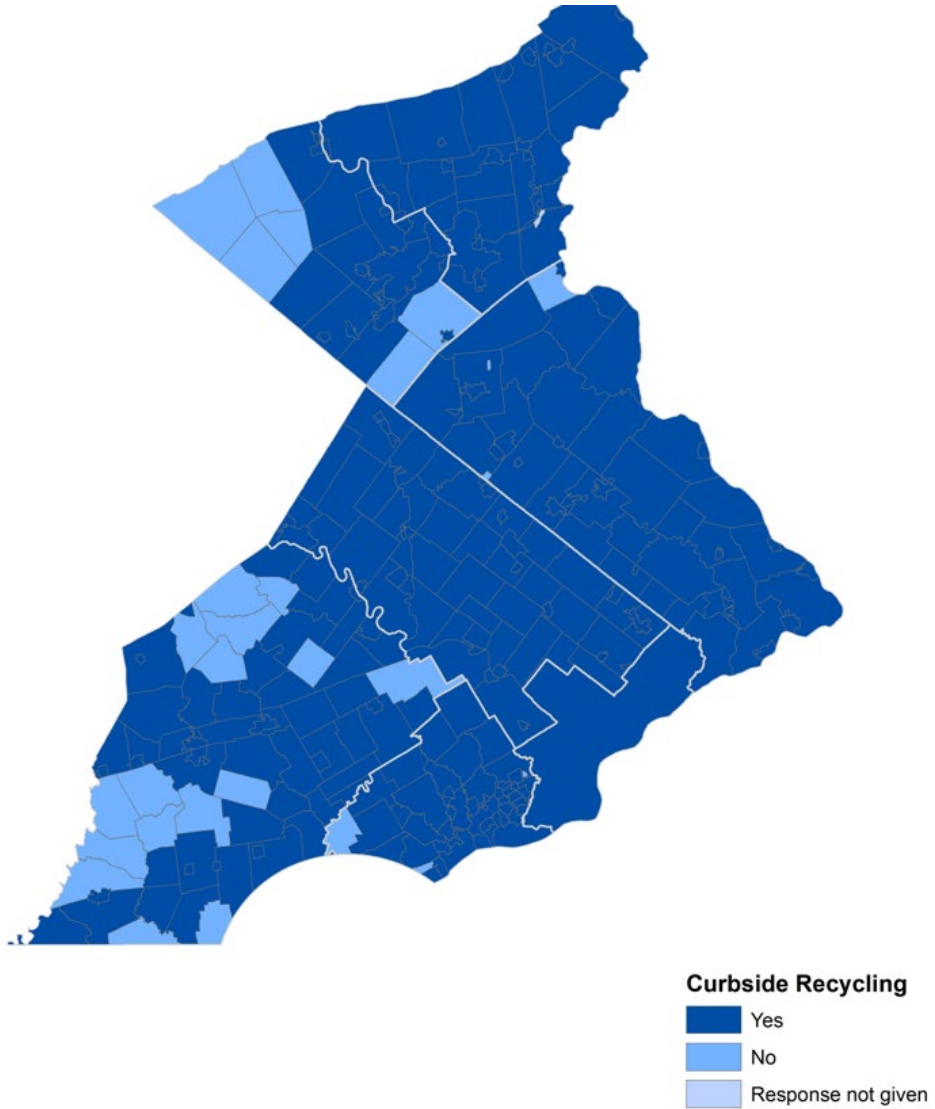
**Bradford, Susquehanna, Wayne, Sullivan,  
Wyoming, Lackawanna, Luzerne, Carbon, Monroe, Pike**





## Map 8

**Chester, Delaware, Montgomery, Philadelphia,  
Bucks, Lehigh, Northampton**



# Map 9

**Union, Snyder, Northumberland,  
Montour, Columbia, Schuylkill**

