

Canada-wide Plastic Packaging Flows:

A Progress Report



Canada Plastics Pact Mission

The [Canada Plastics Pact](#) is leading Canada's response to the escalating plastic crisis. We exist to eliminate plastic waste by accelerating and scaling the solutions that will keep plastics in the economy and out of people, animals and nature. Through fostering innovation and collaboration, more than 98 Partners from across the plastics value chain are taking meaningful steps to eliminate unnecessary and problematic plastics, redesign packaging and bolster their usage of recycled plastic. CPP is a member of the [Ellen MacArthur Foundation's Global Plastics Pact network](#) and is a solution space of [The Natural Step Canada](#) in partnership with the [Smart Prosperity Institute](#), whose shared vision is a strong and inclusive economy that thrives within nature's limits.

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Prepared by:



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EXECUTIVE SUMMARY

This 2023 Progress Report aims to provide CPP with a current state analysis of the plastics packaging flow from Canada’s residential sector and from provincial and territorial deposit return systems (DRSs), including an assessment of changes to that flow since the Foundational Report. This report is based on the 2022 data year and is compared to the 2019 data year.

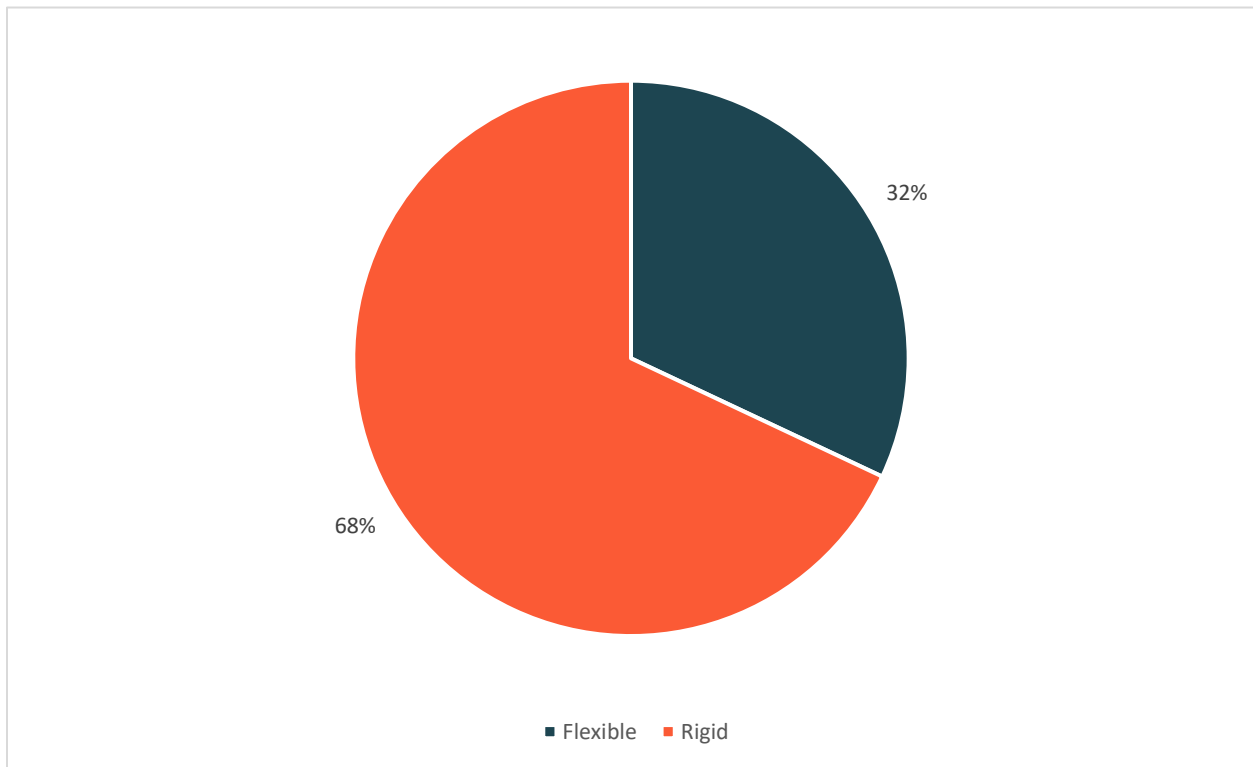
This report is the first in a series of three that will stem from this work. The scope of the plastics flow assessment for this report includes all plastic packaging generated in Canada except for plastic packaging designed to contain hazardous or special products (e.g., paint, lubricating oil) and ICI materials (e.g., commercial waste, construction demolition waste, agricultural products). Data for these excluded sectors will be presented in a final report to CPP by March 2024.

Based on the best available data and estimates, Canada generated 978,899 tonnes of plastic packaging through the DRSs and residential packaging and paper product (PPP) recycling systems in 2022 (**ES Table 1**). This represents an increase of 76,787 tonnes or 9% by weight compared to the Foundational Report, which assessed plastic packaging generation in the 2019 data year). The amount of rigid plastic packaging generated has grown, while flexible plastic packaging generation has decreased. As a result, rigid packaging now represents 68% of plastic packaging generated from the DRSs and residential PPP recycling systems as compared to 64% in 2019 (**ES Figure 1**). While this change in ratios is still within the margin of error, the decrease is not surprising given the implementation of plastic bag bans and the move by some companies to switch to paper-based flexibles (e.g., e-commerce transport packaging).

The amount of plastic packaging recycled through these systems has remained relatively consistent since 2019 but, due to the increase in generation of rigid plastics, there has been a slight decrease in the overall recycling rate of rigid plastics (**ES Table 1**) compared to 2019. In contrast, with the decline in flexible packaging tonnage being generated, there is an overall increase in the proportion being finally recycled. It is important to highlight that these results are in advance of major reforms to DRSs (e.g., potential implementation of a DRS system for non-alcoholic beverage containers in Ontario and reforms to the DRS system in Québec) and implementation of full producer responsibility for residential PPP systems happening across the country. These changes will lead to greater accessibility for Canadians to recycle plastic packaging, increase the types of plastic packaging that can be collected for recycling, and introduce new recycling targets.

ES Table 1: Plastic packaging flow summary in 2019 versus 2022 for residential PPP and deposit return systems.

	2019		2022	
	Generated (tonnes)	Recycled rate (%)	Generated (tonnes)	Recycled rate (%)
	Average		Average	
Rigid plastic packaging	573,512	29%	668,729	27%
Flexible plastic packaging	328,600	3%	310,169	4%
Total plastic packaging	902,112	20%	978,899	20%

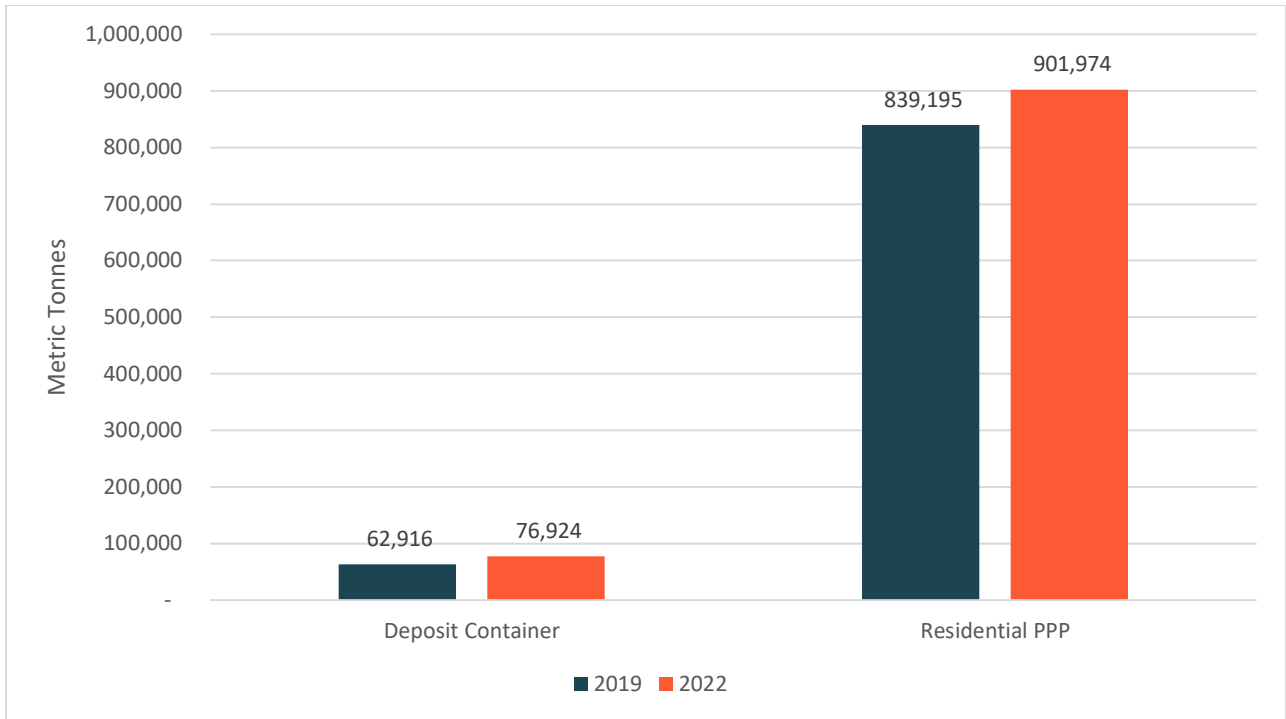


ES Figure 1: Proportion of rigid versus flexible plastic packaging in residential PPP and deposit return systems.

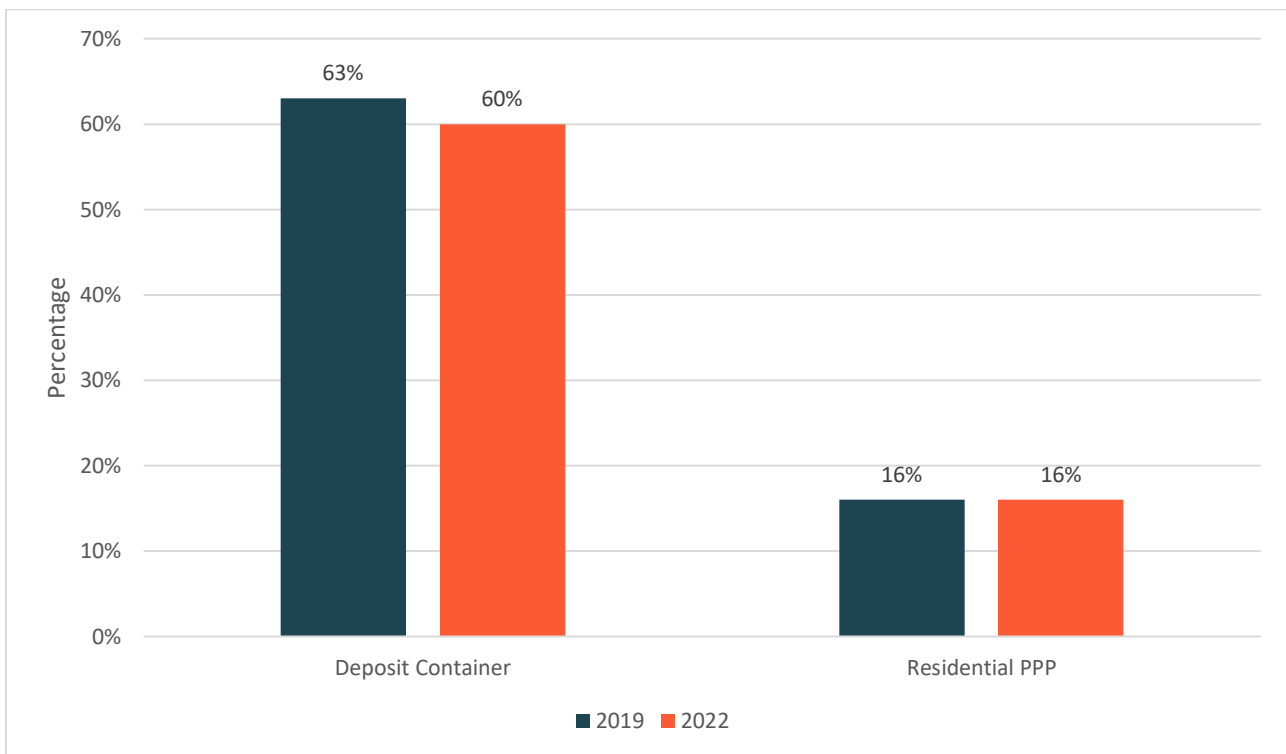
The relative contribution of rigid and flexible packaging to the DRSs versus residential PPP systems varies:

- DRSs account for 8% and residential PPP systems account for 92% of the plastic packaging generated Canada-wide (**ES Figure 2**).
- DRSs achieve significantly higher overall recycling rates than residential PPP systems (**ES Figure 3**), which is likely due to the use of a financial incentive to encourage the containers' return, source separation of the containers at the point of collection into marketable bales and totes, and the fact that the majority of beverage containers are made from easier to recycle resins (i.e., PET and HDPE) as compared to residential PPP.
- For the DRSs and residential PPP systems combined, there was a drop in flexible packaging generation in 2022 compared to 2019 of 6% but an overall increase in the recycling of the flexible packaging of 13% (**ES Figure 4**). There was also an increase in the amount of rigid packaging generated of 17% in 2022 compared to 2019 but a drop in its recycling rate of 2% (**ES Figure 5**).

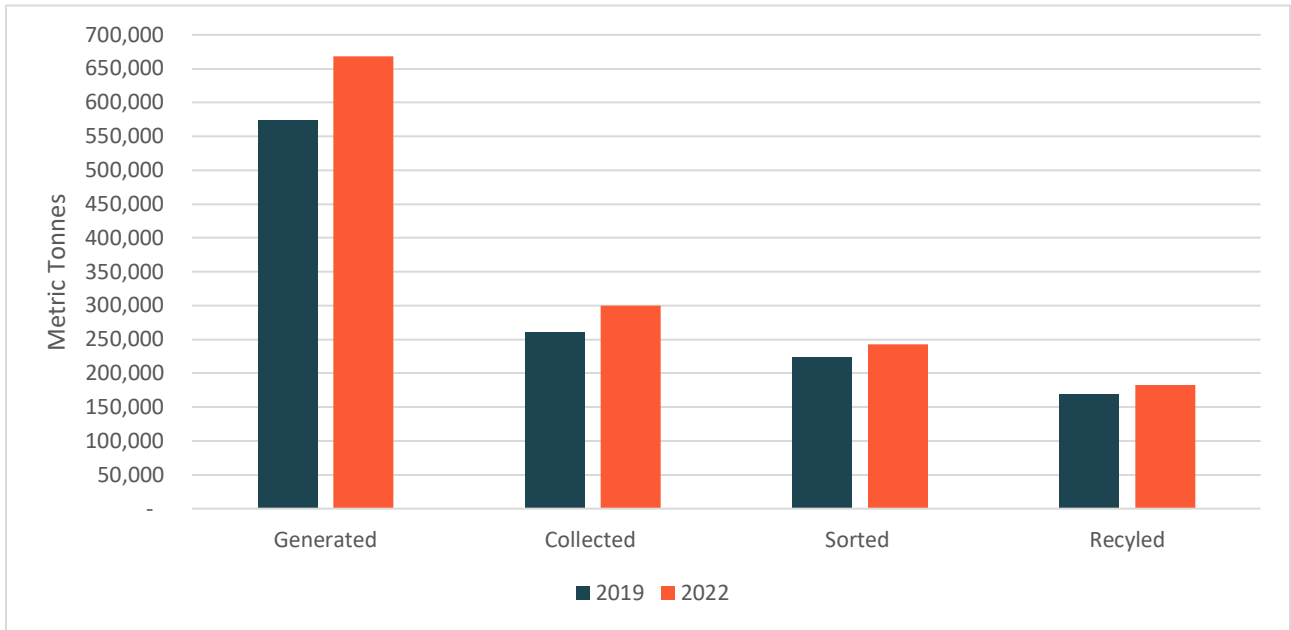
Overall, the picture remains relatively consistent to 2019 with the most significant changes related to the generation of rigid plastic packaging as compared to flexible plastic packaging. While the data indicates improvements in recycling opportunities for flexible packaging recycling, the amount of rigid plastic recycling has not kept pace with the growth in its use.



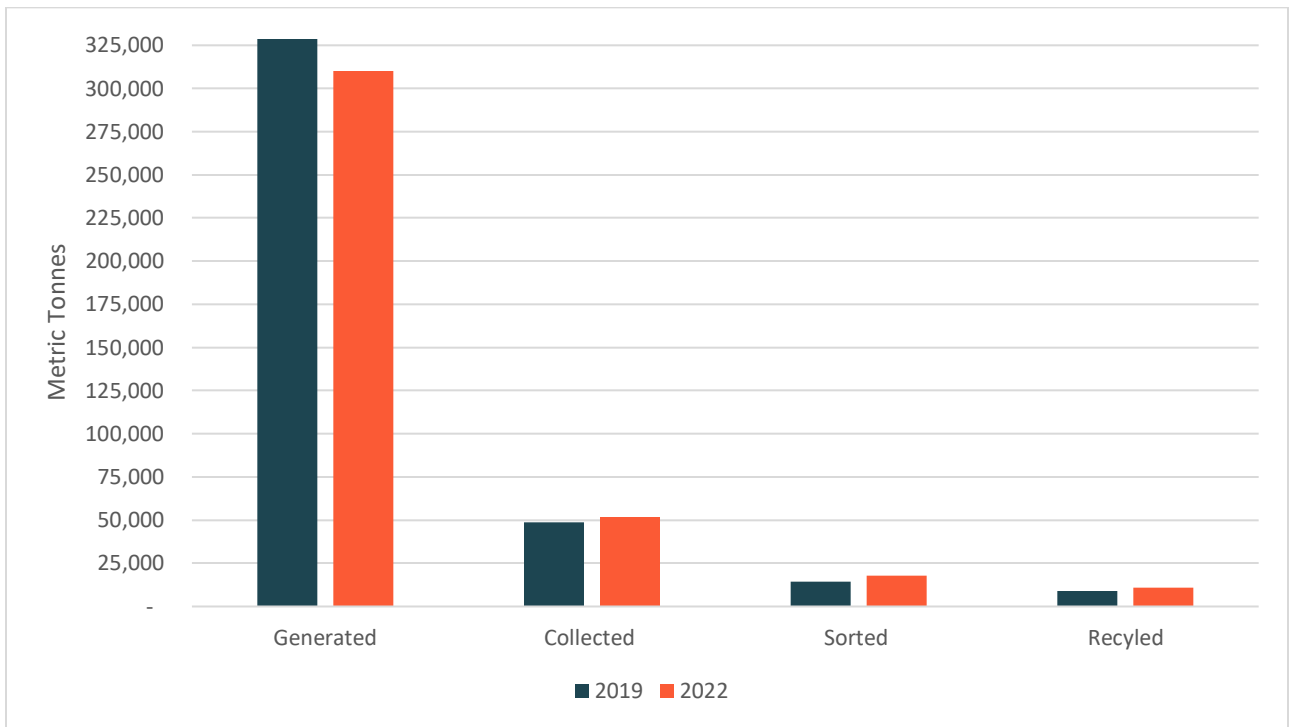
ES Figure 2: Plastic packaging generation in residential PPP and deposit return systems in 2019 and 2022.



ES Figure 3: Plastic packaging recycling in residential PPP and deposit return systems in 2019 and 2022.



ES Figure 4: Canada-wide rigid plastic packaging flow residential and deposit return systems.



ES Figure 5: Canada-wide flexible plastic packaging flow residential and deposit return systems.

1 BACKGROUND

In 2021, Canada Plastics Pact (CPP) was launched and joined an international and globally aligned effort to eliminate plastics waste and end plastic pollution by ensuring that plastic packaging is used within a circular economy. CPP committed to achieving the following four ambitious targets by 2025:

- Define a list of plastic packaging that is to be designated as problematic or unnecessary and take measures to eliminate them.
- Ensure an average of at least 30% recycled content across all plastic packaging (by weight).
- Support efforts towards 100% of plastic packaging being designed to be reusable, recyclable, or compostable.
- Undertake ambitious actions to ensure that at least 50% of plastic packaging is effectively recycled or composted.

Since its launch, CPP has brought together 98+ Partners from across Canada's plastics chain (i.e., brand owners, waste management service providers, government, and not-for-profits) to research, fund, and trial solutions that overcome known barriers to the wise use of plastics and its proper end-of-life management. CPP's efforts to support progress has been swift:

- In 2021, it released its first plan to keep plastics out of the environment (i.e., CPP's Roadmap to 2025) and its Foundational Report, which provided a baseline for plastic packaging generation and recovery using 2019 as the baseline data year. The 2019 data year was used for two reasons. First, many of the producer responsibility organization (PRO) 2020 annual reports were not released in early 2021 when the Foundational Report was drafted. Second, 2019 was the last pre-pandemic year before the Foundational Report, which was important to avoid any data anomalies that could be introduced as a result of the pandemic.
- In 2022, it launched The Canadian Guidance for the Golden Design Rules for Plastic Packaging and its first pilot standup pouch with 20% post consumer recycled content (PCR).
- In 2023, it:
 - released Canada's first industrial, commercial, and institutional (ICI) packaging and paper products (PPP) waste flows study, with a focus on British Columbia;
 - released a study on the reuse and refill of plastic packaging in Canada;
 - released a definitional framework for circular flexible plastic packaging;
 - released a report on improving data collection, reporting & transparency within the plastics packaging value chain;
 - released a report on pathways to mono-material flexible plastic packaging; and
 - undertook research as part of a consortium of circularity leaders to optimize the recycling system for flexible plastic packaging in Canada.

As CPP works to assess its progress towards completing its 2025 Roadmap, it has commissioned a series of three deliverables that will help it assess its progress on its goal to ensure that at least 50% of plastic packaging is effectively recycled or composted:

1. An update to the 2019 data included in the Foundational Report, which provides a status check on Canada's current plastic packaging flow for the residential sector and deposit return system packaging.
2. A national baseline for plastic packaging flow from the ICI sector.

3. An evaluation of plastic packaging data and reporting requirements that suggests solutions to overcome the absence of data available in Canada to track plastic and recycling flows and unify data collection and reporting Canada-wide.

Together these deliverables will provide a current state analysis of Canada's complete plastic packaging flow from all sectors and provide advice on the activities and advocacy CPP may wish to undertake to further achieve their goals. This report is the output of the first deliverable. While an assessment of the current plastic packaging flow for the ICI sectors was initiated, the data were not included in this initial report as further data refinement is being undertaken as part of the second deliverable.

2 OBJECTIVES & SCOPE

This report aims to provide CPP with a current state analysis of plastics packaging flow from Canada's residential sector and from provincial and territorial DRSs with comparisons to the data provided in the Foundational Report.

It includes all plastic packaging generated in Canada except for plastic packaging designed to contain hazardous or special products (e.g., paint, lubricating oil) and ICI materials (e.g., commercial waste, construction demolition waste, agricultural products). Data for these sectors will be presented in report that will be submitted to CPP in March of 2024.

3 APPROACH

The following section outlines the approach taken to assess Canada's current plastic packaging flows including:

- A broad overview of the data sources used and their reliability; and
- The methodology used to estimate current plastic packaging flows.

Appendix A provides definitions for the acronyms used in this report. Appendix B provides definitions for the key terms and points of measurement are unchanged from the Foundational Report.¹

3.1 Data Sources and Acquisition

The most recent data available were collected from provincially and territorially regulated systems (i.e., DRSs for beverage containers and extended producer responsibility [EPR] systems for packaging and paper products [PPP]); municipalities (e.g., waste composition studies, waste audits); direct information from producers, processors, and haulers; and government and industry studies. For the Foundational Report, the 2019 data year was used; for this Progress Report, the 2022 data year was used, where available. Where 2022 data was not available, the most recent data available was used.

As was done for the Foundational Report, data for the Atlantic provinces (i.e., New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island) were combined into an "Atlantic Canada" category to respect concerns raised that presenting data by province would reveal commercially sensitive information due to small number of recyclers in each province, and to reflect performance more accurately in this region given the scarcity of data available from one province to another. Confidence intervals for DRSs and residential PPP systems differ based on the availability and quality of data (Appendix C).

¹ Canada Plastics Pact, 2021. Foundational research and study: Canadian plastic packaging flows. Available at: <https://plasticspact.ca/wp-content/uploads/2021/10/PPP-Foundational-Research-on-Canadian-Plastics-Packaging-Flows-May-2021-final.pdf>

Similar to the Foundational Report, the collection, sorting, and composting of compostable plastic packaging was not measured. First, compost facility operators do not track, measure, or report on the amount of compostable plastics composted. Second, most indicate that compostable plastic packaging continues to be removed from either the feedstock before it enters the composting process (e.g., trommel systems that remove plastic bags) or the finished compost (i.e., because the retention time in the compost facility is not adequate to fully degrade the plastic packaging). For example, even with certified compostable plastic film, the knots used to tie film bags often do not compost and end up as residual in the finished compost. As a result, with the exception of certified compostable plastic film, almost all organics collection programs across Canada actively discourage the collection of both compostable plastics and paper packaging lined with plastic film.

Many participants provided data for this work in confidence. As a result, none of the data will be released in any form other than this report. Provincial and territorial data will be provided in the final report once ICI data are included.

Deposit Return System Plastic Packaging

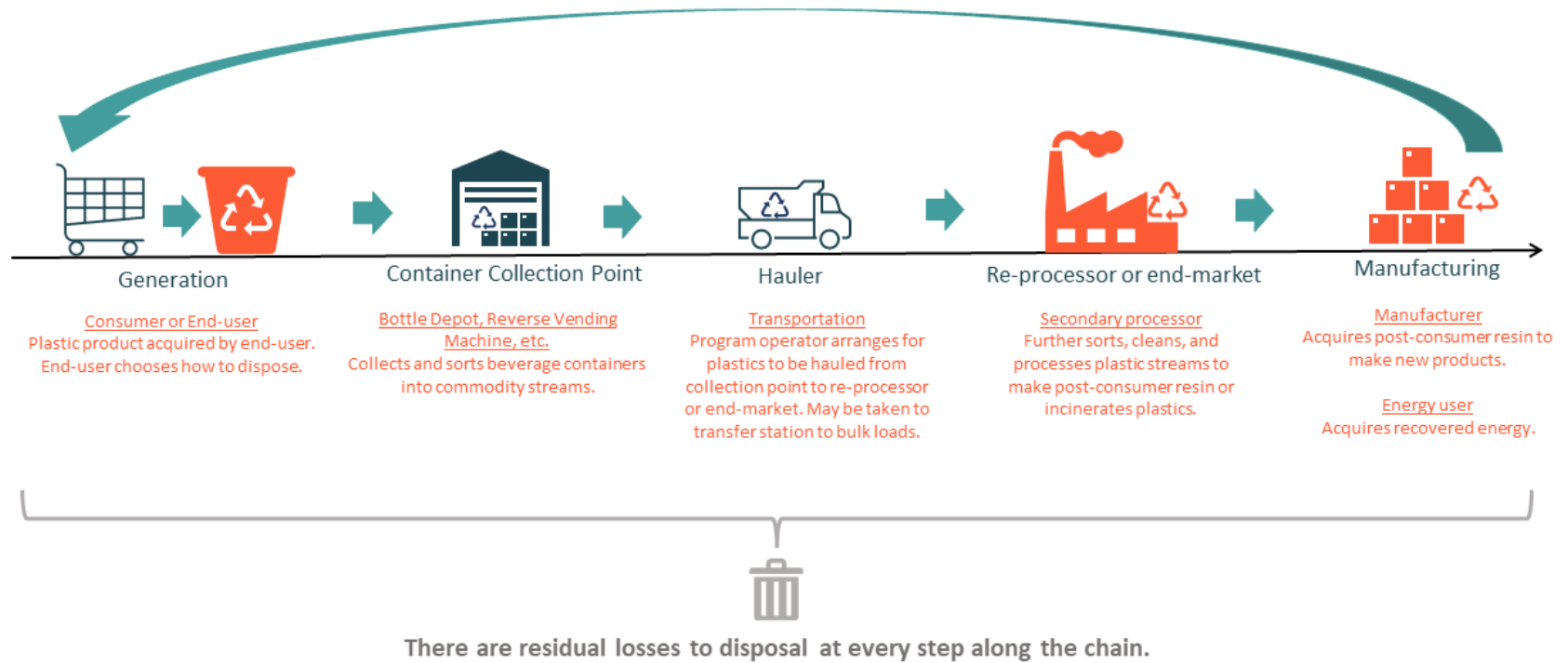


Figure 1: Flow of plastic beverage containers in deposit return systems.

As was the case in 2019, in 2022 all but two of the provinces and territories (i.e., Manitoba² and Nunavut³) have a DRS in place to collect and manage plastic beverage containers. In most cases, data for plastic packaging supplied, collected, and sorted were available through the provinces and territories or the system operators (**Table 1**). In general, the resins make-up of plastic beverage container packaging supplied includes PET (e.g., pop bottles), HDPE (e.g., milk jugs), other rigid plastics (e.g., PP bottles, polycups), and flexible packaging (i.e., bag-in-box or pouches).

British Columbia, Alberta, and the Yukon are the only jurisdictions that publicly report both the units of plastic beverage containers supplied and collected for both alcohol and non-alcohol containers. Most of the other DRS operators only publicly report the collection rate for all beverage containers (i.e., containers made of all materials) combined or a small subset of the beverage containers supplied (e.g., Ontario reports units supplied and collected for alcohol containers only, Québec reports on units supplied and collected for soft drinks and beer). As a result, to obtain more detailed information (e.g., supplied and collected units by resin) the program operator in each jurisdiction was contacted. Where data were available, the supplied data are reported as number of containers or ‘units’. As a result, conversion factors were applied to convert the total number of containers supplied by format and resin into weight.

Table 1: Sources for deposit return systems data collected or calculated.

Province / Region	Supplied	Generated	Collected	Sorted	Recycled
All programs	Based on 2022 annual report 2022 or data supplied by the program operator.	Same as supplied.	Based on 2022 annual report 2022 or data supplied by the program operator.	Same as collected.	Based on a yield factor. See Table 3 .

The categories of beverage containers and the level of detail available for each resin type (e.g., PET, HDPE, laminates) varies by province and territory (**Table 2**). In some provinces, the data collected has become less discrete since 2019, and in others it has become more discrete. For example, for the 2019 data year, Saskatchewan’s SARCAN and Alberta’s Alberta Beverage Container Recycling Corporation were able to report plastics supplied by resin, whereas for the 2022 data year they were only able to report “plastics supplied”. In comparison, British Columbia’s Encorp Pacific was able to expand its reporting to include supplied and collected for PET, HDPE, other rigid plastics, polycups, Key Kegs, and flexible plastics (drink pouches and bag-in-box).

² In Manitoba, beverage containers are collected through a residential producer responsibility program for PPP and through recycling collections from streetscape, businesses, and institutions, rather than through a DRS. See Government of Manitoba, n.d. Manitoba’s Extended Producer Responsibility Program. Available at:

[https://www.gov.mb.ca/sd/wastewise/recycle/index.html#:~:text=Manitoba's%20extended%20producer%20responsibility%20program%20\(EPR\)%20is%20based%20on%20a.and%20sustainable%20use%20of%20resources](https://www.gov.mb.ca/sd/wastewise/recycle/index.html#:~:text=Manitoba's%20extended%20producer%20responsibility%20program%20(EPR)%20is%20based%20on%20a.and%20sustainable%20use%20of%20resources)

³ In 2021, the Nunavut Liquor and Cannabis Commission removed its DRS on all plastic and glass beverage containers due. It maintains its DRS for alcohol bearing aluminum cans. See Nunavut, Department of Finance, 2021. Removal of bottle deposits at the NULC. Available at: <https://gov.nu.ca/finance/news/removal-bottle-deposits-nulc>

Table 2: Resins reported by provinces & territories with deposit return systems⁴

Province / Territory	Supplied	Collected
British Columbia	PET HDPE Other rigid plastics Polycups Key Kegs Flexible plastics (drink pouches, bag-in-box)	PET HDPE Other rigid plastics Polycups Key Kegs Drink pouches Bag-in-box bladders
Alberta	Rigid plastics Bag-in-box bladders Drink pouches Polycups	PET HDPE Other rigid plastics Polycups Key Keg Drink pouches Bag-in-box bladders
Saskatchewan⁵	Plastic	PET HDPE Other rigid plastics
Ontario⁶	PET Tetra Pack and Bag-in-Box containers	PET Mixed Plastic
Québec⁷	PET	PET
New Brunswick	PET HDPE	PET HDPE
Nova Scotia	PET HDPE Other plastics (rigid and flexible)	PET HDPE Other plastics (rigid and flexible)
Prince Edward Island	PET HDPE Other rigid plastics Pouches	PET HDPE Other rigid plastics Pouches
Newfoundland & Labrador	Plastics	PET HDPE Other plastics (rigid and flexible)
Yukon	PET HDPE	PET HDPE
Northwest Territories	Rigid plastics Flexible plastics	PET HDPE Other rigid plastics Polycups Key Kegs Drink pouches Bag-in-box bladders

DRSs have reliable data. The quantity supplied is tracked on a unit basis because a container recycling fee and deposit is charged to the consumer on a unit basis. The quantity collected is also counted on a unit basis and deposit refunds are dispersed on a unit basis. At container collection points (e.g., bottle depots, reverse vending machines), the collected containers are source separated into market-ready bales or totes (**Figure 1**). The bales or totes might include mixed resins (e.g., labelled as 'other plastics') that will be further sorted by the end-market.

⁴ Not all the data available is publicly reported. Program operators were contacted to obtain the most discrete data available.

⁵ In Saskatchewan, neither flexible plastics (i.e., bag-in-box bladders and drink pouches) nor Key Kegs are included in its DRS.

⁶ In Ontario, only alcohol containers are included in the DRS for the 2022 data year.

⁷ In Québec, only soft drinks and non-refillable beer containers are included in the DRS for the 2022 data year.

In general, DRSs do not measure or report the quantity ultimately recycled (i.e., the container recyclability rate achieved by end-market processor)⁸ with the exception of Alberta, which reports a theoretical recyclability rate (i.e., the amount of each container that could be recycled under optimum conditions). As a result, additional interviews were conducted with processing facilities that manage Canada’s DRSs’ plastics to gain an understanding of the final recycling rate (or yield) for deposit bearing beverage containers based on container format and resin. **Table 3** provides the yields used to calculate recycling rate.

Table 3: Yield factor applied to estimate the quantity recycled for beverage containers managed in deposit return systems.

Resin	Low estimate of yield	High estimate of yield
PET	80%	85%
HDPE	80%	85%
Flexible Plastics	50%	75%

⁸ For example, the percentage of material converted into post consumer resin (PCR) by the end-market, excluding the material sent to incineration or energy recovery.

Residential Sector Plastic Packaging

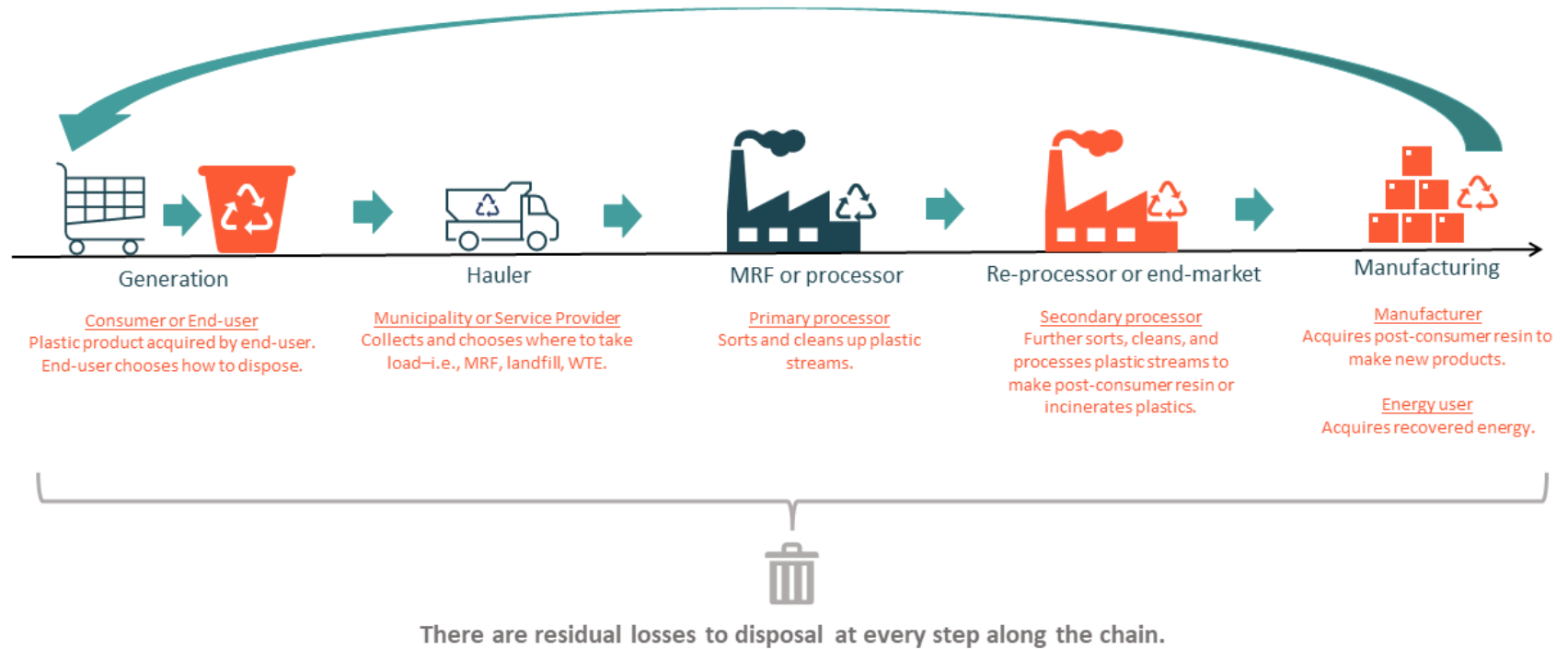


Figure 2: Flow of plastic packaging in residential PPP systems.

As was the case in 2019, British Columbia, Saskatchewan, Manitoba, Ontario, and Québec have provincially regulated residential recycling systems in place that manage an array of plastic packaging.

Information on plastic packaging supplied, collected, and sorted from the residential sector (i.e., households) were derived from two main sources:

1. The published annual reports of regulated PPP systems that operate in British Columbia, Saskatchewan, Manitoba⁹, Ontario, and Québec. In most cases, data for plastic packaging supplied and collected were available through the system operators though there is significant variation in reporting between PPP system operators (**Table 4**).

Table 4: Resins reported by PROs operating regulated PPP systems.

Province / Territory	Supplied	Collected	Sorted	Recycled
British Columbia	Rigid, Flexible	Rigid, Flexible	Not reported	Not reported
Saskatchewan	All PPP ¹⁰	All PPP	All plastic* ¹¹	Not reported
Manitoba	PET containers and bottles, HDPE containers and bottles, Film, Laminates, PS, other resins	PET containers and bottles, HDPE containers and bottles, Film, Laminates, PS, other resins	Not reported	Not reported
Ontario¹²	PET, HDPE, Film, Laminates, PS, Mixed resins	Not reported	PET, HDPE, Film, Laminates, PS, Mixed resins	Not reported
Québec	PET bottles, HDPE bottles, Laminates, HDPE & LDPE film, HDPE & LDPE shopping bags, EPS food packaging, EPS goods packaging, PS, PET containers, PLA and other degradable packaging, other resins	PET bottles, HDPE bottles, Laminates, HDPE & LDPE film, HDPE & LDPE shopping bags, EPS food, EPS protection, PS, PET containers, PLA and other degradable packaging, other resins	PET, HDPE, Plastic mix, Mixed Rigid Plastic (MRP), Plastic film	Not reported

For residential sector data, the generated amount is greater than the amount reported as supplied by PROs operating regulated EPR systems for PPP. This is because, unlike DRSs (where the amount supplied is equivalent to the amount generated), all the regulated provincial PPP systems operating in Canada apply a de minimis that exempts small

⁹ As Manitoba does not have a DRS for beverage containers, beverage containers collected from households are collected through the residential PPP program and are included in the program's published data. The Canadian Beverage Container Recycling Corporation encourages the collection of beverage containers from streetscapes and businesses in Manitoba, but these data are not discernable from the household collection of containers in their annual report.

¹⁰ All PPP means there is no disaggregation of the types or amount of plastic packaging either supplied or collected.

¹¹ The addition of a star "*" denotes a change from previous reporting.

¹² As currently reported through the Stewardship Ontario pay-in-model. Data in Stewardship Ontario's Annual Report are consolidated.

producers from a requirement to report the tonnes they supply onto the market if they generate materials in quantities and/or dollar values below a defined limit.¹³

2. Municipal government waste management data were collected from each province and territory. This includes data related to:
 - residential waste disposal rates;
 - waste composition studies;
 - recycling inbound and outbound studies; and
 - recycling collected and sorted tonnes.

Waste audit and waste composition studies were used to assess the amount of designated material generated to account for the quantity supplied by exempt producers. However, as was found in the Foundational Report, there remains little consistency in the municipal waste data collected Canada-wide, especially related to the types of plastic resins and packaging formats that are tracked in the waste audits (i.e., conducted at curbside, inbound loads to the MRF, outbound loads at from the MRF) or in waste composition studies (i.e., conducted at landfill). There is also significant variation in how often waste audits and waste composition studies are undertaken (e.g., annually, biannually, or longer) and the sampling frequency used for each study (e.g., monthly assessments, seasonal assessments, or one assessment per year). Wherever possible, seasonal audits with more detailed categories were used.

Table 5 provides a summary the data sources used to inform residential sector plastic flow analyses. Recycling for all regions was calculated using a yield factor based on discussions with the downstream processors.

Table 5: Sources for residential PPP sector data collected or calculated.

Province / Region	Generated	Supplied	Collected	Sorted
British Columbia	Calculation and extrapolation based on waste composition studies (2021/2022).	Based on Recycle BC Annual Report (2022). ¹⁴	Based on Recycle BC Annual Report (2022).	Estimated marketed tonnes and calculation based on post-collection contract obligation and collected tonnage.
Alberta	Calculation and extrapolation based on waste composition studies from two municipalities (garbage) and inbound composition from two MRFs (collected) and inbound	N/A	Calculation and extrapolation based on inbound composition studies from two MRFs (collected) and inbound quantity based on ACES Report. ¹⁶	Calculation and extrapolation based on sorted tonnes from Calgary, Edmonton, and Lethbridge MRFs.

¹³ A de minimis is an exemption from the program for small producers. The material produced by these exempt producers are not included in supplied data reported by PROs. The de minimis level varies by province or territory.

¹⁴ Recycle BC, 2023. 2022 Annual Report. Available at: https://recyclebc.ca/wp-content/uploads/2023/06/RecycleBC_AR2022_FINAL.pdf

¹⁶ For the 2022 reporting year, the City of Edmonton made significant improvements to its MRF and began to collect a wider array of plastics.

	quantity based on ACES report. ¹⁵			
Saskatchewan	Calculation and extrapolation based on Saskatoon (2019) waste composition study (waste and recycling).	Based on Multi-Material Stewardship Western Annual Report (2022).	Calculation and extrapolation based on waste composition studies (waste and recycling) (2019).	Calculation and extrapolation based on sorted tonnes from Regina's MRF.
Manitoba	Calculation and extrapolation based on waste composition studies (waste and recycling) (2019).	Based on Multi-Material Stewardship Manitoba Annual Report (2022).	Calculation and extrapolation based on waste composition studies (waste and recycling) (2019).	Calculation and extrapolation based on sorted tonnes from Winnipeg's MRF.
Ontario	Calculation and extrapolation based on waste composition studies (waste and recycling) (2021/2022).	Based on Stewardship Ontario's Pay-In-Model data (2022).	Calculation based on CIF/SO ¹⁷ waste composition study and RPRA Datacall (2022).	Calculation based on RPRA Datacall (2022) for sorted tonnes.
Québec	Calculation and extrapolation based on 2022 province-wide waste composition study (garbage and recycling).	Based on 2022 Schedule of Contribution calculation.	Calculation based on 2022 province-wide waste composition study (garbage and recycling).	Calculation based on 2022 price index and marketed tonnes from RECYC-QUEBEC.
Atlantic Canada	Calculation and extrapolation based on New Brunswick composition studies (2019).	N/A	Calculation and extrapolation based on New Brunswick composition studies (2019).	Calculation and extrapolation based on Nova Scotia and Prince Edward Island marketed tonnes and Central Newfoundland MRF.
Territories	Limited data available for the residential sector that is representative of the entire territories.	N/A	Limited data available for the residential sector that is representative of the entire territories.	Limited data available for the residential sector that is representative of the entire territories.

To address gaps and discrepancies, the project team conducted interviews with downstream processing facilities to gain an understanding of the recycling rate (i.e., yield) for materials based on packaging format and resin. **Table 6** provides the yield applied to estimate of the amount of material recycled achieved. The yield factor is inclusive of high value commercial use (e.g., 'bottle to bottle' applications) through to no value commercial uses.

Table 6: Yield factor applied to estimate the quantity recycled for plastic packaging managed in residential PPP systems.

Bale	Low estimate of yield	High estimate of yield
PET	70%	85%

¹⁵ Eunomia, 2020. Alberta Collaborative Extended Producer Responsibility Study (ACES). Available at:

<https://rmaalberta.com/news/alberta-collaborative-extended-producer-responsibility-study-now-available/>

¹⁷ Continuous Improvement Fund, 2023. CIF/SO Terms of Reference Year 6 (2021/22). Residential Waste Composition Study.

Available at: <https://thecif.ca/wp-content/uploads/2023/03/CIF-Year-6-Residential-Waste-Composition-Study-Feb-2023.pdf>

HDPE, PP, Tubs & lids, PS	75%	85%
Mixed plastics, MRP	50%	67%
Film plastic	50%	75%

Where multiple data sets were available within the same province or region, a confidence interval of 90% was used for each of the categories, and high and low ranges were determined. If the confidence interval showed a high variability, subcategories (e.g., PET, HDPE) were collapsed and data was calculated based on rigid and flexible categories.

3.2 Modelling and Analysis

The data sourcing and analyses used to inform the 2023 Progress Report mirrored processes used to inform the Foundational Report. This ensures the results of the analyses are comparable and progress can be more easily detected.

Base Model Development

The project team developed an improved ‘all plastics flow’ modelling system. As this Progress Report is Deliverable 1 of three deliverables, the updated modelling system will enable combining and updating data and information that the project team has collected on a number of related projects: i.e., the Canada Plastics Pact Foundational Research and Study: Canadian Plastic Packaging Flows (Foundational Report, 2021), the British Columbia Industrial, Commercial and Institution Packaging and Paper Products Baseline Report: Waste Flows Study (2023), the Yukon Industrial, Commercial and Institutional Packaging and Paper Products Baseline Report: Waste Flows Study (2023), and the PRFLEX: Perfecting the Recycling System for Flexible Plastic Packaging in Canada, Part 1 - Diagnostics Report (2023). As well, the updated model enables the team to compile and track more discrete plastics data where it is available.

The data used to inform this report (i.e., Deliverable 1) included data from the consolidated databases of previous projects as well as new data. The new data collected from diverse sources were obtained in varying formats and needed to be organized into a consistent format so that the data could be analyzed. Once organized, data were transcribed into the database in a consistent and standardized framework.

For plastic packaging under deposit, the factors to convert quantity in units to quantity in metric tonnes were usually provided by the program operators. In some cases, conversion factors from one province were applied to another where province-specific conversion factors were not available.

For all plastic packaging (deposit return and residential), the yield factor applied to the sorted quantities to estimate the amount of material recycled are presented in **Table 3** and **Table 6** and are based on discussions with downstream processors accepting deposit return and residential plastic packaging across Canada. Note, for this Progress Report, where flexible plastic packaging is collected (e.g., pouches, bag-in-box), a 50% – 75% yield was applied based on information from downstream processors. This is a change from the Foundational Report for which a 0% yield was applied, except for British Columbia’s DRS. This shift is due to these materials now being used in durable goods applications as opposed to being sent to energy recovery facilities.

The updated model enabled plastics packaging resin categorization (e.g., rigid plastic packaging [PET, HDPE, other, unclassified] and flexible plastic packaging [film, laminates, unclassified]) and by geographical location (i.e., province) organized around the two system flows:

- Plastic packaging managed by deposit return systems; and
- Residential sector plastic packaging.

Other calculations performed in the model included:

- use of factors to convert supplied units to weight;
- application of yield factors to sorted quantities to estimate amount of material recycled; and
- calculation of confidence intervals including high and low ranges.

The outputs of the analysis resulted in a series of summary tables and charts of plastic packaging generated, collected, sorted, and recycled by system, material, and province or regional grouping (i.e., Atlantic Canada). Population statistics were obtained from Statistics Canada.

3.3 Analysis

Plastic packaging flows were estimated using a bottom-up approach, drawing from a variety of data sources for plastic packaging generated by and collected from consumers combined with data and estimates from industry for plastic packaging sorted and recycled. Once data for the ICI are gathered as part of next stage of this project, overall results will be cross-checked against other studies including data from Environment and Climate Change Canada, Statistics Canada, and other relevant studies.

4 CURRENT LANDSCAPE & PROGRESS SINCE 2019

The following section provides estimates of the amount of material generated, supplied, collected, sorted, and ultimately recycled for the residential sector (i.e., households) and through deposit return systems. Note: Two alterations were made to the model

- Bag-in-box data for British Columbia's DRS for 2019 was updated to correct an error in the data provided to inform the Foundational Report.
- Yield rates were included for flexible plastics stemming from the DRSs of 50 – 75%. This is because since 2019, the British Columbia's and Alberta's DRSs have identified new options to recycle a portion of the flexible containers into post-consumer recycled content (PCR).

As data for the ICI sector will be presented in the final report, the relative contribution of each stream (ICI PPP, residential PPP, and DRS) cannot be reported until the final report is released.

4.1 Plastic Packaging Generated by System

Deposit Return and Residential PPP Systems Relative Contribution

Figure 3 provides a breakdown of the amount of plastic packaging generated under residential sector PPP systems (i.e., PPP systems serving single-family and multi-unit households) and regulated DRSs (serving the collection of deposit bearing beverage containers from both the residential and ICI sector). Overall, DRSs account for 8% and PPP systems account for 92% of the plastic packaging generated Canada-wide.

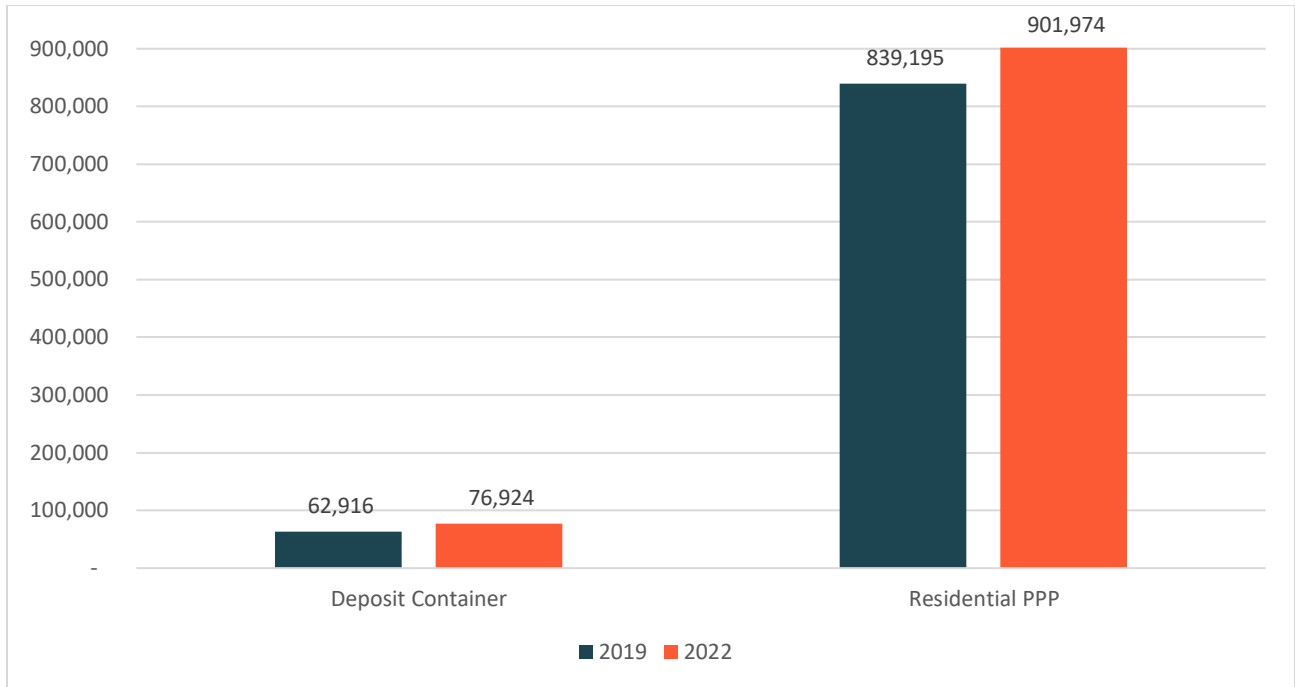


Figure 3: Plastic packaging generated by system.

The relative contribution of rigid and flexible plastic packaging to the DRSs versus residential PPP systems varies:

- For DRSs, 99% of all beverage containers supplied to market are rigid plastic (**Figure 4**), which is consistent with the findings in the Foundational Report. However, there has been a 14% increase in the amount of flexible plastic beverage containers and a 22% increase in the amount of rigid plastic beverage containers generated by weight compared to the Foundational Report (**Table 7**). Note: some of this increase is related to the British Columbia’s February 2022 expansion of its to include the capture of all “ready -to-serve” milk and plant-based beverages (e.g., oat, soy, and almond milk).
- For residential PPP systems, 66% of the packaging is rigid and 34% is flexible (**Figure 5**). Compared to the Foundational Report, this is a 6% decrease in the proportion of flexible plastics and a corresponding 16% increase in the proportion of rigid plastics. While this is still within the margin of error, the decrease is not surprising given the implementation of plastic bag bans and the move by some companies to switch to paper-based flexibles (e.g., e-commerce transport packaging).
- The combined contribution of all plastic packaging to both systems (i.e., DRS and residential PPP) is 68% rigid plastic and 32% flexible plastic (**Figure 6**). There is no comparable statistic reported in the Foundational Report as the total proportion of rigid to flexible plastics reported in that report included plastics from the ICI sector. These data will be updated for Deliverable 3.

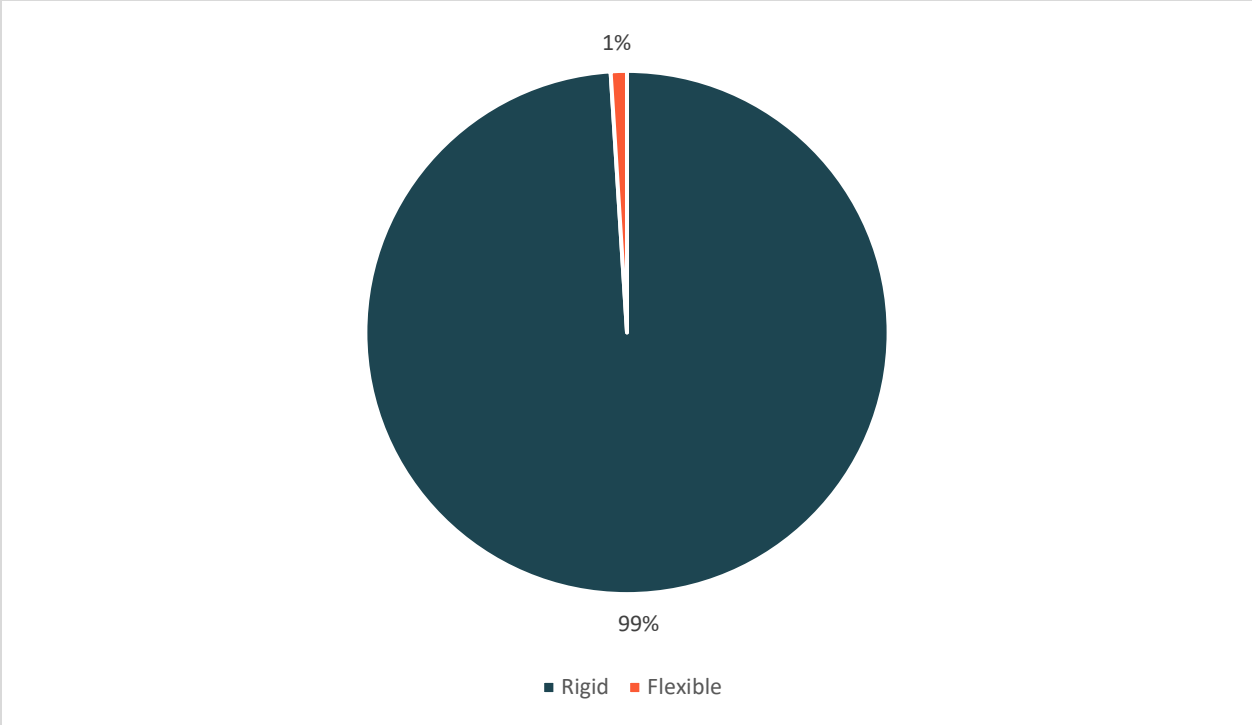


Figure 4: Proportion of rigid versus flexible plastics generated in deposit return systems.

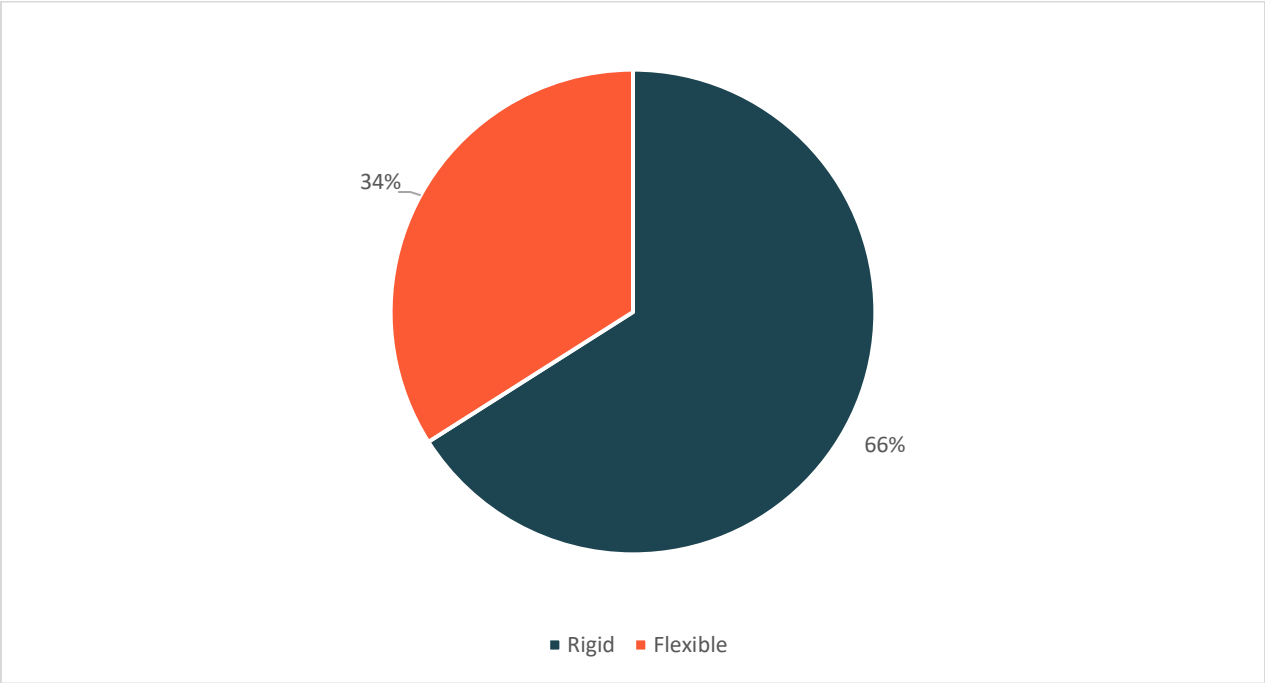


Figure 5: Proportion of rigid versus flexible plastics generated in residential PPP systems.

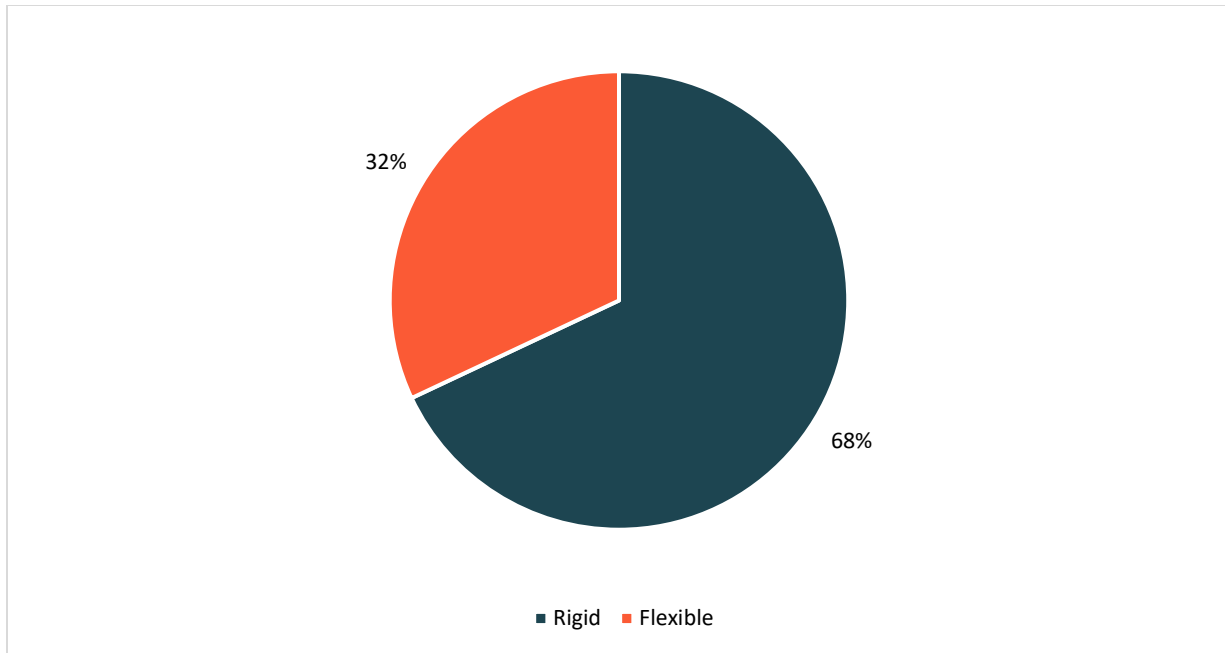


Figure 6: Proportion of rigid versus flexible plastics generated in residential PPP and deposit return systems combined.

Deposit Return System Generation

Table 7 compares the generation of plastic beverage containers Canada-wide in 2019 versus 2022. The data show that the generation of:

- Rigid plastic beverage containers increased by 13,925 tonnes or 22% by weight. As noted above, some of this increase is related to the expansion of the DRS in British Columbia to add all “ready -to-serve” milk and plant-based beverages (e.g., oat, soy, and almond milk) in February of 2022.
- Flexible plastic beverage containers generation increased 83 tonnes or 14% by weight. As noted above, the increase in flexible packaging is partially related to the amount reported in British Columbia.
- The total amount of plastic beverage containers increased by 14,008 tonnes or 22%.

Residential PPP System Generation

Table 8 compares the generation of plastic packaging managed by residential PPP systems Canada-wide in 2019 versus 2022. These data show that under the ‘average scenario’ the generation of:

- Rigid packaging increased by 81,292 tonnes or 16% by weight.
- Flexible packaging decreased by 18,513 tonnes or 6%.
- All residential PPP system plastic packaging increased by 62,779 tonnes or 7%.

The increase in rigid packaging could be the result of the growth of Canadian economic activity since the pandemic (i.e., +3.8% GDP growth in 2022 following +5.3% GDP growth in

2021),¹⁸ and a transition in the use of certain materials –e.g., the recent ban on PS trays has led to a substitution of PET, which is a heavier resin.

The decrease in flexible plastic packaging since the Foundational Report could be the result of early implementation of the Government of Canada’s plastic shopping bag restrictions and retail shopping bag restrictions or bans taking effect in Prince Edward Island, Nova Scotia, Newfoundland and Labrador, the Yukon Territories, Northwest Territories, and many municipalities across Canada. There could also be a movement to shift from unrecyclable flexible packaging to other types of packaging, including rigid packaging.

Total Generation – Residential PPP and Deposit Return Systems

Table 9 compares the combined generation of plastic packaging managed by residential PPP and DRSs Canada-wide in 2019 versus 2022. The data shows that under the average scenario:

- The generation of total rigid plastic packaging increased by 95,217 tonnes or 17% by weight.
- The generation of total flexible plastic packaging decreased by 18,430 tonnes or 6%.
- The overall generation of all DRS and residential PPP system packaging increased by 76,787 tonnes or 9%.

¹⁸ Statistics Canada, 2021. Provincial and territorial economic accounts, 2022. Available at: <https://www150.statcan.gc.ca/n1/daily-quotidien/231108/dq231108b-eng.htm>

Table 7: Canada-wide plastic packaging flow from deposit return systems.

		Generated (tonnes)	Collected (tonnes)	Collected rate (%)	Sorted (tonnes)	Recycled (tonnes)			Recycled rate (%)
						Low	High	Average	
2019	Rigid plastic	62,303	47,636	76%	47,636	38,109	40,491	39,300	63%
	PET	50,156	36,845	73%	36,845	29,476	31,318	30,397	61%
	HDPE	8,534	8,179	96%	8,179	6,543	6,952	6,748	79%
	PET/HDPE	3,399	2,502	74%	2,502	2,002	2,127	2,064	61%
	Other	214	110	52%	110	88	94	91	42%
	Flexible plastic	613	294	48%	294	124	186	155	25%
	Film	-	-	-	-	-	-	-	-
	Laminates	613	294	48%	294	124	186	155	25%
	Total	62,916	47,931	76%	47,931	38,233	40,677	39,455	63%
2022	Rigid plastic	76,228	55,560	73%	55,560	44,448	47,226	45,837	60%
	PET	60,276	40,943	68%	40,943	32,755	34,802	33,778	56%
	HDPE	11,414	11,178	98%	11,178	8,942	9,501	9,222	81%
	PET/HDPE	4,106	3,277	80%	3,277	2,622	2,786	2,704	66%
	Other	432	162	37%	162	129	138	133	31%
	Flexible plastic	696	308	44%	308	130	195	163	23%
	Film	-	-	-	-	-	-	-	-
	Laminates	696	308	44%	308	130	195	163	23%
	Total	76,924	55,868	73%	55,868	44,578	47,421	46,000	60%

Table 8: Canada-wide plastic packaging flow from residential PPP systems.

		Generated (tonnes)			Collected (tonnes)			Collected rate (%)	Sorted (tonnes)			Recycled (tonnes)			Recycled rate (%)
		Low	High	Average	Low	High	Average		Low	High	Average	Low	High	Average	
2019	Rigid plastic	467,946	554,471	511,209	193,695	233,599	213,646	42%	176,309	176,309	176,309	117,193	142,186	129,689	25%
	PET	147,245	176,774	162,010	82,761	101,538	92,149	57%	87,559	87,559	87,559	61,292	74,425	67,859	42%
	HDPE	61,639	71,018	66,329	34,560	40,269	37,414	56%	41,211	41,211	41,211	30,909	35,030	32,969	50%
	PET/HDPE	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Other	143,095	168,384	155,739	40,489	51,191	45,840	29%	47,540	47,540	47,540	24,992	32,731	28,861	19%
	Unclassified	115,967	138,295	127,130	35,884	40,600	38,242	0	-	-	-	-	-	-	-
	Flexible plastic	301,267	354,707	327,987	43,362	53,414	48,387	15%	13,961	13,961	13,961	6,980	10,470	8,726	3%
	Film	122,208	139,006	130,607	22,538	28,322	25,430	19%	13,961	13,961	13,961	6,980	10,470	8,726	7%
	Laminates	75,801	84,170	79,985	9,762	11,465	10,613	13%	-	-	-	-	-	-	0%
	Unclassified	103,258	131,531	117,395	11,062	13,627	12,345	11%	-	-	-	-	-	-	0%
	Total	769,213	909,179	839,195	237,057	287,012	262,033	31%	190,270	190,270	190,270	124,172	152,657	138,414	16%
2022	Rigid plastic	502,144	693,976	592,501	219,377	273,282	244,379	41%	187,429	187,429	187,429	123,134	150,316	136,725	23%
	PET	153,845	215,717	183,467	92,243	117,207	104,348	57%	98,814	98,814	98,814	69,170	83,992	76,581	42%
	HDPE	75,664	116,025	92,367	40,605	52,960	45,210	49%	33,896	33,896	33,896	25,422	28,811	27,117	29%
	PET/HDPE	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Other	150,621	196,290	173,456	47,170	59,588	53,379	31%	54,719	54,719	54,719	28,542	37,513	33,027	19%
	Unclassified	122,014	165,944	143,212	39,359	43,526	41,443	0	-	-	-	-	-	-	-
	Flexible plastic	270,122	349,703	309,473	44,937	58,284	51,611	17%	17,463	17,463	17,463	8,731	13,097	10,914	4%
	Film	80,250	106,680	93,465	19,021	26,773	22,897	24%	17,463	17,463	17,463	8,731	13,097	10,914	12%
	Laminates	87,493	109,810	98,651	14,230	17,454	15,842	16%	-	-	-	-	-	-	0%
	Unclassified	102,378	133,213	117,357	11,686	14,058	12,872	11%	-	-	-	-	-	-	0%
	Total	772,266	1,043,679	901,974	264,314	331,566	295,990	33%	204,891	204,891	204,891	131,865	163,413	147,639	16%

Table 9: Canada-wide plastic packaging flow from residential PPP and deposit return systems combined.

		Generated (tonnes)			Collected (tonnes)			Collected rate (%)	Sorted (tonnes)			Recycled (tonnes)			Recycled rate (%)
		Low	High	Average	Low	High	Average		Low	High	Average	Low	High	Average	
2019	Rigid plastic	530,249	616,775	573,512	241,332	281,235	261,282	46%	223,946	223,946	223,946	155,302	182,677	168,989	29%
	PET	197,402	226,931	212,167	119,606	138,383	128,994	61%	124,404	124,404	124,404	90,768	105,743	98,256	46%
	HDPE	70,173	79,552	74,863	42,739	48,448	45,593	61%	49,390	49,390	49,390	37,453	41,983	39,717	53%
	PET/HDPE	3,399	3,399	3,399	2,502	2,502	2,502	74%	2,502	2,502	2,502	2,002	2,127	2,064	61%
	Other	143,309	168,598	155,953	40,600	51,302	45,951	29%	47,650	47,650	47,650	25,080	32,825	28,952	19%
	Unclassified	115,967	138,295	127,130	35,884	40,600	38,242	0	-	-	-	-	-	-	-
	Flexible plastic	301,880	355,320	328,600	43,656	53,708	48,681	15%	14,255	14,255	14,255	7,104	10,656	8,881	3%
	Film	122,208	139,006	130,607	22,538	28,322	25,430	19%	13,961	13,961	13,961	6,980	10,470	8,726	7%
	Laminates	76,414	84,783	80,598	10,056	11,759	10,907	14%	294	294	294	124	186	155	0%
	Unclassified	103,258	131,531	117,395	11,062	13,627	12,345	11%	-	-	-	-	-	-	0%
	Total	832,129	972,095	902,112	284,987	334,943	309,964	34%	238,201	238,201	238,201	162,405	193,334	177,870	20%
2022	Rigid plastic	578,373	770,204	668,729	274,937	328,842	299,939	45%	242,989	242,989	242,989	167,582	197,543	182,562	27%
	PET	214,122	275,993	243,743	133,186	158,151	145,291	60%	139,758	139,758	139,758	101,925	118,794	110,359	45%
	HDPE	87,078	127,439	103,781	51,783	64,137	56,387	54%	45,073	45,073	45,073	34,364	38,312	36,338	35%
	PET/HDPE	4,106	4,106	4,106	3,277	3,277	3,277	80%	3,277	3,277	3,277	2,622	2,786	2,704	66%
	Other	151,053	196,722	173,888	47,332	59,750	53,541	31%	54,880	54,880	54,880	28,671	37,650	33,161	19%
	Unclassified	122,014	165,944	143,212	39,359	43,526	41,443	0	-	-	-	-	-	-	-
	Flexible plastic	270,818	350,399	310,169	45,245	58,592	51,919	17%	17,771	17,771	17,771	8,861	13,292	11,077	4%
	Film	80,250	106,680	93,465	19,021	26,773	22,897	24%	17,463	17,463	17,463	8,731	13,097	10,914	12%
	Laminates	88,189	110,506	99,348	14,538	17,762	16,150	16%	308	308	308	130	195	163	0%
	Unclassified	102,378	133,213	117,357	11,686	14,058	12,872	11%	-	-	-	-	-	-	0%

	Total	849,190	1,120,603	978,899	320,182	387,434	351,858	36%	260,759	260,759	260,759	176,443	210,835	193,639	20%
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4.2 Plastic Packaging Collected for Recycling and Sorted

Deposit Return System Collection and Sorting

Figure 7, Figure 8, and Table 7 compare the flow of plastic beverage containers Canada-wide in 2019 versus 2022. The data show that:

- Rigid plastic beverage containers increased by 7,924 tonnes or 17% by weight but its overall collection rate fell by 4% (rounded) (i.e., from 76% to 73%).
- Flexible plastic beverage containers increased by 14 tonnes or 5% by weight but its overall collection rate decreased by 4% overall (from 48% to 44%), which is within the margin of error.
- Total plastic beverage containers increased by 7,938 tonnes or 17% by weight but the overall collection rate fell by 4% (rounded) overall (i.e., from 76% to 73%).

When interpreting the collection data, it is important to note that:

- Saskatchewan excludes flexible plastic beverage containers from its DRS (and does not track flexible beverage containers supplied). Further, none of Saskatchewan's municipalities report collecting pouches or bag-in-box beverage containers as part of their PPP systems.
- Nunavut does not operate a DRS nor a municipal PPP system that collects rigid or flexible plastic beverage containers.
- None of Manitoba's PPP systems collect flexible beverage containers for recycling (i.e., neither Multi-Material Stewardship Manitoba nor the Canadian Beverage Container Recycling Association).

The DRSs collected data are equal to the sorted value because containers are individually sorted into bales or totes for sale to end-markets. The manner in which beverage containers are collected helps to eliminate sorting yield losses.

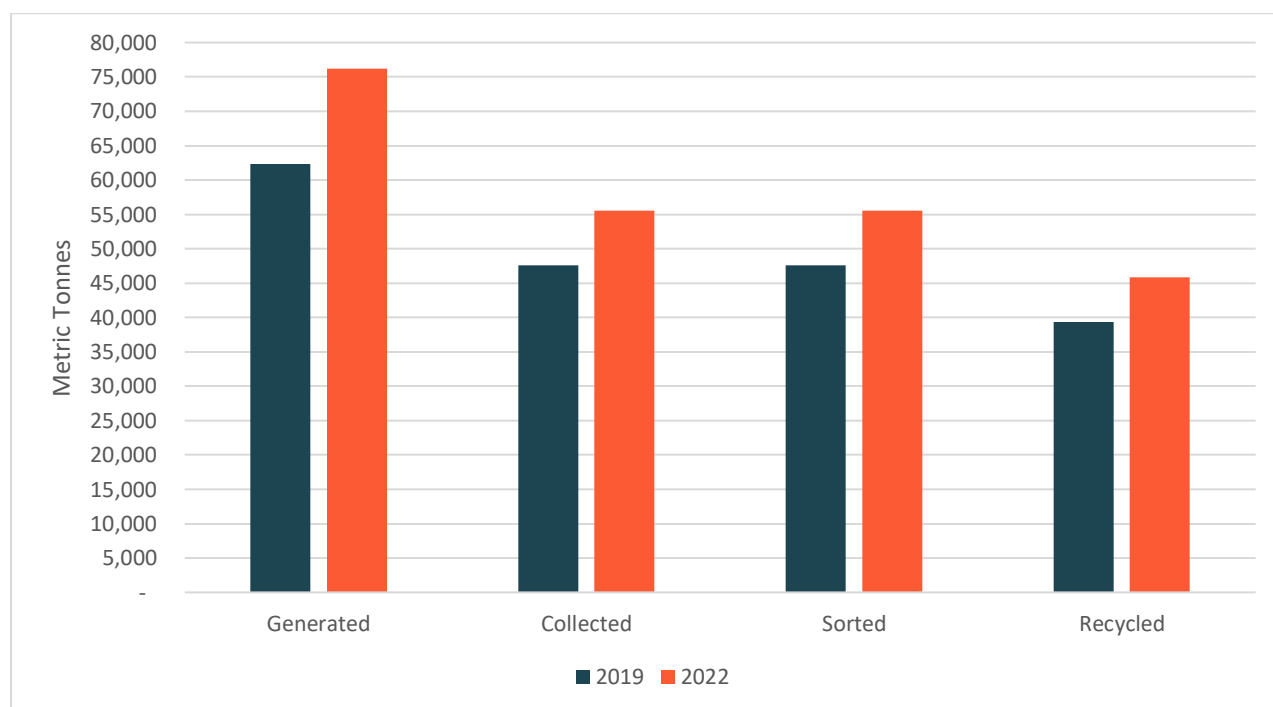


Figure 7: Canada-wide rigid plastic packaging flow in deposit return systems.

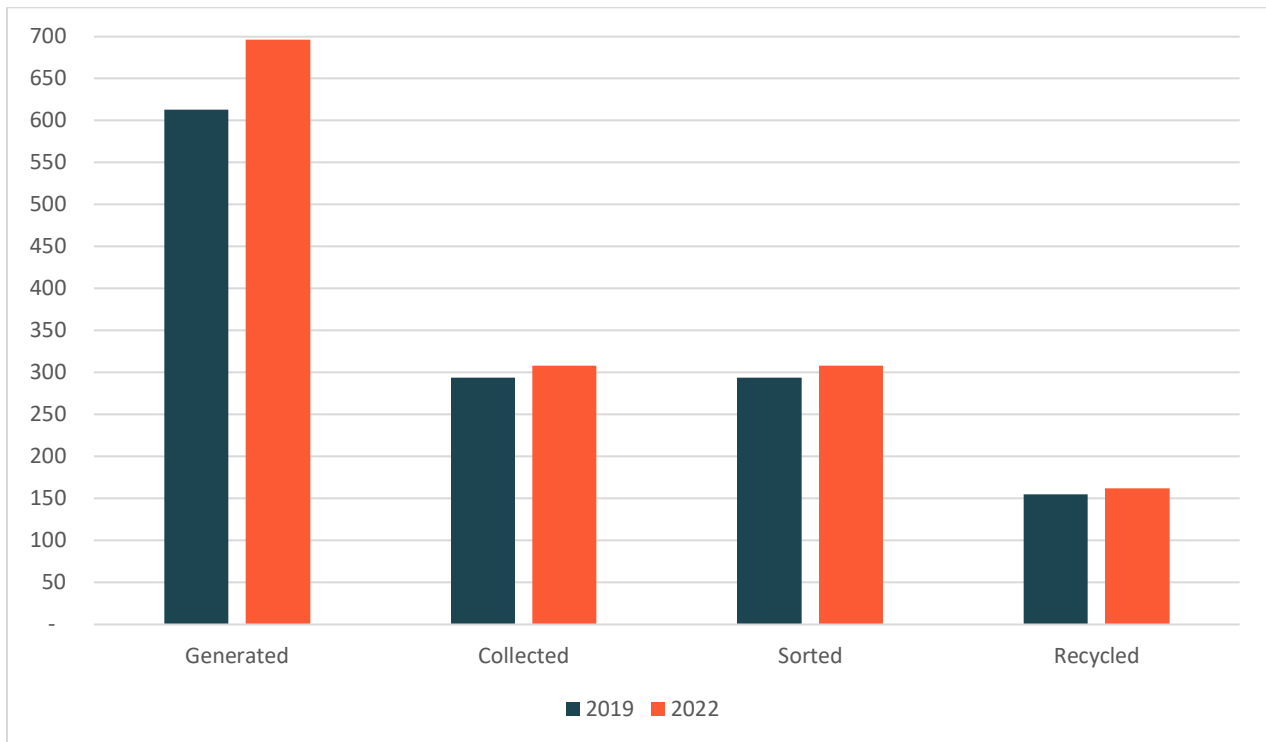


Figure 8: Canada-wide flexible plastic packaging flow in deposit return systems.

Residential PPP System Collection and Sorting

Figure 9, Figure 10, and Table 8 compare the flow of plastic packaging managed by residential PPP systems Canada-wide in 2019 versus 2022. The data show that in residential PPP systems the collection results under the average scenario are as follows:

- Rigid plastic packaging increased by 30,733 tonnes or 14% by weight, but its overall collection rate decreased by 1% (i.e., from 42% to 41%), which is within the margin of error.
- Flexible plastic packaging decreased by 3,223 tonnes or 7% by weight and increased its overall collection rate by 2% (i.e., from 15% to 17%), which is within the margin of error.
- Total plastic packaging increased by 33,957 tonnes of 13% by weight and increased its overall collection rate by 2% (i.e., 31% to 33%), which is within the margin of error.

The data also show that in residential PPP systems the sorting results under the average scenario are as follows:

- Rigid plastic packaging increased by 11,119 tonnes or 6% by weight.
- Flexible plastic packaging increased by 3,502 tonnes or 25% by weight.
- Total plastic packaging increased by 14,621 tonnes of 8% by weight.

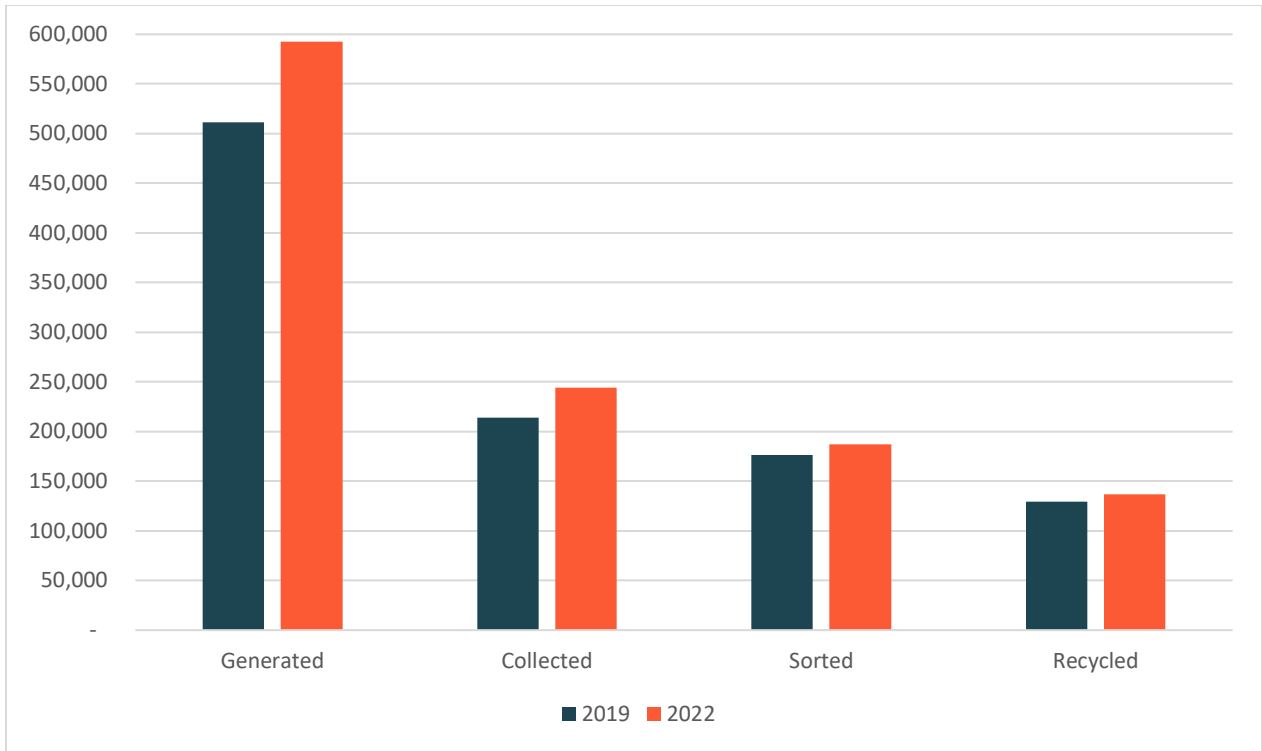


Figure 9: Canada-wide rigid plastic packaging flow in residential PPP systems.

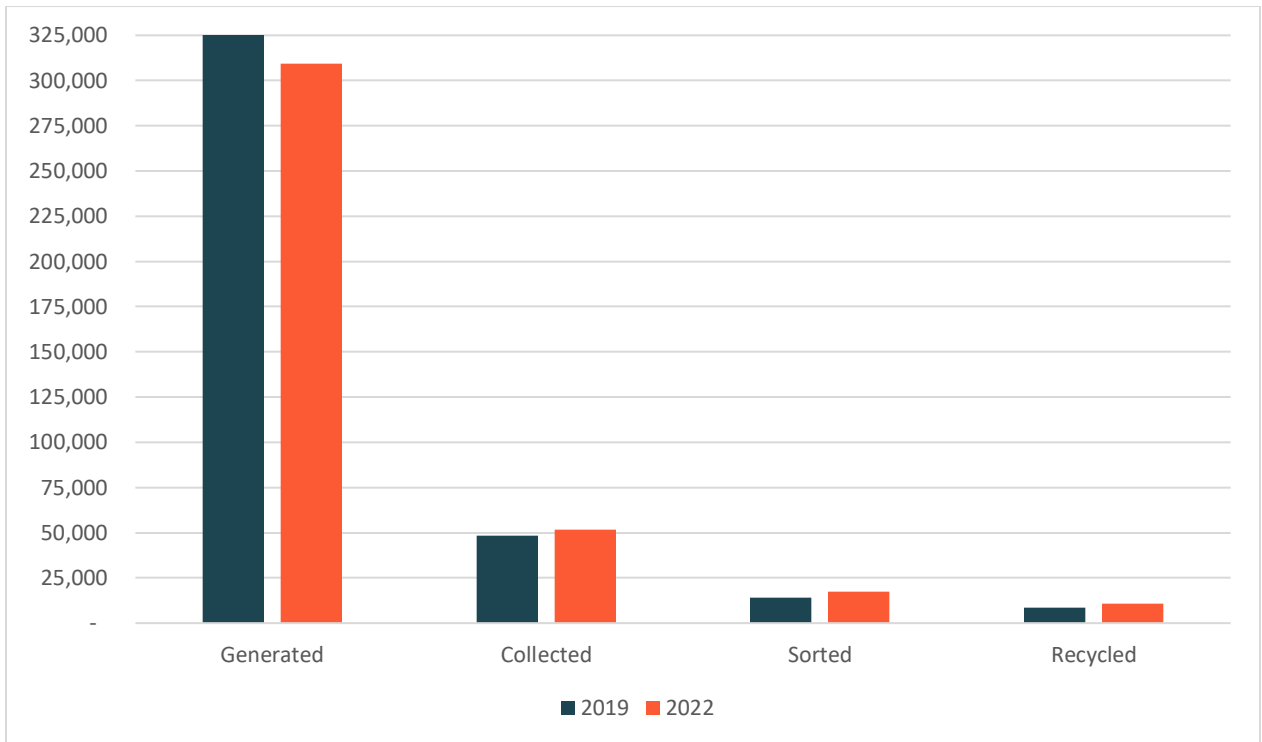


Figure 10: Canada-wide flexible plastic flow in residential PPP systems.

Combined Plastic Packaging Collection and Sorting

Figure 11, Figure 12, and Table 9 compare the flow of plastic packaging managed by residential PPP systems Canada-wide in 2019 versus 2022. The data show combined collection results under the average scenario are as follows:

- Rigid plastic packaging increased by 38,657 tonnes or 15% by weight, but its overall collection rate decreased by 1% (i.e., from 46% to 45%).
- Flexible plastic packaging increased by 3,237 tonnes or 7% by weight and increased its overall collection rate by 2% (i.e., from 15% to 17%).
- Total plastic packaging increased by 41,894 tonnes or 14% by weight and increased its overall collection rate by 2% (i.e., 34% to 36%).

The data also show that in residential PPP systems the sorting results under the average scenario are as follows:

- Rigid plastic packaging increased by 19,043 tonnes or 9% by weight.
- Flexible plastic packaging increased by 3,515 tonnes or 25% by weight.
- Total plastic packaging increased by 22,558 tonnes or 9% by weight.

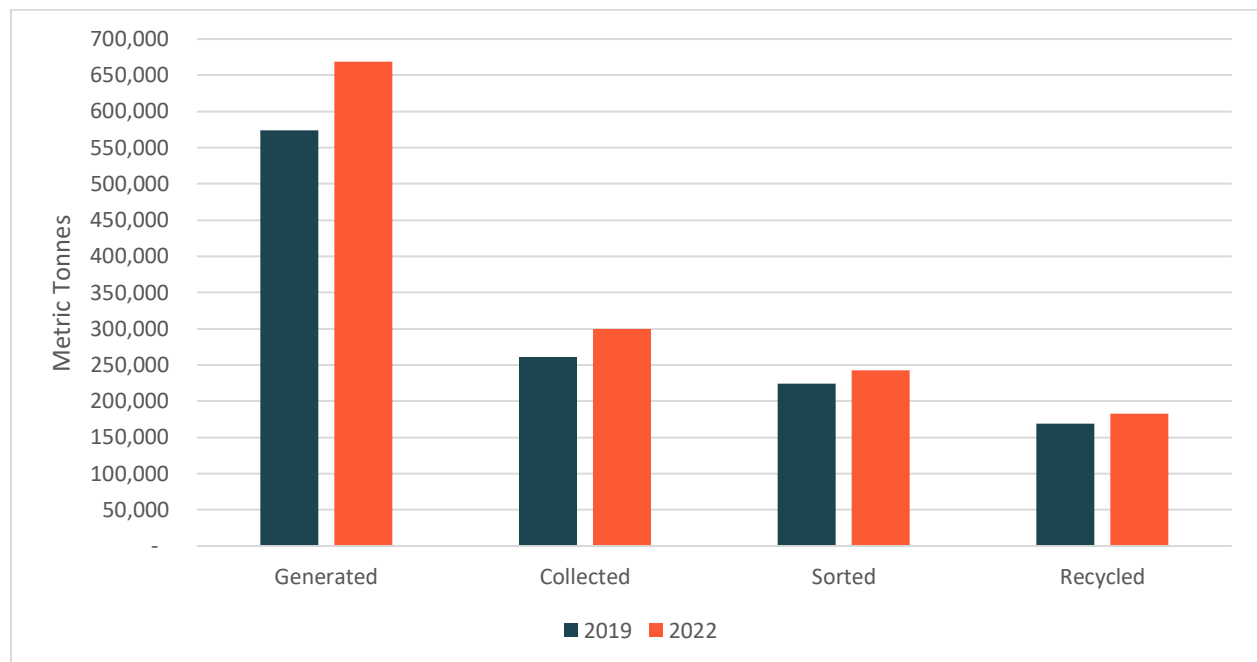


Figure 11: Canada-wide rigid plastic packaging flow in residential PPP and deposit return systems combined.

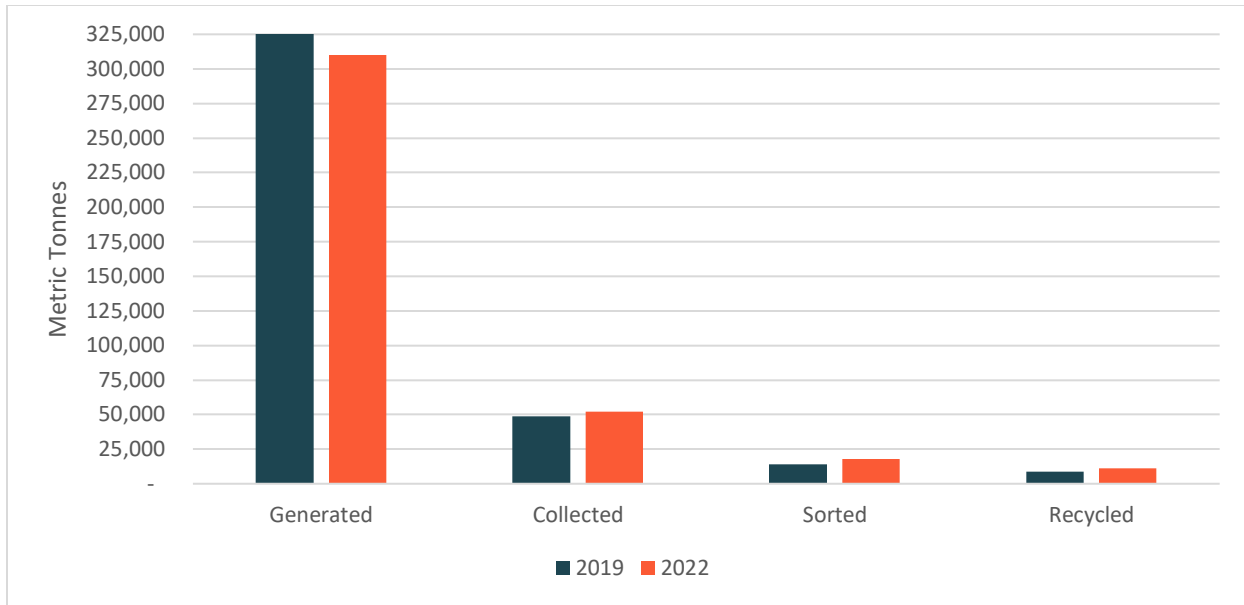


Figure 12: Canada-wide flexible plastic packaging flow in residential PPP and deposit return systems combined.

4.3 Plastics Packaging Final Recycling

Deposit Return System Recycling

Figure 7, Figure 8, and Table 7 compare the flow of plastic beverage containers Canada-wide in 2019 versus 2022. The data show that, under the average scenario, in DRSs the amount of plastic packaging finally recycled is as follows:

- Rigid plastic beverage containers increased by 6,537 tonnes or 17% by weight.
- Flexible plastic beverage containers increased by 8 tonnes or 5% by weight.
- Total plastic beverage containers increased by 6,545 tonnes or 17% by weight.

Residential PPP System Recycling

Figure 9, Figure 10, and Table 8 compare the flow of plastic packaging managed by residential PPP systems Canada-wide in 2019 versus 2022. The data show that, under the average scenario, in residential PPP recycling systems, the amount of plastic packaging finally recycled is as follows:

- Rigid plastic packaging increased by 7,036 tonnes or 5% by weight.
- Flexible plastic packaging increased by 2,188 tonnes or 25% by weight.
- Total plastic packaging increased by 9,225 tonnes of 7% by weight.

Combined Plastic Packaging Recycling

Figure 11, Figure 12, and Table 9 compare the flow of plastic packaging managed by residential PPP systems Canada-wide in 2019 versus 2022. The data show that, under the average scenario, the total combined amount of plastic packaging finally recycled under residential PPP systems and DRSs combined is as follows:

- Rigid plastic packaging increased by 13,547 tonnes or 8% by weight but an overall decrease in recycling rate of 2%.
- Flexible plastic packaging increased by 2,196 tonnes or 25% by weight and an overall increase in recycling rate of 1%.

- Total plastic packaging increased by 15,769 tonnes or 9% by weight and with the recycling rate remaining relatively unchanged (0.1% increase).

5 COMPARISON TO OTHER STUDIES

A comparison of the findings of this report to other data sources will be undertaken after the work on ICI plastic packaging has been completed. The data sources need to be compared based on the overall plastics flow given the lack of consistency in how data are reported (e.g., DRSs manage both residential and ICI packaging; while multi-residential buildings are considered residential, waste collection data from these sources are often included in commercial waste reporting as they are often co-collected with ICI waste on commercial routes).

6 CHALLENGES & OPPORTUNITIES

6.1 New Challenges

Municipal data concerns

In general, data from municipalities were more difficult to obtain for this 2023 Progress Report than they were for the Foundational Report. Historically, municipalities have been the 'holders' of residential sector recycling data. If their communities offer recycling systems to their residents, then they are the entities who set up recycling collection systems, arrange for the material to be sorted, and arrange for it to be ultimately sold or delivered to end-markets. To enable their local programs, municipalities have invested heavily in recycling infrastructure and have co-developed collection systems for organics, recyclables, and garbage to reach their performance goals.

However, municipalities' control over residential recycling system delivery is beginning to shift. Since 2019, more than half of Canada's provinces and territories (i.e., Alberta, Saskatchewan, Manitoba, Ontario, Québec, New Brunswick, Nova Scotia, and the Yukon Territory) have regulated or signaled a transition from municipally operated packaging and paper product (PPP) collection and recycling systems to producer responsibility organization (PRO) operated systems under an EPR framework. In most cases, except Québec, the EPR framework provides municipalities with no guaranteed optional role (e.g., first right of refusal to act as the collection service provider) in the future systems. Instead, if they wish to continue to be the collection service providers or materials recycling facility (MRF) operators serving the future PPP system, then they will be required to 'compete' with the private sector for available PRO contracts. Even if municipalities cease to be service providers, then they may wish to sell or lease their existing infrastructure to avoid stranded assets. The uncertainty caused by this period of transition to full EPR systems has created a climate where municipalities are more concerned about data confidentiality and how access to their data might affect their ability to negotiate with the future PROs and the private sector in a competitive marketplace.

Flexible packaging

Flexible packaging continues to be recycled at significantly lower rates than rigid packaging due to the complexity involved in recycling this material, including challenges with its collection, sorting, and ultimate recycling. However, a switch from flexible to the more recyclable rigid packaging is not likely to solve this issue. CPP has documented that flexible packaging is the preferred packaging option for many producers because it:

- "provides a high product-to-packaging ratio;
- does not dent or shatter when dropped;
- is lighter weight than rigids (e.g., jars, cans, bottles);

- can reduce GHG emissions over heavier packaging materials and formats due to space savings granted during transport of flexible packaging (e.g., one truckload of product in flexible packaging accomplishes the same as 26 truckloads of rigid containers);
- has an ability to transport a substantial amount more of empty flexible packaging than what is possible with rigid packaging;
- requires less energy and water to produce flexible packaging than some other types of packaging materials and formats, therefore creates fewer GHG emissions; and,
- can have its labeling information printed directly on the package as opposed to having an adhesive label added which (*sic*) may contaminate the recyclability of the package because it is lightweight”.¹⁹

As a result, in 2023, CPP along with several partner organizations (i.e., Circular Material, Circular Plastic Taskforce (CPT), Éco Entreprises Québec (ÉEQ), the Chemistry Industry Association of Canada (CIAC), The Recycling Partnership, and Recycle BC) launched its [PRFLEX](#) project, which is aimed at advancing the recycling of flexible plastics Canada-wide. This multi-year project has several phases. The first phase of this research identified the following issues, which the consortium is now working to overcome:

- Sorting facilities (e.g., MRFs) are unable to prepare the material for delivery to end-markets.
- None of the existing re-processors currently have the capacity to recycle flexible PP.
- There is limited existing capability to recycle multi-material flexible packaging.
 - Multi-layer plastic packaging made of different resins or with incompatible barrier layers (e.g., metalized, nylon, PVDC) cannot be recycled with current technologies.
 - PVC, including in labels and inks contaminate, is not recyclable;
 - Plastic additives (e.g., degradable additives) impact the recycling process; and
- Flexible packaging streams are readily contaminated with paper, glass, and metal (i.e., either through attachments to flexible packaging or free floating in the recycling streams due to insufficient sortation) and this affects recycling yields.

6.2 What work is underway?

[Canada-Wide Expansion of EPR Systems for PPP and Beverage Containers](#)

Since the Foundational Report, there has been a significant expansion of EPR systems for PPP and for beverage containers. However, as these changes have not been fully implemented, their impact has yet to be felt. Canada-wide expansion of EPR for PPP and beverage containers will enable producers to harmonize the materials collected for recycling and build economies of scale to support recycling systems. In anticipation of these changes, PROs for residential PPP systems in British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, New Brunswick, and Nova Scotia have signed an agreement to develop a nationally integrated approach enable their transition to EPR.²⁰

Table 10 provides an overview of the changes made to EPR systems that manage plastic packaging since the Foundational Report. In addition to the changes listed, Newfoundland and Labrador and the Northwest Territories are consulting on future EPR systems for residential PPP.

¹⁹ Canadian Plastics Pact (2023). Pathways to Mono-Material Plastic Packaging, Guidance Document – Version 1. Available at: https://plasticspact.ca/wp-content/uploads/2023/04/PPP_Pathways-to-Mono-Material-Flexible-Plastic-Packaging_Guidance-Doc.pdf

²⁰ Circular Materials, 2023. National integration for blue box in Canada. Available at <https://www.circularmaterials.ca/news/national-integration/>

Table 10: Expansion of provincial and territorial EPR systems managing plastic packaging since the Foundational Report, which looked at the 2019 data year.

Province or Territory	EPR System	Change	Implementation Date
British Columbia ^{21,22}	Residential PPP	Amended Recycling Regulation to expand PPP system to include packaging-like products (e.g., food storage, sandwich, and freezer bags; plastic shrink film wrap; LDPE and HDPE drop sheets, bubble wrap, plastic plant pots and saucers) and short-term use and single-use products (e.g., disposable food storage containers).	June 29, 2020
	Residual products	Amended Recycling Regulation to require products to manage all empty containers whether used in the residential or ICI sector.	June 29, 2020
	Beverage containers	Amended Recycling Regulation to add milk and plant-based beverages (e.g., soy, oat, and almond milk) to the DRS. Continues to exclude milk products that are included in Alberta, Saskatchewan, the territories (e.g., kefir, buttermilk).	February 1, 2022
	Single-use plastic reduction.	Single-Use and Plastic Waste Prevention Regulation passed. <ul style="list-style-type: none"> • Bans single-use plastic shopping bags. • Bans plastic disposable bundled food service accessories (e.g., fork, knife, napkins), restricts other accessories to by request, • Bans food service ware made from difficult to recycle plastics like compostable 	Effective December 20, 2023.

²¹ Government of British Columbia, 2020. 2020 Amendments to the Recycling Regulation. Explanatory notes. Available at: https://www2.gov.bc.ca/assets/gov/environment/waste-management/recycling/recycle/2020-06-29_explanatory_notes_to_reg_amendments.pdf

²² Government of British Columbia. Single-Use Plastic Waste Prevention Regulation. Available at: https://www.bclaws.gov.bc.ca/civix/document/id/oic/oic_cur/0461_2023

		plastics, biodegradable plastics, PVC, EPS, and PVDC. <ul style="list-style-type: none"> Bans oxo-degradable plastic packaging. 	
Alberta ²³	Residential PPP	Shifting from municipally controlled to EPR system.	Complete by October 1, 2026
Saskatchewan ²⁴	Residential PPP	Shifting from shared responsibility system to EPR system.	Regulation amended. Transition to be determined.
Manitoba ²⁵	Residential PPP + primary and secondary schools	Shifting from shared responsibility system to EPR system.	Regulation not yet amended. Transition to be determined
Ontario ²⁶	Residential PPP + long term care + nursing homes + primary and secondary schools + streetscape	Shifting from shared responsibility system to EPR system.	Complete by 2026.
Québec ^{27,28,29,30}	Residential + ICI PPP	Shifting from shared responsibility system for residential PPP to a full EPR system for all PPP regardless of the sector it is generated in.	The system must service the education sector as of 2025, other institutions and the commercial sector no later than 2027, and the industrial sector no later than 2032.

²³ Government of Alberta. Extended Producer Responsibility Regulation. AR 194/2022. Available at: https://kings-printer.alberta.ca/1266.cfm?page=2022_194.cfm&leg_type=Regs&isbncln=9780779832873

²⁴ Government of Saskatchewan. Household Packaging and Paper Stewardship Program Regulations, 2023, E-10.22 Reg 9. Available at: <https://publications.saskatchewan.ca/#/products/120617>

²⁵ Multi-Material Stewardship Manitoba. Full EPR Transition Plan Development. Available at: <https://stewardshipmanitoba.org/mmsm/full-epr-plan-development/#:~:text=Revised%20Draft%20Transition%20Plan%20%2D%20June%20%20%2C%202022&text=MMSM%20resubmitted%20its%20draft%20Transition,Parks%20on%20June%20%20%2C%202022>

²⁶ Government of Ontario. Blue Box Regulation. Available at: <https://www.ontario.ca/laws/regulation/r21391>

²⁷ Government of Québec. Modernized Deposit-Refund. Available at: <https://www.environnement.gouv.qc.ca/matieres/consigne-collecte/modernisation-consigne-en.htm>

²⁸ Dussault, M., 2022. A Look at EPR across Canada the Evolution of EPR in Québec. Available at: <https://swananorthernlights.org/wp-content/uploads/2022/04/2A-Marie-Dussault-EPR-in-Quebec.pdf>

²⁹ Government of Québec. Regulation respecting the recovery and reclamation of products by enterprises, c Q-2, r. 40.1. Available at: <https://www.legisquebec.gouv.qc.ca/en/document/cr/q-2.%20r.%2040.1>

³⁰ Government of Québec. Regulation respecting the recovery and reclamation of products by enterprises. <https://www.legisquebec.gouv.qc.ca/en/document/cr/q-2.%20r.%2040.1>

	Beverage containers DRS	Shifting to full EPR DRS to include all ready-to-serve beverage containers except flexible beverage packaging and packaging under 100ml and over 2L.	Phased implementation and Phase II will include new plastic containers. Phase II: March 1, 2025: adds containers made from glass, other breakables materials, plastic, ferrous metals, multilayered (e.g., cartons, juice boxes), bio-sourced).
	Agricultural Plastics	Amended Regulation respecting the recovery and reclamation of products by enterprises to include agricultural plastics. This regulation includes the widest array of agricultural plastics in Canada (e.g., maple syrup tubing).	June 30, 2023 (phase I) and June 30, 2025 (phase II).
New Brunswick^{31,32}	Residential PPP + primary and secondary schools	Shifting from municipally controlled to EPR system.	Complete by 2026
Nova Scotia³³	Residential PPP	Shifting from municipally controlled to EPR system.	Complete by 2027
Yukon Territory³⁴	Residential PPP + primary and secondary schools + small businesses	Shifting from municipally controlled to EPR system.	Regulation not yet released. Transition to be determined

³¹ Government of New Brunswick. Designated Materials Regulation. Available at: <https://laws.gnb.ca/en/tm/cr/2008-54>

³² Circular Materials, 2023. New Brunswick Stewardship Plan for Packaging and Paper. Available at: <https://www.recyclenb.com/static/site-content/files/management-plans/circular-materials/cm-nb-stewardship-plan-for-packaging-paper-new.pdf>

³³ Government of Nova Scotia. Extended Producer Responsibility for Packaging, Paper Products and Packaging-Like Products Regulations. NS Regulation 139/2023. Available at: <https://novascotia.ca/just/regulations/regs/envpppextproducer.htm>

³⁴ Government of Yukon, 2023. Extended Producer Responsibility (EPR) in the Yukon. Available at: <https://yukon.ca/en/engagements/extended-producer-responsibility-ep-yr>

APPENDIX A: ACRONYMS

Acronyms	Meaning
AD	Anaerobic digestion
CIAC	Chemistry Industry Association of Canada
CIF	Continuous Improvement Fund
CPP	Canada Plastics Pact
CPT	Circular Plastic Taskforce
DRS	Deposit return system
ECCC	Environment and Climate Change Canada
ÉEQ	Éco Entreprises Québec
EPR	Extended producer responsibility
EPS	Expanded polystyrene
HDPE	High density polyethylene
ICI	Industrial, commercial, and institutional
MRF	Materials recovery facility
MRP	Mixed rigid plastic
LDPE	Low-density polyethylene
PCR	Post-consumer recycled content
PP	Polypropylene
PRFLEX	Perfecting The Recycling System for Flexible Plastic Packaging in Canada
PRO	Producer responsibility organization
PS	Polystyrene
PVC	Polyvinyl chloride
PVDC	Polyvinylidene chloride, or polyvinylidene dichloride
XPS	Extruded polystyrene foam
R1	Collection of plastic waste
R2	Sorting yield
R3	Reprocessing yield
RPRA	Resource Recovery Productivity Authority
SO	Stewardship Ontario

APPENDIX B: TERMS & DEFINITIONS

Terms	Definitions
Anaerobic digestion	The breakdown of an organic chemical compound by micro-organisms in the absence of oxygen to carbon dioxide, methane, mineral salts, and new biomass.
Chemical recycling	“Chemical recycling techniques can be broadly separated into three categories: solvent purification, decomposition (chemical depolymerization), and conversion (thermal depolymerization). Solvent purification is like mechanical recycling in that the polymers making up the plastic feedstock remain in their original state. The depolymerization techniques, however, aim to break down the polymers within the plastic feedstock into shorter “monomers” (single unit) or “oligomers” (several monomer units), before restoring them back into their polymer chains.” ³⁵
Collected	Plastic packaging received from a consumer, whether residential, business, or institutional, following the consumer’s use. <ul style="list-style-type: none"> • Referred as collection of plastic waste or R1.³⁶
Collection rate	Materials collected as a percentage of materials generated.
Composted	The breakdown of an organic chemical compound by micro-organisms in the presence of oxygen to carbon dioxide, water, and mineral salts of any other elements present (mineralization) and new biomass.
End-market	A facility that receives sorted material as feedstock for the manufacture of products, packaging, materials, or substances. Otherwise referred to as the secondary or downstream processor.
Generated	Plastic packaging supplied to consumers and available for collection from consumers.
Inbound	Plastic packaging received by a processing facility.
Marketed	Has the same meaning as sorted.
Other rigid plastic packaging	Means non-bottle rigid plastic packaging made from resins other than pet and HDPE such as EPS, PP, PS, and PVC.
Outbound	Means plastic packaging as shipped from a processing facility.
Plastic packaging	All products made of plastic used for the containment, protection, handling, delivery, and presentation of goods, from

³⁵ CSA Group, 2021. Defining Recycling in the Context of Plastics. Available at: <https://www.csagroup.org/wp-content/uploads/CSA-Group-Research-Defining-Recycling-in-the-Context-of-Plastics.pdf>

³⁶ Environment and Climate Change Canada (ECCC), 2019. Economic study of the Canadian plastic industry, markets and waste: summary report to Environment and Climate Change Canada. Available at: <https://publications.gc.ca/site/eng/9.871296/publication.html>

	<p>raw materials to processed goods, from the producer to the user or the consumer.³⁷</p> <p>For the purposes of this report, plastic packaging associated with hazardous or special products (e.g., paint and used oil containers) and all ICI packaging (including agricultural plastic packaging) has been excluded.</p>
Processor	Includes both primary processors that sort plastic packaging (i.e., MRF) and secondary or downstream processors that recycle the sorted plastics. Note some materials may bypass the primary processor if they are already segregated.
Recycled	<p>Means plastic packaging that is reprocessed into products, packaging, materials, or substances whether for the original or other purposes but excluding energy recovery. Whether packaging was recycled in a closed or open loop was not assessed.</p> <p>Referred to as reprocessing yield or R3.³⁸</p>
Recycling rate	Materials recycled as a percentage of materials generated.
Sorted	Means plastic packaging that is sorted and prepared for shipment to an end-market. Note that shipments typically include a proportion of contamination. Referred to in the ECCC plastic study (2019) as the sorting yield or R2.
Sorting rate	Materials sorted as a percentage of materials collected.
Supplied	Means plastic packaging that is sold, leased, donated, disposed of, used, transferred the possession of or title of, or otherwise made available to a consumer or distributed for use by a consumer. Producers report on packaging supplied as part of deposit return system and producer responsibility requirements. Note that the amount of materials generated may be different than supplied due to regulatory exemptions (e.g., de minimis), failure of obligated producers to report (e.g., free-riders) or producer reporting errors.
Unclassified plastic packaging	Means plastic packaging for which data by resin was not available.

³⁷ Adapted from <https://wrap.org.uk/sites/default/files/2020-12/European-Plastics-Pact-Roadmap.pdf>

³⁸ Environment and Climate Change Canada (ECCC), 2019. Economic study of the Canadian plastic industry, markets and waste: summary report to Environment and Climate Change Canada. Available at: <https://publications.gc.ca/site/eng/9.871296/publication.html>

APPENDIX C: CONFIDENCE INTERVALS

Data reliability

As with the Foundational Report, a significant finding of this 2023 Progress Report is that there are still gaps in data reliability and availability, which presents challenges for taking targeted system-level action. This report presents the best available information or, where data was limited or unavailable, the best estimate.

While data for plastic packaging managed under regulated DRSs and regulated EPR systems is generally more available, there is still markedly more detailed and comprehensive reporting occurring in the DRSs than in the PPP systems. Because of the financial accountability required with DRSs (i.e., the management of consumer deposits and refunds) data for DRSs track packaging by individual units from the point of supply to collection. At the point of collection, those containers are then source separated into marketable bales or totes. As a result, there is high confidence in these numbers.

Overall, the data available for PPP systems, even regulated systems, varies. The measurement and reporting of the generation, collection, sorting and recycling of plastic packaging, and resin types of that plastic packaging, remains inconsistent across systems. As a result, data gaps led to the application of confidence ranges that reflect uncertainty. **Table ES1** provides an overview of the confidence levels in the national data presented in the report.

Categories	Generated	Collected	Sorted	Recycled
DRSs	Higher	Higher	Higher	Medium-High
Residential PPP Systems				
EPR	Medium-High	Medium-High	Medium-High	Medium-High
Non-EPR	Medium-Low	Medium-Low	Medium-High	Medium-High

Table A –1: National data reliability.

Legend:

