



# 2015 Post-Consumer Plastics Recycling in Canada

March 2017

Prepared by Moore Recycling Associates for the  
Canadian Plastics Industry Association

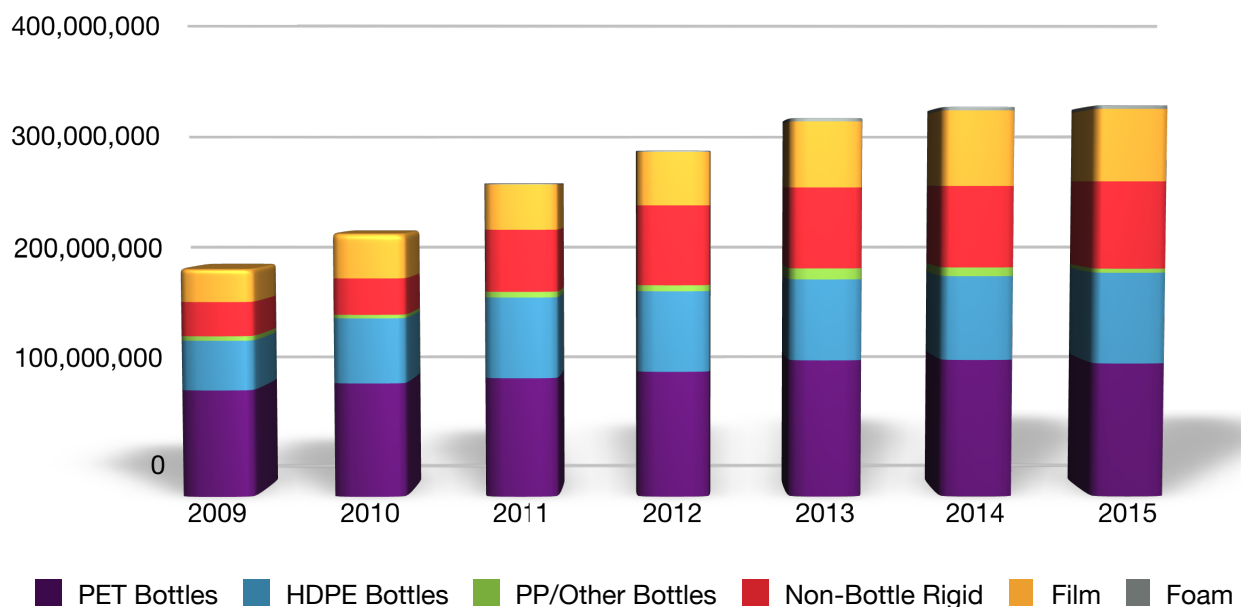
## Introduction

This is the seventh year that Moore Recycling Associates has conducted a survey to determine the amount of post-consumer plastic recovered in Canada for recycling. This report documents how much Canadian post-consumer plastic was collected and reclaimed by U.S. or Canadian reclaimers and how much was sold to overseas markets. This study is sponsored by the Canadian Plastic Industry Association (CPIA) and is made possible by the businesses that cooperate by providing data.

## Executive Summary

In 2015, at least 322 million kilograms of post-consumer (including commercial)<sup>1</sup> plastic material in Canada was collected for recycling. This represents a 0.4 percent increase over 2014, primarily due to increases in HDPE bottles and non-bottle rigid recycling.

### Post-Consumer Plastic Collected Year to Year<sup>2</sup> (kgs)



<sup>1</sup> Throughout this report, the term “post-consumer” refers to plastics that have been used for their intended purpose by consumers and businesses. Commercial materials that have met their intended use are often recovered outside of curbside or drop-off collection programs and include items such as totes, pallets, crates, and other commercial packaging. This report does not cover the recycling of post-industrial (pre-consumer) materials, which the U.S. EPA defines as materials, such as scrap and trimmings, that are generated in manufacturing and conversion processes.

<sup>2</sup> PET - polyethylene terephthalate, HDPE - high-density polyethylene, PP - polypropylene, LDPE - low-density polyethylene, PS - polystyrene, PVC - polyvinyl chloride

As was the case in 2014, the vast majority of material collected in Canada for recycling remained in North America rather than moving to overseas markets. Seventy-nine percent of the material reported was reclaimed in Canada or the U.S., and 17 percent was exported overseas. The destination of the remaining 4 percent is unknown.

### Summary of Canadian Post-Consumer Plastic Recycling

	2015 Collection (millions of kgs)	Change in Collection 2014-2015 (millions of kgs)	2015 Material Processed in Canada <sup>2</sup>	2015 Capacity <sup>3</sup> (millions of kgs)	2015 Utilization <sup>4</sup> of Capacity	North American End Markets
<b>PET Bottles</b>	110.2	-3	122.8	NA	NA	fiber, food & beverage bottles, film & sheet, strapping, non-food bottles
<b>HDPE Bottles</b>	74.8	5.8	97.4	106	92%	bottles, pipe, film & sheet, automotive applications, lawn & garden products, lumber & decking
<b>PP/Other Bottles</b>	3.3	-3.8	NA	NA	NA	For PP: automotive applications, crates & buckets, caps & closures, lawn & garden products
<b>Non-Bottle Rigid Plastics</b>	71.6	4.8	54.5	90	61%	automotive applications, crates & buckets, lawn & garden products, pipe, film & sheet, fence posts, consumer & household products
<b>Film</b>	59.2	-2.6	19.8	45	44%	film & sheet, pipe, automotive applications, lawn & garden products, pallets, lumber & decking, crates & buckets
<b>Foam</b>	3	0.1	NA	NA	NA	protective packaging, building products, picture frames

Most of the Non-Bottle Rigid Plastic increase, and the decrease in PP/Other Bottles, is due to a correction in the data for volumes of material previously reported as PP bottles that actually included a mix of bottle and non-bottle rigid plastic. The data for 2015 reflects the correct allocation of bottle and non-bottle rigid plastic. The PET Bottles and plastic Film categories

<sup>3</sup> 2015 Material Processed in Canada can include imports from the U.S., Mexico, and outside of North America. In 2015, the vast majority of imported material came from the U.S.

<sup>4</sup> Capacity for processing bottles often overlaps with capacity to process non-bottle rigid plastic and/or film. Thus, adding the capacities reported here for bottle, non-bottle rigid, and film could result in some double counting.

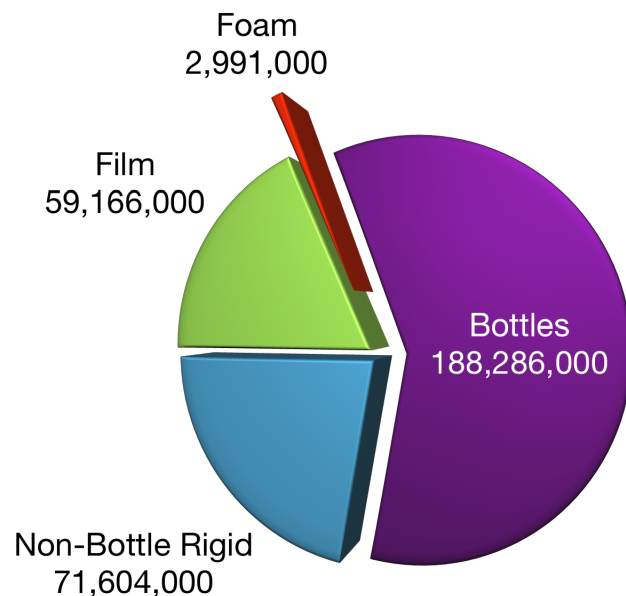
<sup>5</sup> Utilization is determined by using the estimated capacity and the reported purchases of material from Canada, the U.S., Mexico, and outside North America by Canadian reclaimers.

decreased in 2015 compared to 2014 reports, and the slight increase overall was mostly due to the increase in HDPE natural bottles that was reported in 2015. This is a voluntary survey; the amounts reported here represent the minimum that is known to have been recovered for recycling. A larger survey response rate would provide a more accurate—and likely higher—documented amount of Canadian plastic collected for recycling. This report's findings are based on data from two surveys: a post-consumer plastic recycling survey of export markets for all post-consumer plastic categories and all domestic markets (except for PET bottle reclaimers) conducted by Moore Recycling, and a separate survey of PET bottle reclaimers conducted by the Association of Plastic Recyclers (APR) and the National Association for PET Container Resources (NAPCOR). Data for this report were provided by 57 companies<sup>6</sup>, 24 Canadian and 17 U.S. plastic reclaimers<sup>7</sup>, as well as 16 exporters. Data gathered during the survey was cross-checked with data available from Canadian provinces and other recycling industry information.

Plastic bottles continue to comprise the majority of the recycled plastic market. PET bottles remain the highest volume plastic product segregated by resin, but this volume decreased slightly in 2015. HDPE natural bottles continued to be the second largest category segregated by resin and represent most of the overall growth in volume for 2015, with a 5.7 million-kilogram increase; all other categories combined exhibited a decrease of 4.4 million kilograms.

In 2015, non-bottle rigid plastic recycling increased by 4.8 million kilograms above 2014 values. Most of this increase was due to the shift in volume reported from PP Bottles to PP non-bottle rigid plastic, but there was also a small increase in mixed rigid bales reported.

Low resin prices at the end of 2015, and into 2016, hurt the growth of non-bottle rigid plastic recycling facilities in North America. Nevertheless, the volume of non-bottle rigid recycling reported here is likely conservative, particularly the volume reported as non-bottle rigid plastic segregated by resin (primarily from the commercial sector).



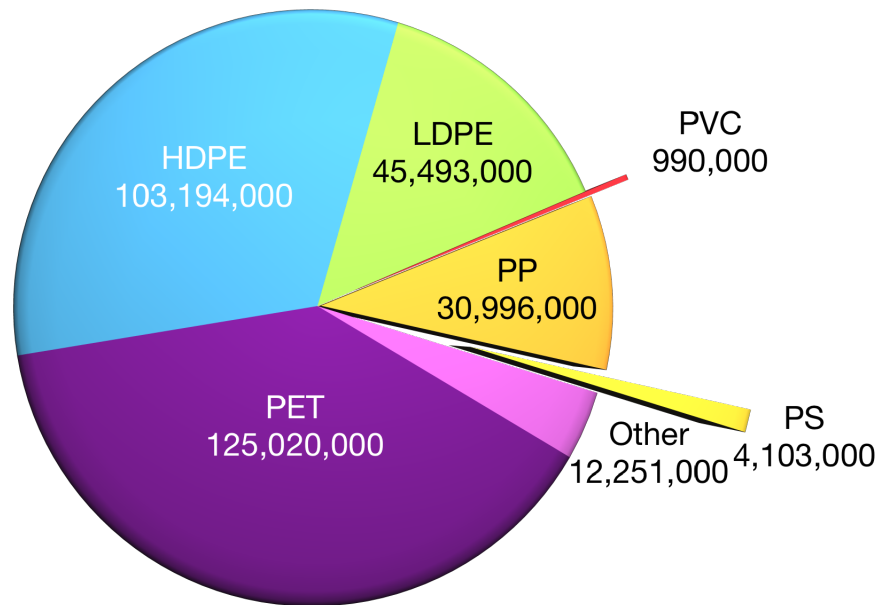
<sup>6</sup> In contrast to reports for 2012 and earlier, the total for companies responding includes those responding with Canadian sourced post-consumer plastic scrap to the Moore Recycling survey, as well as the APR/NAPCOR PET bottle reclamation survey.

<sup>7</sup> Moore Recycling surveys and counts material from reclaimers, defined as companies that wash post-consumer material or otherwise process unwashed material into a clean feedstock or end product.

Most film categories decreased in 2015, with the exception of PE Mixed Color Film and Other Film. The largest decrease was in PE Clear Film followed by MRF Curbside Film; the destination for much of this volume is unknown.

The majority of the reported foam represented foam polystyrene (PS), which was predominantly from protective packaging for durable products but also from food packaging, e.g., meat trays, clamshells, and coffee cups.

### Post-Consumer Plastic Recycled By Resin (kgs)



PET and HDPE comprise the majority of post-consumer plastic recycled in Canada. The majority of the PET is from bottles (88 percent), down two percent from the previous few years, with the remaining 12 percent comprised of non-bottle rigid PET. For HDPE, the bottles comprised 73 percent of the volume reported—an increase of four percent—with non-bottle rigid (16 percent) and film (11 percent) decreasing by two percent in each category. The third largest resin source collected for recycling was LDPE, which consisted primarily of film (99 percent). PP consisted of 89 percent non-bottle rigid and nine percent bottle material<sup>8</sup>.

<sup>8</sup> This shift from 79 percent PP non-bottle rigid and 21 percent PP bottle sources in 2014 is due to correction in the reporting mentioned earlier.

## Methodology

Moore Recycling Associates conducts the Canadian survey simultaneously with the annual U.S. Plastic Recycling Survey. This is a voluntary survey. The survey gathers data on all Canadian- and U.S.-sourced plastic, except plastic purchased by PET bottle reclaimers in Canada or the U.S.; as previously mentioned, those data are provided by a study conducted through APR and NAPCOR.

The following steps were taken to prepare the report:

- Moore Recycling continually updates its markets database to include current exporters, reclaimers, and other handlers of plastic scrap;
- Moore conducts an electronic survey of market participants in plastic recycling to collect data; and
- Moore undertakes a verification step of the survey-collected data, checking the accuracy of the data through follow-up calls, conversations with industry contacts, and reviews of other public sources of recycling industry information, including available provincial data.

### Data Collection and Analysis

Moore Recycling continually updates a proprietary database of plastic exporters, processors, reclaimers, and key brokers to ensure that the survey reaches the key plastic scrap buyers from North America.<sup>9</sup>

Moore Recycling uses a custom-designed web-based survey system to gather data. Although the overall methodology has not changed since the first report, Moore Recycling continually seeks ways to improve the completeness and timeliness of the survey responses. For example, in 2015, Moore added PP Bottles and Containers, and PP Bottles/Containers and Bulky as new categories to the mixed rigid plastic section. Moore Recycling works to update the commodity categories and the terminology used by the industry in order to provide the key materials to report, to avoid misunderstanding, and to further support harmonizing the terminology used in the industry. The model bale specifications released by the Association of Plastic Recyclers (APR)<sup>10</sup> are a key resource in this process.

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<sup>9</sup> Through Moore Recycling's project work in the industry and websites that it manages—[PlasticsMarkets.org](http://PlasticsMarkets.org), [RecycleMorePlastic.org](http://RecycleMorePlastic.org), and [PlasticFilmRecycling.org](http://PlasticFilmRecycling.org)—Moore Recycling regularly receives requests from new contacts for information on material and markets. Moore also identifies potential buyers through published market databases and conversations with suppliers, such as material recovery facilities (MRFs) and key reclaimers.

<sup>10</sup> Bale specifications released by APR utilize the “Terms and Tools” found at <https://www.recycleyourplastics.org/recycling-professionals/education/terms-tools-app/>.

An email with a unique link and message is sent to each contact. After an adequate amount of response time has passed, Moore Recycling employees send follow-up emails and make telephone calls to retrieve data. This follow-up process can take weeks or months, depending on responses. Data are entered into the online survey tool, either directly by the company surveyed, or by Moore Recycling staff. Incoming data are reviewed for accuracy, and follow-up calls are made as needed. After data collection is complete, Moore Recycling compiles the data and categorizes them based on the detail reported.<sup>11</sup>

The final data totals are reviewed and analyzed; then, they are reported in as much detail as possible without compromising the participating companies' confidentiality. In order to determine trends and identify anomalies that may require further data vetting, the analysis includes year-to-year comparisons of the totals, material categories, and buying trends among export and domestic buyers. Describing how the data are collected, as well as what is and is not included in the survey, provides readers of this report with the context necessary to cross-reference the results with other available industry data.

### Survey Categories

The Moore Recycling survey requested data for PET bottle exports and for reclamation and export of the following:

- HDPE bottles (natural, colored, mixed)
- PP and other bottles
- Commingled bottles
- Mixed rigid plastic bale categories (detailed below)
- Categories of Non-Bottle Rigid Plastic Segregated By Resin - a list of recovered products that are generated as segregated commodities or have been sorted into segregated categories and then sold. The list is based on categories respondents have offered in previous surveys (e.g., PET thermoforms, HDPE injection (drums, buckets, or crates), PP hangers, PVC Flooring, and PC CDs). Moore Recycling also provided an "other" category for PET, HDPE, PP, PS, PVC, ABS, and PC.
- Film (detailed below)
- Foam - EPS (Expanded Polystyrene), EPP (Expanded Polypropylene), EPE (Expanded Polyethylene), Flexible Polyurethane, Rigid Polyurethane, and Other Foam

The APR and the National Association for PET Container Resources (NAPCOR) conducted a separate, but similar survey of domestic PET reclaimers. Moore Recycling does not survey these

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<sup>11</sup> Moore Recycling conducts the survey and maintains the confidentiality of individual responses; no individual company data are released, nor are any specific data that do not include at least three companies reporting.

reclaimers and instead receives data on domestic processing of PET bottles along with the following non-bottle rigid plastic data from the APR/NAPCOR: strapping, thermoforms—both from PET bottle bales and purchased separately—and cap and label material from the PET bottle reclamation process.

The detailed mixed rigid plastic bale categories are as follows:

- **HDPE Colored Bottles with Containers** - Primarily HDPE bottles, with some HDPE or PP household containers, no bulky items.
- **PP Small Rigid Plastics (formerly PP Bottles and Containers)** - Primarily polypropylene bottles, non-bottle containers and other small rigid items, no bulky items
- **PP All Rigid Plastics (formerly PP Bottles/Containers and Bulky)** - Primarily PP bottles, non-bottle containers and bulky items (bulky is described below).
- **1-7 Bottles and Small Rigid Plastics (formerly All Rigid Plastic: No Bulky)** - 1-7 bottles and caps, small non-bottle rigid containers (includes cups, trays, boxes, clamshells, tubs, pots, deli containers, cartons, and blister)
- **1-7 All Rigid Plastics (formerly All Rigid Plastic: With Bulky)** - 1-7 bottles and caps. All non-bottle rigid containers (includes cups, trays, boxes, clamshells, tubs, pots, deli containers, carton, and blister), and all bulky rigid plastic (includes carts, crates, buckets, baskets, toys, and lawn furniture)
- **3-7 Bottles and Small Rigid Plastics (formerly Pre-picked Rigid Plastic: No Bulky)** - Non-bottle rigid containers (includes cups, trays, boxes, clamshells, tubs, pots, deli containers, cartons, and blister). PET and HPDE bottles removed, leaving 3-7 bottles
- **3-7 Bottles and All Other Rigid Plastics (formerly Pre-picked Rigid Plastic: With Bulky)** - Non-bottle rigid containers (includes cups, trays, boxes, clamshells, tubs, pots, deli containers, cartons, and blister). Bulky rigid plastic (includes carts, crates, buckets, baskets, toys, and lawn furniture). PET and HPDE bottles removed, leaving 3-7 bottles
- **Mixed Bulky Rigid Plastics (formerly Bulky Rigid Plastic)** - Bulky rigid plastic (includes carts, crates, buckets, baskets, toys, and lawn furniture) predominantly PE and PP
- **Tubs and Lids** - Non-bottle household containers, including buckets, predominantly PP and PE, with no bulky items
- **Tubs and Lids: With Bulky (formerly PE/PP Bottles, Containers, and Bulky (Olefin)** - Primarily PE and PP bottles, non-bottle containers and bulky items (includes carts, crates, buckets, and lawn furniture)
- **Mixed Clamshell** - A mixture of PET, PP, PS, and PVC clamshell-type containers
- **Other Mixed Rigid Plastic** - A “catch-all” category, defined on a case-by-case basis



All of the mixed rigid plastic bale categories contain some non-bottle material. The categories may be a mixture of resins, or some combination of bottles, containers, bulky items, and other non-bottle rigid plastic. Most are a combination of both resin and product type. The non-bottle rigid plastic portion<sup>12</sup> of the mixed rigid bales reported by respondents was calculated for this report by applying the content percentages of resin and product type from the 2014/15 mixed rigid bale composition study.<sup>13</sup> Previous reports dating back to 2011 used the 2011 composition study.<sup>14</sup>

Moore Recycling also asks for data in the following categories:

- **Post-Commercial Mixed Rigid Plastic** - A “catch-all” category for mixed resin rigid plastic that is generated from businesses, defined on a case-by-case basis
- **Mixed Electronic Scrap** - Primarily high impact polystyrene (HIPS), acrylonitrile butadiene styrene (ABS), polycarbonate (PC)

And in the following specific Film categories:

- **PE Clear Film** (formerly Commercial Clear Film) - Clear, clean polyethylene (PE) film from commercial sources, including stretch wrap, and poly bags
- **PE Mixed Color Film**(formerly Commercial Mixed Color Film)- Mixed color PE film from commercial sources, including stretch wrap; no post-consumer bags
- **PE Retail Bag and Film** (formerly Mixed Film) - Mixed color, clean PE film, including stretch wrap and retail collected post-consumer bags, sacks, and wraps
- **MRF Curbside Film** (formerly Curbside Film) - Post-consumer Mixed PE film collected curbside
- **PE Agricultural Film** (formerly Agricultural Film) - Dirty Ag Film, or film that has been in contact with the ground, exhibiting up to 50 percent contamination, including mulch film; this also includes Clean Ag Film, or dry film, and film that has been used in applications that do not involve contact with the ground, at up to 10 percent contamination, including greenhouse film
- **Other Film** - A “catch-all” category for film that does not fit in any of the categories above; mostly non-PE films, such as polyvinyl chloride (PVC) and polypropylene (PP)

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<sup>12</sup> Only the plastic portions of the mixed rigid bales are included in the volume; the waste is removed, unlike gross volumes, which are used for most other recycled commodities.

<sup>13</sup> *National Mixed Rigid Plastic Bale Composition Study*, Association of Plastic Recyclers (APR), July 2015

<sup>14</sup> *National Mixed Rigid Plastic Bale Composition Study & Analysis of Non-Bottle Rigid Plastic Available for Recycling*, Association of Plastic Recyclers (APR), 2011

Participation in the survey is voluntary, and the reported data are based on the responses received. Many companies have limited resources to put towards participation in the survey, and some companies may choose not to respond due to confidentiality policies. Therefore, there is not 100 percent participation, and the presented totals represent the minimum amount of plastic recovered for recycling and sold into the marketplace. Only data provided by North American reclaimers, predominantly U.S. and Canadian, but also exporters selling directly overseas, are included in the reported totals, unless we determine that data are missing in areas where substantive information from other reliable resources is available. Data provided by brokers and material recovery facilities (MRFs) are primarily used as a reference to better understand the flow of material, but Moore Recycling may include their data if enough information is provided that would enable us to attribute material sold to a non-responder.

Except for the largest exporters, players in the export market come and go and may frequently change the materials purchased. This can make the export market difficult to track. Moore Recycling tracks exporters handling plastic through a number of industry resources, and most of the large exporters respond to the survey.

Moore Recycling cross-checked the 2015 data with available provincial collection estimates and also referenced Statistics Canada's estimated national totals. If there were large gaps between the survey responses and other industry data, we conducted additional research to ensure that the results represent a reasonable accounting of post-consumer plastic collected in Canada for recycling. For example, as was the case in previous years, the 2015 survey responses from exporters and reclaimers reflected a lower total for curbside film than what the provinces reported as recovered. After additional information was gathered from industry contacts, we added the curbside film data from provincial collection estimates to reflect the minimum amount of post-consumer collected for recycling in 2015.

Again, since participation in the survey is voluntary, Moore Recycling sometimes receives responses from existing companies that did not previously respond. Increases in year-to-year recovery rates are often a combination of increased collection along with material that was recycled in previous years but not reported. When Moore Recycling can conclude the nature of an increase (or decrease), the reasoning is indicated; however, it can be difficult to make a solid determination in any given year, depending on the depth of information Moore Recycling receives from plastic handling companies for previous years and while taking into account confidentiality concerns.

Often, Moore Recycling must follow up with responders due to inconsistent placement of data in survey categories. Quality control is essential to determining if there has been an actual shift or just an entry error. Clarification is often needed to determine whether reported material can be counted as post-consumer, commercial or if it is, in fact, industrial scrap. Mixed rigid bale commodities

often require follow up and a data quality check due to the inconsistent terminology used in the marketplace to describe these commodities.

Post-consumer commercial material can be difficult to track because it is often purchased by companies that are also handling industrial scrap. The survey now specifically includes a detailed section on post-industrial plastic recycling to encourage responses from industrial/commercial scrap recyclers. Having an additional focus on post-industrial recycling enables us to engage these recyclers about handled material that they may not realize is considered post-consumer- that is, it has met the intended use.

As previously mentioned, Moore Recycling applied the bale composition results from the 2014/15 study<sup>15</sup> commissioned by the Association of Plastic Recyclers (APR) to the mixed rigid plastic bale volumes reported by responders to arrive at the non-bottle portion of these bales, separated by resin.

When reclaimers do not report capacity volumes, the volume of acquired material is used to estimate capacity.

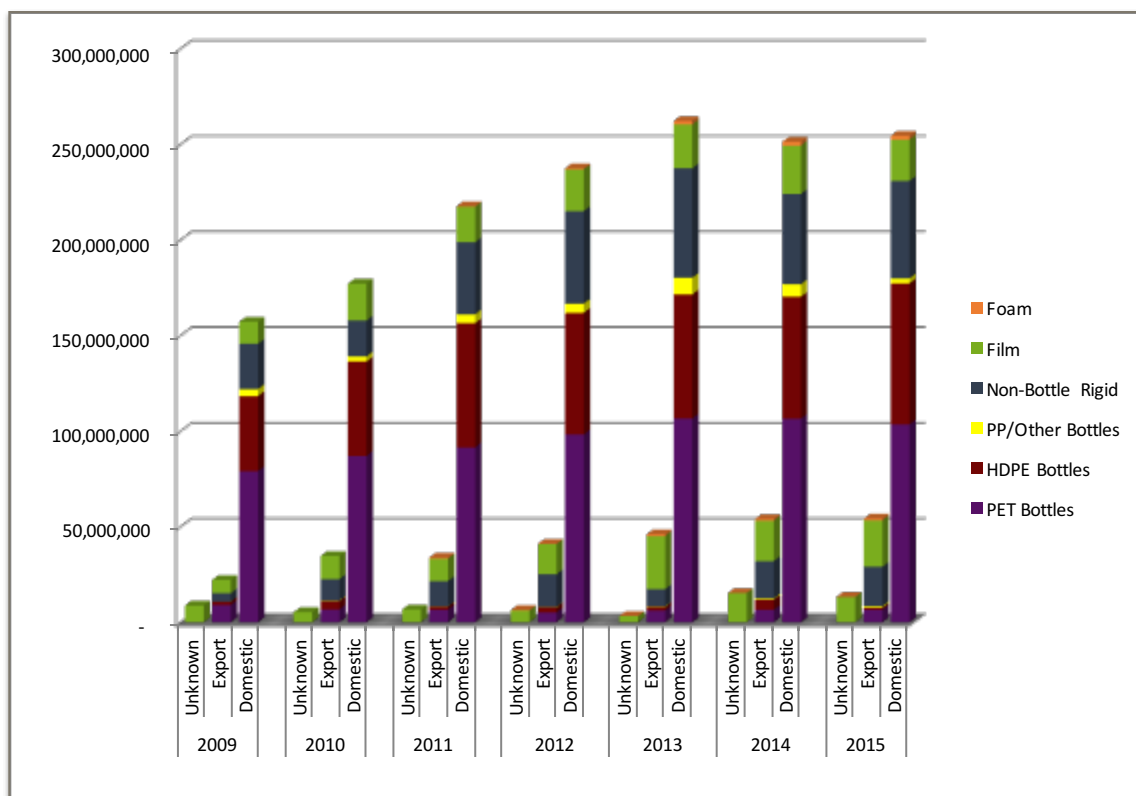
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<sup>15</sup> *National Mixed Rigid Plastic Bale Composition Study*, Association of Plastic Recyclers (APR), July 2015

## Findings: Overview

In 2015, a minimum of 322 million kilograms of post-consumer plastic were collected for recycling in Canada; this represents a 0.4 percent increase from 2014 values. Seventy-nine percent of the plastic was reported as recycled in the US and Canada. There was a 3.2 million-kilogram increase in the total volume of material that stayed on-shore, a rebound after 2014's 10.8 million kilogram decrease. Exports held steady and material without a known destination decreased by almost 2 million kilograms from 2014 values.

**Post-Consumer Plastic Recycled Year-to-Year (kgs)**



**Post-Consumer Plastic Recycling By Major Category Year-to-Year (kgs)**

Year	Bottles	Non-Bottle Rigid	Film	Foam	Total
2009	132,825,000	28,132,000	27,147,000	NA	188,104,000
2010	150,439,000	29,912,000	36,830,000	NA	217,182,000
2011	169,341,000	50,931,000	37,102,000	753,000 <sup>16</sup>	258,127,000
2012	174,689,000	65,544,000	43,744,000	983,000	284,961,000
2013	189,539,000	66,337,000	53,963,000	2,680,000	311,518,000
2014	189,321,000	66,763,000	61,772,000	2,880,000	320,736,000
2015	188,286,000	71,604,000	59,166,000	2,991,000	322,047,000

<sup>16</sup> In 2009 and 2010, foam plastic was included in the PS reported as non-bottle rigid plastic. Since 2011, foam collection data has been presented separately in its own section.

Non-Bottle Rigid plastic exhibited the highest increase by major category, with Bottles and Film decreasing overall and a very slight increase in Foam. Even though the increase in volume in 2015 was primarily due to an increase in natural HDPE bottles, the decrease in PET bottles and the shift in PP bottle volume to non-bottle rigid plastic represents an overall loss in the Bottle category.

Non-Bottle Rigid exhibited an overall increase, primarily due to the volume that shifted from bottles as well as to a small increase in mixed rigid bales that were reported. The Non-Bottle Rigid recycling values represented in this report are likely conservative, particularly the volume reported as resin-segregated non-bottle that was plastic generated by the commercial sector. This is due to the difficulty in tracking commercial scrap that is combined with industrial scrap. The figure reported for foam recycling also remains understated, since a number of companies do not yet participate in the survey.

### Post-Consumer Plastic Recycled Year-to-Year (kgs)

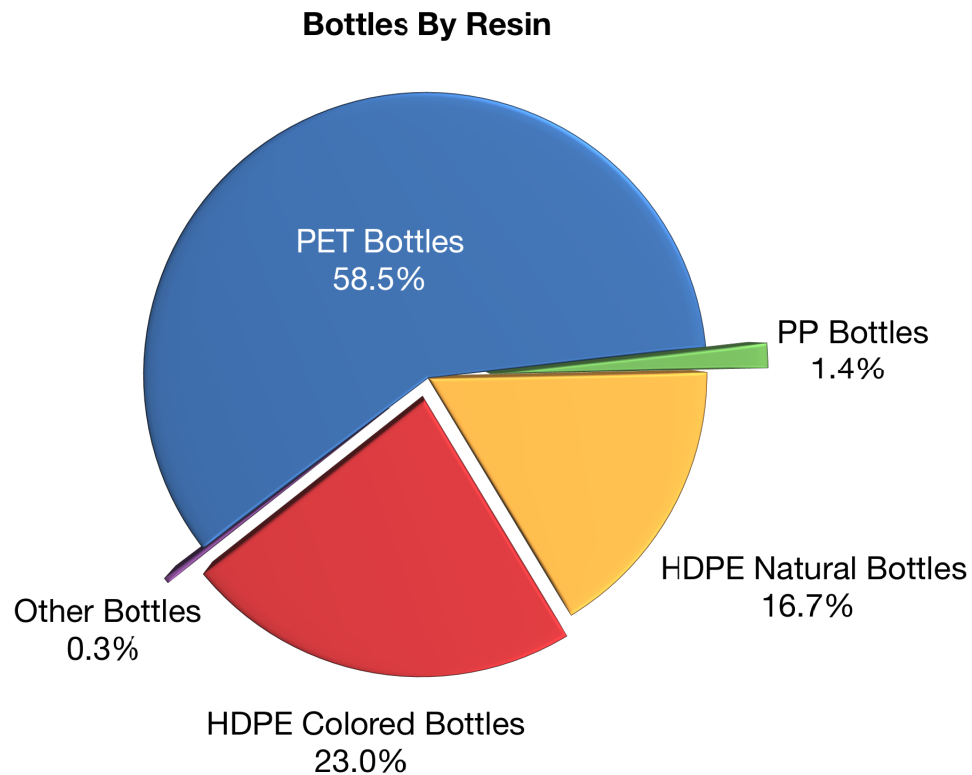
Year	Exported outside North America	Purchased for processing in Canada	Purchased for processing in US	Unknown destination	Total
2009	22,168,000	NA <sup>17</sup>	NA	8,762,000	188,104,000
2010	34,728,000	149,197,000	27,929,000	5,329,000	217,182,000
2011	33,862,000	165,833,000	51,725,000	6,707,000	258,127,000
2012	41,106,000	193,589,000	43,849,000	6,418,000	284,961,000
2013	46,007,000	212,591,000	49,580,000	3,341,000	311,518,000
2014	54,076,000	208,985,000	42,345,000	15,330,000	320,736,000
2015	54,218,000	213,365,000	41,130,000	13,333,000	322,047,000

U.S. companies purchased approximately 41.1 million kilograms (13 percent) of post-consumer plastic from Canada for processing in the U.S., a three percent decrease in volume compared to 2014. The material purchased by U.S. reclaimers combined with the plastic exported overseas resulted in 95.3 million kilograms (30 percent) of post-consumer plastic leaving the country, a one percent decrease in volume from 2014. Overall, the purchases by Canadian reclaimers of Canadian generated plastic increased by 4.4 million kilograms (2 percent over 2014) to 213 million kilograms (66 percent) of Canadian-sourced recycled plastic. Canadian Reclaimers purchased 86 million kilograms of U.S.-sourced plastic in 2015, which represents an eight-million-kilogram increase. The majority of recycled plastic remains in North America, with Canadian and U.S. reclaimers purchasing 79 percent of Canadian-sourced material, which is an increase of over half a percent from last year, when we saw a decrease of 10.8 million kilograms. The material without a known destination is MRF Curbside Film, which accounts for almost 70 percent of the MRF film. Given the dearth of reclamation capacity for MRF film, it is likely that this material was exported.

<sup>17</sup> In 2009, 157 million kilograms of Canadian post-consumer plastic was reclaimed by Canada and the U.S. combined.

## Findings: Bottles

Bottles are collected in Canada through municipal curbside programs, as well as at depots and retail drop-off locations as part of beverage deposit systems that are mandated in most provinces. Each province accepts different types of beverage containers as part of its program, and each has a unique collection system. Collection efforts in Canada resulted in 188.3 million kilograms of post-consumer bottles being sold into the marketplace for recycling in 2015. This represents an overall decrease in the Bottle category of 0.5 percent compared to 2014.



### Bottles By Resin Year-to-Year (kgs)

Year	PET Bottles	HDPE Natural Bottles	HDPE Colored Bottles	PP Bottles	Other Bottles
2009	88,133,000	13,263,000	27,693,000	3,476,000	261,000
2010	93,857,000	18,800,000	34,846,000	2,664,000	273,000
2011	98,141,000	20,268,000	46,260,000	4,454,000	218,000
2012	103,410,000	21,928,000	44,426,000	4,469,000	457,000
2013	112,817,000	24,166,000	42,502,000	7,346,000	1,709,000
2014	113,116,000	24,954,000	44,062,000	6,564,000	623,000
2015	110,157,249	31,443,858	43,330,570	2,718,129	636,065

#### PET Bottles

In 2015, approximately 103.5 million kilograms of Canadian-sourced post-consumer PET bottles were reclaimed in Canada and the U.S., and 6.6 million kilograms—six percent of the PET bottles collected in Canada—were exported overseas, primarily to China. Most of the exported PET bottles were in PET bottle bales; a small amount was in mixed rigid bales. Compared to 2014, Canadian reclaimers purchased 4.4 million kilograms more Canadian-sourced PET bottles and 15 million kilograms more U.S.-sourced material. U.S. purchases of Canadian material decreased by almost 7.5 million kilograms in 2015, after increasing significantly from 2012 to 2013 and remaining at a similar volume, of 25 million kilograms, in 2013 and 2014.

#### Capacity and End Uses

There were five PET reclaimers operating in Canada in 2015. The PET bottle collection volume and domestic reclamation capacity continue to be close to equilibrium, although the capacity does exceed the PET collection volumes in Canada. In its *Report on Post-Consumer PET Container Recycling Activity in 2015*, NAPCOR reported that fiber remains the dominant North American end use for recycled PET bottles. Food and beverage bottles were the second most common end use of rPET in 2015, with Sheet and Film plastic coming in close behind. Strapping, non-food bottles, and other products also use recycled PET. The report states that the use of Canadian rPET in fiber, bottles, and sheet end products increased overall in 2015.<sup>18</sup>

#### HDPE Bottles

An estimated 75 million kilograms of post-consumer HDPE bottles were recycled in 2015, a 5.8 million kilogram increase from 2014 values. This increase was due to increased domestic recycling of natural HDPE bottles in 2015, which continues the trend of the past few years. Colored HDPE continues to comprise the largest percentage of total HDPE bottles recovered for recycling in

<sup>18</sup> *Report on Post-consumer PET Container Recycling Activity in 2015*, NAPCOR & APR

Canada, at 58 percent (43 million kilograms). Minimal HDPE bottle material (1%) was reported as having been shipped overseas in 2015 compared to previous years. Eleven percent (~ 5 million kilograms) was reported to have been exported in 2014.

Of the 75 million kilograms of HDPE bottles recovered in Canada for recycling, 61 million kilograms were recycled in Canada, which represents an increase from the 58 million kilograms in 2014. Canadian reclaimers also purchased 36.8 million kilograms of HDPE bottles from the U.S. for processing in Canada, up significantly from 2014. This is a departure from the trend of decreasing purchases of U.S. material that took place prior to 2014. U.S. reclaimers purchased 13.1 million kilograms of Canadian-sourced HDPE bottles. This is a return to previous purchasing levels prior to 2014, in which U.S. reclaimers purchased less than half of the amount purchased in each of the three years before 2011-2013.

### **Capacity and End Uses**

Moore Recycling estimates that the 2015 Canadian HDPE bottle reclamation capacity is 106 million kilograms; this is a slight increase from 2014 values. We calculated a utilization rate of 92 percent for 2015, up from 86 percent in 2014. Canadian and U.S. reclaimers continue to report new bottles as the primary end use for reclaimed natural bottles, followed by lumber and decking applications, and pipe. Pipe continues to be the largest end use for colored HDPE bottles in the U.S. and Canada. In 2015, significant volumes of colored HDPE bottles also went into the following end markets: automotive components, lawn and garden products, new bottles, film and sheet, and lumber and decking.

### **PP and Other Bottles**

A minimum of 2.7 million kilograms of post-consumer PP bottles were reported as recycled in 2015, which is down from the 6.6 million kilograms reported in 2014. This decrease was due to a reporting error: a large portion of the material historically reported as bottles was actually non-bottle rigid volume.

LDPE, PVC, and other bottles comprised 636 thousand kilograms of the total material in this report, which is similar to 2014. The Canadian reclaimers that handle mixed resin bales can handle non-olefin (PVC or Other #7) minority resin bottles in one of several ways: either disposing of them, selling them (if a domestic or export market is available) or, in some cases, providing the material to waste-to-energy facilities.

The survey asked reclaimers who reported mixed rigid bales whether they utilized all of the material or disposed of, sold, or otherwise provided any portion of it to another reclaimer, exporter, broker, or intermediate processor. No bottle material was reported as disposed or sold.



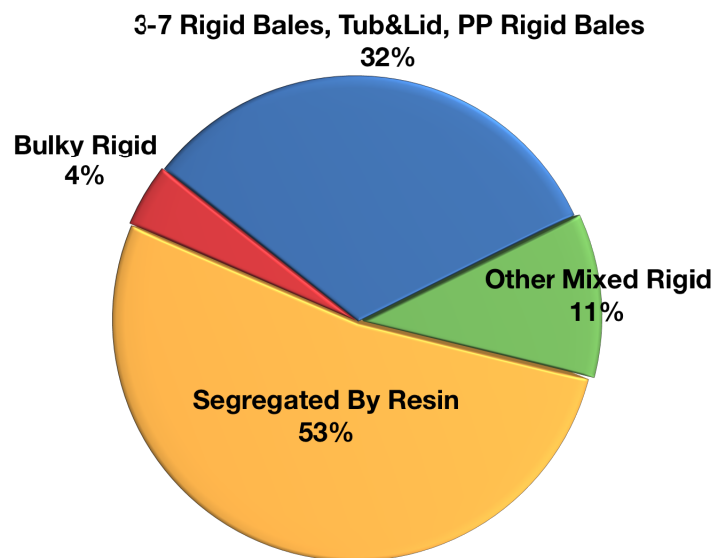
## Capacity and End Uses

Due to limited data sources, information on PP reclamation capacity is not available. Recycled PP bottles are used to manufacture automotive components, crates and buckets, caps and closures or items such as lawn and garden furniture.

## Findings: Non-Bottle Rigid Plastic

In 2015, 71.6 million kilograms of non-bottle rigid plastic were reported as reclaimed or exported. This represents an increase of seven percent from the volume reported for 2014.

### Non-Bottle Rigid Plastic By Source

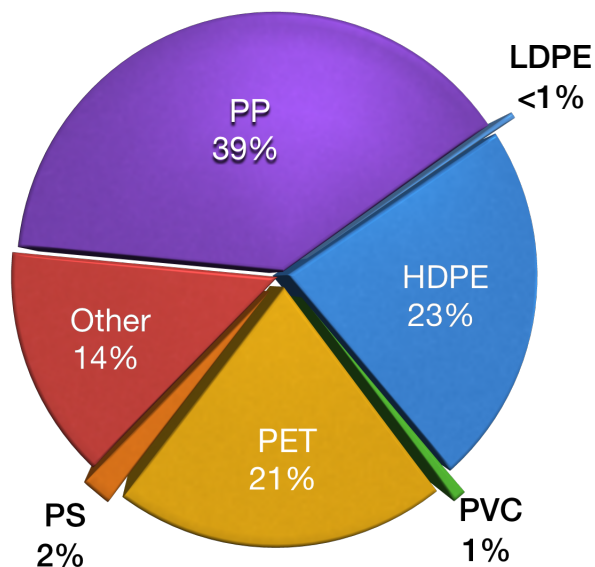


“3-7 Rigid Bales” and “PP Rigid Bales” combines the “and Small Rigid Plastic” and “and All Other Rigid Plastic” categories of each. “Other Mixed Rigid” includes data provided as Post-Commercial Mixed Rigid, Other Mixed Rigid Plastic and any mixed rigid bale categories, with less than 800 thousand kilograms reported.

Non-bottle rigid plastic, segregated by resin, increased by 0.7 million kilograms, to almost 38 million kilograms, comprising 53 percent of the non-bottle rigid material reported. Mixed rigid plastic comprised the other 47 percent, at just under 34 million kilograms. The 3-7 Bottles and Small /All Other Rigid Plastic bales was just over half of all of the mixed rigid material, including post-commercial, E-scrap and Other Mixed, that were reported for 2015.

For 2015, 71 percent of all non-bottle rigid plastic was reported as purchased by domestic markets (Canadian or U.S. reclaimers)—holding steady from 2014. The majority (91 percent) of non-bottle plastic segregated by resin remained in Canada, and Canadian purchases of their own mixed rigid bales reached 80 percent in 2015, compared to 56 percent reported for 2014, and 72 percent reported for 2013. U.S. reclaimers purchased a small volume of Canadian-sourced mixed rigid bales and resin-segregated material, for a combined volume of 8.2 million kilograms of non-bottle material, which is a slight increase from 2014 values.

### Non-Bottle Rigid Plastic By Resin



Consistent with previous years, PP and HDPE comprise the majority (62 percent) of the non-bottle rigid plastic recovered in Canada. PET is the next largest at 21 percent of the non-bottle reported. The PET non-bottle material, e.g. clamshells and other non-bottle packaging, comes from both PET bottle bales and mixed rigid bales that were reported. The category “Other” comprised just 14 percent, which is just above what it was in 2014. “Other” consists of other mixed rigid plastic material that was reported without the detail needed to break it down by resin, and it also includes the other resins from mixed rigid bales.

### Non-Bottle Rigid Plastic By Resin Year-to-Year (kgs)

	2009	2010	2011	2012	2013	2014	2015
PET	2,460,000	1,667,000	5,101,000	5,703,000	12,870,000	12,670,000	14,862,000
HDPE	10,778,000	10,256,000	12,798,000	22,089,000	21,940,000	17,706,000	16,678,000
PVC	924,000	1,359,000	271,000	1,342,000	1,412,000	650,000	621,000
LDPE	400,000	328,000	185,000	523,000	462,000	269,000	285,000
PP	10,764,000	6,933,000	21,790,000	23,248,000	24,820,000	25,288,000	27,711,000
PS	903,000	1,173,000	273,000	803,000	926,000	1,288,000	1,321,000
Other	1,902,000	8,195,803	10,513,000	11,836,000	3,907,000	8,892,000	10,124,000

Data from the report *2014/15 National Mixed Rigid Plastic Bale Composition Study* performed by Moore Recycling Associates for APR were applied to arrive at the resin quantities for 2015. Previous years used data from the 2010/2011 *National Mixed Rigid Plastic Bale Composition Study*.

PET and PP non-bottle categories both increased by approximately 2 and 2.5 million kilograms, respectively. The PET non-bottle increase was due mostly to the volume of thermoforms reported as part of the PET bottle bales. The increase in PP was due to the mixed rigid bales reported. The increase in the "Other" category is due to additional mixed rigid material that was reported undefined by resin. LDPE and PS exhibited minor increases and PVC exhibited a minor decrease.

Just over 7 million kilograms were included in the non-bottle rigid fraction of the mixed rigid bales reported by domestic reclaimers that were non-olefin plastic (PET, PS, PVC, and Other). The survey asked reclaimers reporting mixed rigid bales whether they utilized all of the material or disposed of, sold, or otherwise provided any portion of it to another reclaimer, exporter, broker, or intermediate processor. Those that responded to this question said that they utilized all of the material they purchased from U.S. and Canadian sources.

### Capacity and End Uses

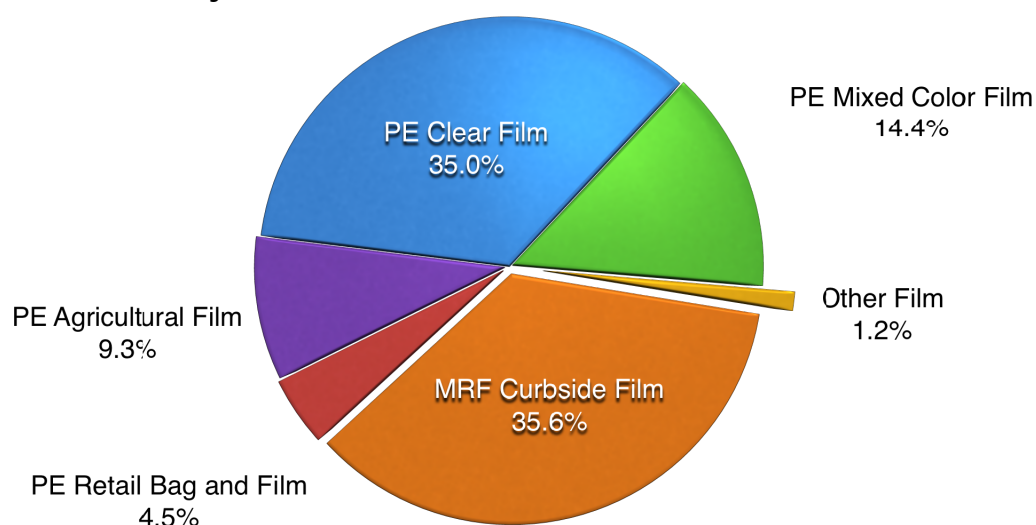
A conservative estimate for non-bottle rigid plastic reclamation capacity is 90 million kilograms for 2015, representing a 25 million kilogram decrease compared to 2014. The capacity change from 2014 to 2015 is, in part, due to one reclaimer going out of business in 2014. It should be noted that this capacity does not include all commercial/industrial scrap grinding and compounding capacity. Canadian purchases of non-bottle rigid plastic decreased overall, but 61 percent of non-bottle rigid plastic reclamation capacity was utilized in 2015, up 3 percent over 2014, mostly due to the decrease in capacity for 2015.

Recycled non-bottle rigid plastic is commonly used in automotive components, crates, buckets, lawn and garden products, and pipe, as well as in film and sheet manufacturing. Other uses include various consumer and household products, lumber and decking, and fence posts.

### **Findings: Film and Bags**

In 2015, a minimum of 59.2 million kilograms of post-consumer film and bags were collected for recycling, representing a decrease of four percent compared to 2014. PE mixed color film exhibited an increase of 3.6 million kilograms, whereas all other categories decreased by a combined 7.2 million kilograms compared to 2014. PE Clear Film exhibited the biggest decrease, with 5 million kilograms less collected in 2015 compared to 2014, followed by MRF Curbside Film, which had a decrease of 1.3 million kilograms.

### Film By Source



### Film By Source Year-to-Year (kgs)

Year	PE Clear Film	PE Mixed Color Film	MRF Curbside Film	PE Retail Bag and Film	PE Ag Film	Other Film
2009	6,869,000	6,371,000	12,210,000	NA	1,658,000	38,000
2010	13,537,000	7,103,000	12,371,000	NA	966,000	2,853,000
2011	13,820,000	3,273,000	13,211,000	991,000	5,592,000	215,000
2012	15,681,000	5,468,000	14,395,000	3,117,000	4,321,000	762,000
2013	23,768,000	4,104,000	16,658,000	4,156,000	4,298,000	980,000
2014	25,687,000	4,865,000	22,363,000	2,965,000	5,674,000	219,000
2015	20,718,000	8,500,000	21,048,000	2,667,000	5,498,000	736,000

Beginning in the 2011 survey, Mixed Film was divided into PE Mixed Color Film (no post-consumer bags) and PE Retail Bag and Film (includes post-consumer bags, sacks, and wraps). The amount of PE Mixed Color Film reported above for 2010 and 2009 was previously reported under Mixed Film and may include some post-consumer bags.

PE Clear Film is by far the most valuable film in the marketplace. This is clean PE film, including stretch wrap and poly bags, that is recovered by the commercial sector from transportation and other packaging. After PE Clear Film, the most valuable is PE Mixed Color Film, then PE Retail Bag and Film. While the bag and film material collected at retail drop-offs from the public is much cleaner than film collected curbside and sent through MRFs, it also has color and varying consistency in quality, depending on the program's quality control, which can reduce its market value. MRF Curbside Film and PE Agricultural Film are harder to recycle because they require a wash stage or an end product that can handle the contamination. Fewer than five U.S. and

Canadian companies are able to process curbside film. Processors of post-consumer material collected curbside continue to express concerns about contamination from glass (and other abrasive material) and non-polyethylene plastic. Nearly all reclaimers expressed concern about the presence of PP and other non-polyethylene film in the recycling stream.

The reported data indicate that a minimum of 37 percent of recovered post-consumer film is being processed by Canadian or U.S. reclaimers, which is down just under four percent compared to 2014. U.S. reclaimers purchased four percent (2.2 million kilograms) of the film plastic recovered in Canada, a slightly higher percentage than 2014. Canadian reclaimers purchased slightly less from the U.S. than in the past, only 360 thousand kilograms in 2015, compared to 500 thousand kilograms in 2014. Prior to 2014, Canadian reclaimers purchased more from the U.S., 3 and 5 million kilograms in 2013 and 2012, respectively.

The export market has historically been a major buyer of film coming out of the U.S. and Canada. In 2015, a minimum of 41 percent of the recovered film was exported overseas, up from 34 percent in 2014. The main categories exported in 2015 were PE Clear Film, PE Mixed Color Film, MRF Curbside Film, and, to a lesser degree, Agricultural Film. As previously mentioned, given that few in Canada can process the MRF Curbside Film, it is likely that a fair amount of this material that has an unknown destination is exported. Very little of the remaining material was exported, including PE Retail Bag and Film. It is possible that we are either missing significant amounts of commercial film that is being recycled, or material that could be collected and marketed as Commercial PE Film is being processed by MRFs and counted as MRF Curbside Film, given its contamination level. Alternatively, there could be a lack of collection or opportunities to expand commercial film recycling in Canada.

### Capacity and End Uses

For 2015, Moore Recycling estimates that the film and bag reclamation capacity in Canada was 45 million kilograms, which is a decrease from 2014 values. Moore Recycling confirmed that one company is not reclaiming material. Overall capacity utilization was 44 percent, up from 40 percent in 2014, due to a lower estimated capacity, as Canadian purchases of film were also down. Most of the capacity in Canada is for clean, clear commercial film, and only a smaller amount was for post-consumer retail or curbside film. The major end use of recycled film in Canada is new film and sheet, unlike the U.S., where the lumber and decking market continues to be the largest consumer. Additional end uses in Canada (and the U.S.) reported in 2015 were automotive components, crate and buckets, and lawn and garden products.

## **Findings: Foam**

In 2015, a minimum of 2.9 million kilograms of foam were recycled, which represents a slight increase from 2014 values. Of the total volume of foam reported, 2.8 million kilograms was foam

polystyrene (Foam PS), predominantly from protective packaging, which is expanded polystyrene (EPS). Seventy-one percent of the Foam PS reported was processed domestically. While we have received more responses from domestic reclaimers in the past few years, there are still a number of companies that do not respond to the survey, so the total collected may be under reported. Very small volumes of other foam categories were reported; all of the Expanded Polypropylene (EPP) collected was recycled domestically, and Rigid Polyurethane and Other foam was reported as exported overseas.

The use of densification equipment to compress foam has enabled efficient transport to markets in Canada, the U.S., and overseas. Sources of recycled Foam PS include commercial generators, depot operations (both municipal and private), and curbside collection programs.

### Capacity and End Uses

Foam PS is recycled into fire protection products, crown moldings, and decorative frames for mirrors, pictures, and wall hangings. Due to the limited number of reclaimers responding about the domestic reclamation of Foam PS, no additional information is available.

## Conclusions

Post-Consumer plastic collected in Canada increased again to a minimum of 322 million kilograms, which is an increase of 1.3 million kilograms above 2014 values. Year-to-year, the data continue to show that the vast majority of material collected for recycling in Canada is staying in Canada for reclamation and remanufacturing. Support of sustainability and recycling goals in Canada has led to domestic markets for most plastic scrap types and a low dependence on the export market.

## Additional Information

The Canadian Plastics Industry Association (CPIA) provides resources to communities, businesses, and consumers to assist in increasing awareness and education about the recycling of plastic packaging and diversion from Canadian landfills. For information about plastics recycling, visit [www.plastics.ca](http://www.plastics.ca). For information on markets for post-consumer plastic, visit [www.PlasticsMarkets.org](http://www.PlasticsMarkets.org) and [www.PlasticFilmRecycling.org](http://www.PlasticFilmRecycling.org).

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