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Achieving 90% Recovery of Plastic Beverage Containers

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BCRNC RCRCB

Report For

Beverage Container Recycling Network of Canada (BCRNC)

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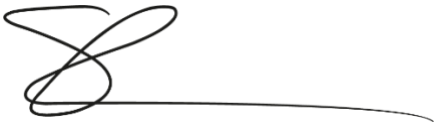

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Version control table

Version	Date	Project Manager	Description
V1.0	03/05/2024	Michael Wasserman	First draft on current state analysis sent to client for initial gateway review of sections 1-4.
V2.0	05/06/2024	Michael Wasserman	First draft of Section 5 only
V3.0	11/7/2024	Michael Wasserman	Updated versions of Section 1-5
V4.0	23/8/2024	Michael Wasserman	Final Report

Executive Summary

Environment and Climate Change Canada identified a 90% collection rate for the plastic packaging recycling stream as a pathway to support Canada's Zero Plastic Waste goal.[1]To this end, the Beverage Container Recycling Network of Canada (BCRNC) Commissioned Eunomia Research & Consulting in partnership with Giroux Environmental Consulting and Millette Environmental to review the current state of beverage container recycling in Canada; estimate the current material flow of plastic beverage containers, analyze factors that contribute to high performing systems internationally and within Canada, and identify key opportunities to achieve a 90% collection rate of plastic beverage containers.

The materials in scope of this study include rigid plastic containers made of Polyethylene Terephthalate (PET), High-Density Polyethylene (HDPE), Polypropylene (PP) cups, and Rigid Polystyrene (PS) containers, as these constitute the majority of plastic beverage containers sold and can be recycled into new containers. Although flexible plastics are used as plastic beverage containers, analysis from British Columbia (BC), Alberta (AB), Manitoba (MB), and New Brunswick (NB) indicates that 95-98% of plastic container sales are rigid, supporting the decision to focus on rigid containers to maximize recovery rates.

To identify opportunities to achieve a 90% recovery rate for plastic beverage containers this study:

- Reviewed the current state of Canadian deposit return systems (DRS), as well as available information on curbside systems that collect plastic beverage containers where there is no DRS. This was completed through primary interviews with system operators in Canada and secondary desktop research.
- Estimated the current material flow of plastic beverage containers indicating potential sources and estimated volumes of uncollected containers. This was completed by compiling DRS annual reports in addition to other published data and developing a material flow model.
- Analyzed the key factors that contribute to a high performing DRS. This was completed through secondary research and internal workshops with subject matter experts.
- Estimated the recovery rate of plastic beverage containers if primary opportunities were implemented. This was completed through a regression analysis to identify the impact of program changes based on a review of DRS in Canada and globally and then using these results within the material flow model.
- Identified end of life options for plastic beverage containers post recovery. This was completed through both interviews and secondary research.

Plastic Beverage Container Material Flows

In 2022, the total sales of plastic beverage containers in Canada amounted to an estimated ~220,000 tonnes. However, only 77,000 tonnes, or 35%, of these sales were covered by a DRS. Eight out of thirteen provinces had more than 90% of their plastic beverage containers under deposit. However, the two largest provinces, Ontario and Quebec, had only 1% and 14% of their plastic beverage containers under deposit, respectively. Quebec plans to expand its DRS in 2025, which will bring more than 90% of its plastic beverage containers under deposit.

In 2022, approximately 65% of rigid plastic beverage containers were recovered in Canada (See Table E – 1). On average, DRSs had a 72% recovery rate while the recovery rate for curbside programs was 53% showing that DRS collected more material available.

[1] https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/recycled-content-labelling-rules-plastics.html

Table E - 1: Estimated Recovery Rate of Rigid Plastic Beverage Containers by Stream, by Province (2022)

	Total Sales (tonnes)	DRS Return Rate of In Scope Sales	% Recovered Through DRS	% Collected ICI	% Collected Residential	Total Recovered
BC	23,000	72%	72%	7%	6%	85%
AB	26,100	79%	79%	8%	1%	89%
SK	6,400	79%	79%	8%	1%	88%
MB	6,900	0%	0%	14%	49%	63%
ON	95,600	42%	<1%	5%	47%	52%
QC	46,900	54%	7%	7%	48%	63%
NB	5,100	68%	62%	11%	0%	73%
PEI	700	76%	67%	9%	6%	82%
NS	5,700	66%	61%	7%	6%	74%
YT	300	64%	69%	10%	6%	85%
NT	300	69%	66%	11%	0%	77%
NV	200	0%	0%	0%	0%	0%
NL	3,000	64%	61%	5%	0%	66%
Total	**220,200**	**72%**	**25%**	**7%**	**33%**	65%

Approximately, 77,000 tonnes of plastic beverage containers were not recovered in 2022. An estimated 59% of these containers are in Ontario which is by far the largest source of unrecovered containers. Of 77,000 tonnes of unrecovered containers approximately 51,000 tonnes remain in residential garbage, 20,000 tonnes remain in Industrial, Commercial and Institutional (ICI) garbage, and 5,000 tonnes are litter.

Factors That Contribute to High Recovery Performance

To evaluate how Canada can reach a 90% recovery of plastic beverage containers, the key DRS factors that contribute to high performance were reviewed. These factors were developed through workshops with subject matter experts and review with BCRNC. The factors reviewed include:

- Deposit/Refund level - Deposits serve as a financial incentive for consumers to redeem covered containers to a return location to receive the deposit back. Evidence from multiple studies have identified deposit/refund as a key factor in driving return. Best practice for the deposit/refund level is $0.15 CAD.
- Program scope - The scope of containers included within a DRS refers to the containers and beverages included in the system for which a deposit is required. More containers in a program leads to a greater opportunity to maximise the capture of containers. Best practice includes considering a diverse range of beverage types, container materials, and sizes.
- Legislated target - Targets set in legislation establish overarching objectives for a system to achieve certain redemption, recycling, and accessibility metrics and promote continuous system improvements. Best practice is to set binding targets in a recycling program that can drive system operators to change other elements of the program.
- Consumer Education - Research indicates that a barrier to high performance is consumer's lack of awareness or understanding about the system and increased consumer education can help improve recovery rates. Best practice is to promote public education, and measure and monitor consumer satisfaction.

- Accessibility and type of return points - The number, location, and type of return points are important considerations in delivering an accessible redemption network. A network of return points that takes into consideration travel distances to a return point, accessibility for those with and without cars and the time consumers need to spend returning containers will all impact participation and return rates. Best practice is to have 1 return location per 1,000 consumers.
- Convenience at redemption facilities - Ensuring convenience at redemption facilities is a pivotal component of a high-performing DRS. Beyond merely providing ample points for container redemption, the return process itself at these facilities must be designed with consumers' ease and efficiency in mind. Best practice is to set and meet minimum collection standards to ensure consumer ease and accessibility at redemption facilities
- Infrastructure and requirements for on the go collection - A portion of beverage containers are consumed on-the-go, meaning they are purchased and consumed outside the home. Having infrastructure to capture this material can improve recovery rates. Best practice is to invest in collection infrastructure in public spaces.
- Infrastructure and requirements for commercial collection - A DRS system that offers return points specifically geared to bulk returns from the ICI sector is especially important in places with onsite sale and consumption (e.g. restaurants, hotels, or event spaces) as well as other institutional spaces such as schools or hospitals with onsite consumption. Best practice is to offer greater bulk return locations for the ICI sector and to support distributor take-back requirements for onsite consumption spaces.
- Refund payment options – The consumer's main motivation in engaging with a DRS is to recuperate their deposit. Best practice is to offer multiple payment methods for deposit refunds, such as cash, online account, e-transfer to a bank account, options for donation of their refund, and refund in the form of retail store vouchers.
- System funding - As with any diversion program, there are costs associated with operating and administering a DRS for beverage containers. The approach to administering fees and using system revenue such as material sales and unredeemed deposits can influence program incentives. Best practice is for unredeemed deposits and revenues from material sales to be kept by the system operator to make system improvements.
- Variable handling fees - Most DRSs include a handling fee, a per unit fee paid to retailers or redemption centres/depots for the costs incurred in hosting and operating a return point. Best practice is to set these fees based on the cost of handling different materials to create a more efficient system.
- Depot Ownership - Within a depot-based redemption network, depots themselves can be owned and operated privately or by the producer responsibility organization. When depots are privately owned the PRO has some influence over where the depots are located and who operates them as they can issue requests for applications that have certain standards. Best practice for this factor was not identified.
- Strength of complementary recycling system - Curbside systems and DRSs are complementary programs which, when carefully designed and implemented, contribute to sustainable material management. Best practice for this factor was not identified as it is not within the control of the system operator but can influence the system.
- Consumer demographics and behaviour - Understanding the motivations and behaviours of different types of consumers is important to identify contributing factors that may influence their participation in a DRS. These may be segmented by age, income, or gender. Best practice for this factor was not identified as it is not within the control of the system operator but can influence the system.

Barriers and Opportunities to 90% Recovery

Based on the review of key factors that contribute to high performance across Canadian provinces, the following barriers were identified as the most impactful for limiting recovery rates in Canada:

- Regulatory: not having DRS for non-alcoholic beverage containers in two provinces (Manitoba and Ontario) is a primary barrier to increasing plastic beverage container recovery in Canada. Only 1% of Ontario's 76,100 plastic beverage containers are in DRSs. Given that Ontario is the most highly populated province in the country, the current model in Ontario represents a significant barrier to container recovery nationally.

- Financial Incentive: Low Deposit/Refund Levels: Deposit refund levels in Canada currently range from $0.05 - $0.10 CAD, with some larger plastic beverage containers having a deposit level of $0.20 or $0.25 CAD. Based on regression modelling, a minimum of a $0.15 CAD deposit level is needed to reach a 90% recovery rate, and a $0.20 CAD deposit can further support recovery rates. As most plastic beverage containers have a deposit level lower than this amount, the deposit level is a barrier to reaching a 90% recovery rate.

- Limited Scope**:** There is a varied scope across DRS programs in Canada; not all programs include the same plastic containers. Milk and milk substitutes or dairy drinks are only included in five of ten DRS programs, which limits the recovery of many ready-to-drink HDPE containers. The two largest provinces, Ontario and Quebec, had only 1% and 14% of their plastic beverage containers under deposit in 2022, respectively, limiting recovery in those provinces.

- Accessibility and Convenience: Currently, many DRSs do not have a best practice level of return points (1 return location per 1,000 people) to meet accessibility standards. However, Canada is a very large country with extensive rural and remote areas in each province and territory, so this context is important to consider when discussing international accessibility best practices and its applicability to Canada.

To overcome the barriers, the following opportunities were identified as having the greatest potential impact:

1. Increase deposit/refund levels in all DRS programs to the level recommended as best practice ($0.15 - $0.20 CAD) to incentivize returns at a rate greater than 90%;

2. Increase program scope to a) cover the same beverage containers across all DRS programs (e.g. including milk and milk substitutes in all DRS programs, expand the collection of containers made of HDPE as well as PET), and b) implement a full-scope DRS in Ontario and Manitoba; and

3. Increase the number of return locations in DRS programs so there is one return location per 1,000 people to improve accessibility.

At baseline, Canada recovers 65% of plastic beverage containers. Approximately 25% are recovered through DRSs, and 40% are recovered through curbside programs. The impact of implementing these opportunities across Canada was estimated.

If a DRS were expanded in Ontario and Quebec and implemented in Manitoba with no changes to other systems, Canada would recover an estimated 77% of plastic beverage containers. Approximately 72% would be recovered through a DRS, and 5% would be recovered through curbside programs.

If a comprehensive DRS was implemented in all provinces but accessibility and the deposit level remained the same, Canada would recover an estimated 79% of plastic beverage containers. Approximately 72% would be recovered through a DRS and 7% would be recovered through curbside programs.

If a comprehensive DRS was implemented in all provinces and accessibility increased to best practice level but the deposit level remained the same, Canada would recover an estimated 79% of plastic beverage

containers. Approximately 75% would be recovered through a DRS and 4% would be recovered through curbside programs.

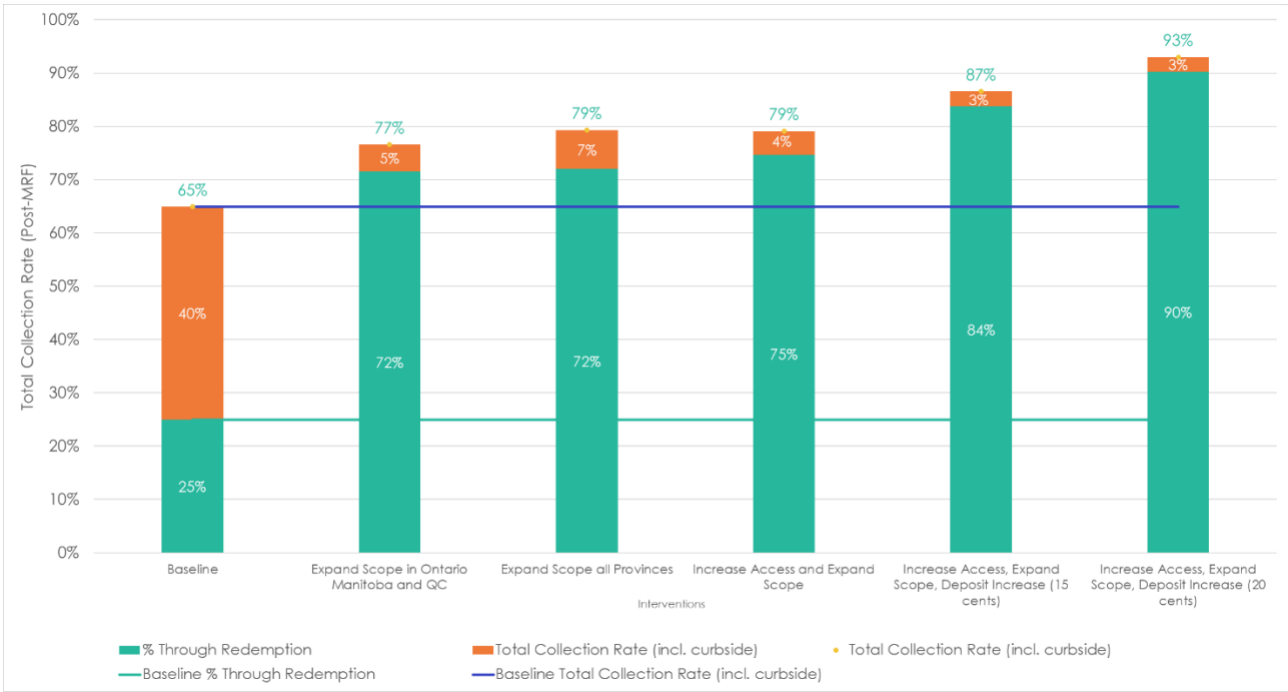
If a comprehensive DRS was implemented in all provinces, accessibility was improved, and a $0.15 CAD deposit was implemented in all provinces, Canada would recover an estimated 87% of plastic beverage containers. Approximately 84% would be recovered through a DRS and 3% would be recovered through curbside programs

If a comprehensive DRS was implemented in all provinces, accessibility was improved, and a $0.20 CAD deposit was implemented in all provinces, Canada would recover an estimated 93% of plastic beverage containers. Approximately 90% would be recovered through a DRS and 3% would be recovered through curbside programs

Table E - 2: Estimated Impact of Implementing Primary Opportunities in Canada

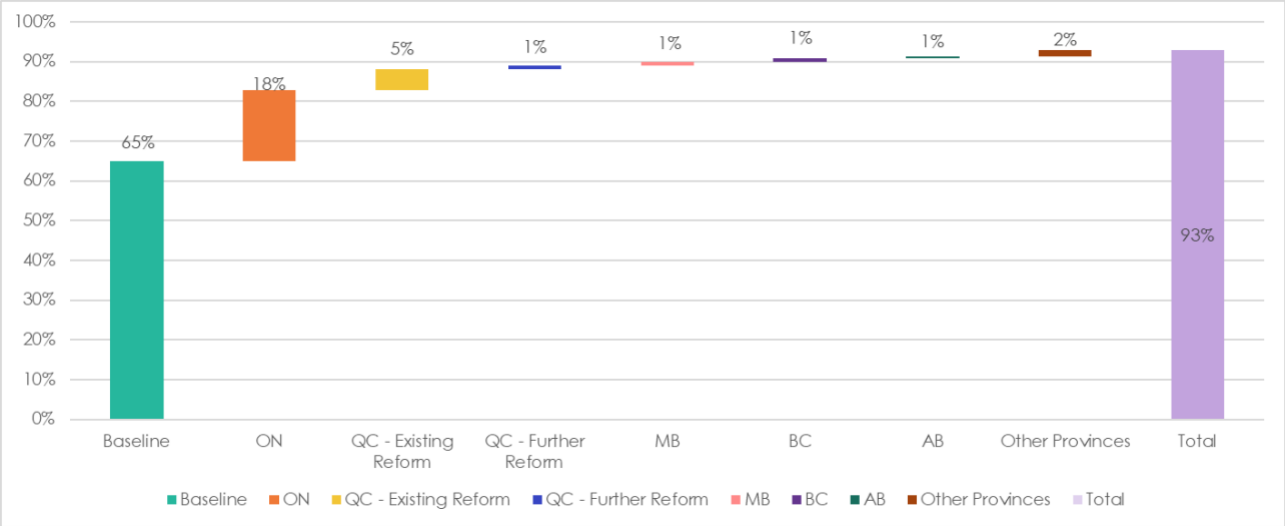
Opportunities Implemented	DRS Recovery	Curbside Recovery	Total Recovery
Baseline	25%	40%	65%
Expand scope in Ontario and Québec. Implement DRS in Manitoba.	72%	5%	77%
Expand scope and implement a DRS in all provinces.	72%	7%	79%
Expand scope and implement a DRS in all provinces and improve accessibility.	75%	4%	79%
Expand scope or implement a DRS in all provinces, improve accessibility, and implement a minimum $0.15 CAD deposit.	84%	3%	87%
Expand scope or implement a DRS in all provinces, improve accessibility, and implement a minimum $0.20 CAD deposit.	90%	3%	93%

Figure E - 1: Estimated Impact of Implementing Primary Opportunities in Canada



Implementing all opportunities including a $0.20 CAD deposit level can improve Canada's recovery rate of plastic beverage containers from 65% to 93%. A majority of this 28-percentage point increase comes from Ontario (18 points), followed by the planned but yet to be implemented existing reform in Québec (5 points).

Figure E - 2: Estimated Contribution of Each Province to Overall Increase in Collection



Although the primary opportunities can help Canada achieve a 90% recovery rate for plastic beverage containers, there are secondary opportunities that can also help improve recovery rates but at a smaller scale. These include:

- Targeted collection and outreach for containers from the ICI sector (including schools, institutions, hotels, restaurants, trade or construction sites, etc.)
- Targeted collection and partnerships with municipalities for public space / event collection
- Legislated collection / recovery targets
- Greater outreach / promotion and education to consumers
- Improved convenience such as offering both cashless and cash refunds, online accounts
- Examining program models - industry-led models can reinvest surplus funds into program improvements which is not done with government-led programs.

End of Life Management of Plastic Beverage Containers

In 2021, the ECCC reported barriers to expanding availability of food grade PCR in Canada which included a lack of suitable supply of post consumer PET. [2] Previous Eunomia studies also found that Canada has additional processing capacity for domestically collected PET and HDPE as Canada is currently importing baled PET and HDPE bottles from the U.S.[3]

The amount of material recycled in Canada is not only dependent on the amount of material recovered but also on the definition used for recycling. Currently there are various definitions used across provinces for a plastic recycling rate. There has been a multi-stakeholder working group led by the Canadian Standards Association (CSA) that published Defining Recycling in the Context of Plastics. A Principled and Practical Approach in 2021.[4] The definition of what is "recycled" delineates the disposition of materials that may be included in the calculation of performance against the recycling target. If the definition of recycled is inconsistent with circular economy principles, then it can be expected that recycling supply chains might employ materials management solutions that are inconsistent with those principles. CSA defines plastic recycling as "the reclamation of plastics (as polymer, monomer, or constituent chemical building blocks) in such a manner that they displace the primary or raw materials that are used as chemical building blocks in the production of plastics and plastic products and packaging."[5]

Implementing the primary opportunities and increasing recovery of plastic beverage containers through DRSs has additional benefits as material collected through a DRS stream is generally of higher quality and produces greater yields. For example, PET bottles collected through a curbside program has an estimated yield of 70%-85% while PET bottles collected through a DRS has an 80%-85% yield.6 Using the CSA definition of recycling, a recycling rate was estimated for plastic beverage containers in the baseline year and estimated future performance if the primary opportunities were implemented (See Table E - 3). When the

[2] ECCC, 2021. Food Grade Recycled Resin, Prepared by Stina. Accessible at https://www.plasticsmarkets.org/jsfcontent/ECCC_Food_Grade_Report_Oct_2021_jsf_1.pdf
[3] Eunomia Research & Consulting
[4] Canadian Standards Association. 2021. Defining Recycling in the Context of Plastics. A Principled and Practical Approach. Accessible at https://www.csagroup.org/wp-content/uploads/CSA-Group-Research-Defining-Recycling-in-the-Context-of-Plastics.pdf
[5] Ibid
[6] CPP, 2024. Deliverable 1: Deposit Return and Residential Recycling Systems Performance. January 2024. Accessible at https://plasticspact.ca/wp-content/uploads/2024/01/CPP_Canadian-Plastics-Flow_2023-Progress-Report.pdf

recovery rate is estimated to be 93% if all opportunities are implemented, then the recycling rate would be 76%.

Table E - 3: Estimated Recovery vs Recycling Rate (Using CSA Definition)

Scenario	From DRS		From Curbside		Total	
	Recovery Rate	Recycling Rate	Recovery Rate	Recycling Rate	Recovery Rate	Recycling Rate
Baseline	25%	21%	40%	31%	65%	52%
Expand scope in Ontario and Quebec. Implement DRS in Manitoba.	72%	59%	5%	4%	77%	63%
Expand scope and implement a DRS in all provinces.	72%	59%	7%	5%	79%	64%
Expand scope and implement a DRS in all provinces and improve accessibility.	75%	62%	4%	3%	79%	65%
Expand scope or implement a DRS in all provinces, improve accessibility, and implement a minimum $0.15 CAD deposit.	84%	69%	5%	2%	87%	71%
Expand scope or implement a DRS in all provinces, improve accessibility, and implement a minimum $0.20 CAD deposit.	90%	74%	3%	2%	93%	76%

Conclusion

Environment and Climate Change Canada identified a 90% collection rate for the plastic packaging recycling stream as a pathway to support Canada's Zero Plastic Waste goal. By expanding DRS scope or implementing a DRS in all provinces, raising the minimum deposit level to $0.20 CAD, and improving accessibility, Canada can achieve this goal and recover 93% of plastic beverage containers.

List of Figures

List of Tables

1.0 Introduction

The Beverage Container Recycling Network of Canada (BCRNC) consists of representatives from the beverage container recycling agencies of British Columbia, Alberta, Saskatchewan, Manitoba, Quebec, New Brunswick, Newfoundland and Labrador, Nova Scotia, Prince Edward Island and Northwest Territories. Canadian provinces have a strong history of beverage container recycling; and across Canada over 78% of recycled beverage containers are recycled through these programs.[1] This recovery rate represents all materials (not just plastics) returned or collected from provincial programs with dedicated legislated beverage container recycling initiatives.

BCRNC commissioned Eunomia Research & Consulting in partnership with Giroux Environmental Consulting and Millette Environmental to undertake a study focussed on identifying opportunities to enhance recovery of plastic beverage containers across Canada. The primary objective of the study is to:

- Review the current state of beverage container recycling in Canada; identify likely sources and estimated volumes of uncollected plastic beverage containers; analyze factors that contribute to high performing systems internationally and within Canada, and identify key opportunities to achieve a 90% collection rate of plastic beverage containers nationally.

Secondary objectives of this work are to review current and forecasted recycling market information for beverage container plastic resins from Canadian programs.

In December 2023 the Government of Canada announced in the Canada Gazette a "*Notice of intent to issue a notice under section 46 of the Act with respect to reporting of certain plastic products for 2024, 2025 and 2026*"[2] which outlines that the Minister of the Environment is planning a proposed Federal Plastics Registry under the authority of the Canadian Environmental Protection Act (CEPA) (the Act) to create an inventory of data of plastics manufactured or produced in Canada. Furthermore, a 90% collection rate was identified as being required from the packaging recycling stream to achieve Canada's Zero Plastic Waste goals according to the Environment and Climate Change Canada 2019 report *Economic study of the Canadian Plastic Industry, Markets and Waste*, as published in Table 1 of The Recycled Content and Labelling Rules for Plastics: Regulatory Framework Paper (ECCC, 2023).[3]

This report is structured in the following sections.

- **Section two** reviews the current state of Canadian deposit return systems (DRSs), as well as available information on curbside systems that collect plastic beverage containers where there is no DRS. Details presented include: program models, collection infrastructure and accessibility information; designated containers; regulatory requirements; performance return rates, and financial elements such as deposit/refund values, container recycling fees, or producer fees;

- **Section three** presents Eunomia's estimates of the current material flow of plastic beverage containers indicating potential sources and estimated volumes of uncollected containers;

- **Section four** analyzes the key factors that contribute to a high performing DRS and includes case studies on high performing systems in other jurisdictions;

[1] Beverage Container Recycling Network of Canada website, accessible at https://www.recyclingnetwork.ca/
[2] Canada Gazette, Part 1, Vol 157, No 52 accessible at https://gazette.gc.ca/rp-pr/p1/2023/2023-12-30/html/notice-avis-eng.html
[3] ECCC 2023. The Recycled Content and Labelling Rules for Plastics: Regulatory Framework Paper https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/recycled-content-labelling-rules-plastics.html)

- **Section five** presents key barriers identified in Canadian beverage container recovery programs, and the primary opportunities identified to increase recovery including modelled results of each opportunity;

- **Sections six** provides more information on end-of-life plastic processing markets in Canada.

2.0 Current State Baseline Information

2.1 Background and Study Scope

The key driver for undertaking this study is the December 2023 announcement by the Government of Canada in the Canada Gazette [4] which outlines that the Minister of the Environment is announcing a notice of intent to develop a Federal Plastics Registry to create an inventory of data of plastics manufactured or produced in Canada.

The plastic products captured under the Gazette Notice are those set out in Parts 1 through 3 of the schedule that are manufactured in or imported into Canada. Part 1 resins involved in the manufacturing of plastics applicable to beverage containers in Canada include the following resins[5]:

- Polyethylene terephthalate (PET) resins
- Low-density polyethylene (LDPE) resins
- High-density polyethylene (HDPE) resins
- Other polyethylene (PE) resins
- Polypropylene (PP) resins; and
- Polystyrene (PS) resins

The notice indicates that the resins can be either virgin fossil-based, bio-based, or post-consumer recycled resin, and belong to Category 1 packaging which includes primary, secondary and tertiary packaging that is reusable or single-use packaging that is rigid or flexible(beverage containers).

Information to be provided into the proposed Federal Plastics Registry will include the following, applicable to beverage container producers or authorities managing plastics collected[6]:

- The identity of all the resins used to make plastic products placed on the Canadian market
- The source of the resin used to make plastic products placed on the Canadian market
- The category and subcategory of plastic products placed on the Canadian market
- The total quantity in tonnes of plastic in products placed on the Canadian market
- The total quantity in tonnes of plastic collected at end of life and sent for diversion
- The total quantity in tonnes of diverted plastics that are recycled
- The total quantity in tonnes of diverted plastics that are processed into chemicals, including fuels;
- The total quantity in tonnes of diverted plastics that are sent to final disposal at a landfill
- The total quantity in tonnes of diverted plastics that are sent to final disposal and incinerated without energy recovery
- The total quantity in tonnes of diverted plastics that are recovered for energy recovery

[4] Canada Gazette, Part 1, Vol 157, No 52 accessible at https://gazette.gc.ca/rp-pr/p1/2023/2023-12-30/html/notice-avis-eng.html
[5] Canada Gazette, Part 1, Vol 157, No 52 accessible at https://gazette.gc.ca/rp-pr/p1/2023/2023-12-30/html/notice-avis-eng.html
[6] Canada Gazette, Part 1, Vol 157, No 52 accessible at https://gazette.gc.ca/rp-pr/p1/2023/2023-12-30/html/notice-avis-eng.html

- The total quantity in tonnes of diverted plastic in products that are collected with direct reuse arranged; and
- The method used to determine the quantities referred to.

This study will determine what baseline information is available on beverage container recycling programs in Canada and what the key opportunities are to achieve 90% recovery of beverage containers sold, and present available information on the domestic plastic processing market for producing food grade recycled plastic for use in new plastic beverage containers.

In March 2024, the study Steering Committee emphasized that of all the tasks outlined in the Statement of Work for this study, 75% of the level of effort should be focussed on identifying the specific opportunities with the greatest potential to achieve 90% recovery of plastic beverage containers in Canada, with plastic containers that can be recycled into plastic containers being of primary interest, as the committee wanted to know more about the capacity of post-consumer food grade resin supply. To support this objective, the group decided that the scope for modeling key opportunities in this study would focus on rigid containers that are primarily made of plastic and are recycled at plastic processors. This means that the analysis and modelling presented in Sections 3 and 5 is focussed on the following rigid plastic containers:

- Poly-Ethylene Terephthalate (PET);
- High-Density Poly-Ethelyne (HDPE
- Poly-propelyne (PP) cups; and
- Rigid Polystyrene (PS) containers.

The current state information (Section 2) presents details on all plastic containers in beverage container recycling programs in Canada (flexibles and rigid), however the modelling undertaken in Section 3 (estimation of sources of unrecovered plastic containers) only includes rigid plastic containers as this represents the vast majority of plastic beverage containers sold. The following bullet points present further details on this decision:

- Although gable top cartons and aseptic cartons contain a thin film of plastic, these are primarily paper based containers and are not sent to plastic processors, nor are they recycled back into beverage containers (cartons and aseptic cartons are typically recycled into non-food grade applications);
- Flexible plastics are included in less than half of the beverage container recycling programs in Canada, and in those that do accept flexible plastics, they typically:
    - represent a very small portion of the total plastic containers sold (i.e. in four jurisdictions reviewed, flexibles represent between 1.8% and 4.4% of all plastic beverage containers sold); and
    - where flexible plastics are included in DRS, they are not recycled into new plastic beverage containers (in multiple programs they are incinerated for energy recovery due to a lack of end market to recycle flexibles).

For this reason, flexibles were identified by the consulting team as a category of containers for which there is limited value in modelling the potential unrecovered containers since they represent such a small amount of plastic containers sold, are not included in all programs, and where they are included, they are not recycled back into plastic beverage containers. It was decided together with the steering committee that the scope of the study should focus on the most valuable opportunities to increase recovery rates of plastic containers across Canadian programs, and that this would likely be rigid PET and HDPE plastic containers, these are recycled into beverage containers.

Table 1 presents the amount of flexible plastic containers (i.e. drink pouches and bag-in-box), as a portion of the amount of total plastic containers sold in British Columbia (BC), Alberta (AB), Manitoba (MB), and New Brunswick (NB) (data was readily available for sales of plastic containers by resin for these programs). The table shows that the volume of plastic container sales in these four programs is 95% – 98% rigid plastic containers.

Table 1: Portion of Flexible Plastics out of All Plastic Containers Sold in Selected Programs (2022 and 2023)

Province	Number of Units of Flexibles Sold: Pouches + Bag-in-Box (Alcohol and Non-Alcohol)	Number of Units of Rigid Plastic Containers Sold (PET + HDPE) (Alcohol and Non-Alcohol)	% of Flexibles Sold in Total Plastic Containers Category
BC (2022)	16,624,855	659,505,125	2.52%
AB (2023)	16,662,745	920,164,886	1.78%
MB (2022)	12,221,131	263,542,430	4.43%
NB (NB) (2022)	6,225,974	155,469,649	4.00%

2.2 Program Operational Models and Accessibility

This section presents baseline information on beverage container recycling programs in Canada in the level of detail needed to enable a robust national baseline study. This information will inform analysis on subsequent tasks in this study to assess Canada's current programs in relation to best practice factors, and to assess options for increasing recovery to 90% of plastic containers placed on the market by beverage producers.

2.2.1 Overview of Program Models Included in this Analysis

Programs included as part of this baseline analysis are presented in 4. Note that the scope of work for this study is focused on the primary programs for plastic beverage container recovery in each jurisdiction. In jurisdictions with a DRS, the DRS is the primary program reviewed; in jurisdictions without a DRS, the curbside program is the primary program reviewed. Where it is noted that a program is "in transition," this refers to a system transitioning to an Extended Producer Responsibility (EPR) program.

Table 2: Primary Plastic Beverage Container Recovery Programs Included in Current State Analysis

Province	Beverage Container Recovery Program	System Operator	Curbside System Notes on How Beverage Container Recovery is Integrated	Curbside System Operator
British Columbia (BC)	DRS for alcohol and non-alcohol	Encorp Pacific	Containers collected curbside are included in DRS recovery total	Recycle BC
Alberta (AB)	DRS for alcohol and non-alcohol	Alberta Recycling Management Authority (ARMA)	Not included (Curbside system currently in transition to EPR)	Circular Materials
Saskatchewan (SK)	DRS for alcohol and non-alcohol	SARCAN	Not included (no information on whether containers collected in curbside system are counted)	Multi-Material Stewardship Western (MMSW)
Manitoba (MB)	non-alcohol out of home and curbside model (not DRS)	Canadian Beverage Container Recycling Association (CBCRA)	Curbside system operator estimates resin specific beverage container recovery totals annually based on MRF auditing	Multi-Material Stewardship Manitoba (MMSM)
Ontario (ON)	DRS for alcohol Non-alcohol collected curbside	The Beer Store	Included (Curbside system in transition to 100% EPR by multiple PROs)	Circular Materials
Quebec (QC)	DRS for alcohol and non-alcohol	Consignation	Containers collected curbside are estimated	Écoentreprises Quebec
New Brunswick (NB)	DRS for alcohol and non-alcohol	Encorp Atlantic	Curbside system recently transitioned to EPR in 2024. Methodology under development for tracking DRS containers collected curbside	Circular Materials Atlantic
Nova Scotia (NS)	DRS for alcohol and non-alcohol	Divert NS	Curbside system in transition to EPR. Methodology under development for tracking DRS containers collected curbside	Circular Materials Atlantic
Prince Edward Island (PEI)	DRS for alcohol and non-alcohol	Government of PEI	Containers collected curbside are included in DRS recovery totals	Island Waste Management Corporation
Newfoundland and Labrador (NL)	DRS for alcohol and non-alcohol	Multi-Material Stewardship Board (MMSB)	Containers collected curbside are estimated and counted in DRS totals	MMSB / Regional Waste Management Authorities
Yukon Territory (YK)	DRS for alcohol and non-alcohol	Government of YK	Containers collected curbside are not included in DRS recovery totals	N/A
Northwest Territories (NWT)	DRS for alcohol and non-alcohol	Government of NWT	Containers collected curbside are not included in DRS recovery totals	N/A

Table 3 presents detail on the program model in place for beverage container programs in Canada. Information presented includes:

- The type of model in place for each jurisdiction that recycles beverage containers (e.g. the type of program operating - EPR / industry-led model, or a government-led model where producers do not have financial or operational obligations;
- Applicable sectors covered by the program, aside from "consumers". For example, if there are any legislated requirements for the commercial or institutional sectors, this is noted.
- Presence of legislated targets for beverage containers, and
- Funding model, such as separate container recycling fees or half-back deposit models. A Container Recycling Fee (CRF), Container Handling Fee (CHF), Environmental Handling Charge (EHC), or Recycling Fund Fee (RFF) are non-refundable fees charged to consumers on each container to cover the costs of recycling the container in programs that refund the full deposit.

CRFs are charged in four of the five industry-led programs (BC, Alberta, Manitoba and New Brunswick), while a similar fee is charged in three of the six government-led programs (Saskatchewan, Northwest Territories, and Yukon). Fees are not charged in DRSs operated in Quebec, Nova Scotia, Newfoundland and Labrador, or PEI. In the three Atlantic government-operated DRSs, they do not refund the full deposit and use the other half of the deposit to fund the program.

Table 3: Overview of Beverage Containers Program Models

Province / Territory	Program Model			Funding Model	
	Policy Approach (Industry-led or Government-led)	Applicable Sectors the Program Applies to	Legislated Targets	Deposit/Return Model (if applicable)	CRF / EHC / CHF / RFF or Producer Fees
BC	Industry-led	All consumers, no designated ICI requirements in legislation	Recovery rate (collection rate)	Full Back	CRF visible
AB	Industry-led	All consumers, no designated ICI requirements in legislation	None	Full Back	CRF visible
SK	Government-led	All consumers, no designated ICI requirements in legislation	None	Full Back	EHC visible
MB	Industry-led (CBRCA program)	All consumers, no designated ICI requirements in legislation	Recovery rate (collection rate)	No deposit	CRF visible
ON	Industry-led (non-alcohol)	Residential curbside only	Recovery rate (collection rate)	No deposit	Producer Fees (no visible fee)
ON	Industry-led (alcohol only)	All consumers, no designated ICI requirements in legislation	None	Full Back	Producer Fees (no visible fee)
QC	Industry-led	New (Nov 2023): Mandatory collection of DRS containers from ICI on-premises consumption establishments with seating capacity of >75 2025: Mandatory collection of DRS containers from ICI on-premises consumption establishments with seating capacity of >20	Collection rate Recycling rate Circular economy (local recycling) rate Accessibility rate	Full Back	Producer Fees (no visible fee)
NB	Industry-led (April 2024)	All consumers, no designated ICI requirements in legislation	None	Full Back (April 2024)	CRF non-visible
NS	Government-led	All consumers, no designated ICI requirements in legislation	None	Half Back deposit	No container fees
PEI	Government-led	All consumers, no designated ICI requirements in legislation	None	Half Back deposit	No container fees
NL	Government-led	All consumers, no designated ICI requirements in legislation	None	Half Back deposit	No container fees
YT	Government-led	All consumers, no designated ICI requirements in legislation	None	Half Back deposit	Recycling Fund Fee (RFF) visible
NT	Government-led	All consumers, no designated ICI requirements in legislation	None	Full Back	Container Handling Fee (CHF) visible

2.2.2 Data Availability and Transparency

Table 4 presents information on data transparency related to the program model.

Table 4 shows that in jurisdictions where there is not a DRS, there would be curbside recycling available where beverage containers would be picked up alongside other packaging. In non-DRS recycling programs, the information needed to enable a robust national baseline study on detailed material specific collection rates across Canada is not available on specific packaging streams, such as beverage containers. Data transparency in a DRS dedicated to beverage containers allows for transparent analysis of recovery rates by materials, for all beverage containers.

Table 4: Overview of Information Publicly Available in DRS Programs vs. Non-DRS Beverage Container Recycling Programs

Program Model	Annual Data Available						
	# Units Sold	# Units Collected	Material-Specific Collection Rates	Collection Rate Calculation Transparency	# Return Points / Accessibility	Participation Rate (% Population Reporting they Participated)	System Revenue and Expense Data for Collecting / Processing
DRS	Yes	Yes	(Yes) Some, but not all, report material-specific collection for plastic resin	Yes	Yes	(Yes) Some, but not all, industry-led DRS programs report this	(Yes) Some, but not all, industry-led DRS programs report this
Non-DRS: Ontario curbside PPP	Ontario: No (weight-based sales aggregated data)	Not available	Ontario: Not available	Not Available	% of population with curbside service	Not available	Not Available
Non-DRS: Manitoba CBRA	Yes	Not available	Average PET recovery rate %	Not available	# of bins provided to each type of sector	Not available	Yes

2.2.3 DRS Collection Infrastructure and Accessibility

Table 5 presents detail regarding number and type of return point infrastructure, as well as accessibility rates for Canada's DRS programs, which refers to the population served per number of return points for used beverage container collection. This could include depots, satellite depots, or return to retail (R2R) locations. Accessibility rates are calculated using Statistics Canada's 2024 Q1 population data. Note that neither Ontario nor Manitoba's non-alcohol beverage containers are included in the table because they are collected curbside co-mingled with all other recyclable packaging materials and there is no DRS for non-alcohol containers.

Table 5: DRS Collection Infrastructure and Accessibility Rate (2024)

Province / Territory	Program Model	Collection Model	Accessibility (Population Served by Each Return Point)	Accessibility Requirements or Standards
BC	DRS	Hybrid: 163 depots 2 Drop & Go 16 express unstaffed 1482 return-to-retail (R2R) (455 of these are serviced by Encorp Pacific) Bin provision to ICI and streetscape	3373	Accessibility standards in program plan: Overall % of population access to a return point Drive time targets for urban and rural # return points within a 15 km radius
AB	DRS	Return-to-depot: 221 depots	21,723	No accessibility requirements of standards
SK	DRS	Return-to-depot: 73 depots w/drop & go 1 mobile drop & go unmanned unit Bin provisions to ICI and public space	16,788	No accessibility requirements of standards
MB	Non-DRS	Away from home bins (parks, streetscapes, schools, businesses): 81,750 Single family bins: 283,353 Multi-family bins: 143,295	Not available	No accessibility requirements or standards
ON (alcohol only)	DRS	Return-to-retail: 1247 locations	11,400	No accessibility requirements of standards
QC	DRS	Prior to Nov. 1, 2023: Return-to-retail: ~8,000 retail locations As of March 2025: Will be hybrid collection with additional 200 satellite depots	1,123	Accessibility requirements in modernized DRS legislation, adding to the return-to-retail model with satellite depots. Also municipal targets (minimum # of return points for certain municipalities).
NB	DRS	Return-to-depot: 68 depots	12,444	No accessibility requirements or standards
NS	DRS	Return-to-depot:	13,888	No accessibility requirements or standards

Province / Territory	Program Model	Collection Model	Accessibility (Population Served by Each Return Point)	Accessibility Requirements or Standards
		77 depots		
PEI	DRS	Return-to-depot: 10 depots 3 satellite stations	13,551	No accessibility requirements or standards
NL	DRS	Return-to-depot: 53 depots	10,199	No accessibility requirements or standards
YT	DRS	Return-to-depot: 14 depots	3,242	No accessibility requirements or standards
NT	DRS	Return-to-depot: 21 depots 3 satellite stations	1,864	No accessibility requirements or standards

Collection Infrastructure and Out of Home or Commercial/Institutional Recovery

Collection infrastructure targeting out of home and/or industrial/commercial/institutional (ICI) recovery varies across programs.

In Quebec, there are new requirements in place for establishments offering on-site consumption (for example, restaurants, hotels, event spaces and cafeterias) will be required by regulation to take part in the DRS. Locations with seating capacity greater than 20 people must participate no later than November 2023; and locations with seating capacity of more than 75 people must participate no later than March 2025.

In British Columbia, there are no legislative requirements to specifically target collection from the ICI sector, however every container is legislated regardless of where it is consumed. Encorp Pacific has partnered with a variety of commercial spaces to target collection from this sector. Partners include Nat Bailey Stadium, Rogers Arena, BC Place, Oliver Parks and Recreation, and Island Health to provide new beverage recycling initiatives for on-site consumption away from home and at events. In addition, there are partnerships within the institutional sector that includes provision of collection bins and services at four major hospitals. As well, Express & Go systems have been installed at a number of locations including University campuses. Encorp Pacific also samples private ICI waste/recycling collection to determine the percent of DR containers in this stream that are ultimately recovered, and includes these numbers in its recovery numbers

As of 2023, a total of 28,587 bins have been placed in out of home locations by Encorp Pacific including:

- 18,458 bins for schools (temporary bins)
- 6,175 in commercial venues
- 2,500 for events
- 733 bear proof bins in national parks, and
- 670 streetscape bins

Manitoba's "out of home" recovery program managed by CBCRA includes dedicated outreach within the ICI sector targeting businesses of all sizes (small, medium, and large) and also targeting industries with the highest number of employees and visitors. This includes manufacturing, finance and insurance, retail trade, health care and social assistance, gas stations and accommodation and food services, including post-secondary schools, construction facilities, office buildings, industrial/manufacturing facilities, and hospitals/care homes.

In Newfoundland and Labrador, MMSB operates a program targeting the school institution sector. The total number of containers collected from this program is now reported annually in their annual report. MMSB returns the applicable value of the refund to the schools on an annual basis.

New Brunswick's new program operated by Encorp Atlantic has recently implemented a new bin collection program in schools, they have secured participation from 50 out of 300 schools in 2024, and plan on continuing outreach to remaining schools. They have a public page where the number of containers collected from each participating school is charted so that schools can track progress.

SARCAN in Saskatchewan also has a dedicated school outreach program where they provide bins to schools and encourage school group tours of their depots. They have provided bins to businesses, arenas, retail spaces, and have a cost-share program with municipalities to provide clip on equipment to public waste bins in municipal streetscapes where beverage containers can be placed for out of home recovery. In addition, they are piloting a new mobile shipping container at public events and festivals to facilitate out of home recovery.

Accessibility

Establishing accessibility targets is more common in EPR /industry-led programs for beverage containers, with targets most often established in stewardship program plans. Of the four industry-led DRS programs for beverage containers in Canada only one has accessibility requirements to be met in regulation (Quebec) with others not having a regulatory requirement but still setting them in stewardship plans. The government-operated DRS programs do not have legislated accessibility targets.

Legislation in BC requires "reasonable access" to recycling services and is in the process of providing more clarification on how to measure "reasonable access". Encorp Pacific has established detailed accessibility standards with third-party monitoring and evaluation protocols implemented to measure "reasonable access".

Accessibility targets established by Encorp Pacific:

- Ensure that 97% of the province's population has reasonable access to a return point.
- Criteria to measure whether this target is met:
    - In urban areas, the drive time target is set at within a 30 minute drive.
    - In rural areas, the drive time target is set at within a 45 minute drive.
    - In urban areas, there should be a return point within 15 kms.
    - In rural areas, there should be a return point within 60 kms.

Reporting on this criterion is done by Geographic Information System (GIS) mapping and reporting annually. Results indicate that provincially, 99.3% of the province's population has access to a return point within the defined criteria established (drive time). When comparing regional districts, 22 of 29 regional districts meet the 97% target.

Quebec's new modernized DRS legislation has accessibility targets outlined. By November 1, 2023, the Designated Management Body (Consignation) must implement a network of drop-off return sites comprising of at least 1,200 locations in southern Quebec, and this number must increase to at least 1,500 locations by March 1, 2025. Additional drop-off sites in isolated or remote areas will be set up based on need. The network of drop-off points must also comply with criteria regarding the number of locations by population bracket and Regional County Municipality (RCM) or recovery capacity. Retailers that sell products in redeemable containers and whose stores have an area reserved for sales of more than 375 m^2 (4,036 sq. ft.) must participate in the network either independently or in cooperation with other retailers. The drop-off sites may be located inside their stores or in a separate structure. In addition to retailer drop-off sites, others may be added to the network and reserved for this purpose whether or not they are retailer-managed. To facilitate consumer return of redeemable containers, all types of containers (including refillable) are accepted at all drop-off sites and handled in a way that enables reuse.

Encorp Atlantic launched its new industry-led DRS program in NB in April 2024. There are plans to improve accessibility however the plans do not outline specific targets, only improvements to the existing collection infrastructure. Field trials that were conducted by Encorp Atlantic Inc. (the former organization operating the previous program in NB) in an eight-year initiative (2014-2022) provided valuable data on convenience factors and public perception toward a new approach to collecting deposit-bearing beverage containers. The research included findings that highlighted the growing emergence of both the bag-drop concept in automated centres and that retailer participation can be a positive experience. One of Encorp Atlantic Inc.'s most successful pilot projects in this research initiative, was the Re-Centre in Moncton, which tested a drop & go recycling experience (bag-drop) as a more convenient way for consumers to return their containers while optimizing labour productivity for depot operators. Participants provided support for the drop & go concept and wished to see it expand.

Encorp Atlantic is also deploying technology tools that include a payment tracking system and a foundation for the planned express (drop & go) recycling service, based on the success of Re-Centre. This future drop & go recycling service and its network of locations will be known as Re-Express. With Re-Express, busy consumers will be able to sign up online for a free account and then drop off their containers at their convenience at any Re-Express location. Re-Express customers will access their container counts and refunds via an online account on a centralized website. Re-Express will be seen as an added value for current customers and will be particularly appealing to consumers who do not already return and redeem their containers. Encorp plans to explore the option of installing Re-Express drop & go self-serve kiosks inside other waste drop off facilities and/or Re-Express drop & go self-serve stations using bag-drop windows/façade retrofits or the installation of stand-alone units.

2.3 Regulated Elements: Inclusions, Definitions, and Rules

This section presents the designated containers in each regulated program through a high-level summary by container type in Table 6, which shows where containers are not included in designated programs. This is followed by a description of specific container definitions and exclusions presented Table 7 which helps demonstrate where there are similarities and differences in definitions across programs. Table 8 highlights how the reporting categories differ across programs with respect to plastic containers. This information reveals there are major inconsistencies in how different plastic containers are counted and reported as being collected.

2.3.1 Designated Containers in Each DRS Program

Table 6 presents an overview of the designated beverage container types and sizes included in each beverage container DRS recycling program across Canada. The Quebec program currently only includes PET containers for soft drinks (other PET containers, like water bottles, will be added as part of Phase 2 of the DRS modernization starting in March 2025). Manitoba is not included as it does not have a DRS for plastic containers If there is a "no" in a pink shaded cell this indicates that this container type is not included in the program.

Table 6: Summary of Included / Excluded Plastic Containers in DRS Programs (2024)

Container Type	BC	AB	SK	ON (alcohol only)	QC (soft drinks & beer only)	NB	NS	PEI	NL	YT	NT
PET/HDPE ≤ 1L	√	√	√	No	√	√	√	√	√	√	√
PET/HDPE >1L	√	√	√	No	√	√	√	√	√	√	√
Pouches ≤ 1L	√	√	No	No	No	√	√	√	√	No	√
Pouches >1L	√	√	No	No	No	√	√	√	√	No	√
Bag-in-box >1L	√	√	No	No	No	√	√	√	√	No	√
Non-alcohol containers <5L	√	√	√	No	√	√	√	√	√	√	√
Alcohol containers ≤ 500ml	√	√	√	No	√	√	√	√	√	√	√
Alcohol containers >500ml	√	√	√	No	√	√	√	√	√	√	√
Polystyrene cups 0-500ml	√	No	No	No	No	√	No	No	No	No	No
Milk & Milk Products	√	√	√	No	No	No	No	No	No	√	√
Wine & spirits - Pouches	√	√	No	No	No	√	√	√	√	No	√
Wine & spirits - Bag-in-Box	√	√	No	√	No	√	√	√	√	No	√
Wine & spirits - Plastic	√	√	√	√	No	√	√	√	√	√	√

Table 7 presents detail from the definitions of designated beverage containers included and excluded, for each beverage container program – both DRS and curbside. Information was obtained either from regulations, guidelines, or from industry stewardship plans for each program. As the table demonstrates, some programs designate types of beverages that are included in the regulation, others designate by type of container. Some programs define "beverage" while others define the "container". Almost all regulations state that designated containers must be sealed by a manufacturer.

Note that only rigid plastic containers are included in the beverage container definition in four programs: Saskatchewan, Quebec, Yukon, and Ontario's non-alcohol curbside program. In Ontario, although flexible beverage containers might be allowed in some municipal blue box programs as "packaging material" not all are included within the definition of "beverage container" in the regulation. Products and packaging included in the Blue Box Regulation are those primarily composed of glass, flexible or rigid plastic, metal, paper or a combination of these materials. The regulation includes a separate category for beverage containers, and only rigid containers are defined. This differs from Ontario's alcohol DRS operated by The Beer Store, which includes both flexible and rigid plastic containers. The other nine programs include both flexible plastic and rigid plastic beverage containers either in the definition or in the program inclusion list.

Table 7: Designated Beverages and Beverage Containers Included and Excluded

Province / Territory	Designated Types of Beverages, or Plastic Containers Included in a Regulated Program – Definitions from Regulations	Container Exclusions
BC	"beverage" means: any liquid that is a ready-to-serve drink. This includes plastic containers able to hold 1 L or less; able to hold more than 1 L.	Baby formula, yogurt drinks and nutritional meal replacements are exempt. Rigid and flexible containers are included.
AB	"beverage" means any liquid that is a ready-to-serve drink not exempt from this Regulation. "container" means a bottle, can, plastic cup or paperboard carton or a package made of metal, plastic, paper, glass or other material, or a combination of them, that contains a beverage	Containers that are not sealed by a manufacturer are excluded in regulation. Rigid and flexible containers are included.
SK	Prescribed beverage "containers": metal cans; plastic bottles; non-refillable glass bottles; aseptic containers (multi-material shelf stable); and paper-based polycoat gable top containers. "beverage" means a liquid that is a ready-to-serve sealed drink and includes alcohol, carbonated and non-carbonated soft drinks and fruit drinks, vegetable juices; non-alcoholic beer and wine, tea, water, energy drinks, plant-based drinks, fluid milk	Bag-in-box containers, industrial milk bladders >5L, meal replacements, fortified liquid diet, baby juices, concentrates are all excluded by regulation. Only rigid containers are included.
MB	"beverage container" means final consumer packaging that contains or contained a ready-to-serve beverage, other than unflavoured fluid milk; and was sealed by the beverage's manufacturer.	Fluid milk is excluded by regulation. Rigid and flexible containers are included.
ON	Alcohol DRS program: alcohol drinks sold through LCBO stores and winery retail stores, and beer containers sold in The Beer Store system. Non-alcohol non-DRS curbside program: "beverage container" means a container that contains a ready-to-drink beverage product, made from metal, glass, paper or rigid plastic, or any combination of these materials, and is sealed by its manufacturer.	Alcohol DRS: rigid and flexible containers are included. Non-alcohol non-DRS curbside program : only rigid containers included.
QC	As of November 1, 2023, all soft drinks and beer in plastic containers 100ml to 2 L. In March 2025, the system will expand to include all other containers, including plastic and multi-layered containers, for beverages like juice, water, milk, wine, and spirits that were not included by November 1, 2023.	Bag in a box, concentrates are excluded. Beverage containers of < 100 mL and > 2 L are excluded. All other plastic containers (spirits, juice, milk, water) are excluded until March 2025. Only rigid containers included.
NB	All sealed, ready-to-drink alcohol and non-alcohol drinks including: PET beverage containers (coloured or clear), alcohol + non-alcohol; HDPE Polypropylene (PP) and Polystyrene (PS); "other plastics," such as acrylic, nylon, polycarbonate, and polylactic acid and multilayer plastics; LDPE plastic pouches	Exclusions include cider that has not been pasteurised, "milk", plant-based milk alternatives not labelled as "fortified", meal replacements, formulated liquid diets, infant formula, concentrated drinks. Rigid and flexible containers are included.
NS	All sealed, ready-to-serve non-alcohol (juice; health, energy and diet drinks; soft drinks; water) and alcohol (wine, spirits, beer) drinks.	Exclusions include milk and milk substitutes, soya and rice beverage products, meal replacements, formulated liquid diets, baby formula, concentrated drinks. Rigid and flexible containers are included.
NL	All sealed, ready-to-drink non-alcohol and alcohol drinks.	Exclusions include milk and milk substitutes, infant formula, concentrated drinks, nutritional supplements. Rigid and flexible containers are included.
PEI	All sealed, ready-to-drink non-alcohol (juices; sport, energy and diet drinks; soft drinks; water) and alcohol (wine, spirits, beer) drinks.	Exclusions include milk and milk substitutes, chocolate milk and milk products; soya milk and rice milk; concentrated drinks. Rigid and flexible containers are included.
YT	All sealed, ready-to-serve alcohol and non-alcohol drinks including wine, spirits, beer, milk and milk substitutes, drinkable dairy products, juice, soft drinks, coffee drinks, smoothie drinks.	Exclusions include juice concentrate, liquid meal replacement, infant formula. Only rigid containers are included.
NT	All sealed, ready-to-serve drinks including non-alcohol (soft drinks, energy drinks, water, juices, and milk and liquid milk products) and alcohol (wine, spirits, beer) drinks.	Exclusions include infant formula, milk products <30ml. Rigid and flexible containers are included.

Table 8 highlights how beverage container recycling programs categorize and report on collected plastic containers in very different ways, which can impact program comparisons, and the ability for recycling authorities to track and report on container categories by material type consistently across programs. Table 8 shows how the reporting categories differ in annual public-facing reports on collection. Note that there are no plastic resin definitions in annual reports, stewardship plans, or regulations.

Table 8: Differences in Reporting Categories for Plastic Beverage Containers in Recycling Programs in Canada

Jurisdiction	Separate Category Reporting Recovery			
	PET Containers	HDPE Containers (Translucent/Clear)	HDPE Containers (Opaque)	"Other Plastic" Category Includes:
BC	All plastic containers (no delineation between PET and HDPE)			Bag in box Pouches
AB	PET coloured and clear combined	HDPE Clear	Not reported	All polycoats: Bag in box Pouches Aseptic cartons Gable top cartons
SK	All plastic containers (no delineation between PET and HDPE)			Aseptic cartons
MB out of home container program	PET reported	Not reported	Not reported	Not reported
ON (non-DRS non-alcohol)	Not reported	Not reported	Not reported	Not reported
ON (DRS alcohol)	PET reported	Not reported	Not reported	Bag in box Aseptic cartons
QC	All plastic containers (no delineation between PET and HDPE)			Not reported
NB	PET reported separate categories for: Non-alcohol PET Alcohol PET	HDPE Clear	Reported in "other" plastics	Opaque HDPE Bag in box Pouches PS Cups
NS	All plastic containers (no delineation between PET and HDPE)			"Other Plastics" are reported
NL	All plastic containers (no delineation between PET and HDPE)			"Other Plastics" are reported
PEI	All plastic containers (no delineation between PET and HDPE)			"Other Plastics" are reported
NWT	All plastic containers (no delineation between PET and HDPE)			Bag in box Pouches Aseptic cartons and gable top cartons reported together
YK	PET tonnage shipped out is reported as recycled	HDPE tonnage shipped out is reported as recycled		Aseptic cartons and gable top cartons reported together

There are multiple instances of inconsistencies with respect to plastic container reporting presented in Table 8 above, which will impact tracking collection by resin type. These inconsistencies include:

- Not delineating between PET and HDPE
- Not counting opaque HDPE in the HDPE category, rather in the "other plastics" category
- Counting gable top cartons, which are primarily made of paper with a very thin plastic coating and are not processed by plastic recyclers, in the "other plastic" category
- Counting aseptic cartons and gable top cartons together, as part of the "other plastics" category even though they are not processed by plastic recyclers; and
- Reporting tonnage shipped as recycled rather than collected.

2.3.2 Recovery Targets and Definitions of Recovery

Four beverage container recycling programs that are industry-led have legislated recovery targets; two are DRS programs (Quebec, British Columbia) while two are not (Ontario, Manitoba). Quebec is the only industry-led program with a detailed comprehensive set of newly established legislated targets for recovery rate by material, recycling rate, local circular economy recycling targets, and accessibility targets beginning in 2026. No other jurisdiction has legislated performance targets for beverage containers, although some Producer Responsibility Organizations (PROs) have set their own non-legislated targets in their stewardship plans. Table 9 presents details for programs with targets and shows which programs do not have targets that were readily identified in their business plans or stewardship plans.

Table 9: Recovery Targets for Recovery of Plastic Beverage Containers in Industry-Led Programs in Canada

Jurisdiction	Legislated Recovery Target	Description of Legislated Target	Recovery Target in Program Plan (Not Legislated)
BC	75% recovery (units)	75% recovery rate for each subcategory in Schedule 1 of the Recycling Regulation: plastic containers ≤ 1 litre; plastic containers > 1 litre; bag in a box; stand up pouches Recovery rate = amount of product collected divided by the amount of product produced, expressed as a percentage.	Plastic containers < 1 litre 2022: 73.6% | 2023: 74.6% | 2024: 75.6% 2025: 76.8% | 2026: 78.0% Plastic containers > 1 litre 2022: 86.1% | 2023: 86.3% | 2024: 86.5% 2025: 86.7% | 2026: 87.0% Bag in box 2022: 54.1% | 2023: 60.0% | 2024-26: 75% Pouches 2022: 50.0% | 2023: 60.0% | 2024-26: 75%
AB	None	No legislated targets in regulation. ABCRC annual report defines a collection rate as the percentage of beverage containers collected compared to the number of beverage containers sold by producers.	No specific recovery targets in BCMB reports or plans, although the Government of Alberta has an aspirational goal of achieving an 85% collection rate.
MB	75% recovery (units)	Recovery of 75% of the containers sold in the province, outlined in a Guideline authorized by the Packaging and Printed Paper Stewardship Regulation. No definition of recovery in regulation.	No material specific recovery targets in Stewardship Plan.
ON	75% recovery (tonnage)	75% recovery of tonnes supplied into the market of all beverage containers (all materials) in 2026 in the Blue Box Regulation, beverage containers are a special category, increasing to 80% in 2030. No definition of recovery in regulation.	No material specific recovery targets in Stewardship Plan or regulation.
QC	55% in 2026 recovery (units) 50% recycling rate Circular economy recycling target 80% Accessibility	All targets legislated in *The Regulation respecting the development, implementation and financial support of a deposit refund system for certain containers.* Plastic containers recovery: 55% recovery 2026 | 75% recovery 2028 80% recovery 2030 | 85% recovery 2032 | 90% recovery 2034 Plastic containers recycling: 50% recycling rate (consistent across years) 80% circular economy (local recycling) rate (overall) Circular economy is deemed local if occurring in Quebec, Ontario, NB, NS, PEI, NL, Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New Jersey, New York or Pennsylvania. Accessibility rate: 1,200 drop-off return locations by Nov 2023; 1,500 drop-off return locations by Nov 2025	All targets are legislated.
NB	None	No legislated targets.	Material specific targets in Encorp Atlantic Stewardship Plan: Non-alcohol PET + HDPE (translucent) < 1 litre 2024-2025 70% | 2026 71% | 2027-2028 72% Alcohol PET + HDPE (translucent) < 1 litre 2024-2025 64.0% | 2026 65% | 2027-2028 66% Other plastic (opaque HDPE & pouches) 2024 34% | 2025-2027 35% | 2028 36%

2.3.3 Recycling Definitions

There is no consistent definition of recycling in Canada. A clear definition of recycling is important to both policymakers that are seeking to measure outcomes associated with recycling programs and to

the regulated community that must deliver them. There has been a multi-stakeholder working group led by the Canadian Standards Association (CSA) that published *Defining Recycling in the Context of Plastics. A Principled and Practical Approach* in 2021.[7] The definition of what is "recycled" delineates the final disposition of materials that may be included in the calculation of performance against the recycling target. If the definition of recycled is inconsistent with circular economy principles, then it can be expected that recycling supply chains might employ materials management solutions that are inconsistent with those principles.[8]

Table 10 presents various recycling definitions for plastics applicable to beverage container packaging in Canada. These definitions are cited by a jurisdictional scan undertaken by the CSA, and by review of beverage container recycling regulations in Canada.

Table 10: Recycling Definitions for Regulated Plastic Beverage Containers

Jurisdiction	Definitions of Recycling, Recyclability, or Recycling Rate for Plastics	Source
National	Recycling is a process that requires collection, sorting and re-processing of end-of-life plastics into material that can be used in new products.	Environment and Climate Change Canada (ECCC)[9]
	Recycling is the reclamation of plastics (as polymer, monomer, or constituent chemical building blocks) in such a manner that they displace the primary or raw materials that are used as chemical building blocks in the production of plastics and plastic products and packaging.	Canadian Standards Association[10]
BC	No definition of recycling, or recycling rate in legislation. There is a definition for "recyclable material" : a product or substance that has been diverted from disposal, and satisfies one of the following criteria: is managed as a marketable commodity with an established market by the owner or operator of a site; is being used in the manufacture of a new product that has an established market or is being processed as an intermediate stage of a manufacturing process; has been identified as a recyclable material in a waste management plan. Encorp Pacific reports on the amount recycled in weight diverted from landfill, but not a recycling rate (only recovery rate).	*Recycling Regulation,* under the *Environmental Management Act*
AB	The Beverage Container Management Board (BCMB) is authorized to approve recycling methods for purposes of managing approved beverage containers. The producer-operated Alberta Recycling Management Authority is authorized to make bylaws respecting agreements concerning processing and recycling of designated materials. Recycling rate will quantify % of residual loss compared to containers collected (measured net of residuals lost during the processing of materials).	BCMB Business Plan
SK	The "recycling rate" means household packaging and paper products recycled by the program as a percentage of household packaging and paper products in products supplied to the market. There are no recycling rate definitions or requirements to report end of life recycling.	*Household Packaging and Paper Stewardship Program Regulations*, 2023
MB	Recycling means: "To do anything, including reuse or recover, that results in providing a use for a thing that otherwise would be disposed of or dealt with as waste, including collecting, transporting, handling, storing, sorting, separating, and processing the thing, but does not include the disposal of waste in land, the use of a thermal destruction process or any other activity prescribed by regulation." There are no recycling rate definitions or requirements to report end of life recycling.	Manitoba *Waste Reduction and Prevention Act* Product Stewardship Program Development Guidelines.
ON	… activities that define when a material can be deemed recycled: "used in the making of new products, packaging or other things…" There are no recycling rate definitions or requirements to report end of life recycling.	Ontario's *Resource Recovery and Circular Economy Act* 2016
QC	Recycling is defined as the reclamation of residual materials for the manufacture of new containers, packaging, or printed matter in order to promote closed-loop circularity. There is a recycling rate target of 50% (following process loss) for plastic beverage containers.	*Regulation respecting the development, implementation and financial support of a deposit refund system for certain containers.*
NB	There are no recycling definitions in the regulation. However, the regulation requires that the stewardship plan for the management of empty beverage containers abide by the following order of preference:	Not applicable.

[7] Canadian Standards Association. 2021. Defining Recycling in the Context of Plastics. A Principled and Practical Approach. Accessible at Defining Recycling in the Context of Plastics (csagroup.org)
[8] Canadian Standards Association. 2021. Defining Recycling in the Context of Plastics. A Principled and Practical Approach. Accessible at Defining Recycling in the Context of Plastics (csagroup.org)
[9] ECCC, 2023. Recycled content and labelling rules for plastics: Regulatory Framework Paper
[10] Canadian Standards Association. 2021. Defining Recycling in the Context of Plastics. A Principled and Practical Approach. Accessible at Defining Recycling in the Context of Plastics (csagroup.org)

Jurisdiction	Definitions of Recycling, Recyclability, or Recycling Rate for Plastics	Source
	reuse; recycle or compost; energy recovery; and disposal	
NS	There are no recycling rate definitions or requirements to report end of life recycling.	Not applicable.
PEI	"The practice of accepting, collecting, storing, sorting, handling, and preparing for transport or transporting, recyclable material for the purpose of the use or incorporation of the material in the manufacture of secondary products, and includes (i) compacting, (ii) bundling, (iii) baling, (iv) shredding, and (v) crushing." There are no recycling rate definitions or requirements to report end of life recycling.	Prince Edward Island's *Environmental Protection Act*
NL	"A process by which a post-use material is collected with the intent of processing that material to transform it into another material or substance or for another use." The MMSB is authorized to establish standards relating to recycling. There are no recycling rate definitions or requirements to report end of life recycling.	Newfoundland and Labrador's *Environmental Protection Act*
NWT	There are no recycling rate definitions or requirements to report end of life recycling.	Not applicable.
YT	There are no recycling rate definitions or requirements to report end of life recycling.	Not applicable.

2.3.4 Producer Obligated Requirements in Regulation

There is a wide variation across beverage container recycling regulations with respect to how the "producer" of the beverage is defined in each program/regulation. There are many variations of definitions that include manufacturer, brand owner, brand holder, franchisee, importer, distributer, seller, retailer as well as "marketplace facilitator" in one jurisdiction. Table 11 presents an overview of the key differences observed in how the producer is defined in regulation, along with a very high-level overview of the obligated requirements of the producer. Three jurisdictions were identified that outlined end-of-life requirements for managing collected material (e.g. prioritizing recycling over energy recovery) – this includes British Columbia, Alberta, and Ontario.

Table 11: Producer Regulatory Requirements and Definitions for Beverage Container Recovery Programs

Province / Territory	Who is Obligated	Producer Obligations as Designated in Regulation
BC	Manufacturer Brand owner Licensee Distributor Seller Importer	A Producer must submit a Stewardship Plan for approval that: – shows how the plan will achieve a 75% recovery rate for each subcategory listed in Schedule 1 for the beverage container product category. – shows how the plan will achieve any performance measures, requirements or targets established by the director, and any performance measures, requirements or targets in the plan. – shows the producer has undertaken satisfactory consultation with stakeholders. – provides for the producer collecting and paying the costs of collecting and managing products within the product category. – shows that there is reasonable and free consumer access to collection facilities or collection services, while making consumers aware of the producer's extended producer responsibility program, the location of collection facilities or the availability of collection services, and how to manage products – shows how the plan will assess the performance of the producer's program, the management of costs incurred by the program and the management of environmental impacts of the program. – includes a dispute resolution procedure for disputes that arise between a producer and person providing services related to the collection and management of the program. END OF LIFE: shows how the plan will reduce the environmental impacts of a product throughout the product's life cycle, and the management of the product in adherence to the order of preference in the pollution prevention hierarchy: reduce the environmental impact of producing the product, redesign the product to improve reusability or recyclability; eliminate or reduce the generation of unused portions of a product that is consumable; reuse the product; recycle the product; recover material or energy from the product; otherwise dispose of the waste.
AB	Manufacturer Filler Importer	The BCMB (designated in regulation) must: – Annually submit a business plan to the Minister that indicates its goals for the coming fiscal year. – Provide an annual report to the Minister summarizing the activities of the Board and containing the audited financial statements of the Board for the fiscal year, and the renumeration and benefits paid to Board members and management personnel. – The Board shall make by-laws prescribing the manner and frequency of container collections from depots and retailers by the collection system agent and manufacturers; prescribing the manner and frequency of payments to depot operators and retailers by the collection system agent and manufacturers; prescribing the handling commissions; establishing the criteria and procedures for changing the handling commissions; respecting the registration of containers, including the form and manner in which containers are registered and the fee, if any, that is payable on registration; respecting all aspects related to permits and administration of the operation of depots; respecting the keeping of records regarding transactions in beverage containers. Manufacturers must: – register with the Board; use and maintain a common collection system for the recovery and recycling of empty non-refillable registered containers from depots. – manufacturers shall appoint a collection system agent satisfactory to the Board to act on behalf of the manufacturers with respect to the operation of the common collection system. – a manufacturer of a beverage in a refillable container for sale or distribution in Alberta must provide a collection service capable of recovering the manufacturer's empty refillable registered containers from all depots and retailers accepting such containers or use the common collection system referred to for the recovery of those containers. – collect or cause to be collected from a depot or retailer refillable registered containers that contained a beverage manufactured by that manufacturer. – reimburse the depot operator or retailer for each container collected. END OF LIFE: MANUFACTURER RE-USE AND RECYCLING REQUIREMENTS (BCMB By-Law) A manufacturer of a Beverage in a refillable Container shall: Re-use the Container as a refillable Container if the manufacturer considers the container to be suitable for re-use as a container or cause the container to be recycled in a manner that is satisfactory to the BCMB, if the manufacturer considers the container is not suitable for re-use as a Container. Non-refillable Containers shall be recycled in a manner that is satisfactory to the BCMB. Methods not satisfactory to the BCMB: disposal, incineration, and thermochemical decomposition.
SK	Importer Manufacturer Filler	Importers and fillers must apply to the Ministry of Environment for approval of their containers. Once a business obtains approval, they will receive a licence to collect and remit the EHC and refundable deposit on approved containers. The registration process for beverage containers is managed by SARCAN. They are required to remit to the minister the environmental handling charge and a prescribed deposit for registered containers.
MB	Steward Supplier	A "steward of designated material" means the first person who, in the course of business or a prescribed activity in Manitoba, supplies a designated material to another person in Manitoba. Obligated producers (or producer responsibility organizations) to submit a product stewardship program (PSP) for approval by the Minister of Environment and comply with any guidelines established by the minister.
ON (non-alcohol)	Brand holder Importer Retailer	Every producer shall establish and operate a system for managing blue box material and implement a promotion and education program.

Province / Territory	Who is Obligated	Producer Obligations as Designated in Regulation
	Franchisee Marketplace-Facilitator	Every producer who has been allocated collection responsibilities for an eligible source in the allocation table shall establish and operate a collection system (for curbside collection). END OF LIFE: The recovered resources collected must be: i. marketed for re-use for their original purpose or function, or ii. marketed for use in new products or packaging Note: recovered resources used as fuel, for incineration, or disposal are not allowed to be counted towards the producers' recovered resources (by regulation).
QC	Manufacturers Marketer Supplier Retailer Distributor	Any person operating an industrial or commercial establishment, who manufactures, markets or otherwise distributes containers, must develop, implement and contribute financially to programs or measures to reduce, recover or reclaim residual materials generated by the containers. Entities that sell, market or otherwise distribute target products are responsible for managing them at the end of their useful life. Delegated management organizations are legislated. Material specific targets for recovery, recycling, and accessibility are legislated. Requirements for restaurant establishments to participate. END OF LIFE: The traceability of residual materials must be ensured up to their final destination so that they are considered in the calculation of the achieved performance rates, which will encourage the growth of local and neighbouring market solutions. Landfilled residual materials, residual materials subject to utilization for energy purposes or that undergo biological treatment cannot be calculated in the performance rate.
NB	brand owner	A brand owner must submit an application for registration; a beverage containers stewardship plan; and one or more performance measures, by material type, used to assess the goals and objectives of the stewardship plan as well as the targets by material type, set by the brand owner for each of the performance measures.
NS	Retailer Distributor	Obligations to label "return for refund", and requirement to register with Divert NS. Obligations to remit monthly deposits collected to Divert NS.
PEI	Distributor Retailer	Obligations to label "return for refund", and requirement to register with the Provincial Government. Obligations to remit payments of deposits to the Government.
NL	Manufacturer Seller Distributor Bottler / Filler Importer	Obligations to label "return for refund", and requirement to register with the MMSB. Obligations to remit monthly deposits collected to MMSB.
YT	Supplier	"Producer" means a person who, in the course of carrying on a business, supplies a beverage container in Yukon; obligations to register with the Government of Yukon to supply a refundable beverage container. Producers are required to track the number of both refundable and non-refundable beverage containers sold into the Territory, in addition to the total charges levied by retailers for all "chargeable" beverage containers.
NT	Manufacturer Distributor Retailer	Obligations to register and obtain a licence to sell within the Territory. Obligations to remit monthly payments of handling fees and deposits to the Government.

2.3.5 Performance Monitoring Obligations for Recycling Authorities

Table 12 presents the reporting obligations designated in regulation for the industry-led DRS programs. Table 13 presents the reporting obligations for government-led DRS programs.

Table 12: Performance Monitoring & Reporting Obligations for Industry-Led Programs

Province / Territory	Obligated Sales or Performance Reporting Requirements for Industry-Led Programs – as per Regulation
BC	An annual report, that includes: – a description of educational materials and educational strategies the producer uses for the purposes of this Part; – the location of the producer's collection facilities, and any changes from the previous report in its collection facilities and collection services, including the number and location of collection facilities; – efforts taken by or on behalf of the producer to reduce environmental impacts throughout the product life cycle and to increase reusability or recyclability at the end of the life cycle; – a description of how the collected product was managed in accordance with the pollution prevention hierarchy; – the total amount of the producer's product produced and collected and, if applicable, the producer's recovery rate; – the total amount of the producer's product collected in each regional district; – independently audited financial statements detailing – all deposits received and refunds paid by the producers covered by the approved plan, and – revenues and expenditures for any fees associated with the approved plan that are charged separately and identified on the consumer receipt of sale; – a comparison of the approved plan's performance for the year with the performance measures, performance requirements and targets referred to in section 5 (1) (a) [approval of extended producer responsibility plan]; – any other information specified by the director.
AB	A depot operator, the collection system agent and a manufacturer shall provide to the Board information pertaining to the recovery of containers. The BCMB outlines what will be required in the report in the BCMB by-laws (reporting requirements are not in the provincial regulation). The Manufacturer and Retailer By-Law requires that the manufacturer keep records on the number of containers sold by the manufacturer; the number of containers of each material stream collected from each depot and each retailer; and the volume of containers recycled.
MB	"Accurate monitoring and reporting on beverage container sale, recovery and recycling rates" is required as per regulation. In the Guideline to the regulations: "a steward may recommend appropriate program performance measures in the plan submitted for approval. The measure(s) must be able to show both what is recovered and what is not. The Minister may specify one or more performance measures or targets in approving the program plan. A steward may include any type of performance measures or targets in the program plan, in addition to any required by the Minister." A steward must post a copy of the report on the program website; document the performance in adherence to the program plan; and specify what the stewards will do to reduce or eliminate any gap between actual and projected performance.
ON (non-alcohol)	On or before December 31 of each year, a producer shall account for a weight of recovered resources in each material category that meets or exceeds its management requirement for that material category. The producer shall determine its management requirement for a material category using the following formula: Management Requirement = A × B where, "A" is the weight in tonnes of blue box material in the material category that the producer is required to report in the previous year, and "B" is the recovery percentage for the previous year for a material category. The producer must annually report: - the weight of blue box material in each material category supplied to consumers in Ontario - the weight collected from an eligible source at the time a related product was installed or delivered.
QC	Details not yet available, system in transition.
NB	An annual report is to be submitted to Recycle NB that outlines: the amount of fees, interest on outstanding fees and penalties remitted to the Board; the results of any inspections conducted under this Regulation; a description of all enforcement activities; and a description of other related activities of the Board; a copy of each annual report submitted by a brand owner; a copy of the Board's audited financial statement for the previous fiscal year.

Table 13: Performance Reporting Requirements for Government-Led Programs

Province / Territory	Obligations and Reporting Requirements for Government-Led Programs
SK	Manufacturers and distributors of beverages in the province must report the amount of beverages distributed and remit to the Saskatchewan Ministry of Finance the environmental handling charge and the refundable deposit for each container distributed. The Ministry of Finance consolidates industry sales data, then SARCAN is provided with information to verify return rates.
NS	Divert NS is the designated Recycling Authority. Report all units sold during the immediately preceding calendar month, and the remittance due (by the distributor) by type of beverage container, to Divert NS.
PEI	No public reporting requirements, there is no third-party Recycling Authority in this program.
NL	MMSB is the designated Recycling Authority. Recovery Rate %, #units beverage containers sold and recovered reported by MMSB to the Government.
YT	There is no third-party Recycling Authority in this program. The program reports publicly on the annual recovery rate % and total number of units recovered.
NT	There is no third-party Recycling Authority in this program. The program reports publicly on the annual recovery rate % and total number of units recovered.

2.4 Financial Program Elements

This section presents baseline and historical information on the financial elements applicable to plastic beverage container recycling in Canada such as CRF for plastic resins, including changes in recent years; deposit/refund values for each plastic container, by size or type of beverage as applicable; and handling fee setting information for return points in DRS.

2.4.1 Container Recycling Fees for Plastic Resins Across Programs

Beverage container programs are funded through three different ways in Canadian jurisdictions:

- In three of four industry-led DRS programs, there are variable CRFs on containers sold based on cost of collection, transportation, and processing the material. These are set annually, are paid by beverage manufacturers, passed on to retailers and to consumers;
- Manitoba's industry-led non-DRS "out of home" and in-home beverage container recovery program includes variable CRFs on containers sold, which funds both the out of home recovery program and provides funding to the curbside program operator to pay for collection of beverage containers;
- In Quebec, producers fund the program, but there are no visible fees (prohibited by legislation);
- In three government-led programs there are other forms of container fees as described earlier. These are added to the cost of each beverage container, this fee is set by the government and paid by the consumer; and
- In three other government-led programs there are no additional fees added to the cost of the container (instead, the consumer only receives half of their deposit back with the remaining portion of the deposit used to fund the program).

Variable rate CRFs are charged in four of the five industry-led programs (BC, Alberta, Manitoba, and New Brunswick), which are set annually. These fees, charged on the purchase of each beverage container, cover the local net cost of recycling a specific beverage container type (net cost of recycling is calculated by a PRO and accounts for remaining costs after estimated commodity revenues for that container type and unredeemed deposits are taken into account). The CRF varies for each beverage container category to avoid one container cost from cross-subsidizing another, and encompasses expenses for recycling beverage containers, including collection, processing, and transportation of containers; handling fees paid to depot operators; administration; as well as public education and outreach initiatives.

Rates for CRFs are usually revised annually based on 3-5 year forecasts to avoid major swings in the estimated net costs of managing used containers and may be adjusted to ensure adequate funds for program operations. CRFs are collected from brand owners via an online Deposit Remittance Form. In Quebec, legislation prohibits the use of CRFs added to the cost of beverage containers. Instead, the program charges producer fees based on units sold into the marketplace to cover the costs of the DRS. There is no publicly available information on the producer fees, they are internalized, which is frequently how systems operate in the United States and Europe.

In all cases that use fees, they are added to the consumer price and remitted by retailers to the recycling authority (i.e. beverage container agency managing the program). In all cases, the recycling authority administering the program decides how the revenue is used to fund program operations.

Industry-led beverage container programs in Western Canada (BC, Alberta, and Manitoba) have achieved some harmonization regarding sales verification processes, and methodologies for setting CRFs. CRFs are based on actual local management costs and therefore cannot be harmonized across Canada (this could lead to subsidization of some provincial programs by others). The actual CRFs in these jurisdictions are different because the costs (e.g. promotion and education, as well as collection) and revenue from material sales are different in each province as well as the strategic goals that may require different investments in different provinces.

Table 14 presents a comparison of container fees for plastic container types across all DRS programs, with rates effective as of April 1, 2024. Cells shaded in dark grey represent a container type category that is not designated in that program. Container fee acronyms used in the table include: Container Recycling Fee (CRF); Environmental Handling Charge (EHC); Recycling Fund Fee (RFF); and Container Handling Fee (CHF).

Table 14: Designated Container Fees by Container Type or Beverage Type for DRS Programs that Use Fees – Current as of April 2024 for Plastic Containers

Container Type	BC	AB	SK	MB	NB	NS	PEI	NL	YT	NT
	CRF	CRF	EHC		CRF	Non-Refundable Portion of Deposit	Non-Refundable Portion of Deposit	Non-Refundable Portion of Deposit	RFF	CHF
PET/HDPE ≤ 1L				$0.03	Non-alcohol: $0.03 Alcohol: $0.01					
PET/HDPE >1L				$0.03	Non-alcohol: $0.03 Alcohol: $0.01					
All Plastic ≤ 1L	$0.04	$0.02	$0.08		$0.01				$0.05	$0.08
All Plastic >1L	$0.05	$0.05	$0.08		$0.01				$0.10	$0.10
Pouches ≤ 1L		$0.05		$0.03						$0.05
Pouches >1L		$0.05								$0.10
Bag-in-box	$0.20	$0.05		$0.03						$0.10
Non-alcohol containers <5L						$0.05	$0.05	$0.03		
Alcohol containers ≤ 500ml						$0.05	$0.05			
Alcohol containers >500ml						$0.10	$0.10			
Polystyrene cups 0-500ml	$0.04			$0.03						
Milk - All containers ≤ 1L	$0.04								$0.05	
Milk - All containers >1L	$0.05								$0.05	
Wine & spirits - Pouches								$0.03		
Wine & spirits - Bag-in-Box								$0.03		
Wine & spirits - Plastic								$0.10		
Light Grey Cell = Container included in another category										
Dark Grey Cell = Category NOT designated										

Table 15 presents changes that have taken place in CRF rates for plastic containers in BC's program. Table 16 presents changes that have taken place in CRF rates for plastic containers in Alberta's

program, between 2020 and 2024. There have not been any changes to the CRFs in other programs in the last five years.

Table 15: BC Program Changes in CRFs By Plastic Container Types (2020-2024)

Type of Container		2020	2021	2022	2023	2024
Milk	Plastic 0-1L	N/A	N/A	$0.05	$0.02	$0.04
	Plastic >1L	N/A	N/A	$0.09	$0.01	$0.05
	Polystyrene cups	N/A	N/A	N/A	$0.02	$0.04
All other beverages	Plastic 0-1L	$0.03	$0.02	$0.02	$0.02	$0.04
	Plastic >1L	$0.05	$0.07	$0.04	$0.01	$0.05

Table 16: Alberta Program Changes in CRFs By Plastic Container Types (2020-2024)

	2020	2021	2022	2023	2024
Plastic 0-1L	$0.03	$0.03	$0.03	0.04	$0.02
Plastic >1L	$0.11	$0.11	$0.07	0.07	$0.05
Polycup 0-1L	$0.03	$0.03	$0.03	n/a	n/a

2.4.2 Container Recycling Fees Operational Details

Table 17 presents details regarding how the CRF works (e.g. is it visible or not to the consumer at point of sale), who is responsible for setting the fee, who owns any surplus fees, and whether there are any restrictions identified on the use of CRFs.

Table 17: Container Fee Details – Visibility, Responsibility and Ownership

Province / Territory	Program	CRF / EHC / CHF / RFF or Producer Fees	Visibility of Fee	Who Sets Fee	Ownership of Fees	Restrictions on Use of Fees?
BC	Industry-led DRS	CRF	visible	Producers	PRO: Encorp Pacific	None
AB	Industry-led DRS	CRF	visible	Producers	PRO: ABCRC	None
SK	Government-led DRS	EHC	visible	Government	Government	None
MB	Industry-led (out of home only)	CRF	visible	Producers	CBCRA	None
MB	Industry-led (non-alcohol) curbside PPP	Producer Fees	Not visible	Producers	MMSM	None
ON	Industry-led (non-alcohol) curbside PPP	Producer Fees	Not visible	Producers	Circular Materials	None
ON	Industry-led DRS (alcohol only)	No container fees	N/A	N/A	N/A	None
QC	Industry-Led DRS	Producer Fees	N/A	Producers	PRO: QBCRA	None
NB	Industry-led DRS	CRF	Not visible	Producers	PRO: Encorp Atlantic	None
NS	Government-led DRS	No container fees	N/A	N/A	N/A	None
PEI	Government-led DRS	No container fees	N/A	N/A	N/A	None
NL	Government-led DRS	No container fees	N/A	N/A	N/A	None
YT	Government-led DRS	RFF	visible	Government	Government	None
NT	Government-led DRS	CHF	visible	Government	Government	None

2.4.3 Notes on Surplus Funds Handling

In government-led programs, unredeemed deposits and revenues from material sales contribute to funding operational costs, surplus funds that are not spent during program operations annually are either re-directed to other waste diversion activity in the province or to general revenue. Surplus funds are owned by the government in Prince Edward Island, Saskatchewan, and the Territories; and by Divert in Nova Scotia, and the Multi-Material Stewardship Board (MMSB) in Newfoundland and Labrador.

In industry-led DRS programs, unredeemed deposits and revenues from material sales also fund operational costs in addition to pilot programs, new technologies or improvements to accessibilities, and to an operational reserve fund. A reserve fund is considered a best practice for all recycling programs which can be used to continue operations during times of uncertainty with unstable markets, and to fund wind down operations if necessary. In industry-led DRS programs, the PRO, a non-profit organization legally bound by rules of public reporting on all expenses, retains ownership of surplus funds in a reserve fund.

2.4.4 Deposit and Refund Values for Plastic Containers Across Programs

Table 18 presents a comparison of deposit and refund values for plastic container types across all programs, with rates effective as of April 1, 2024. The deposit is denoted by the number on the left of the slash, and the refund is represented by the number on the right. Programs that are in the process of implementing changes are indicated in red text. The table shows the wide variation in container size designations and categories between programs with very little consistency.

Table 18: Deposit / Refund Values ($CAD cents) for Plastic Beverage Containers in DRS by Province/Territory (2020-2024)

Jurisdiction	2020	2021	2022	2023	2024	Summary of changes over last 5 years
BC	Prior to Oct. 1, 2020 **All plastic 0-1L:** 10/10 **All plastic >1L:** 20/20 **Polystyrene cup w/ foil lid**: 10/10 As of Oct. 1, 2020 **All plastic 0-1L:** 10/10 **All plastic >1L:** 10/10 **Polystyrene cup w/ foil lid:** 10/10	**All plastic 0-1L:** 10/10 **All plastic >1L:** 10/10 **Polystyrene cup w/ foil lid:** 10/10	**All plastic 0-1L:** 10/10 **All plastic >1L:** 10/10 **Polystyrene cup w/ foil lid:** 10/10	**All plastic 0-1L:** 10/10 **All plastic >1L:** 10/10 **Polystyrene cup w/ foil lid:** 10/10	**All plastic 0-1L:** 10/10 **All plastic >1L:** 10/10 **Polystyrene cup w/ foil lid:** 10/10	Deposit/refund on plastic >1L decreased from 20- to 10-cents to have a unified deposit level for all plastic in Oct 2020 Plastic bottles of milk- and plant-based milk subject to deposit as of 2022
AB	**All plastic ≤ 1L:** 10/10 **All plastic >1L:** 25/25	**All plastic ≤ 1L:** 10/10 **All plastic >1L:** 25/25	**All plastic ≤ 1L:** 10/10 **All plastic >1L:** 25/25	**All plastic ≤ 1L:** 10/10 **All plastic >1L:** 25/25	**All plastic ≤ 1L:** 10/10 **All plastic >1L:** 25/25	NONE
SK	**All plastic <1L:** 10/10 **All plastic ≥ 1L:** 25/25	**All plastic <1L:** 10/10 **All plastic ≥ 1L:** 25/25	**All plastic <1L:** 10/10 **All plastic ≥ 1L:** 25/25	**All plastic <1L:** 10/10 **All plastic ≥ 1L:** 25/25	**All plastic <1L:** 10/10 **All plastic ≥ 1L:** 25/25	NONE
ON (alcohol only)	**Plastic wine & spirits ≤ 630ml:** 10/10 **Plastic wine & spirits > 630ml:** 20/20	**Plastic wine & spirits ≤ 630ml:** 10/10 **Plastic wine & spirits > 630ml:** 20/20	**Plastic wine & spirits ≤ 630ml:** 10/10 **Plastic wine & spirits > 630ml:** 20/20	**Plastic wine & spirits ≤ 630ml:** 10/10 **Plastic wine & spirits > 630ml:** 20/20	**Plastic wine & spirits ≤ 630ml:** 10/10 **Plastic wine & spirits > 630ml:** 20/20	NONE
QC	**Plastic soft drinks & beer:** 5/5	**Plastic soft drinks & beer:** 5/5	**Plastic soft drinks & beer:** 5/5	Prior to Nov. 1, 2023 **Plastic soft drinks & beer:** 5/5 As of Nov. 1, 2023 **Plastic soft drinks & beer:** 10/10	**Plastic soft drinks & beer:** 10/10	Deposit/refund increase from 5- to 10-cents as of Nov. 1, 2023
NB	**Plastic non-alcohol ≤5L**: 10/5 **Plastic alcohol ≤500ml:** 10/5 **Plastic alcohol >500ml**: 20/10	**Plastic non-alcohol ≤5L**: 10/5 **Plastic alcohol ≤500ml:** 10/5 **Plastic alcohol >500ml**: 20/10	**Plastic non-alcohol ≤5L**: 10/5 **Plastic alcohol ≤500ml:** 10/5 **Plastic alcohol >500ml**: 20/10	**Plastic non-alcohol ≤5L**: 10/5 **Plastic alcohol ≤500ml:** 10/5 **Plastic alcohol >500ml**: 20/10	Prior to Apr. 1, 2024 **Plastic non-alcohol ≤5L:** 10/5 **Plastic alcohol ≤500ml:** 10/5 **Plastic alcohol >500ml:** 20/10 As of Apr. 1, 2024 **All plastic** 10/10	Change from half-back to full-back deposit on all plastic containers, regardless of container size or beverage type (alcohol vs. non-alcohol)
NS	**Plastic non-alcohol <5L:** 10/5 **Plastic wine & spirits ≤ 500ml:** 10/5 **Plastic wine & spirits ≥ 501ml:** 20/10	**Plastic non-alcohol <5L:** 10/5 **Plastic wine & spirits ≤ 500ml:** 10/5 **Plastic wine & spirits ≥ 501ml:** 20/10	**Plastic non-alcohol <5L:** 10/5 **Plastic wine & spirits ≤ 500ml:** 10/5 **Plastic wine & spirits ≥ 501ml:** 20/10	**Plastic non-alcohol <5L:** 10/5 **Plastic wine & spirits ≤ 500ml:** 10/5 **Plastic wine & spirits ≥ 501ml:** 20/10	**Plastic non-alcohol <5L:** 10/5 **Plastic wine & spirits ≤ 500ml:** 10/5 **Plastic wine & spirits ≥ 501ml:** 20/10	NONE
NL	**Plastic non-alcohol:** 8/5 **Plastic wine & spirits:** 20/10	**Plastic non-alcohol:** 8/5 **Plastic wine & spirits:** 20/10	**Plastic non-alcohol:** 8/5 **Plastic wine & spirits:** 20/10	**Plastic non-alcohol:** 8/5 **Plastic wine & spirits:** 20/10	**Plastic non-alcohol:** 8/5 **Plastic wine & spirits:** 20/10	NONE
PEI	**Plastic non-alcohol ≤5L:** 10/5 **Plastic alcohol ≤500ml:** 10/5 **Plastic alcohol >500ml:** 20/10	**Plastic non-alcohol ≤5L:** 10/5 **Plastic alcohol ≤500ml:** 10/5 **Plastic alcohol >500ml:** 20/10	**Plastic non-alcohol ≤5L:** 10/5 **Plastic alcohol ≤500ml:** 10/5 **Plastic alcohol >500ml:** 20/10	**Plastic non-alcohol ≤5L:** 10/5 **Plastic alcohol ≤500ml:** 10/5 **Plastic alcohol >500ml:** 20/10	**Plastic non-alcohol ≤5L:** 10/5 **Plastic alcohol ≤500ml:** 10/5	NONE

Jurisdiction	2020	2021	2022	2023	2024	Summary of changes over last 5 years
					Plastic alcohol >500ml: 20/10	
YT	**Plastic milk & milk substitutes (any size):** 10/5 **Plastic non-milk <750ml:** 10/5 **Plastic non-milk ≥750ml:** 35/25	**Plastic milk & milk substitutes (any size):** 10/5 **Plastic non-milk <750ml:** 10/5 **Plastic non-milk ≥750ml:** 35/25	**Plastic milk & milk substitutes (any size):** 10/5 **Plastic non-milk <750ml:** 10/5 **Plastic non-milk ≥750ml:** 35/25	**Plastic milk & milk substitutes (any size):** 10/5 **Plastic non-milk <750ml:** 10/5 **Plastic non-milk ≥750ml:** 35/25	**Plastic milk & milk substitutes (any size):** 10/5 **Plastic non-milk <750ml:** 10/5 **Plastic non-milk ≥750ml:** 35/25	NONE
NWT	**All plastic ≤1L:** 10/10 **All plastic >1L:** 25/25	**All plastic ≤1L:** 10/10 **All plastic >1L:** 25/25	**All plastic ≤1L:** 10/10 **All plastic >1L:** 25/25	**All plastic ≤1L:** 10/10 **All plastic >1L:** 25/25	**All plastic ≤1L:** 10/10 **All plastic >1L:** 25/25	NONE

2.4.5 Handling Fees

Both government-led and industry-led programs pay return point operators (i.e. depots or return-to-retail locations) compensation for their services which include accepting empty containers from consumers, paying out the deposit refund, and sorting and bulking material manually for processing and shipping to end-markets. Handling fees can vary depending on material type, type of redemption facility, whether the containers are commingled or compacted, and whether collection is manual or automatic. Retailers and/or redemption centres (e.g. "depots") are typically paid for their take-back services in the form of a handling fee paid by the system operator, or by the bottler or distributor directly to the collection point.

In jurisdictions where the government is responsible for system operations, handling fees are sometimes paid by the government. Aside from an effective minimum deposit value, handling fees are a critical part of what make deposit systems work well, particularly in jurisdictions where retailers face no legal obligation to take back containers. Handling fees are intended to act as compensation for the costs associated with collecting and sorting container returns, such as those related to investments in extra labour (for manual collection) or for the purchasing or leasing of automated return systems such as reverse vending machines (RVMs), in the case of automated collection. On a long-term basis, they're also intended to cover expenses related to space requirements or overhead costs like site maintenance and electricity.[17]

See section 4.1.11 for an overview of handling fees in Canadian programs, and best practice elements in relation to handling fees.

2.5 Collection Rates Across Programs – Baseline Data

This section presents information on collection rates across programs, beginning with total collection rates (all materials) followed by plastic collection rates, where data is available or was shared with the project team.

Table 19 presents overall collection rates for single use beverage containers across Canada for the last 5 years, for all material types. The table does not include refillable containers, and only soft drink and beer containers are included in Quebec's program. Non-alcohol beverage container collection rates are not presented for Ontario or Manitoba, these containers are not in DRS (beverage containers are collected curbside, co-mingled with other plastic packaging). Collection rate information presented is based on the units recovered from units sold into the market, as reported by all DRS programs in Canada. Collection details for containers are not publicly available for Ontario's curbside co-mingled packaging recycling program. Manitoba's CBCRA program does report a collection rate, however this rate is published without transparent data to enable a review of the calculation methodology used to achieve this rate, which differs from all DRS programs in Canada that typically publish units sold and recovered.[18]

[17] Reloop, 2023. Handling Fees in DRS: Factsheet. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/05/RELOOP_Factsheet_HandlingFees_Jan-2023_Web.pdf

[18] CM Consulting, an international non-profit DRS expert consultancy, has opted to not include Manitoba beverage container recycling data for issues of data transparency, stating in its *2020 Who Pays What* report: "Due to lack of transparency, granularity, and methods and analysis behind the rate, we made a decision to omit Manitoba data from the 2020 Who Pays What report because we are unable to corroborate the numbers that have been officially reported by the producers". Pg 13. Accessible at https://www.cmconsultinginc.com/wp-content/uploads/2021/02/WPW-2020-FINAL-JAN-30.pdf

Table 19: Single-Use (Non-Refillable) Beverage Container Collection Rate Across Canada (All Materials) Alcohol and Non-Alcohol Containers (unless otherwise stated) (2018-2022)[19]

Province / Territory	2018	2019	2020	2021	2022
National average all programs	71%	78%	72%	76%	77%
BC (DRS)	81%	82%	76%	80%	81%
AB (DRS)	86%	85%	82%	84%	83%
SK (DRS)	89%	84%	74%	85%	84%
MB (non-alcohol Recycle Everywhere)	Not Available	68%	71%	72%	69%
ON (DRS alcohol)	81%	79%	70%	74%	75%
ON (non-alcohol curbside co-mingled)	45% (2016 data)[20]	Not Available	Not Available	Not Available	Not Available
QC (DRS soft drink & beer)	69%	69%	64%	67%	68%
NB (DRS)	81%	78%	73%	72%	72%
NS (DRS)	81%	82%	81%	82%	82%
PEI (DRS)	83%	85%	82%	85%	81%
NL (DRS)	68%	68%	61%	70%	70%
YT (DRS)	Not Available	79%	67%	72%	69%
NT (DRS)	84%	77%	61%	68%	69%

Figure 1 presents historical baseline data on beverage container recycling in select Canadian programs where data is available, for Alberta, British Columbia, Ontario, and Saskatchewan. Data is shown for Alberta, British Columbia, and Saskatchewan's DRSs, which combine alcohol and non-alcohol DRS programs, while the Ontario DRS is for alcohol-only containers. Information represents recycling rates (after accounting for an estimated process loss following collection and processing) for all non-refillable materials combined (glass, plastic, aluminum, steel). Figure 1 demonstrates that the DRS programs for beverage containers have much higher recycling rates than Ontario's non-DRS curbside collection program for non-alcohol containers, where beverage containers are collected curbside co-mingled with other packaging.

[19] Reloop, Global Deposit Book 2022 accessible at https://www.reloopplatform.org/resources/global-deposit-book-2022/; Personal communications undertaken with program managers for this study (2024).
[20] CM Consulting, Who Pays What Report 2020. Accessible at https://www.cmconsultinginc.com/wp-content/uploads/2021/02/WPW-2020-FINAL-JAN-30.pdf

Figure 1: Historical Beverage Container Recycling Rates for Non-Refillable Containers (All Materials) 2004 to 2019[21]

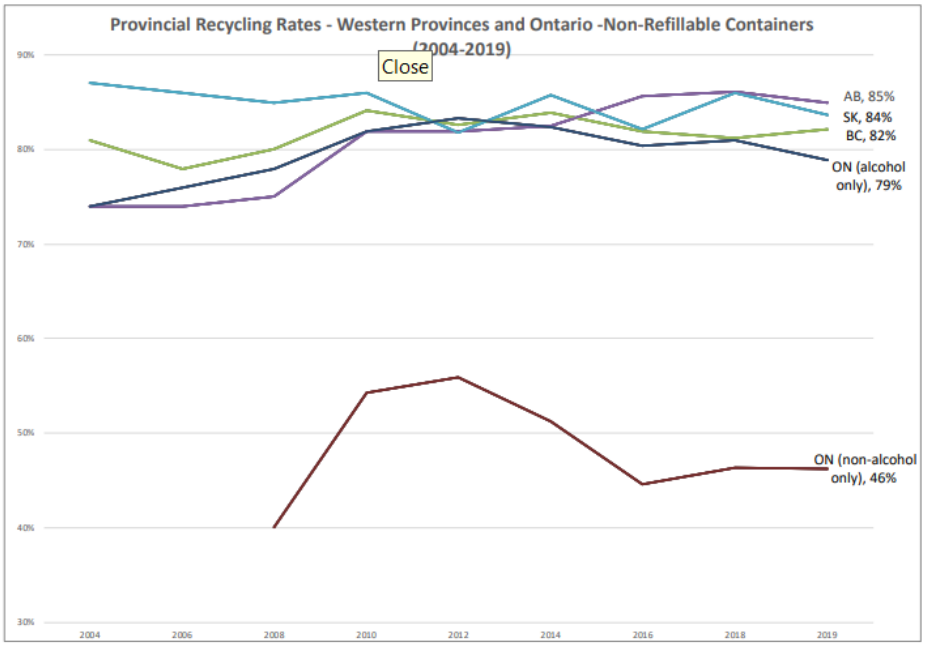


Table 20 presents collection rates for single use plastic beverage containers in Canadian DRSs where data is available for the last five years. Plastic resin collection rates are lower than the overall collection rates. Unless otherwise stated, the collection rate stated represents all plastic containers collected from multiple categories, many programs combine reporting for both PET and HDPE, as well as "other" plastics. Data presented in this table was provided by recycling authorities for each program, or from annual reports, with the exception of the available rate for Ontario's curbside non-alcohol recycling rate, this is an estimated rate published in Reloop's *Who Pays What* 2020 report. The table demonstrates the lower plastic container recycling rate in curbside programs compared to DRS systems that include plastic containers (Quebec's rate is also low because in these years they did not include PET in their DRS).

Note that there are no plastic resin definitions in annual reports, stewardship plans, or regulations across programs, and that most programs report on plastic containers recovered very differently.

[21] CM Consulting Inc., Who Pays What Report 2020. Accessible at https://www.cmconsultinginc.com/wp-content/uploads/2021/02/WPW-2020-FINAL-JAN-30.pdf

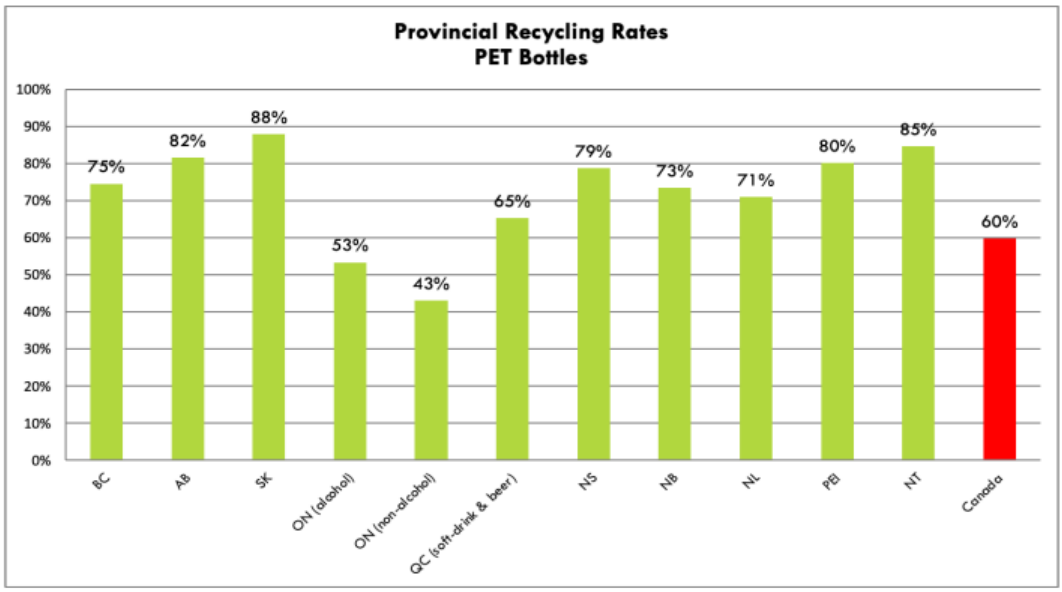
Table 20: Plastic Single-Use (Non-Refillable) Beverage Container Collection Rates Across Canada, 2019-2023[22] (Data Available as of April 1, 2024)

Jurisdiction and Program Type	2019	2020	2021	2022	2023
National Average all programs	Not available	Not available	Not available	71.83%	Not available
British Columbia (alcohol and non-alcohol, excluding beer)	74.6%	70.3%	72.7%	74.4%	78.5%
Alberta (alcohol and non-alcohol)	81.6%	78.5%	81.3%	75.0%	81.7%
Saskatchewan (alcohol and non-alcohol)	88.0%	67.9%	80.4%	80.0%	Not available
Manitoba (Recycle Everywhere Program)	Not available	PET: 79%	PET: 80%	PET: 80%	Not available
Ontario (alcohol only)	53.4%	46.1%	46.1%	44.6%	42.0%
Ontario (non-alcohol PET)	43%[23]	Not available	Not available	Not available	Not available
Quebec (beer & soft drinks only)	65.40%	56.10%	56.50%	54.10%	Not available
New Brunswick (non-alcohol)	PET/HDPE: 73.4% Other plastics: 22.3%	PET/HDPE: 72.9% Other plastics: 20%	PET/HDPE: 69% Other plastics: 24%	PET/HDPE: 67.9%	Not available
New Brunswick (alcohol)	Not available	PET/HDPE: 66.3% Bag in box: 25.1%	PET/HDPE: 62.6% Bag in box: 22.7%	Not available	Not available
Nova Scotia (alcohol and non-alcohol)	PET/HDPE: 79%	PET/HDPE:7 7%	PET/HDPE: 79%	PET/HDPE: 80.5%	PET/HDPE: 74.6%
Newfoundland & Labrador (alcohol and non-alcohol)	PET: 71%	PET: 64%	PET: 78%	PET: 70.3% Other plastics: 27%	Not available
Prince Edward Island (PEI) (alcohol and non-alcohol)	PET: 80.0%	PET: 75.6%	PET: 87.7%	PET: 76.4%	Not available
Northwest Territories (alcohol and non-alcohol)	75.7%	60.7%	67.8%	65.8%	Not available

Figure 2 presents Canada-wide historical data on PET-specific recycling rates (taking into consideration sorting and processing losses) for plastic beverage containers from Reloop's *Who Pays What* 2020 report to demonstrate the difference between curbside beverage container recycling rates (i.e. Ontario non-alcohol) compared to other DRS programs. Ontario's alcohol DRS program only includes one resin (PET).Comparable curbside rates were not available for curbside programs in Manitoba and Quebec in this report.

[22] Stewardship Program Annual Reports; Reloop Global Deposit Book 2020; some data provided by BCRNC members directly to consulting team.
[23] Reloop, Who Pays What Report 2020. Accessible at https://www.cmconsultinginc.com/wp-content/uploads/2021/02/WPW-2020-FINAL-JAN-30.pdf

Figure 2: Recycling Rates for <1 L Plastic PET Bottles Collected Canada, 2019 [24]



2.6 Key Messages from Baseline Information

Models, Accessibility and Performance Key Messages

- Recovery of plastic containers is less than the recovery rates for all containers (i.e. all materials, total recovery rates) across many programs, suggesting there are opportunities to improve the plastic container recovery rate across many programs (see Section 5 for specific opportunities).
- The DRS programs demonstrate much higher return rates compared to Ontario's co-mingled curbside program that includes beverage containers.
- DRS programs facilitate transparent data tracking of the number of containers sold in a jurisdiction, they report total units sold as well as the exact total number of containers collected from all sources by material in most programs.
- In contrast, curbside non-deposit programs do not have the same level of data transparency on the exact number of beverage containers collected for recycling, nor the number of units sold, only the estimated total tonnage sold onto the market for all material types.
- DRSs can facilitate data tracking by material type and resin, if required (some, but not all, DRSs in Canada already do this). Curbside co-mingled programs use an estimation methodology that is based on waste audits to track material type by resin. This is not publicly available.
- DRSs that have implemented a variety of return point options and are not focussed exclusively on the traditional fully staffed depot-only model and have higher accessibility rates (measured by population served by each return point). BC has implemented accessibility standards to be met by its return point network, other programs have no standards in place. Alternative return point options are in place in BC and Quebec, and planned for New Brunswick's future program, such as drop & go

[24] Reloop, Who Pays What Report 2020. Accessible at https://www.cmconsultinginc.com/wp-content/uploads/2021/02/WPW-2020-FINAL-JAN-30.pdf

express at depot (no line ups), express drop at satellite stations (could be mobile or temporary), return-to-retail (either reverse vending machines or staffed kiosk).

- There are no observable differences in the performance between programs that have visible (i.e. added to the price of a product) vs not visible container recycling fees. High return rates are demonstrated across both program funding models.
- There is a very wide variation in deposit and return levels for the same containers across programs in Canada. Consistencies in deposits and refunds will help improve recovery on a national level by harmonizing upwards for both deposit/refund values, at least on a regional level as many programs already do work together regionally.
- There are differences regarding surplus funds and how these are handled in the different program models. In industry-led programs surplus funds are used for system improvement, to cover increasing handling costs for return points, to add more return points, and to contribute to a reserve fund. In government-led programs surplus funds are either re-directed into general revenues for the provincial government or are used to fund other waste diversion activity within the jurisdiction. If all programs in Canada are going to be striving to reach 90% recovery, surplus funds in the program will most likely need to be dedicated to program improvements including the addition of return points, funding new technologies, or covering the increasing costs associated with handling fees.
- When DRSs have higher return rates there is less surplus funds from unredeemed deposits that can be used to invest in the system.

Program Scope and Definitions Key Messages

- Programs with the widest scope of plastic containers are included in DRSs in BC and Alberta. Milk containers are only included in BC, Alberta, Saskatchewan, and both Territories.
- There are a wide variety of definitions for "beverage" containers designated, some programs designate beverage type, others by container type.
- There are inconsistencies in container reporting categories. Seven DRS programs do not distinguish between PET and HDPE when reporting "plastic" containers collected. Two DRS programs only report on translucent HDPE containers and do not report on opaque HDPE. One DRS program categorizes opaque HDPE in with "other plastics". Three programs report gable top cartons in with "other plastics" rather than a separate carton category. Note that generally, cartons are not considered to be "plastic" containers as they are primarily made from paper with a thin plastic coating, and they are not sent to plastic processors for recycling.

Recycling Definitions, Rules, and Other Requirements

- Only four programs have legislated targets specific to beverage containers (BC, MB, ON, QC), these are industry-led programs which develop their own accessibility criteria, plans, and measurement points which demonstrates the strong ability of using legislation to drive both collection and data transparency.
- There is no consistent definition of recycling used across recycling programs in Canada. A clear definition of recycling is important to both policymakers that are seeking to measure outcomes associated with recycling programs and to the regulated community that must deliver them. Only Alberta and Quebec outline a "recycling rate" that refers to the end-of-life amount recycled (following collection, processing, accounting for process loss).
- Four of the industry-led recycling programs that include beverage containers have requirements outlined in legislation regarding what is allowed to occur at end of life. BC, Alberta, Quebec, and Ontario have such requirements.
- Reporting obligations differ greatly between industry-led and government-led beverage container recycling programs. Industry led programs are required to report annually on sales and recovery,

both number of units and/or weight of units, by type of container, and on other system performance elements such as accessibility, promotion and education activities. Most government-led programs have minimal reporting requirements, reporting an overall recovery rate is standard practice across government-led beverage container recycling programs.

- None of the programs reviewed have specific requirements for out of home recovery of beverage containers, only Manitoba has this as part of its program. Encorp BC is the only other jurisdiction that has implemented an extensive out of home recovery element to their portfolio, and this has been done to meet the results-based regulatory target of 90% recovery of beverage containers. This demonstrates the importance of results-based legislated targets.

3.0 Current State of Material Flow Analysis

To gain an understanding of the current performance of plastic beverage container recycling in Canada, Eunomia estimated the tonnage of plastic beverage containers that are uncollected for every province in Canada. The scope of beverage containers for this study includes rigid plastic beverage containers, (i.e. including containers that are primarily made of plastic such as PET and HDPE, but not cartons, aseptic cartons, or flexible plastics). When "in-scope" is mentioned in this section, it refers to the containers in scope of this study, rather than referring to the containers which are included in a deposit system. The baseline year for this analysis is 2022. Quebec will see most of its plastic beverage container come under deposit in 2025, therefore this analysis does not yet fully consider the impact of these changes. This will be further analyzed in Section 5 of this report.

Eunomia used a variety of sources to make these calculations. The main sources of data used were:

1) Annual reports from Producer Responsibility Organizations (PRO)s in industry-led DRS, or third party annual reports from government-led DRS programs for 2022.

2) Data shared with us from PROs that may not be published.

3) Annual EPR reports for residential curbside collected tonnage in provinces without a DRS for beverage containers.

4) Bespoke waste characterization studies on waste (i.e. garbage) stream for provinces.

5) Canada Plastic Pact (CPP) data on waste characterization from the ICI sector at the provincial level which includes beverage containers.

Calculations were performed at the provincial level and then aggregated nationally. Eunomia calculations at the resin and beverage type level were undertaken to understand:

1) How DRS programs which are defined by beverage type (e.g., soft-drink, alcoholic) influence the overall collection rate of plastic beverage containers nationally

2) Whether there were resin-specific patterns observed for uncollected containers, either from DRS or curbside programs.

In cases where data didn't split out beverage containers by material, Eunomia used data from either waste characterizations for the province, or used average data information from programs which did report at the product and resin level. Eunomia adjusted this information based on the scope of the DRS system being modelled. For example, if one province had an overall resin split for its containers which includes dairy, but

dairy was not included in the DRS in another province, dairy containers were removed from the split before application to the other province.

The resulting material flow analysis is organized as follows:

1) Sales of plastic beverage containers, separated by inclusion under a DRS or not (i.e. curbside non-deposit).

2) Collection methods of plastic beverage containers.

3) Estimated sources of uncollected beverage containers.

A full list of sources of data, and assumptions made in calculations can be found in appendix 4.

3.1 Sales and Inclusion in DRS

The first step in the material flow analysis was to estimate the total tonnage of plastic beverage containers sold in each province, as well as how many of the plastic beverage containers were included within a DRS. To calculate each of these datapoints – Eunomia used annual sales data as reported by DRS. Deposit return systems will only report the beverage container sales for containers which are designated in the program. To fill in gaps for beverage containers that were not included in a DRS, Eunomia used average sales per capita by beverage and resin type to estimate the tonnage available in other provinces.

Sales DRS were most often reported as number of containers sold, rather than by tonnage. In order to combine sales data with other waste and disposal data (e.g., from curbside recycling, landfill tonnages), Eunomia converted the container sales into tonnes as other waste data is reported on a tonnage basis. Eunomia used average weights per container from British Columbia and the Container Recycling Institute.[25]

Table 21 shows the results of the calculations, with the total sales of plastic beverage containers by province as well as the tonnage included in DRS by province. The final column describes which types of beverage containers are not covered by a deposit program.

[25] "2018 Beverage Market Data Analysis," The Container Recycling Institute, 2020.

Table 21: Tonnage of Selected Plastic Beverage Containers Sold Included in DRS by Province (2022)

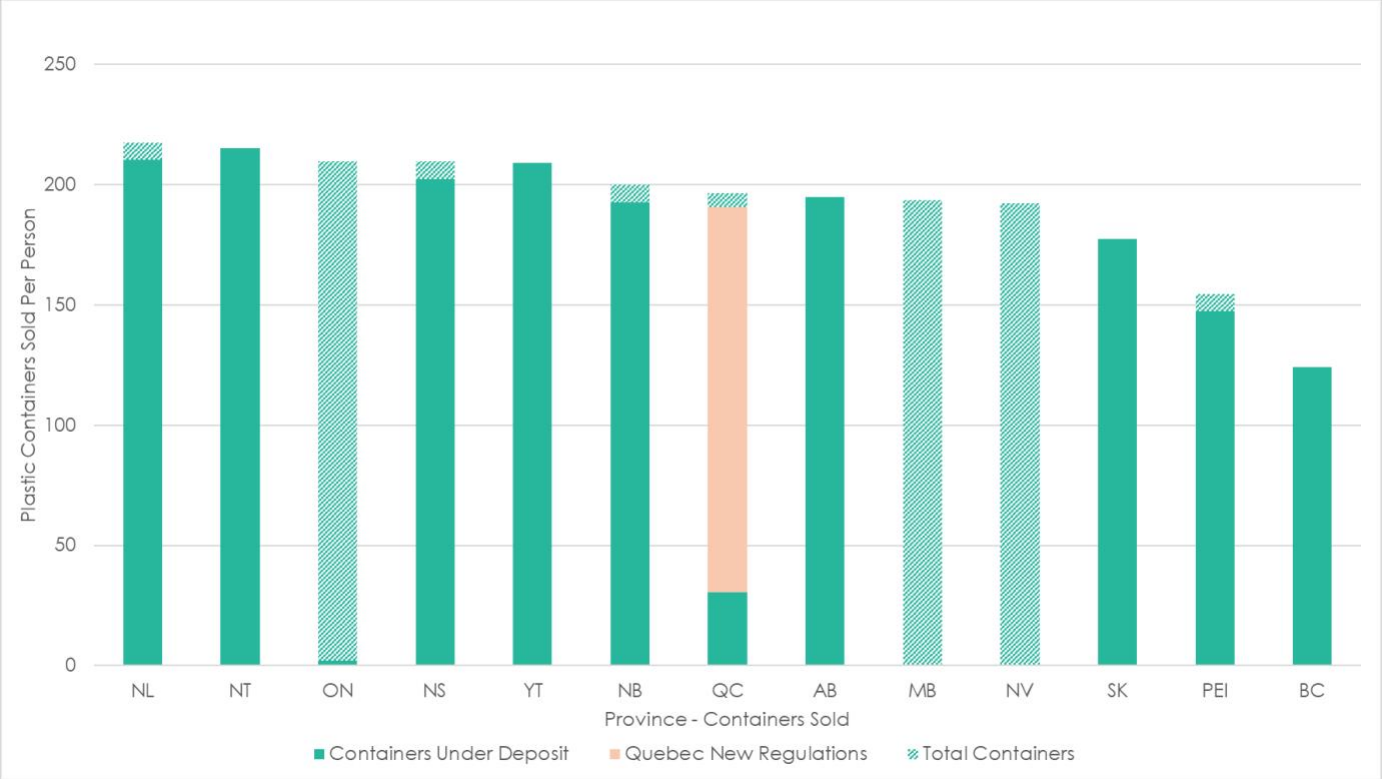
	Total Sales (tonnes)	Sales Covered by DRS (tonnes)	Sales Covered by DRS (percent)	Beverages not Covered by DRS
BC	23,000	23,000	100%	N/A or Trivial
AB	26,100	26,100	100%	N/A or Trivial
SK	6,400	6,400	100%	Water, Dairy
MB	6,900	0	0%	Dairy
ON	95,600	700	1%	N/A or Trivial
QC	46,800	6,400	14%	Non-alcoholic containers
NB	5,100	4,700	93%	All
PEI	700	600	89%	N/A or Trivial
NS	5,700	5,300	92%	Dairy
YT	300	300	100%	N/A or Trivial
NT	300	300	100%	Dairy
NV	200	0	0%	All
NL	3,000	2,800	92%	Dairy
Total	220,000	77,000	35%	

Key Takeaways from Table 21

1) While eight out of thirteen provinces have greater than 90% of the plastic beverage containers under deposit, the two largest provinces, Ontario and Quebec, have only 1% and 14% of their plastic beverage containers under deposit, respectively, as of 2022. This leads to only 39% of plastic beverage containers being under deposit nationally in 2022. In 2025, Quebec will expand its DRS and will have greater than 90% of its plastic beverage containers under deposit.

The total sales per capita by deposit status are shown in Figure 3, illustrating which provinces have an expansive deposit system for plastic beverage containers. In Quebec, Nunavut, Manitoba and Ontario, the majority of container sales are not under deposit (as noted, Quebec will expand its program in 2025 to have most of its plastic beverage container under deposit).

Figure 3: Sales per Capita by Deposit Status on Selected Plastic Containers for Baseline Material Flow Analysis (# of Containers Sold) (2022)



Eunomia also estimated the total sales of plastic beverage containers by resin and product type nationally. Several deposit programs report sales by beverage and resin type, however it is not a universal practice. For provinces which only report beverage container numbers at the overall material level (e.g., "all plastic"), Eunomia applied beverage sales splits from provinces which do report at this granular level. Alberta, Newfoundland, Nova Scotia, and Manitoba report their beverage containers by resin type, while Alberta and Newfoundland also report by product type. These provinces averaged container splits were then applied to the data from other provinces where plastic beverage containers were reported only at the resin or "all plastic beverage container" level. The national totals are then produced by aggregating all of the provincial level calculations. For this analysis, soft-drink plastic containers include water beverage containers. Note that in all instances, tonnages presented do not include gable top, aseptic cartons (these are primarily paper based packages that are not sent to plastic processors), or flexible plastics as noted in the scope section of this report (see Section 1).

Table 22: Calculated Tonnage of Selected Plastic Beverage Containers in DRS by Resin, Nationally (2022)

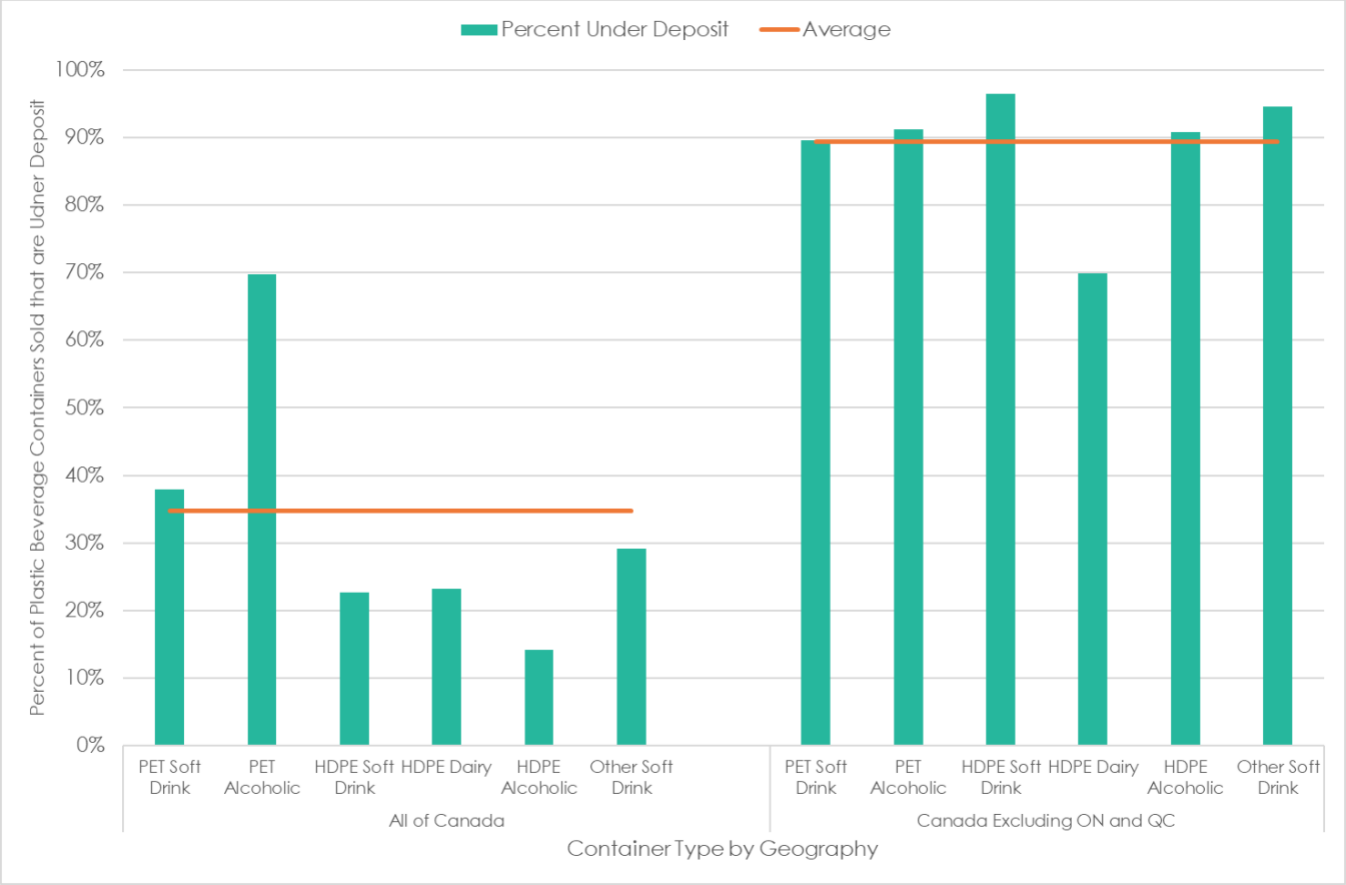
	Total Sales (tonnes)	Sales Covered by DRS (tonnes)	Sales Covered by DRS (percent)
PET Soft Drink/water	163,100	61,700	38%
PET Dairy	0	0	0%
PET Alcoholic	3,300	2,300	69%
HDPE Soft Drink/water	36,400	8,300	23%
HDPE Dairy	12,500	2,900	23%
HDPE Alcoholic	10	1.42	21%
Other Soft Drink	4,800	1,400	29%
Other Dairy	0	0	0%
Other Alcoholic	0	0	43%
Total	220,100	76,600	35%

Key Takeaways from Table 22

1) Alcoholic PET containers have the highest coverage proportion of all containers, as they are under deposit 70% of the time. This is primarily because alcoholic beverages are the only plastic beverage under deposit in Ontario, while they are also under deposit in most other programs across the country. The rest of the plastic container categories are under deposit between 14% and 41% of the time, while the national average is 35%. Quebec will see most of its plastic beverage container come under deposit in 2025, which will increase the total national sales under deposit. At that time, Ontario will be the largest province without a comprehensive DRS reducing the total percent of plastic beverage containers covered by a DRS.

2) Quebec and Ontario account for an estimated 65% of all plastic beverage containers sold in Canada. Their recycling systems therefore represent the majority of the weight in national estimates. Removing these two provinces from the national estimate shows that the remaining provinces have 90% of plastic beverage containers sold under deposit. This is presented in Figure 4 below.

Figure 4: Proportion of Plastic Beverage Containers Deposit - National (Left) and All Provinces without ON and QC (Right) (2022)



3.2 Estimated Comparison of Unrecovered Containers

Eunomia estimated the potential volume of unrecovered containers from three distinct streams:

1. Deposit system returns – containers returned by consumers through the deposit program;
2. Residential curbside/drop off collection – containers which are collected for recycling in residential curbside collections; and
3. ICI curbside collections – separate curbside/private recycling collections for the ICI sector.

Eunomia used a variety of sources for this information, explained in further detail below.

DRS Data

For programs with annual performance reports, Eunomia used container returns data to arrive at a total tonnage of plastic beverage containers returned in the province. Most DRS annual reports provide the number of containers returned. Eunomia converted the returns data into tonnes using average weights by

container type. In some cases, annual reports include the tonnage of beverage containers returned in the DRS via MRFs. Where this was the case, the containers recovered through the MRF stream were allocated to the curbside collection stream to maintain accuracy in method of collection. This was done to demonstrate the portion of containers returned in DRS vs curbside systems overall.

Residential Curbside Collection Data

For jurisdictions that do not have a deposit program, Eunomia calculated the tonnage of beverage containers likely collected and recovered through curbside programs using two main sources:

1. Annual EPR reports for provinces with EPR for packaging;

2. For provinces without EPR for packaging, Statcan data on the recovery of plastic beverage containers was used. Statcan data aggregates the recovery of curbside and deposit return systems, thus the containers returned through the deposit system were subtracted from the Statcan data. The remainder allows for a collection rate to be calculated and applied to the non-deposit containers.

ICI Collection Data

3. No province publishes data that provides a complete picture of ICI recycling. Eunomia used unpublished data obtained via desktop research in a comprehensive study prepared for the Canada Plastic Pact (CPP) and used in their 2021 *Foundational Research and Study: Canadian Plastic Packaging Flows* and 2024 *Canada-Wide Plastic Packaging Flows: A Progress Report*: *Deposit-Return and Residential System Performance*.[26] This data included the tonnage of beverage containers in ICI disposal and recycling by province.[27] The dataset generated for this CPP foundational research was based on over 1000 ICI waste characterizations to arrive at provincial level characterizations of recycling and disposal for different business types. This was then combined with waste generation estimates by businesses using the number of employees in each business type, and using a waste generation factor per employee. The CPP data generated a low, medium and high estimate for the tonnage of beverage containers estimated to end up in the ICI recycling and disposal streams, separately. To ground the range of data, Eunomia then compared these estimates with published provincial studies on the tonnage of beverage containers in ICI collections from Recyc-Quebec. Eunomia compared which of the high, medium and low estimates were closest to the measured data from these studies, and an average of the high and medium estimates was chosen to be used for modelling purposes.

A summary of the calculations is shown in Table 23 . As the scope of this study is rigid beverage containers (HDPE, PET, PP), the overall sales numbers may differ slightly to programs which report flexible beverage containers together in their plastic container category.

[26] Unpublished data prepared by Policy Integrity Inc for Canada Plastics Pact in support of the published report: Canada-Wide Plastic Packaging Flows: A Progress Report: Deposit-Return and Residential System Performance (2024). Accessible at https://plasticspact.ca/wp-content/uploads/2024/01/CPP_Canadian-Plastics-Flow_2023-Progress-Report.pdf

[27] Unpublished data prepared by Policy Integrity Incfor Canada Plastics Pact, in support of the Foundational Research and Study: Canadian Plastic Packaging Flows (2021). Accessible at https://plasticspact.ca/wp-content/uploads/2021/10/CPP-Foundational-Research-on-Canadian-Plastics-Packaging-Flows-May-2021-final.pdf

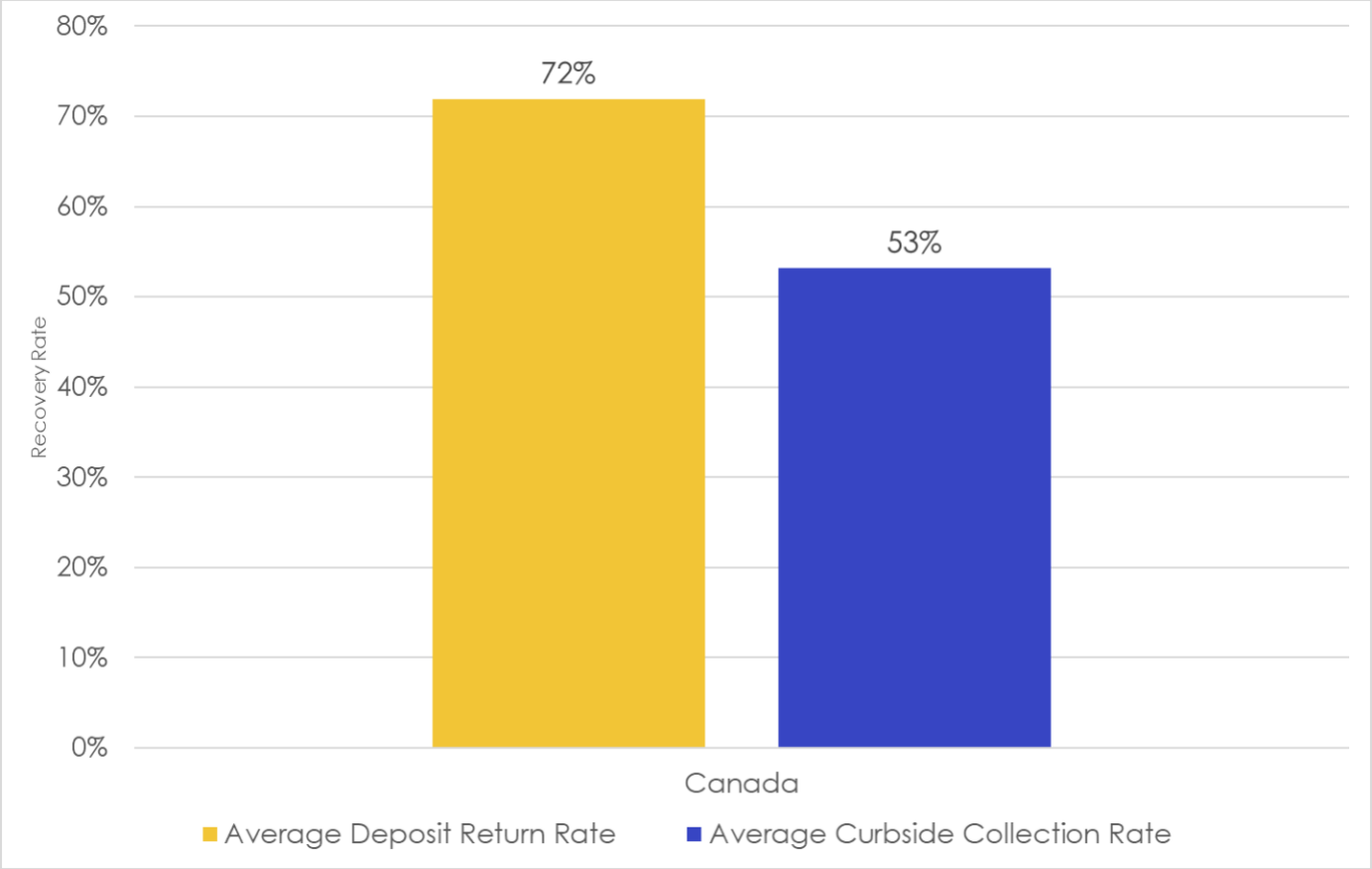
Table 23: Estimated Recovery Rate Of Rigid Plastic Beverage Containers by Stream, by Province (2022)

	Total Sales (tonnes)	DRS Return Rate of in Scope Sales	% Recovered Through DRS	% Collected ICI	% Collected Residential	Total Recovered
BC	23,000	72%	72%	7%	6%	85%
AB	26,100	79%	79%	8%	1%	89%
SK	6,400	79%	79%	8%	1%	88%
MB	6,900	0%	0%	14%	49%	63%
ON	95,600	42%	0%	5%	47%	52%
QC	46,900	54%	7%	7%	48%	63%
NB	5,100	68%	62%	11%	0%	73%
PEI	700	76%	67%	9%	6%	82%
NS	5,700	66%	61%	7%	6%	74%
YT	300	64%	69%	10%	6%	85%
NT	300	69%	66%	11%	0%	77%
NV	200	0%	0%	0%	0%	0%
NL	3,000	64%	61%	5%	0%	66%
Total	**220,200**	**72%**	**25%**	**7%**	**33%**	65%

Key Takeaways from Table 23

Ontario accounts for the greatest tonnage of containers estimated to be unrecovered at nearly 46,000 tonnes; this represents 59% of all unrecovered plastics beverage containers in Canada. While the average plastic recovery rate for deposit bearing containers in Ontario is 42%, only around 1% of PET beverage containers in the province are under deposit. Similarly in the 2022 (pre-modernized) program in Quebec, only 14% of plastic beverage containers are under deposit, with the remainder relying on the curbside collections of the residential and ICI sectors. The residential and ICI sectors have a combined recovery rate of 55% for plastic beverage containers. This is higher than the reported return rate for the DRS system as of 2022 (possibly due to imported returns from border jurisdictions). In total, approximately 25% of all plastic beverage containers are returned through deposit systems, 33% through curbside residential collection, and 7% through ICI collection. Curbside programs account for a higher proportion of containers collected because Quebec and Ontario have the greatest tonnage of containers sold due to high populations. Figure 5 shows that the average recovery rate for deposit programs is much higher than the average collection rate for curbside programs.

Figure 5: National Average Plastics Deposit Return Rate vs National Plastics Curbside Recovery Rate (2022)

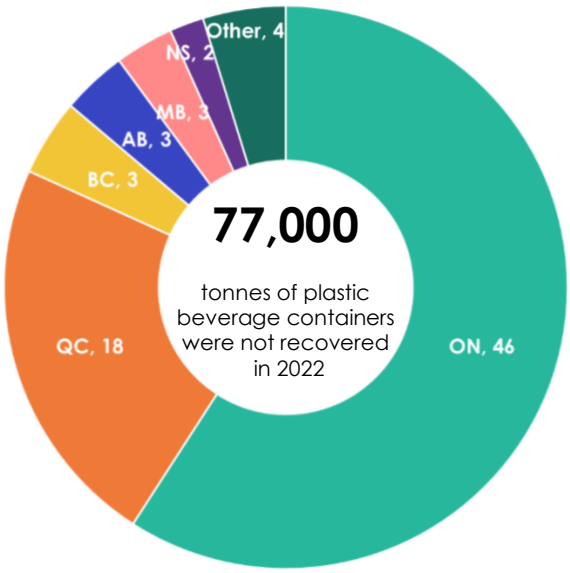


Key Takeaways from Figure 5

1) Deposit systems on average collect plastic beverage containers at a rate that is 19 points higher than curbside collection. The deposit return rate is still 18 points lower than the overall target of recycling 90% of plastic beverage containers in Canada. The highest return rate for plastic containers in Canada is 79% from both the Alberta and the Saskatchewan deposit return systems.

As the two largest provinces in terms of population both Ontario and Quebec have limited deposit systems for plastic beverage containers, their size and reliance on curbside collection results in those two provinces accounting for more than 80% of uncollected containers nationally. This is shown in Figure 6.

Figure 6: Estimated Tonnage of Unrecovered Plastic Beverage Containers by Province (Thousand Tonnes)



3.3 Potential Sources of Unrecovered Containers

Table 24 shows the total tonnage of material that is not recovered and are either placed in the garbage stream at residential or ICI properties or are littered. The residential sector includes single and multi-family. The calculated estimates presented in this table are based on litter studies from Canadian jurisdictions that have documented plastic beverage containers.

Table 24: Estimated Amounts and Likely Destinations of Unrecovered Beverage Containers by Province (2022)

	Residential Garbage (tonnes)	ICI Garbage (tonnes)	Litter (tonnes)	Total Unrecovered Containers (tonnes)
BC	300	2,900	200	3,400
AB	500	2,200	200	2,900
SK	200	500	100	800
MB	1,400	1,000	200	2,600
ON	36,600	5,950	3,140	45,690
QC	9,500	6,600	1,400	17,500
NB	900	400	100	1,400
PEI	0	100	10	110
NS	900	520	100	1,520

	Residential Garbage (tonnes)	ICI Garbage (tonnes)	Litter (tonnes)	Total Unrecovered Containers (tonnes)
YT	20	20	0	40
NT	40	20	0	60
NV	200	0	0	200
NL	800	200	0	1,000
Total	**51,000**	**20,000**	**5,000**	**77,000**

The table shows that approximately 66% of beverage containers that aren't recovered are from residential waste generators in 2022. However, if we exclude Ontario and Quebec, the residential sector only accounts for 41% of unrecovered beverage containers, while the ICI sector accounts for 57%, Which shows that both the type of program (DRS vs curbside such as Ontario) and program scope (limited program scope in unmodernized Quebec program), are important factors in container recovery. The residential sector would include containers which are purchased by households but consumed on-the-go. The largest tonnage of unrecovered beverage containers is PET. This is because this category accounts for the most sales of plastic beverage containers, and is not under deposit in Ontario. Quebec also does not currently include water in its deposit system (this will be changing in 2025). Altogether this results in over 77,000 tonnes uncollected across Canada. With the modernization of Quebec's deposit system this number could reduce by 10-15 thousand tonnes.

3.4 Material Flow Analysis – Key Summary Points

Section 3.0 presented the following key points:

- DRS in Canada achieved a 72% recovery rate in 2022 for the plastic beverage containers reviewed as part of this analysis, but when considering all provinces such as those without DRS (i.e. Ontario and Manitoba) and Quebec's pre-modernized small scope program, the total collection rate for plastic beverage containers in Canada was closer to 66%.

- The sectoral analysis, supported by CPP data on unrecovered beverage containers, estimates that 70% of unrecovered containers are from the residential sector, possibly consumed on the go, with only 30% of unrecovered containers estimated to be unrecovered from the ICI sector.

Section 4 examines international best practices in beverage container recovery.

4.0 Best Practice Performance Factor Analysis

Not all DRS achieve the same performance, and it is important to identify the factors that support high collection rates. This section reviews the internal and external factors that contribute to a high performing DRS and identifies the best practice for each factor. Internal factors are elements of a DRS within the control of system operators or core elements of a DRS while external factors have influence over a DRS performance but are not directly within the system operators control. Best practice factors leading to high performance are drawn from studies undertaken by the following organizations that have been studying deposit-return systems for over a decade: Reloop Platform International (non-profit); Container Recycling Institute (U.S. based), and Eunomia Research & Consulting specialized studies in DRS.

This section reviews the factors identified that lead to improved recovery, followed by a summary table. Five international case studies are presented in the appendix, highlighting jurisdictions that have achieved a 90% collection rate when specific best practice factors have been implemented.

4.1 Internal Factors

Internal factors are elements of a DRS that a system operator has influence over or is a direct mandate of the system. The system operator may be able to make operational changes in relation to the factor, while some factors may require legislative changes.

4.1.1 Deposit/Refund Level

Deposits serve as a financial incentive for consumers to redeem covered containers to a return location to receive the deposit back. The value of a deposit/refund is typically set in legislation. Deposit systems can set a uniform deposit amount applicable to all containers or vary the deposit levels based on beverage type, material, and size. Opting for a uniform deposit level may be simpler for consumers, however, setting a higher deposit value for larger or more expensive containers can ensure the incentive to redeem remains meaningful.[28]

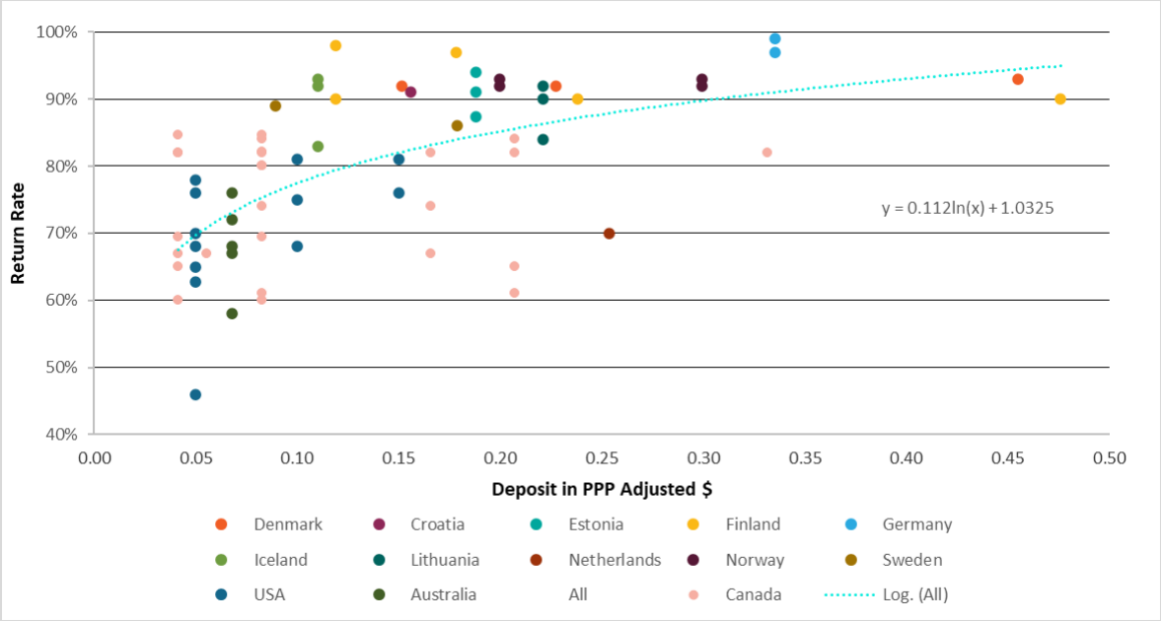
Importance for achieving 90% collection

The value of the deposit/refund is an important factor in achieving a higher recovery rate as it provides a direct financial incentive to consumers. If the deposit/refund is set too low and/or does not keep up with inflation, consumers can feel "return fatigue" and will not be motivated to spend the time and energy required to redeem their deposit.

Evidence from multiple studies have identified a high enough deposit/refund as a key factor in driving returns, showing that high performing systems tend to have higher deposits. Figure 7 shows the positive correlation between higher deposits and high return rates, and that the majority of DRSs that have a 90% collection rate have a deposit of €0.10 ($0.15 CAD) or more. This is in line with other studies that found a minimum deposit of 10 cents value in USD or Euros ($0.15 CAD) is required to be effective at achieving a 90% return rate.[29] While programs with higher deposit values tend to have higher recovery, this is not universal, demonstrating that other design features, such as those described in the best practice factors presented in the following sub-sections, are also important to drive container recovery.

[28] TOMRA_Rewarding_Recycling - English.pdf (hubspotusercontent-na1.net)
[29] TOMRA_Rewarding_Recycling - English.pdf (hubspotusercontent-na1.net)

Figure 7: International DRS Return Rates Compared to Deposit Value for all Beverage Containers (2022)[30]



Best Practice

Best practice elements in DRS systems around the world have been extensively studied by Reloop, an international non-profit organization. Their analysis shows that a 10-cent USD minimum deposit ($0.15 CAD) is necessary to motivate consumers to return containers.[31] As shown in Figure 7, return rates in DRS markets by minimum deposit amount of $0.10 (USD) ($0.15 CAD) in effect, the programs with the lower return rates (including those in Canada), are linked to lower deposit values (shown in green and red). In jurisdictions such as Germany and Norway with minimum deposits of $0.10-$0.15 USD ($0.15 - $0.20 CAD) (shown in navy blue and yellow), the return rates are consistently above 90%.

The state of Oregon offers a best practice example of the impact of setting a meaningful deposit value. When Oregon increased its deposit on beverage containers from $0.05 USD to $0.10 USD in April 2017, the impact was almost immediate. Within a period of 7 months (by December 2017), the return rate had increased from 64% to 82%.[32] In April 2024, Oregon's system operator reported a preliminary 2023 return rate of 90.5%, the highest of all U.S. deposit programs.[33]

A 2023 study[34] undertaken by the U.S. based Container Recycling Institute (CRI) and Reloop studied the impact of high deposit values to understand if there were any negative impacts on sales following deposit

[30] Note that this figure has some countries appearing more than once to reflect differential performance or delivery across different container types.

[31] Reloop, 2023. High-Performance Principles To Modernize Deposit Return Systems. Accessible at https://bottlebillreimagined.org/wp-content/uploads/2023/06/Factsheet-10-principles.pdf

[32] Reloop Newsletter May 2023, accessible at https://bottlebillreimagined.org/bottle-bill-common-ground-issue-3-10-cent-minimum-deposit/

[33] Resource Recycling news, accessible at https://resource-recycling.com/recycling/2024/04/16/oregon-deposit-system-estimates-90-5-return-rate/

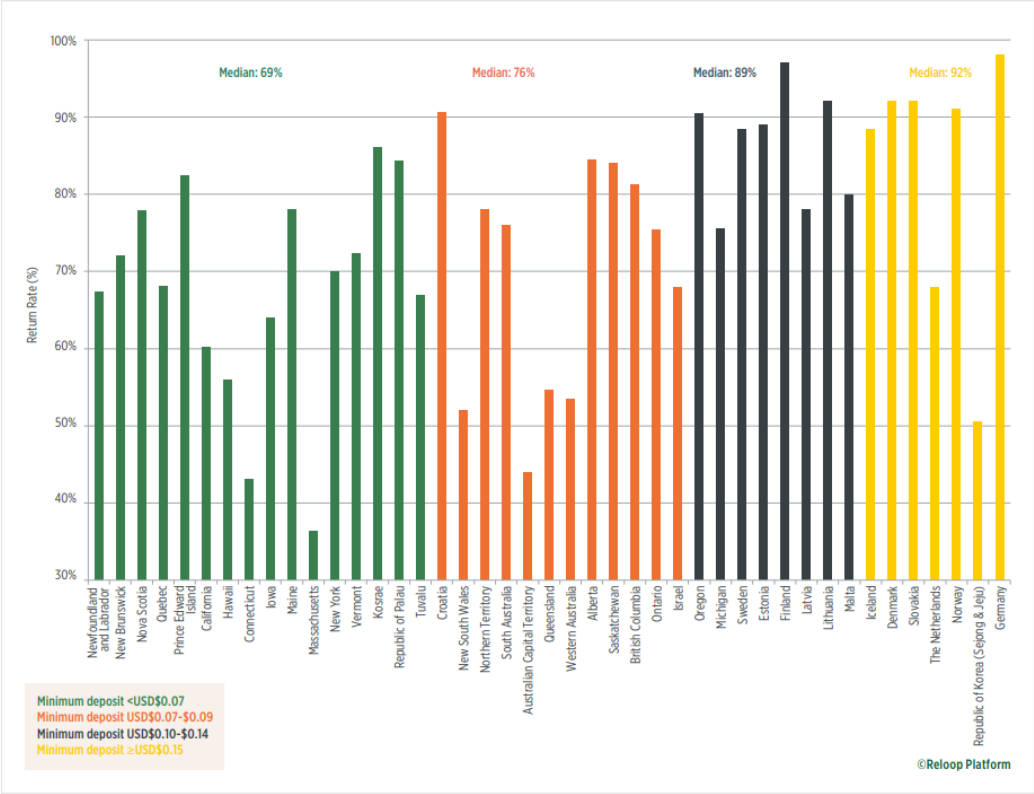
[34] The Container Recycling Institute (CRI), and Reloop International, 2023. The impact of deposit return systems on beverage sales. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/08/Reloop-Impact-of-DRS-Report.pdf

increases. Findings indicate that there is no direct negative impact to beverage sales and a higher deposit in DRSs. Beverage sales are affected by a complex interplay of factors including seasonal temperatures, economic conditions, and supply chain disruptions. These factors may independently or collectively affect beverage sales and prices. Observed fluctuations in sales across the case studies were well within the scope of normal variation. Sales trends followed a similar pattern whether the jurisdiction experienced a DRS event (e.g. a change in deposit or implementation of a new DRS) or not. Observed fluctuations in sales appear to align with regional trends. Results indicate that in programs with higher deposits there is no discernable impact on sales.

Figure 8 presents Reloop's 2024 snapshot of global deposit values in all DRS programs tracked annually, categorized by minimum deposit value. Results show a strong positive correlation with deposit value and return rate:

- The green category on the left shows programs with a deposit value of less than $0.07 USD ($0.05 to $0.10 CAD), where the Atlantic Canadian programs are as of 2023, demonstrating a median container return rate of 69%.
- The orange category shows programs with a deposit value of approximately $0.07 to $0.09 USD ($0.10 to $0.12 CAD), where the western Canadian programs are as of 2023, demonstrating a median container return rate of 76%.
- The navy category shows programs with a deposit value of approximately $0.10 to $0.14 USD ($0.104 to $0.19 CAD), demonstrating a median container return rate of 89%.
- The yellow category on the right shows programs with a deposit value of $0.15 USD or more ($0.21 CAD), demonstrating a median return rate of 92%.

Figure 8: Return Rates by Minimum Deposit Value (2022 and 2023) [35]



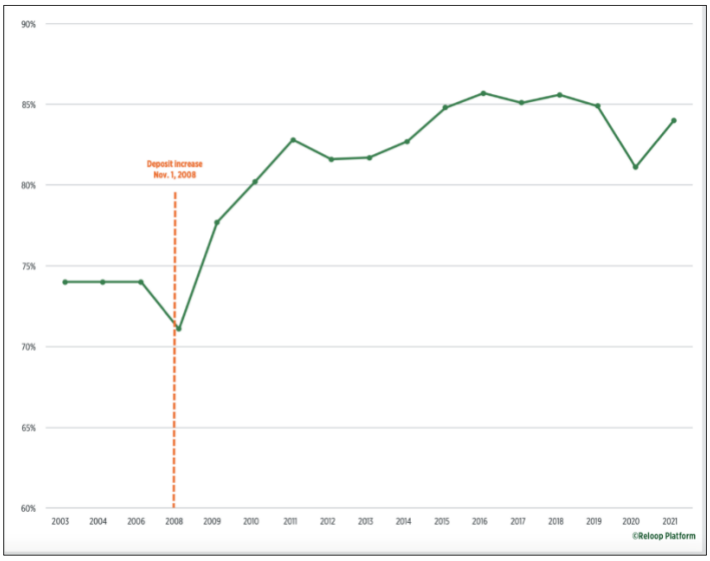
*Note: The figure presents return rates for years 2022 or 2023 and does not include countries that have recently introduced DRS, such as Romania.

Although it does not achieve a 90% collection rate, Alberta's program, which is currently the highest-performing DRS in Canada, offers another example of the impact of setting a meaningful deposit value. Within just three years of increasing the deposit on all beverage containers from 5-10-cents CAD for containers 1L and under, and from 20- 25-cents CAD for containers over 1L the overall return rate increased by approximately 12 percentage points, as shown in Figure 9.[36]

[35] Reloop, 2022. Global Deposit Book. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/05/RELOOP_Global_Deposit_Book_111202.pdf

[36] Reloop 2024. Deposit Return Systems, How hey Perform, Factsheet. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/05/RELOOP_Factsheet_Performance_May2024_Web.pdf

Figure 9: Impact of Increasing Deposit Value to Minimum 10-cents CAD in Alberta's DRS



4.1.2 Program Scope (Beverages /Container Types)

The scope of containers included within a DRS refers to the containers included in the system for which a deposit is required. A comprehensive program scope minimizes consumer confusion regarding which containers are eligible for a refund, thereby fostering increased participation. Including more container types also helps to create a fair playing field among beverage producers and avoids the possibility of consumers switching to container types excluded from the DRS to avoid perceived price increases.

Some DRSs have a limited scope, covering specific beverage types, such as Ontario's current system which only includes alcoholic beverages. Others cover only specific container types such as Norway's system, which excludes glass and solely encompasses PET bottles, aluminum, and steel containers. Other DRSs cover a wide range of beverage containers. Whether broad or limited in scope, most DRSs have exemptions for certain beverages like dairy products or essential dietary products such as infant formula and nutritional beverages.

Importance for achieving 90% collection

Studies indicate that systems covering a limited scope of containers can hinder consumer engagement.[37] Ensuring that most beverage containers are included in the DRS reduces consumer confusion regarding which containers can be redeemed and which need to be recycled either through curbside recycling collection or drop-off recycling locations. Analysis of DRS options have shown that excluding common beverage types such as water and soft drinks leads to lower return rates.[38] Covering a wider scope of beverages may motivate greater engagement from consumers, as the more containers they consume are covered by a deposit, the greater the financial incentive to return containers for the deposit.

[37] TOMRA_Rewarding_Recycling - English.pdf (hubspotusercontent-na1.net)
[38] Eunomia, 2024. Ontario Deposit Return for Beverage Container Study, prepared for Canadian Beverage Association. In Progress.

Best Practice

Best practice includes considering a diverse range of beverage types, container materials, and sizes. While expanding the coverage of beverage containers may potentially boost return rates, other factors play a role in driving up collection rates. Having a wide scope of containers included in the program can yield other beneficial impacts beyond collection rates, including reducing consumer confusion at redemption points and potentially leading to better economies of scale for the system.

With regards to material type, most DRS programs in operation today include plastic, metal (aluminium and steel), and glass. Several programs also include liquid paperboard (LPB) (i.e., cartons) and multi-material pouches. LPB is currently included in most Canadian DRSs as well as several Australian programs and there is a growing trend to include such containers in upcoming new DRSs.[39]

Just as including a wide scope of container types is important, so is ensuring that the program covers a wide range of beverage types. Most deposit systems include a range of alcoholic and non-alcoholic beverages, including bottled water (still and sparkling), carbonated soft drinks, sports drinks, juices and nectars, beer, hard cider, wine, spirits, plant-based beverages. Although milk and dairy drinks are still excluded from many programs, more and more are beginning to add them. Legislation should be designed in a way that empowers the regulatory authority or managing body to ensure that new beverages placed on the market can be added to the program. As for container size, the typical size range for DRS eligible containers is 100ml up to 3L. Size determinations are usually guided by the prevalence of commonly consumed volumes and the technological capabilities for efficiently redeeming containers.[40]

An example of an expansion in scope leading to higher collection is Queensland, Australia's DRS, which expanded in November 2023 to include glass wine and spirit bottles. Since then, the scheme has recorded a 13.5% increase in the quantity of glass bottles being returned, indicating that having a wider scope of beverages covered by DRS improved redemption rates.[41]

BC and Alberta already have a very wide-ranging program scope in Canadian DRS programs. Quebec's modernized DRS expands the program to include all ready-to-drink beverages in containers between 100mL and 2L. Prior to making this change, there were extensive surveys undertaken which showed that consumers were confused by the limited program scope and that they were more likely to return containers if more types of beverage containers were included in the DRS.

4.1.3 Legislated Targets

Targets set in legislation establish overarching objectives for a system to achieve certain redemption, recycling, and accessibility metrics and promote continuous system improvements. For systems with return rates currently below 90%, multiple targets can be set to progressively increase over a determined number

39 Reloop, 2024. Deposit Return Systems, How they Work. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/05/RELOOP_Factsheet_Performance_May2024_Web.pdf

40 Reloop, 2024. Deposit Return Systems, How they Work. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/05/RELOOP_Factsheet_Performance_May2024_Web.pdf

41 Eight billion containers returned through Queensland refund scheme - Waste Management Review

of years. This approach has been adopted in multiple jurisdictions, such as Quebec, which has mandated recovery and reclamation targets to rise by 5% every two years until reaching 90%.[42]

Importance for achieving 90% collection

Establishing a target alone doesn't ensure reaching a 90% collection rate. Setting binding targets in a recycling program can drive system operators to change other elements of the program, such as deposit levels, consumer education efforts, and convenient return infrastructure among other design factors, to help achieve targets. Setting a target in legislation can achieve the following[43]:

- Serve as a guiding principle for system operators and stakeholders, including depot operators, retailers, and recyclers.
- Set measurement and evaluation metrics to regularly assess progress towards the target and inform system operators of the effect of their investments and changes to the system.
- Outline enforcement measures, especially if the target is linked to incentives or penalties to encourage compliance.
- Create accountability mechanisms and engage consumers to give a sense of responsibility to all stakeholders to help achieve the target.

Best Practice

Well-designed targets foster continuous system improvement to reach 90%. Targets should be established with consideration for current rates to ensure they are achievable. Additionally, they must address non-compliance and outline penalties to deter non-compliance. Furthermore, the targets must be supported by robust enforcement mechanisms. An example of enforcement best practice is Oregon's trigger mechanism to increase the deposit level if the recycling rate fell under 80% for two consecutive years. This happened in 2017, and the deposit value was raised from USD $0.05 to USD $0.10 as a course-correction. In 2023, Oregon's return rate was 90.5%.[44] It should be noted that in addition to the legislated targets, Oregon also has a higher than average deposit value, a hybrid system that includes both depots and return-to-retail options to increase accessibility, and Oregon also has a well-developed drop-and-go system which most other states do not have. Oregon DRS is a leading example of a high performing system in the U.S.

In Canada, Quebec has recently implemented a suite of material-specific legislated targets for beverage container recovery in its modernized DRS, in addition to legislated targets for container reclamation (reuse) recycling, local circular economy recycling, and accessibility. It is the only Canadian DRS program to have legislated a suite of comprehensive targets such as these, and they are considered best practice. The material-specific targets relate to current recycling end markets available, and they increase by increments of 5% every two years

[42] Government of Quebec. Modernized Deposit-Refund (gouv.qc.ca)

43 Reloop, A Guide to Modern Deposit Return Systems: 10 Essential Practices. Accessible at https://bottlebillreimagined.org/wp-content/uploads/2023/12/Reloop-NA_A-Guide-to-Modern-DRS_10-Essential-Practices.pdf

[44] Oregon OBRC Annual Report 2023. Accessible at About_Reports_2023_Annual.pdf (obrc.com)

Table 25: Legislated Targets in Quebec's Modernized DRS Program for Beverage Containers[45]

	Material	2026	2028	2030	2032
Collection rate:	Metal	75%	80%	85%	90%
	Plastic	55%	75%	80%	85%
	Glass	60%	75%	80%	85%
	Multi-layer (e.g. carton)	No target	65%	70%	75%
	Biosourced	No target	75%	80%	85%
	Overall Collection Rate:	**70%**	**80%**	**85%**	**90%**
Circular Economy: Local Reclamation	Reclamation (reuse and/or recycling) is deemed local if occurring in Quebec, Ontario, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador, and in the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New Jersey, New York and Pennsylvania.	80% for metal + plastic 90% glass	80% for multi-layer cartons + biosourced		
Accessibility:	By November 1, 2023, there must be at least 1,200 drop-off return locations across southern Quebec. This number must rise to at least 1,500 locations by March 1, 2025. In addition to these targets, the collection network must also comply with criteria regarding the number of locations by population bracket and Regional County Municipality or equivalent territory recovery capacity. For example, in the city of Montréal, there must be one return point for every 15,000 inhabitants.				

Setting and meeting targets has other benefits specific to producers, such as helping them achieve brand commitments including by meeting recycled content and virgin material reduction targets, increasing bottle-to-bottle recycling, and reducing greenhouse gas emissions.

4.1.4 Consumer Education

Encouraging consumers to participate in the system and return their empty containers for a refund can be a challenge. Research indicates that a barrier to high performance is consumer's lack of awareness or understanding about the system. [46] This includes confusion about which containers are included, the deposit value, return point locations, and the advantages of DRS over alternative collection methods, such as curbside pickup. This can be mitigated by engaging in consistent communication with consumers. Consumer education encompasses consumer awareness as well as communication and promotional activities.

All European deposit systems require the deposit value to be clearly listed on both the store shelf and sales receipt; this helps to educate consumers and avoids unnecessary confusion. In contrast, in Australia, while deposit containers are required to indicate the "refund" value, sales receipts and product labels on shelves do not, which misses a key opportunity to educate the public.[47] A survey of residents in the Australian

[45] RECYC-QUEBEC website on modernization of the DRS program, https://www.environnement.gouv.qc.ca/matieres/consigne-collecte/modernisation-consigne-en.htm

[46] Reloop, 2023. Consumer participation in DRS: Drivers, barriers, and implications. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/05/Consumer-participation-in-DRS-factsheet.pdf

[47] Government of Connecticut website: Rewarding Recycling Learnings from the World's Highest-Performing Deposit Return Systems, Tomra. Accessible at https://portal.ct.gov/-/media/deep/reduce_reuse_recycle/bottles/tomra_rewarding_recycling.pdf

Capital Territory[48] found that not knowing about the DRS was the main reason for not participating (identified by 35% of non-users). A separate survey of residents in the Northern Territory, another Australian state, had similar findings: 25% of respondents said that having poor knowledge/understanding of which containers could be redeemed was a barrier.[49]

Importance for achieving 90% collection

Consumer education is important for reducing confusion and increasing participation to achieve 90%. In a 2022 survey of Albertans[50], consumers who reported in consumer surveys to returning containers only 'once in a while' or 'never' were asked why they don't return these items for a refund more often. Lack of awareness regarding which containers are eligible for a refund was consistently mentioned as the number one reason across most container types. Lack of awareness with regards to the correct deposit value was also cited as a reason; among those unable to cite the deposit value for beverage containers 1L or greater in size, 51% of respondents said that knowing the correct deposit value would increase the likelihood of them returning these types of containers for a refund.

In 2020, data from Lithuania's deposit system showed that glass beverage containers were being returned at a lower rate than other container types. Eighty-five percent of glass bottles were returned in 2020, falling below the Ministry of Environment's target of 90%. In order to increase the return rate of this container type, the system operator – USAD – launched a 2-month campaign targeted specifically at glass bottles. The campaign utilized a mix of media channels, including Facebook and Instagram. More than 800 bags with campaign visuals were distributed to vacationers in the most popular Lithuanian seaside resort Palanga, and also sent to micro influencers who shared their impressions online. Press releases were also published in top Lithuanian news portals educating and reminding consumers how to correctly recycle items. It is reported that the campaign resulted in 28% more glass bottles being returned for recycling in July and August 2021, compared to in 2020 before the campaign.[51]

Best Practice

Leading DRSs include legislated targets to monitor and report on public awareness/satisfaction with the program. Widespread awareness and public support is achievable if legislation requires system operators to promote public education, and measure and monitor consumer satisfaction. Targets should require that a minimum percentage of the public are aware of the program, as well as aware of what containers are included, what deposit amounts are, and where containers can be returned. A minimum percentage of the public should also report satisfaction with their experience of returning containers for a refund.

In addition to legislated targets to monitor and report on public awareness, the following are considered to be leading consumer awareness approaches[52]:

1. Outreach to consumers about the existence of the deposit system, covered containers, return locations, as well as the importance of beverage container recycling using a range of media

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[48] Piazza Research. "TCCS FOI 20-048." https://www.cityservices.act.gov.au/__data/assets/pdf_file/0007/1632679/20-048-Online-Publishing-Package_Redacted.pdf

[49] Department of Environment and Natural Resources (DENR). 20 August 2018. "Evaluation of the Operation of the Northern Territory Container Deposit Scheme." https://ntepa.nt.gov.au/__data/assets/pdf_file/0011/590798/cds_review_report_ernst_young.pdf

[50] Beverage Container Management Board of Alberta, 2022. Survey of Albertans. https://www.bcmb.ab.ca/uploads/source/Surveys/2022.05.16.BCMB.2022.Survey.of.Albertans.REPORT.pdf

[51] Eurobest website 2021 Campaign Winners. Accessible at https://www2.eurobest.com/winners/2021/pr/entry.cfm?entryid=2426&award=101&order=6&direction=2

[52] Reloop, 2023. Consumer participation in DRS: Drivers, barriers, and implications. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/05/Consumer-participation-in-DRS-factsheet.pdf

platforms, including television, social media, YouTube, Google Ads, and other channels. Outreach and promotion should be carried out in a number of languages to reach as many consumers as possible.

2. Public reporting of system results, including but not limited to material-specific and overall return rates, environmental benefits achieved from the recycling of beverage containers in the system (e.g., reduced carbon emissions, virgin material saved, energy and water savings, etc.), number of jobs created, and benefits to the wider community (i.e., litter reduction, money raised through fundraising)

3. Clear labeling on containers and inclusive signage at return locations. Use standardized text, such as "Return for Refund," or a logo on each container to facilitate consumer identification of a covered container.

4. Listing the deposit value separately from the sales price on both retail shelves and sales receipts.

5. Promotion of the system to encourage participation and spur behavioral change.

Encorp BC is considered a best practice in Canada by the Eunomia team. Encorp BC reports annually on all details regarding consumer education/promotion activities they've undertaken to help increase awareness of the program and encourage higher return rates. They developed specific campaigns for different container types, e.g., plastic, gable top, drink boxes, pouches, etc., and also a separate campaign to educate consumers about the addition of milk to the program in 2022. Since 1999, Encorp Pacific has undertaken market research on an annual basis to evaluate program knowledge, assess consumer behaviour and measure levels of brand awareness. They've recently undertaken consumer segmentation analysis which attempts to understand the type of consumer behaviour that leads to non-participation in the program. This research helps Encorp achieve its regulated target.

The Saskatchewan program SARCAN also has some leading practice consumer engagement elements to their DRS associated with the online account. Customers' online return portal includes an environmental tracker so the consumer can see the tally of how many containers they have redeemed (to all drop & go locations associated with the online account, and this can be linked to their volume of depot returns as well, it is all available in one account). The environmental tracker translates the total "life to date" number of containers they have redeemed and translates the data into other environmental benefits to show the impact of their participation (e.g. total number of containers returned equal to the raw materials saved or volume of waste diverted, or greenhouse gas impacts of how many cars taken off the road etc.). SARCAN also conducts depot tours for school groups to encourage interest and engagement early of consumers at an elementary school age.

4.1.5 Accessibility and Type of Return Points

The number, location, and type of return points are important considerations in designing an accessible redemption network. More return points translate to increased return opportunities, reducing the average distance and time consumers must travel to return containers.

The type of return point accepting containers also influences accessibility and volume of returns. In return-to-retail systems, retail establishments selling the containers also accept returns and refund deposits. In drop and go stations (either stand alone or at depot) as well as in return-to-depot systems, both individual consumers and organizations with large volumes can return containers. Hybrid systems enable returns to both depots and participating retail establishments. Having a mix of different return options for all types of consumers (individuals, organizations, ICI), will lead to greater returns. There is no "one size fits all."

Importance for achieving 90% collection

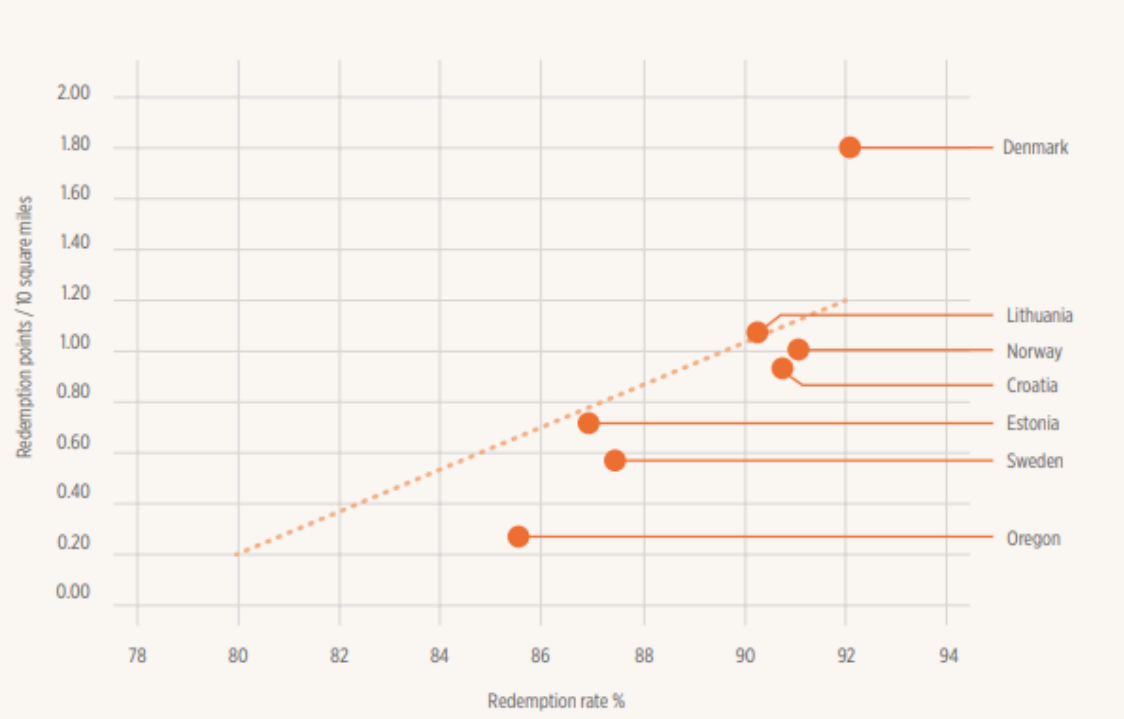
It is important to consider the diverse range of users and their specific redemption patterns, as well as a variety in anticipated return volumes. Examples include [53]:

- Consumers in urban areas that return a relatively small number of containers to retailers frequently due to a lack of storage in multi-family spaces (low-volume).
- Organizations (sometimes called "canners") often collect containers from multiple places and return containers to one spot (high-volume).
- Food service businesses typically generate a significant volume of beverage containers consumed on their premises, and return large quantities of containers (high volume).
- Bag drop systems allow users to collect their containers in bags and deposit them into designated machines or drop-off points (high-volume) conveniently.

In each of these scenarios, user needs can vary significantly. To maintain ease of use, a modern DRS should include specific requirements for high-volume redemption and low volume redemption (see 4.1.8 for high-volume ICI best practice details).

Figure 10 presents an example of jurisdictions with higher return rates and high accessibility return points.

Figure 10: Return Rates and Accessibility in High Performing DRS [54]



[53] Reloop's Guide to Modern DRS: 10 Essential Practices. Accessible at Reloop-NA_A-Guide-to-Modern-DRS_10-Essential-Practices.pdf (reloopplatform.org)
[54] Reloop's Guide to Modern DRS: 10 Essential Practices. Accessible at Reloop-NA_A-Guide-to-Modern-DRS_10-Essential-Practices.pdf (reloopplatform.org)

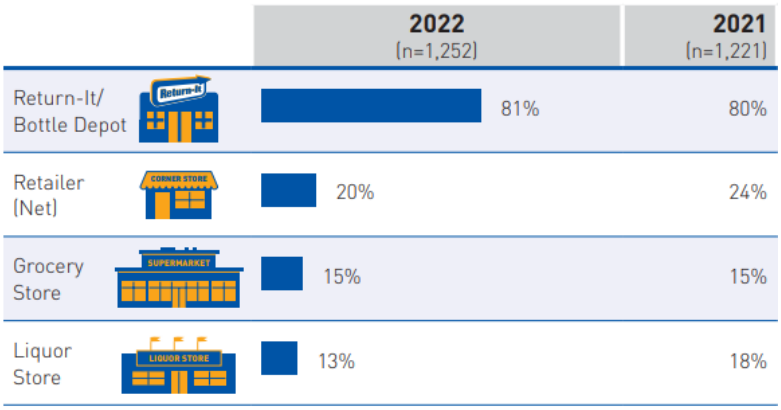
Regarding the type of return, some jurisdictions with rural populations prefer a range of return point types.

It is becoming increasingly popular to install "bag drop" or "express & go" systems either as stand-alone facilities or at depots (where consumers do not need to stand in a line and wait for containers to be counted, rather they just drop and go with a label affixed and when their containers are counted the refund is added to their online account).

Saskatchewan's program has documented an increase of 12% in new consumer participants that previously did not participate in the system since the installation of bag drop technology. The program tracks returns via bag drop vs depot, and reports that 16% of the volume of containers collected is from bag drop systems with 45,000 account holders.

Encorp Pacific surveys consumes on preferred method of return annually, which allows for observation on any changes in preference trends. Survey results show increasing preference for depots, and decreasing preference for retailer and liquor store return points.

Figure 11: Return Preference Survey Results in BC[55]

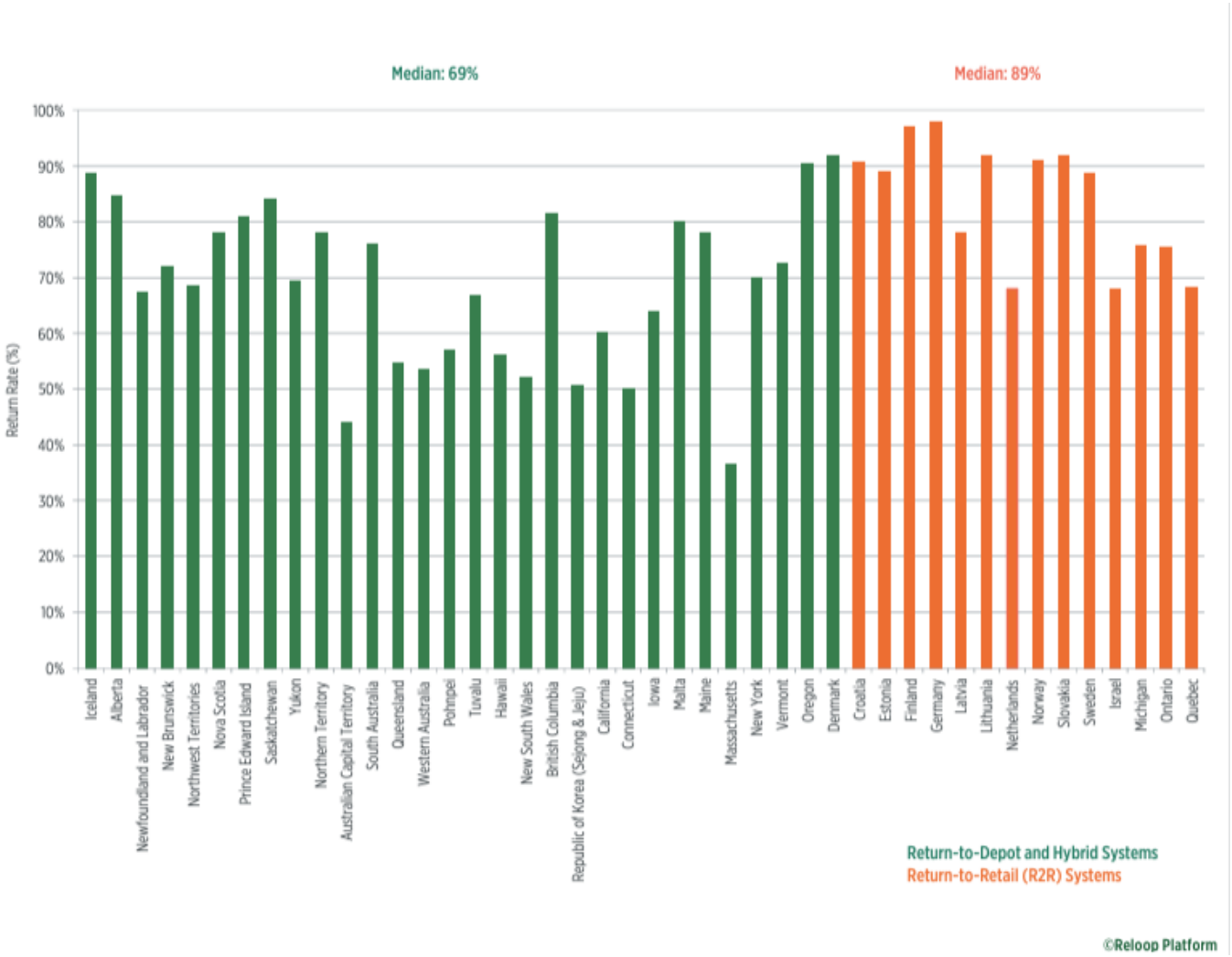


Return-to-retail (R2R) is useful for "at home" consumers as it makes return locations broadly the same as sales locations, and so matches return opportunities closely with container origin. This type of system is more integrated in consumers daily life and does not require a dedicated trip to return containers. Currently, most DRSs achieving a 90% return rate include return-to-retail systems (Figure 12).

Experience from DRSs around the world suggests that R2R systems have demonstrated effectiveness in meeting access and convenience criteria. When comparing the median return rates in R2R and hybrid or return-to-depot systems, R2R systems are correlated with higher performance. A retailer-focussed system can also leverage existing business infrastructure and logistics networks. Utilizing assets both for distribution to and collection from a retailer, commonly referred to as reverse logistics, can drive greater efficiencies, especially in rural and remote areas. However, return-to-retail alone does not guarantee high performance. A hybrid or depot-based model can achieve high collection rates when other design factors such as deposit levels, consumer education, convenience, and accessibility are prioritized to maximize returns. An example of this is Oregon, which has a hybrid model and has achieved a 90% return rate since increasing the deposit value from USD $0.05 ($0.07 CAD) to $0.10 USD ($0.14 CAD).

[55] Encorp Pacific, 2022 Annual Report.

Figure 12: Return Rate Averages Based on Return Infrastructure[56]



Best Practice

Estimating the best practices for the number and type of return locations for a jurisdiction varies based on multiple factors, including geography and population density. One way to evaluate accessibility beyond the number of return locations per capita is to look at the average drive time or average distance to a return location. Table 26 outlines different accessibility metrics and the highest standard identified per accessibility metric. In practice the needs and preferences of each jurisdictions should be reviewed to determine a localized approach to design a best practice accessibility standard.

[56] https://www.reloopplatform.org/wp-content/uploads/2023/05/RELOOP_Factsheet_Performance_May2024_Web.pdf

Table 26: Best Practice Accessibility Metrics

Accessibility Metric	Best Practice
Return points to consumer ratio	1 location per 400 to 1,000 consumers[57]
RVM density per 10,000 people	4 to 7 RVMs per 10,000 individuals[58]
Average distance to return location	8 KM for rural residents 3.2 KM for urban residents[59]
Average drive time to return location	10-minute drive time[60] [61]

Return-to-retail enables consumers to return their containers while shopping or, if they're consuming beverages outside the home, to the nearest convenient location, which could be a shop or another local store this convenience maximizes returns and, as demonstrated in other jurisdictions leads to programs achieving 90%+. Additionally, return-to-retail eliminates the need for system-specific infrastructure which can add costs. However, jurisdictions with lower population and lower population density can achieve high performance through hybrid or return-to-depots. Oregon is an example of a high performing hybrid system designed to incentivize retailers to collect containers, while also establishing a network of depots situated in rural areas or catering to high-volume redeemers.

4.1.6 Convenience at Redemption Facilities

Ensuring convenience at redemption facilities is a pivotal component of a high-performing DRS. Beyond merely providing ample points for container redemption, the return process itself at these facilities must be designed with consumers' ease and efficiency in mind. This involves implementing strategies that reduce the amount of time it takes for consumers to return their containers and redeem the deposit, such as automated return technologies (i.e. reverse vending machines [RVMs]), drop-and-go options, and harmonized acceptance of all container types across return locations. Moreover, maintaining cleanliness and safety standards further enhances consumer satisfaction and encourages participation in the system. In Saskatchewan, depots must adhere to set cleanliness and customer services standards. Each location is evaluated twice a year by Secret Shoppers who assess cleanliness, customer service, accuracy and overall condition of the depot. Annual awards are given to depots that demonstrate exceptional performance in these areas.[62]

A 2022 survey of Albertans conducted by the Beverage Container Management Board (BCMB) found that there was a negative correlation between time spent at the depot and customer satisfaction, noting that

[57] TOMRA_Rewarding_Recycling. Accessible at https://8151194.fs1.hubspotusercontent-na1.net/hubfs/8151194/TOMRA_Rewarding_Recycling%20-%20English.pdf?utm_campaign=DRS%20-%202023&utm_medium=email&_hsenc=p2ANqtz--bnWrBFGRPhgNh41n8n785SLuliDaXavWXHSsXQvGair4zhi2ZL5lZcxfmw2G2L5ZfqTzAp7lH9vxRpb6bm7L7M1n1gv2241zlsGdhJk8oYgBBTTc&_hsmi=215908614&utm_content=215908614&utm_source=hs_automation
[58] Eunomia. Deposit Return in the Netherlands: An assessment of the Afvalfonds proposal for beverage can collection in the public domain – Eunomia Research and Consulting. Accessible at https://eunomia.eco/reports/deposit-return-in-the-netherlands-an-assessment-of-the-afvalfonds-proposal-for-beverage-can-collection-in-the-public-domain/
[59] Reimagining-the-Bottle-Bill-REPORT. Accessible at bottlebillreimagined.org
[60] BC Brewers Recycled Container Collection Council 2021, Annual Report. Accessible at brccc_annual_report_2021.pdf (gov.bc.ca)
[61] Reloop 2023. Consumer participation in deposit return systems: drivers, barriers, and implications. Accessible at Consumer-participation-in-DRS-factsheet.pdf (reloopplatform.org)
[62] Weyburn SARCAN celebrates 'Large Depot of the Year' award - SaskToday.ca

"91% of customers who were at the depot less than 5 minutes were satisfied, compared to just 39% of those who were at the depot for over 20 minutes."[63] The same survey found that one of the top barriers to consumer participation was "time-consuming/long line-ups" at the depots. This barrier was identified by 18% of respondents. On average, Albertans said it was reasonable to wait up to 11.6 minutes to be served at a bottle depot. In terms of changes depot customers would like to see offered to help modernize returns to depots, the most commonly preferred change, suggested by 44% of respondents was to add equipment that counts and sorts beverage containers. This was followed by options to receive refunds by means other than cash (22%) and machines to collect cash refunds instead of directly from a depot employee (20%). Other responses included having the option to drop-off beverage containers at the depot and receive the refund at a later time (17%). About 43% of depot customers said they would use a service where they could drop-off containers immediately and collect money later. A separate survey conducted by the BCMB[64]found that when deciding which bottle depot to go to, some of the most important factors considered by users are the waiting time to be served at the depot (51%), the hours of operation of the bottle depot (55%), and the safety of the area in which the bottle depot is located (53%).

These findings are in line with other survey results, including a 2021 survey by Recyc-Quebec which found that households have little time to devote to the DRS, and the time to return containers must be short (defined as 10 minutes or less).[65] In an earlier survey of Quebec residents,[66] 58% of respondents suggested replacing existing RVMs with faster, newer, and more efficient ones would be one way to improve their experience at return facilities and 50% suggested their experience could be improved by having a greater number of container return stations in the stores. A similar consumer experience survey conducted in British Columbia in 2020 found that the most important feature of the express system was not having to wait in line at the depot (62% rated this as extremely important).[67]

Ease of access and convenience at return facilities is a key consideration for those with a disability and/or mobility challenges. Consideration needs to be given to where refund points are located (e.g., pathways, proximity to disabled parking spaces) and how easy they are to interact with (i.e. height of machines and format of instructions). Considerations should also be made for elderly individuals and parents with small children who are also more likely to encounter difficulties in returning their containers.

Importance for achieving 90% collection

All DRS with return rates 90%+ or above are highly automated. According to a 2021 webinar[68] which explored the link between convenience and system performance, automated return points collect the largest quantities of beverage containers. Norway is an example, where automated return points make up only 23% of the 15,000 redemption facilities across the country, but collect 94% of the total volume of DRS containers. These numbers are also similar in other high-performing countries, like Lithuania.[69]

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[63] Beverage Container Management Board. July 2022. "Report on: 2022 Beverage Container Depot Exist Interview Survey." https://www.bcmb.ab.ca/uploads/source/Surveys/Depot_Exit_Interviews/2022.08.15.Depot.Exit.Interview.Report.Final.pdf

[64] Beverage Container Management Board. 21 May 2022. "Beverage Container Recycling: 2022 Survey of Albertans." Available at https://www.bcmb.ab.ca/uploads/source/Surveys/2022.05.16.BCMB.2022.Survey.of.Albertans.REPORT.pdf

[65] Recyc-Quebec. mai 2021. "Perception des Québécois à l'égard de la modernization et de l'élargissement de la consigne." Etude réalisée et rédigée par SOM. https://www.recyc-Quebec.gouv.qc.ca/sites/default/files/documents/etude-citoyens-modernisation-consigne.pdf

[66] SOM.ca. juillet 2017. MISE À JOUR DE L'ÉTUDE SUR LA MODERNISATION DU SYSTÈME DE CONSIGNE AU QUEBEC

[67] "Express Users Survey 2020 Results Report." as cited in Encorp Pacific (Canada). 13 October 2020. "Draft Beverage Stewardship Plan 2020-2024: Full Consultation Summary Report." https://www.return-it.ca/beverageplan2020/?AA=Download&AT=967&AD=22,Dlf1

[68] https://video.tomra.com/rewarding-recycling-exploring-how

[69] https://video.tomra.com/rewarding-recycling-exploring-how

As automated equipment technology has improved, the number of containers that they can accept per minute has steadily increased.[70] According to one report, modern RVMs are capable of processing 60 containers per minute, or 100 per minute with 'multi-feed' models that allow customers to empty an entire bag into the RVM at once. This ability, combined with digital payment solutions and QR codes that enable customers to simply empty their bag of containers at once and walk away, has significantly improved consumer convenience.

Findings from the U.S. show that when a bag drop system is in place, most DRS states would see between 11% and 25% of material return through bag drop. Additionally, about 23%-35% of material would be returned through retailer reverse vending machines (RVMs).[71]

Best Practice

DRS legislation should include minimum collection standards to ensure consumer ease and accessibility at redemption facilities. Without these requirements, it will be difficult – if not impossible – for some segments of the population to redeem their containers easily, which not only undermines system equity, but also reduces participation. To optimize consumer convenience at return facilities, some of the conditions that return facilities should provide include[72]:

- Having trained staff available during business hours to help customers should they need it. Offering a clean, safe, and well-lit site.
- Making sure the return point is inside a building or in a closed shelter.
- Providing a non-trash receptacle for rejected containers.
- Ensuring storage capacity for returned containers, separate from the shopping area, and not visible or accessible from it.
- Clearly marking the container return area as part of the DRS.
- Ensuring site accessibility for persons with reduced mobility and year-round road access; and
- Aligning operating hours with those of the establishment if the return point is inside the building, with business days displayed clearly.

Although there are no known examples of existing DRS legislation that explicitly mandates automated take-back of deposit containers via automated equipment, many jurisdictions, including those with the highest return rates – already rely on this technology.[73] By streamlining the return process, they enhance convenience for consumers, which in turn increases participation. Given their importance to overall system performance, it is considered best practice for system operators to specify requirements for automated equipment in their system rules wherever such technology is deployed. This helps to ensure that all return points offer the same standard of service and have the capacity to meet the system requirements. Examples of automated equipment requirements include: a connection to power supply; front screen display that provides clear instructions for customers on how to use the machine; and the ability to issue a

[70] TOMRA. Rewarding Recycling Whitepaper.
[71] Reloop, 2022. Bottle Bill Reimagined. Accessible at https://bottlebillreimagined.org/wp-content/uploads/2022/03/Reimagining-the-Bottle-Bill-REPORT.pdf
[72] https://www.reloopplatform.org/wp-content/uploads/2023/11/Reloop-NA_A-Guide-to-Modern-DRS_10-Essential-Practices.pdf
[73] https://www.reloopplatform.org/wp-content/uploads/2023/11/Reloop-NA_A-Guide-to-Modern-DRS_10-Essential-Practices.pdf

voucher / receipt that includes information on the packaging returned by the customer and corresponding deposit amounts.

Minimum operational standards for high-volume returns are also critical as they help ensure a positive redemption experience for users returning large volumes of containers. A common issue faced by canners, for example, is long line-ups, which hinder efficient refunds.[74] According to Reloop's *Guide to Modern DRS,* the use of electronic accounts is one way to streamline operations.

4.1.7 Infrastructure and requirements for on-the-go collection

A portion of beverage containers are consumed on-the-go, meaning they are purchased and consumed outside the home. Some studies suggest this is as high as 30-50% in some jurisdictions.[75] Infrastructure for on-the-go recycling is important as many consumers find public spaces some of the hardest areas to recycle. For example, according to the Alberta Beverage Container Recycling Corporation Recycling Perceptions and Behaviors 2023 Survey, 30% of residents identified public pathways/bike trails and 27% of residents identified public parks/playgrounds where they have a hard time recycling beverage containers. As described in section 2.2.3, Encorp Pacific has partnered with schools, commercial venues, events, national parks, and streetscapes to have separate bins to collect covered containers.

Figure 13: On the Go Collection of Beverage Containers

There are options for upgrading on the go waste collection systems to include beverage containers. As seen in Figure 15, public waste bins can be upgraded with beverage container holders. When beverage containers are placed here someone else may be more willing to collect the container and bring it back for the deposit. This system is in place in Saskatchewan, where public bins have been implemented through municipal partnerships, allowing anyone to collect them and obtain the refund if desired.

Another option is placing automated equipment such as RVMs in spaces like college campuses and sports venues which can capture beverage containers consumed outside the home. Coca-Cola partnered with the University of Alabama and Auburn University to place RVMs on campus to incentivize students to recycle

[74] https://www.reloopplatform.org/wp-content/uploads/2023/11/Reloop-NA_A-Guide-to-Modern-DRS_10-Essential-Practices.pdf
[75] Container Recycling. Accessible at News Release, 2013. Accessible at https://www.container-recycling.org/index.php/91-media/outsidenews/354-container-recycling-institute-releases-special-2013-vermont-bottle-bill-report-

their beverage containers. Alabama does not have a DRS and the RVMs do not provide consumers a deposit. See Figure 14.

Figure 14: RVMs at the Universities in Alabama

Importance for achieving 90% collection

When a beverage container is consumed on-the-go a consumer may be less willing to hold onto the container and more likely to dispose of the container in the trash or it may be littered. Capturing on-the-go beverages minimizes container loss and can make it easier for a system to achieve 90%.

Best Practice

Programs should aim to place recycling bins in public spaces to reduce litter and maintain consumer awareness and confidence in the recycling system, even if they do not constitute a return point for covered containers. Best practice includes systems that consider methods to capture containers consumed on-the-go. This may include placing automated equipment or return locations in public spaces, working with retailers in high traffic areas like malls to collect containers, or setting specific targets for on-the-go collection to ensure that consumers who purchase beverage containers outside of the home have an accessible system for their returns.

4.1.8 Infrastructure and Requirements for Commercial Collection

A modern DRS system offers return points specifically geared to bulk returns from the ICI sector. This is especially important in places with onsite sale and consumption (e.g. restaurants, hotels, or event spaces) as well as other institutional spaces such as schools or hospitals with onsite consumption.

Importance for achieving 90% collection

In DRSs, businesses with onsite consumption facilities pay beverage distributors or wholesalers a deposit on every eligible beverage they buy for service in their event space or restaurant. However, in the case of beverages consumed on their premises, such as in bars, full-service restaurants, and hotels, the deposit is not passed on to the customer since the business retains the actual containers. Convenient refundability should be guaranteed to businesses, just like individual consumers. A business' ability to get the deposit refunded may vary, with some businesses managing to get their wholesaler/distributor to collect the empty containers and refund the deposit, there are often no clear legal requirements to do. Unless the producers' obligation to manage this material is explicitly stated in legislation, distributors might not make this arrangement. In this situation, some businesses may take it upon themselves to organize the return to a redemption center, but do so at their own cost. Because of the operational challenges in redeeming high volumes of beverage containers from these facilities, many businesses may opt to forfeit the deposit altogether. In addition to the financial implications, this forfeiture also results in the loss of containers from the deposit system.[76]

Best Practice

One solution is legislative clarity around mandatory distributor take-back requirements for onsite consumption spaces. In this scenario, the law makes it explicit that beverage companies or distributors are obliged to collect empty containers from businesses, ensuring that those businesses are not burdened with the sole responsibility of managing the returned containers. Finland, Norway, Estonia, Lithuania, Quebec, and Ontario's alcohol DRSs, are examples of DRSs with at least some distributor take-back requirements. It is important to note that in Québec, the regulation requires pickup directly from restaurants, which may lead to higher cost. To ease the additional cost of sorting and preparing for collection that businesses will face, some DRSs, such as those found in Denmark, Norway, and Scotland, have established a food service business-specific material handling fee.[77]

Finland's DRS operator, Palpa, regards commercial sites in the similar way it does retail redemption sites. To ensure ease of separation and preparation for collection, businesses are only required to separate containers by material; plastic bottles and cans are each placed into specific bags, while glass containers are placed in durable plastic bins. Each bag or bin is tagged so that once the material is taken to a counting center, the number of collected containers can be calculated and recorded, and the account holder can be refunded the deposit.[78]

Operational standards help ensure a positive redemption experience for users returning large volumes of beverage containers. A common challenge that canners (and businesses) face, for example, is long queues, which hinder efficient refunds. The use of electronic accounts can greatly assist with streamlining operations. Any technologies used for bulk counting adhere to container identification requirements and

[76] Reloop's Guide to Modern DRS: 10 Essential Practices. Accessible at Reloop-NA_A-Guide-to-Modern-DRS_10-Essential-Practices.pdf (reloopplatform.org)
[77] ibid
[78] ibid

ensure accountability in the counting and verifying of containers collected. It is also important that high-volume return spots do not limit the number of containers which can be redeemed per visit.[79]

4.1.9 Refund Payment Options

Consumer's main motivation in engaging with a DRS is to recuperate their deposit.[80] DRSs can offer multiple payment methods for deposit refunds, such as cash, online account, e-transfer to a bank account, options for donation of their refund, refund in the form of retail store vouchers, etc.

A survey by TOMRA of consumers in Sweden, Norway, Finland, Denmark, Germany, the Netherlands, and Slovakia found that 87% of respondents put their deposit refund towards grocery purchases at the store where they return containers.[81] A survey in two Australian states found that consumers have a preference for receiving cash or direct electronic transfers.[82] [83]

Importance for achieving 90% collection

There is no clear correlation that having options for refund payments that are both cash or cashless can lead to a 90% recovery rate, rather this factor is considered a complementary factor that provides consumer options and improves convenience and consumer satisfaction from participating in the program. It should be used alongside one of the primary factors that demonstrates a correlation between the factor and a 90% return rate.

Refund payment options are a way to cater to consumer preferences and further incentivize them to redeem their containers. Refund payment options are closely tied to convenience at return locations. TOMRA's survey of consumers in return-to-retail systems reveals a preference among consumers for the ability to apply their deposit towards their grocery purchases. This aligns with data indicating that return-to-retail systems can offer greater convenience for consumers, allowing them to redeem containers at locations that are part of their daily routines. The ease of applying deposits towards grocery expenses reduces friction in the refund process.

Alternatively, in the U.S. state of Maine, consumers who use the bag drop technology have refunds placed in an online account. Consumers do not need to immediately transfer their account balance and can instead slowly build their account and wait for a more sizeable amount of funds depending on their preference. The account balance can also be transferred to a local charity.

Best Practice

Preferences vary among consumers regarding refund payment options (cash, or cashless on account, or e-transfer). A diverse set of refund payment options is best practice, including instant refunds that can be redeemed for cash or being able to add refund totals to an account which can be redeemed at a later time, or other cashless options such as e-transfer, or even the option to donate a refund to a local charity. Utilizing technology so consumers can check their returns and balance offers additional benefit to consumers. There are a number of Canadian DRS programs that currently provide both cash and cashless

[79] ibid
[80] TOMRA Collection Consumer Research Report
[81] TOMRA Collection Consumer Research Report
[82] Earnest & Young, 2018. Evaluation of the Operation of the Northern Territory Container Deposit Scheme (Northern Territory of Australia). Accessible at https://ntepa.nt.gov.au/__data/assets/pdf_file/0011/590798/cds_review_report_ernst_young.pdf
[83] Reloop, 2023. Consumer participation in deposit return systems: drivers, barriers, and implications. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/05/Consumer-participation-in-DRS-factsheet.pdf

refund options with online accounts, such as BC, Alberta, Saskatchewan, and Quebec. New Brunswick is considering adding cashless accounts in the future with the addition of drop and go technology.

4.1.10 System Funding

As with any diversion program, there are costs associated with operating and administering a DRS for beverage containers. Typical expenses include collection (e.g., purchase or lease of RVMs, or labour in the case of manual redemption), transportation, and processing costs, as well as costs related to program administration and consumer education and awareness activities. There are also costs associated with the financial transactions such as the processing software and online account information technology.

In general, there are three main sources of revenue to cover program costs in a DRS:

- **Unredeemed deposits:** represents the revenue from deposits that consumers choose not to redeem.
- **Material sales:** represents the revenue from the sales of empty beverage containers collected through the system.
- **Fees:** additional fees, either paid by producers or consumers, to cover the costs of the program after unredeemed deposits and material sales.

Where unredeemed deposits and revenue from material sales are not sufficient to cover program costs, the remaining balance is often covered by a fee paid on each container placed on the market. This fee is commonly paid for by producers, but in Canada can also be paid for by consumers in the form of a Consumer Recycling Fee or Container Handling Fee (see Section 2.4.2 for more detail on consumer fees in each province/territory).

Importance for achieving 90% collection

Funding deposit systems according to best practice principles, which include utilizing unredeemed deposits, material revenues, and having producer fees fund part of the system rather than consumer fees, is crucial for achieving high collection rates of 90% or more. When system operators retain revenue from unredeemed deposits and material sales, they can reinvest these funds back into the system, driving improvements that enhance efficiency and convenience for consumers and ultimately boosting return rates.

For instance, these revenues could facilitate the purchase and installation of more automated return equipment, or for the establishment of additional return points (including in public spaces) making container redemption more accessible and convenient for customers. Additionally, investments could be directed towards additional promotion and education activities aimed at encouraging redemption among consumers. Furthermore, funds could support the implementation of bag-drop or express services, further streamlining the redemption process. However, when unredeemed deposits are not reinvested into the DRS system, as seen in some Canadian programs such as Saskatchewan, PEI, and Yukon where provincial governments retain these funds, the potential for such investments is lost, hindering the system's ability to drive higher return rates effectively.

High-performing DRSs reinvest any surplus revenue into the program, reducing the need for additional charges or fees.[84] In Norway, for example, unredeemed deposits and material revenue cover nearly 100% of

[84] https://www.tomra.com/en/reverse-vending/media-center/feature-articles/drs-8-reinvestment-unredeemed-deposits-material-revenue

program costs; in total, 49% of system costs are offset by unredeemed deposits, 35% from material sales, and 8% from other revenues (mainly interest).[85]

Best Practice

It is considered best practice for unredeemed deposits and revenues from material sales to be kept by the system operator. The remaining balance of the operating costs – once unredeemed deposits and material revenues have been used – should be covered by producer fees (note that producer fees would not be visible to the consumer, nor would they be added into the price (see Figure 15). Best practice is not to charge CRFs to consumers. Use of producer funding for the DRS implements the policy of extended producer responsibility by shifting the cost of managing containers from municipalities or taxpayers to the producers of that material. Use of producer funding is the most efficient and transparent approach, and is the approach used by almost all high-performing DRSs worldwide, including all programs in Europe. It is the recommended best practice.

Figure 15: Best Practice DRS System Funding

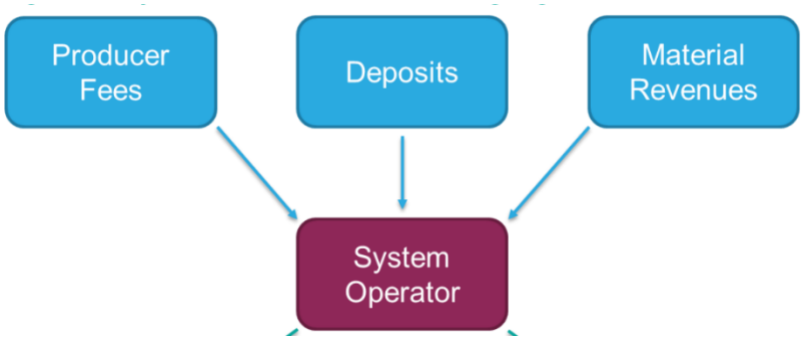


Table 27 presents a high-level summary of how several of the top-performing deposit systems in Europe are funded, along with their return rates. The table shows that in eight out of ten high performing DRS, producer fees are used to fund the system.

Table 27: Best Practice Funding Models of High-Performing DRS

DRS Jurisdiction	Return Rate	Ownership of Unredeemed Deposits	Ownership of Material Revenues	Producer Fees
Croatia	91% (2020)	System operator	System operator	Yes
Denmark	92% (2023)	System operator	System operator	Yes

[85] Tomra website, accessible at https://www.tomra.com/en/reverse-vending/media-center/feature-articles/drs-8-reinvestment-unredeemed-deposits-material-revenue

Estonia	89% (2023)	System operator	System operator	Yes
Finland	97% (2023)	System operator	System operator	Yes
Germany	98% (2023)	Producers and retailers (in the case of private labels)	Retailers	No
Iceland	93% (2023)	System operator	System operator	No
Lithuania	92% (2023)	System operator	System operator	Yes
Norway	91% (2023)	System operator	System operator	Yes
Slovakia	92% (2023)	System operator	System operator	Yes
Sweden	89% (2023)	System operator	System operator	Yes

Regarding unredeemed deposits, it's important that return rate targets are also in place to counteract any incentive producers may have to collect fewer containers and discourage redemption through inconvenient return infrastructure (more unredeemed containers = more unredeemed deposit revenue).

While the responsibility for setting producer fees ultimately lies with the system operator, adhering to best practices involves implementing eco-modulated fees to incentivize eco-friendly design. Under this approach, producers are charged varying fees based on the environmental impact of their packaging choices. For instance, lower fees apply to containers made from a single material or clear plastic, whereas higher fees are imposed for complex designs or materials that hinder recyclability, such as plastic sleeves. Denmark is one example of a high-performing DRS that uses an eco-modulated producer fee structure to incentivize eco-design and closed-loop recycling.[86]

[86] Reloop, 2023. A Guide to Modern DRS: 10 Essential Practices. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/11/Reloop-NA_A-Guide-to-Modern-DRS_10-Essential-Practices.pdf

Table 28: Eco-modulated producer fee structure (in DKK and CAD) (2024)[87,88,89]

	Plastic	Aluminum	Steel	Glass
Basic producer fee	0-170 øre (CAD$0.00-$0.33)	None	7-57 øre (CAD$0.01-$0.11)	0-459 øre (CAD$0.00-$0.90)
Circular economy surcharge for difficult-to-recycle materials	8-23 øre (CAD$0.02-$0.05) (e.g., coloured plastic, PVC, PP)	5-22 øre (CAD$0.01-$0.05) (e.g., plastic sleeve, paper label)	None	2-68 øre (CAD$0.00-$0.13) (e.g., plastic closure, sleeve made of PVC)

4.1.11 Variable Handling Fees

Most DRSs include a handling fee, a per unit fee paid to retailers or redemption centres/depots for the costs incurred in hosting and operating a return point. Handling fees are often paid by the bottler or distributor, system operator, and in some cases by the state (e.g. California). In some jurisdictions, handling fees are paid to depots only, not retailers, and are privately negotiated between the system operator and individual depots (i.e. they are confidential).

British Columbia, Alberta, the Northwest Territories, and Yukon have variable handling fees while other provinces with DRSs have flat-rate handling fees. In high-performing European DRSs, handling fees paid to return point operators typically vary by container type and by collection method (manual vs. automated services). The latter is considered best practice because in these systems handling fees are based on cost-recovery and are reflective of the actual costs – in terms of staff time, storage space, and any operational expenses – of providing takeback services.

Importance for achieving 90% collection

Collecting, sorting, and storing beverage containers returned by consumers comes at a cost, and the purpose of handling fees is to compensate retailers and/or redemption centres/depots for providing these services.

In jurisdictions where handling fees are fixed or have remained the same for decades, the level of compensation provided to return point operators may not be sufficient to cover the costs of managing the containers, let alone to invest in system improvements. This can result in depots going out of business.[90] When there are fewer locations to return containers, the system becomes less convenient for consumers, which results in lower participation and return rates.

All European DRS that achieve 90%+ collection rates for plastic beverage containers have variable handling fees (for more information, see the case studies in the appendix).

[87] Dansk Return System, Driftsgebyrer 2024. Accessible at https://danskretursystem.dk/app/uploads/2023/11/Driftsgebyrer_2024.pdf
[88] Dansk Return System Driftsgebyrer for 1 April - 31 December 2024. Accessible at https://danskretursystem.dk/app/uploads/2024/03/Driftsgebyrer_2024-pr-1-april-2024.pdf
[89] Gennemsnitsgebyrer og pantetiketter 2024. Accessible at https://danskretursystem.dk/app/uploads/2023/11/Gennemsnitsgebyrer_2024.pdf
[90] Redemption centers seek fee increase after more than 30 years (nhregister.com)

Best Practice

In a best practice DRS, handling fees are[91]:

- Based on an assessment of the actual costs incurred by retailers and/or depots to collect, handle, sort, and store redeemed beverage containers.
- Not fixed in legislation.
- Reviewed periodically, typically annually or biannually, by the central system administrator (CSA) in consultation with retailers and/or depot operators.
- Calculated in a way that considers the various factors that impact costs, such as:
    - **Container type:** Different materials take up different amounts of space at redemption locations (e.g., plastic vs. aluminum) or may be more difficult to handle/susceptible to breakage (e.g., glass)
    - **Collection point location:** Depending on their location, retailers and depots will have different costs. For example, lease/rent rates may be more expensive in one area of town than another, and return points in urban areas are likely to have higher throughput, delivering better economies of scale.
    - **Type of collection point (retailer vs stand-alone depot)**: In general, handling fees paid to stand-alone depots are much higher than those paid to retailers because they must compensate for the entire costs of the facility and labour, as opposed to the marginal increase in costs incurred by retailers.
    - **The method of collection (manual vs automated):** While manual collection results in lower costs for retailers, it has significantly higher system-side costs. The opposite is true for highly-automated systems that rely on technology for container collection.

In a modern automated system, consumers place empty containers into automated technology , which counts and compacts the containers and provides the customer with a receipt, which they can redeem for cash. The compacted containers are securely stored in bags until they are picked up and transported to a recycling facility. Modern automated equipment with an online connection also allow returns data to be transmitted directly to the system operator, which allows accounts to be reconciled more quickly.

In a manual system, staff are needed to accept empties from consumers and to refund the deposit. Because the containers are not compacted, there is a greater risk for them to be stolen and redeemed a second time. Un-compacted containers also take up more space in collection vehicles, and must be taken to a counting or sorting centre to be counted and compacted. Only after this is done can accounts be reconciled and return points reimbursed for the deposits they have paid out.

[91] Reloop 2023. Handling Fees Fact Sheet. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/05/RELOOP_Factsheet_HandlingFees_Jan-2023_Web.pdf

To ensure that handling fees are set in accordance with these best practice principles, they should be calculated using a "bottom-up" approach, based on the costs incurred to return point operators in relation to[92]:

- **Space**: Based on the average rental cost per square meter, with assumptions made on the floor space taken up by collection infrastructure such as automated equipment or for storage of collected containers
- **Labour:** Based on average hourly wages, with assumptions made on the staff hours required for redeeming containers, processing receipts, cleaning/maintaining automated equipment, etc.
- **Equipment costs:** based on annualized costs associated with the purchase/leasing, installation of automated technology, as well as ongoing servicing/maintenance costs
- **Cost of consumables:** Based on annualized costs related to the purchase of collection bins or special bags used for automated equipment, electricity usage, etc.

4.1.12 Depot Ownership (Private vs PRO operated)

Within depot-based redemption network, depots themselves can be owned and operated privately or by the producer responsibility organization. When depots are privately owned the PRO has some influence over where the depots are located and who operates them as they can issue requests for applications that have certain standards. PRO operated depots are under full control of the PRO and they have more discretion on the location, size, technology, and aesthetics of the depot.

Importance for achieving 90% collection

As indicated within the other factors in this section, consumers are influenced by the accessibility and convenience of the system. They want to have an easy an enjoyable experience when returning containers. When depots are PRO operated, the PRO is able to have more control over where depots are located and the experience that is created within the depot. This allows the PRO to create a more consistent return experience for consumers so consumers know no matter where they return containers they will have the same experience. Privately owned depots are harder to implement these quality control measures. Therefore, if a consumer has a variable experience across depots they may be less likely to return containers moving forward as one bad experience may influence their overall incentive to return containers.

Best Practice

Best practice for this factor was not identified. Although the ownership structure may allow system operators to have more influence on the return locations, this alone does not improve return rates but instead allows the system operator to better implement other factors at best practice like creating consistent deposit standards, consistent standards for consumers, and reduces challenges in introducing new technology.

92 Reloop 2023. Handling Fees Fact Sheet. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/05/RELOOP_Factsheet_HandlingFees_Jan-2023_Web.pdf

4.2 External Factors

External factors are not within the direct control of the system operator but have influence on the system's performance. As these factors are not within the direct control of the system operator, best practice is not described. If these external factors are changed it may not directly lead to an increase or decrease in the DRS performance, but it could impact the magnitude of impact of the other changes.

4.2.1 Strength of Complementary Recycling System

In many jurisdictions, the network of DRS return locations is not the only option for consumers to recycle their beverage containers. Recycling may be provided through curbside collection or drop off and either funded through a consumer's local municipality or a separate extended producer responsibility program. Curbside recycling programs with higher frequencies of collection with strong educational programs are considered more accessible and achieve high collection rates.

Importance for achieving 90% collection

Curbside systems and DRS are complementary programs which, when carefully designed and implemented, contribute to sustainable material management. However, looking to curbside recycling as the primary method of recovering beverage containers will result in sub-optimal outcomes. Comparisons of the performance of curbside recycling systems globally and increasing access to curbside recycling has had only marginal impacts on the percentage of beverage containers that are collected and recycled. Plastics collected in many curbside recycling programs (especially single-stream recycling, where paper, cans, bottles, and plastics are collected together) are no longer considered food grade due to the high levels of contamination in single-stream systems, so typically cannot directly be used in container-to-container recycling.[93]

This is why so many European countries, after having curbside recycling for several decades, have now implemented DRS for beverage containers to enhance their system and achieve higher rates of beverage container packaging recovery and a more circular economy with container-to-container recycling.[94]

Understanding the strength of a consumer's alternative recycling system is important for achieving 90% collection, as consumers will evaluate all their options when deciding how to recycle. If the alternative recycling system is very weak then a consumer may be more likely to return through the DRS, but if the alternative recycling system is very strong, a consumer may still prefer to recycle through their local recycling system. It is likely that consumers are less sensitive to changes of the internal factors when their local recycling system is strong.

Six presents a comparison of typical recovery performance of containers from leading DRS and curbside systems. Data from U.S. DRS systems shows that the percentage of plastic beverage containers that is recycled in states with a DRS is more than double the percentage in states without one.[95]

[93] Reloop, 2022. Bottle Bill Reimagined. Accessible at https://bottlebillreimagined.org/wp-content/uploads/2022/03/Reimagining-the-Bottle-Bill-REPORT.pdf
[94] Reloop, 2023. A Guide to Modern DRS: 10 Essential Practices. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/11/Reloop-NA_A-Guide-to-Modern-DRS_10-Essential-Practices.pdf
[95] Reloop, 2022. Bottle Bill Reimagined. Accessible at https://bottlebillreimagined.org/wp-content/uploads/2022/03/Reimagining-the-Bottle-Bill-REPORT.pdf

Implementing a DRS in addition to a curbside system offers an opportunity to divert critical materials from disposal and litter streams, to ease the financial pressure on curbside recycling, waste disposal and litter abatement programs, and to ensure that valuable commodities end up where needed: reused or recycled into new beverage containers. Furthermore, DRSs present an economic development opportunity: stimulating investment in recycling infrastructure and building local, more resilient economies, with local employment. Modern, high-performing DRSs can more quickly advance circular economy principles and practices in ways that curbside recycling, even if enhanced, cannot.[96]

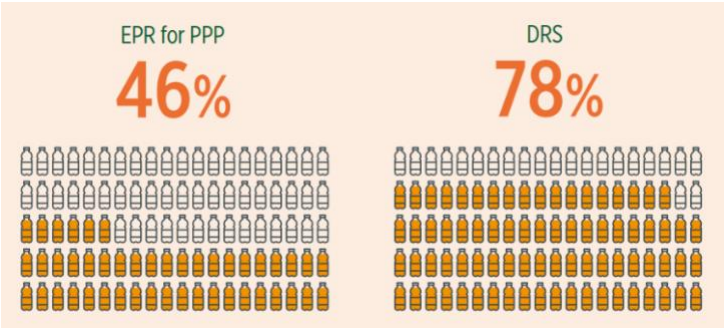
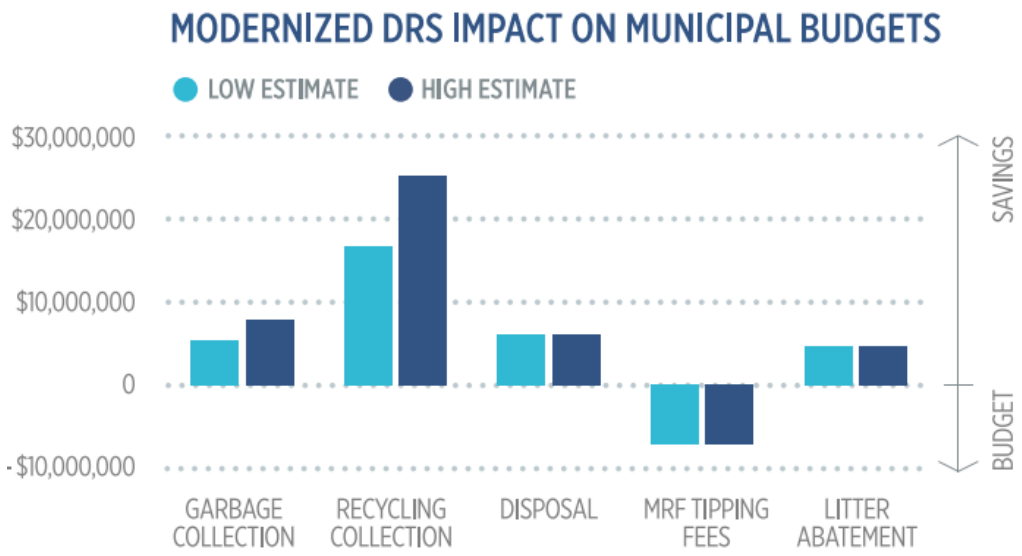


Figure 16 presents the modelled potential cost savings from implementing modernized DRSs in the U.S. Northeast DRS programs, resulting from expanding program scope of containers included on deposit. The modelled cost savings shows that even in well performing curbside recycling systems, implementing or expanding scope of containers in current programs can realize significant cost savings for municipal curbside recycling operations and associated litter abatement programs, while improving container recovery rates. DRS can be seen as complimentary to most well performing curbside systems, and when a DRS is in place most consumers will use it rather than curbside programs. Encorp Pacific estimates that approximately 8% of its containers are collected via curbside systems and 92% are collected through DRS return points.[97]

Figure 16: Example of Estimated Cost Savings from Implementing DRS Compared to Baseline Curbside Recycling Costs for Beverage Containers in Massachusetts



[96] Reloop, 2022. Bottle Bill Reimagined. Accessible at https://bottlebillreimagined.org/wp-content/uploads/2022/03/Reimagining-the-Bottle-Bill-REPORT.pdf
[97] Cited in steering committee meeting by Cindy Coutts, Encorp Pacific.

4.2.2 Consumer Demographics and Behaviour

Understanding the motivations and behaviours of different types of consumers is important to identify contributing factors that may influence their participation in a DRS. These may be segmented by age, income, or gender.

Importance for achieving 90% collection

Figure 17 provides an example of how the market can be segmented based on different demographics to show how consumers interact with the DRS differently. It is likely that implementing best practice across all factors creates the greatest possibility for achieving a 90% collection rate, but if resources are limited then understanding consumer demographics and behaviour can help support a more targeted approach to implementing different factors. This factor should not be considered as a stand alone factor, rather, consumer education and outreach that targets specific demographics will complement other best practice factors implemented for a program.

As shown in Figure 17 about 11% of consumers are considered "Uniformed Urbans" and have a below average awareness of the DRS. They may not be sensitive to some of the factors such as raising the deposit level; they may not be aware of this change so their behaviour does not change. Increasing educational programs may shift their awareness and lead to further participation. Similarly, education and outreach programs that target the "on the go" discarders would represent 14% of people, and up to 18% of containers produced, so this target group, in addition to convenience trashers, should be the focus of outreach efforts in this jurisdiction.

Figure 17: Market Segmentation Study in British Columbia[98]

	Regular Returners	Depot Fans	Convenience Trashers	On the Go Discarders	Uninformed Urbans
Size	**47% people**	**20% people**	**8% people**	**14% people**	**11% people**
	19% containers produced	**43% containers produced**	**18% containers produced**	**18% containers produced**	**3% containers produced**
	2% containers discarded	**4% containers discarded**	**65% containers discarded**	**16% containers discarded**	**12% containers discarded**
Key Demographics	Average age 54	Average age 50	18-34 age	25-44 age	Both young and old
	63% females	Equally male and female	54% males	57% females	Equally male and female
Depot Use	Just below average use	Frequent users	Good level of use, and frequent among those who do	Average use	Low use, they prefer retailer as method for return
	Like one-stop convenience of depots	Love to use the depot	Like the convenience, especially depots with Express	Average reasons for using the depot	Lack of nearby locations and convenience barriers to more use
Express	Below average awareness, current use and future interest	Above-average use but only average current and future interest	Average awareness, high current and future use	Below average awareness, average current use but above average future interest	Below average awareness, current use and future interest
Why they discard	Rarely discard	Rarely discard	Hassle and inconvenience are key reasons	Can't find a place to return it while they are "on the go"	Lack of interest in the return system
	Confusion on what is returnable	Confusion on what is returnable			

[98] https://ar.return-it.ca/ar2022/pdf/Return-It_2022_Annual_Report.pdf

Overall, no single factor independently leads to high performance. High performing DRSs combine different factors to design a system that is understood by all consumers, provides meaningful incentives, is convenient to use, and allows for sufficient funding for system operators.

4.3 Summary of Factors

Table 29 provides a summary of the factors reviewed and how they influence different key stakeholders within the DRS ecosystem. Green cells indicate that the factor is likely to have high or moderate influence over the stakeholder's interaction with the system. Yellow cells indicate that the factor is likely to have a moderate or low influence over the stakeholder's interaction with the system. Red cells indicate that the factor is likely to have a low and no influence over the stakeholder's interaction with the system.

Table 29: Factors Reviewed as Part of Analysis

Factor	Residential Consumer Driver	ICI Consumer Driver	System Driver
Deposit Level			
Scope of Beverages and Container types			
Legislated Targets			
Accessibility to redemption network			
Convenience at redemption network			
Refund payment options			
Infrastructure and requirements for on the go collection			
Infrastructure and requirements for ICI collection			
Consumer education, promotion, and awareness activities			
System funding			
Variable handling fees			
Depot ownership			
Strength of alternative recycling			
Consumer behaviour			

5.0 Barriers and Opportunities to Increasing Recovery in Canadian Programs

In this section of the report, the current state of Canadian beverage container recycling programs is analyzed against best practice factors leading to high performance identified and described in Section 4 of this report. This section of the report presents primary barriers (those that are likely to have greatest impact on a return rate) and secondary barriers. The description of identified barriers is then followed by specific opportunities to overcome the barriers and increase container recovery. Finally, the benefit of implementing these opportunities is estimated.

5.1 Summary of Barriers Identified and Best Practice Approaches in Canadian Programs

The consulting team has identified primary barriers that are restricting recovery of 90% of beverage containers in Canada, as well as secondary barriers that could be limiting recovery to a lesser extent. The primary barriers are the most apparent barriers where a jurisdiction or program doesn't meet a best practice factor as described in Section 4, and addressing these barriers first would result in the greatest potential for recovery of new containers that are currently not recovered, as assessed in Section 3 (Current State of Material Flow). Secondary barriers were identified by the consulting team as those that might be contributing to a small number of unrecovered containers.

The following primary barriers were identified by the consulting team following a review of beverage container recycling program models, designated containers inclusions, and analysis of international best practice factors (see Section 4), as well as through suggestions from interviews. Addressing these primary barriers represent the key opportunities to increase recovery nationally, as presented in Section 5.2.

Primary Barriers

- Regulatory: not having DRS for non-alcohol beverage containers in two provinces (Manitoba and Ontario) is a primary barrier to increasing plastic beverage container recovery in Canada. Only 1% of Ontario's 76,100 plastic beverage containers are in DRS (these are alcohol beverage containers), with all non-alcohol plastic containers collected in the curbside system (representing 99% of plastic beverage containers consumed in Ontario). This is a considered a significant barrier to increasing container recovery in Canada. Ontario's curbside system is estimated to collect 52% of plastic beverage containers available for collection as presented in Section 3. Given that Ontario is the most highly populated province in the country, the current model in Ontario represents a significant barrier to container recovery nationally. DRSs for beverage containers demonstrate that return rates achieve much higher recovery rates of beverage containers when compared to curbside recovery rates, both in Canada and internationally. DRS is considered the best practice for beverage container recovery.

- Financial Incentive: Low Deposit/Refund Levels: All existing DRS for beverage containers in Canada currently have lower than recommended deposit/refund levels to meet DRS best practice. As described in Section 4, a $0.15 CAD deposit/refund level is the minimum amount to incentivize higher return rates in the range of 90% in international DRS programs reviewed both in the U.S. and in Europe. Most Canadian DRSs for a typical single-serve beverage container is $0.10 CAD, with only $0.05 CAD refunds available in three Atlantic provinces, significantly less than best practice for

incentivizing higher return rates. Specifically the return to the consumer has to be best practice (e.g., a half back program with an initial 15 cent deposit is not considered best practice).

- Limited Scope**:** There is a varied scope across DRS programs in Canada, and not all programs include the same plastic containers. Milk and milk substitutes or dairy drinks are only included in five of ten DRS programs, which limits the recovery of many ready-to-drink HDPE containers. The two largest provinces, Ontario and Quebec, had only 1% and 14% of their plastic beverage containers under deposit in 2022, respectively. This leads to only 38% of plastic beverage containers being under deposit nationally in 2022. In 2025, Quebec will expand its DRS and will have greater than 90% of its plastic beverage containers under deposit.

- Accessibility and Convenience: For this assessment, the Eunomia team has identified one of the accessibility best practice criteria presented in Section 4 as a primary barrier in some programs. The number of return points per capita does not meet best practice criteria (described in Section 4). However, Canada is a very large country with extensive rural and remote areas of each province and territory, so this context is important to consider when discussing international accessibility best practice and its applicability to Canada. Canada is a country of almost 10 million square kilometres with a population density of only 4.2 people per square kilometre country-wide, however almost 74% of the population live in Canada's urban areas. In this context, barriers related to geography are important to consider; however specific opportunities discussed in this section relate more to the number and type of return point options in many DRS in Canada, lack of convenient locations (e.g. return to retail or satellite drop off in urban areas at retail shopping points). The cost of adding new return points to improve accessibility at existing return points can be considered a financial barrier related to improving accessibility.

Secondary barriers

The secondary barriers described below also affect Canadian programs, however they are considered to influence recovery to a lesser extent compared to the primary barriers outlined above.

- Designated Recovery from the ICI sector: Current beverage container recovery programs designate containers that are consumed regardless of where it is consumed (e.g. both in the home and away from home including in commercial and institutional settings), such as the BC regulatory requirement. While these containers can be returned through existing infrastructure in many cases there is no specific requirement in legislation that specifies which ICI sectors must have collection, with the exception of Quebec, which has recently implemented a legislative requirement to collect from food service establishments with in-person dining (including restaurants, hotels, conference facilities, etc.) in its modernized DRS. There are five DRS programs that have made substantial efforts to improve recovery from schools (BC, SK, MB, NB, NL). However, this is not required by legislation. ECCC Manitoba is one program that is targeting recovery partnerships with many segments of the ICI sector: offices, trades, manufacturing, institutions such as hospitals, as well as schools.

- Public Space Recovery: There are no legislative requirements to collect beverage containers from public spaces (e.g. streetscapes, parks) in any programs in Canada. BC, Manitoba and Saskatchewan are the only programs identified with partnerships with municipalities to collect beverage containers separately from designated public space receptacles.

- Curbside collection estimates: Lack of a standardized methodology to track the volume of beverage containers collected through the residential curbside systems is a barrier to improving recovery in most programs. Other than BC, Manitoba, and Newfoundland and Labrador, to date other programs in Canada do not yet have in place a methodology to track, estimate, or collect the volume of containers collected curbside.

- Financial: In at least two programs that are DRS operated by the government, surplus revenue from unredeemed deposits flows into general government revenues for the provincial government. This is a barrier for a recycling program operator that cannot access surplus funds to invest in program improvements such as new technologies, new return points, or other elements that improve convenience for consumers.

Table 30 (overleaf) presents a visual representation of this high-level summary of barriers and best practice elements in place in Canadian beverage recovery programs using a color coded system :

- Green indicates the jurisdiction has applied the best practice factor identified;
- Yellow indicates the jurisdiction has some, but not all, elements of a best practice factor identified; and,
- Red indicates the jurisdiction does not have any of the best practice factor elements identified.

The results in Table 30 have been generated through a team workshop with consultant expertise in international DRS systems and informed by the best practice research presented in Section 4 of this report. Best practice factors are presented along the left side of the table, jurisdictions across the top of the table.

Table 30: Analysis of Current Beverage Recovery Programs Against Best Practice Using Colour Coded Assessment (2022)

	BC	AB	SK	MB	ON	QC	NB	PEI	NS	NL	YT	NT
Total Plastic Beverage Containers (PBC) Collected (Tonnes)	19,600	23,200	5,600	4,400	50,000	29,200	3,800	600	4,300	2,000	250	200
PBC Not Collected Residential (Tonnes)	300	800	300	1,400	36,000	9,500	900	100	900	800	20	~0
PBC Not Collected ICI (Tonnes)	2,900	2,200	500	1,000	6,000	6,600	400	100	520	200	20	~0
Reported DRS Return Rate for PBC (2022)												
Percent of all PBC Collected (DRS and non DRS combined)												
Deposit Level												
Scope of Beverages and Container types												
Legislated Targets												
Accessibility to redemption network (collection Model)												
Accessibility to redemption network (population per return point)												
Convenience at redemption network												
Refund payment options												
Infrastructure and requirements for on the go collection												
Infrastructure and requirements for ICI collection												
Consumer education, promotion, and awareness activities												
System funding												
Variable handling fees												

	Best practice factor not implemented in jurisdiction. Collection rate far from 90% goal.
	Some elements of best practice factor implemented or factor is close to best practice standard. Collection rate approaching 90% goal.
	Best practice standard implemented. Collection rate at or very close to 90% goal.

5.2 National Overview of Key Opportunities

The key opportunities identified to improve recovery are those that address the primary barriers presented in Section 5.1. These key opportunities have been modelled to demonstrate the potential increase in recovery by implementing each of these opportunities separately, and then the combined effect of implementing all opportunities together is also presented.

5.2.1 Primary Opportunities

The first stage of this analysis was to identify the factors that can provide the greatest impact in reaching a 90% collection for plastic beverage containers in all programs. Based on project team analysis, the following three factors were selected for modelling, as they are likely to have the greatest impact if implemented across all provinces including implementing a DRS in jurisdictions without a DRS. These three opportunities include:

1. Increasing deposit/refund levels in all DRS programs to the level recommended as best practice to incentivize returns at a rate greater than 90%;

2. Increasing program scope to a) cover the same beverage containers across all DRS programs (e.g. including milk and milk substitutes in all DRS programs, expand collection of containers made of HDPE as well as PET), and b) implement a full-scope DRS in Ontario and Manitoba; and

3. Increasing the number of return locations in DRS programs to improve accessibility.

Note that with respect to accessibility, defining the best practice for the number of return locations for a jurisdiction varies based on multiple factors, including geography, population density, and type of return. As presented in Section 4, evaluating accessibility could include the number of return locations per capita, criteria for average drive time, or average distance to a return location. For the purposes of this modelling exercise, the consulting team selected an increase in the number of return locations as the factor that can be most efficiently modelled to present the potential result in container recovery. However, it would be up to each jurisdiction to define exactly what accessibility metric would be most appropriate for their geography and consumer preferences, and how they would propose to improve the number of return locations. Conducting this type of detailed provincial analysis would be outside of the scope of this project.

As noted in Section 4, it is important to consider the diverse range of users and their specific redemption patterns[99] when planning for improvements to accessibility return locations and return types including:

- Consumers who return a relatively small number of containers to retailers (low-volume);
- Organizations that collect containers from multiple places and return containers to one spot (high-volume);
- Food service businesses that typically generate a significant volume of beverage containers consumed on their premises, and return large quantities of containers (high volume); and
- Consumers that do not need their deposit back immediately and would prefer to drop and go containers that they have collected.

[99] Reloop's Guide to Modern DRS: 10 Essential Practices. Accessible at Reloop-NA_A-Guide-to-Modern-DRS_10-Essential-Practices.pdf (reloopplatform.org)

In each of these scenarios, user needs can vary significantly. To maintain ease of use, a modern DRS should include specific requirements for high-volume redemption and low volume redemption.

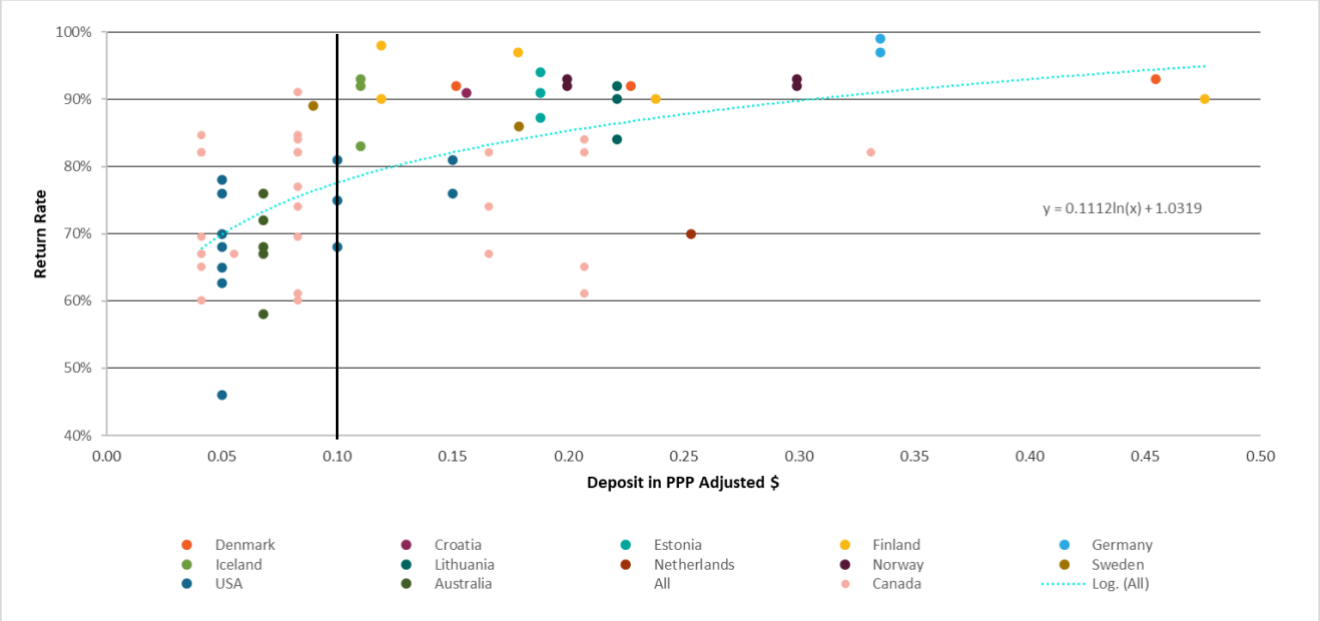
The following sub-sections present an overview of how the impact of these opportunities was modelled, along with the estimated future collection rate if these factors were implemented across Canada.

5.2.1.1 Opportunity 1: Increase Deposit/Refund to $0.15 CAD or $0.20 CAD

Modelling Methodology

The consultant team modelled the impact on the return rate of an increase of all deposit bearing containers that are $0.10 USD and below to a higher deposit/refund level. As presented in Section 4, the minimum deposit/refund value considered a best practice in DRS to incentivize returns is $0.10 USD minimum deposit, which is $0.14 CAD. This is the minimum financial value necessary to motivate consumers to return containers and ensure high levels of container return.[100] Figure 18 demonstrates the deposit/refund value along the x-axis and how recovery rates increase with higher values. Programs that reach 90% return rates with the lowest deposit levels have deposits set at approximately $0.10 USD ($0.14 CAD).

Figure 18: Deposit/Refund Levels and Corresponding Return Rates (2022 in USD)



Based on this international analysis, a $0.15 CAD deposit level was modelled to assess potential return increases. Note that a deposit level higher than this is associated with higher returns in some European programs, therefore this is considered as the minimum deposit level required for 90% collection but a higher deposit level could be explored. There are also exceptions to the rule and having a lower deposit level may still lead to a 90% recovery rate, but this is very rare and at $0.15 CAD is when return rates over 90% become much more common.

[100] Reloop, 2023. High-Performance Principles To Modernize Deposit Return Systems. Accessible at https://bottlebillreimagined.org/wp-content/uploads/2023/06/Factsheet-10-principles.pdf

To model the impact of raising the deposit level, Eunomia estimated the increase in redemption rate associated with a one cent CAD increase in deposit level. Eunomia used three different metrics for this:

1) **Differentiated Deposit Data:** Using data from Canadian programs which have differentiated deposit levels and report different return rates for those deposit levels.

2) **Published Performance Factsheet:** Using case studies on changes in deposit level from Reloop's global fact sheet.[101] This document is a most comprehensive dataset of all deposit return systems globally.

3) **Continuous Regression:** Using a continuous regression based on data from all deposit programs globally on the percent increase in redemption given a percent increase in deposit level.

Each metric is explained in further detail below.

Differentiated Deposits in Canadian Systems

Three programs in Canada have differentiated deposits on plastic beverage containers and reported the return rate of those different containers separately. British Columbia previously had a different deposit level for different plastic beverages. The provinces reviewed include: BC, Alberta, Ontario, and Northwest Territories. The return rates of those differentiated deposits are shown in the table below:

Table 31: Differentiated Deposits in Canada For Single Use Containers

	British Columbia	Alberta	Ontario	Northwest Territories
Year	2019	2022	2022	2022
Deposit Level 1	$0.05 CAD (<1L container)	$0.10 CAD (<1L container)	$0.10 CAD (<630ml container)	$0.10 CAD (<1L container)
Deposit Level 2	$0.20 CAD (>1L container)	$0.25 CAD (>1L container)	$0.20 CAD (>630ml container)	$0.25 CAD (>1L container)
Return Rate Deposit Level 1	73% for < 1L containers	78% for < 1L containers	37% for < 630ml containers	64% for < 1L containers
Return Rate Deposit Level 2	86% for >1L containers	88% for >1L containers	59% for >630ml containers	79% for >1L containers

To use the data above to model the impact of increasing the deposit level of a system on return rates, Eunomia standardized the data by finding the average increase in redemption rate per one cent increase in deposit level of the systems above. Because the deposit levels are in the same program, this method controls for other factors within the program by comparing the programs against themselves. Comparing two deposit levels within the program allows for an estimate on impacting the return rate due to the variation in the deposit level alone. The average return rate increase per one cent increases are shown in the table below.

[101] RELOOP_Factsheet_Performance_12l2022.pdf (reloopplatform.org)

Table 32: Calculating Average Percent Increase in Return Rate Per One Cent Deposit Increase from Existing Program Data

Row	Variable	British Columbia	Alberta	Ontario	Northwest Territories	Average
A	Deposit Gap (Deposit Level 2 – Deposit Level 1) in Cents	$0.15 CAD	$0.15 CAD	$0.10 CAD	$0.15 CAD	--
B	Return Rate Gap (Return Rate Deposit Level 2 – Return Rate Deposit Level 1) in %	13	10	23	15	--
C	Return Rate Increase per one cent deposit level increase (B/C)	0.87	0.7	2.3	0.9	1.2

Using this data, on average a one cent increase in deposit level relates to a 1.2 percentage point increase in return rate, holding other factors fixed. However, this method does not account for potential differences in return rate that may be linked to the actual containers which have different deposit levels on them (e.g., container size may be a confounding factor as consumers may be less likely to purchase large containers on the go). To investigate this further, Eunomia used data from Reloop's 2022 Factsheet on deposit level changes to the *same* containers in a program. This is discussed below.

Analysis of Deposit Level Change

Canadian and international programs were reviewed based on published reports to understand the impact a change in deposit level has on the return rate.[102] Three case studies were identified and summarized in Table 33. In the table the return rate for plastic beverage containers is used and the return rate three years after the deposit was increased was used as the impact measurement as this is when the full impact of the deposit impact was likely to be realized.

Table 33: Impact of Increasing the Deposit on Plastic Beverage Containers

Program	Alberta	Norway	Oregon
Deposit Level Pre-Change (CAD Cents)	$0.05	$0.13	$0.065
Deposit Level Post Change (CAD Cents)	$0.10	$0.26	$0.13
Year of Change	2008	2017	2017
Deposit Level Increase (CAD Cents)	$0.05	$0.13	$0.065
Return Rate Pre-Change	72% (2008)	88% (2017)	53% (2016)
Return Rate Post Change	84% (2011)	92% (2020)	82% (2019)

In each case above, the deposit level doubled in one year. The factsheet then shows the return rate increase which the programs observed after establishing the deposit level change.

While varied in impact, all programs saw increases in their return rates. Eunomia then standardized these case studies as well by finding the average increase in return rate per one cent deposit level increase.

[102] https://www.reloopplatform.org/wp-content/uploads/2022/09/Fact-Sheet-Performance-22Sept2022.pdf

Table 34: Return Rate Increase Per One Cent Deposit Increase Calculation

Program	Alberta	Norway	Oregon	Average
Deposit Level Increase (CAD Cents)	$0.05	$0.13	$0.065	--
Return Rate Increase	+12	+4	+29	--
Return Rate Increase per deposit cent increase	2.4	0.3	4.5	2.4

Using this method, the average percentage point increase in return rate given a one cent increase in deposit is 2.4 points. This average is one point higher than in the first method of using differentiated deposits in Canadian programs (which found 1.4-point increase in return rate per one cent deposit increase).

This method also shows that an increase in return rate likely has diminishing returns when the deposit level and return rates are already relatively high. As seen in the Norway example, the deposit level doubled, however the return rate only increased by 4 points. The initial deposit level in Norway was at $0.13 CAD, which is at least twice the initial deposit levels in Oregon and Alberta. The return rate was also already at 88%. Oregon and Alberta saw larger increases in their return rates than Norway did, however Norway currently has a return to retail system, while Alberta and Oregon are mainly return to depot so Norway is already providing extensive access and the deposit level change may not be as impactful.

To further refine the deposit level impacts and better reflect the diminishing returns to raising deposit levels, Eunomia used a continuous regression using return rate as a dependent variable. This is explained further below.

Continuous Regression

Using the return rate of all global deposit programs, Eunomia estimated the following equation using 2022 return rates:

$$Return\ Rate_i = \alpha + \beta\ ln(Deposit\ Level)_i + \beta_n X_n + \varepsilon_i$$

Where:

- The return rate of programs is the dependent variable
- α is the constant of the equation
- β_1 is the percentage point increase in return rate given a percentage increase in the deposit level
- $ln(Deposit\ Level)_i$ is the natural log of the deposit level of program *i*. Using the natural log allows for the modelling of diminishing returns on increase the deposit level.
- $\beta_n X_n$ is a series of control variables including scope, program harmonization, number of return points per person, and urban proportion of the covered population

The results of the regression showed that a 1% increase in deposit level relates to about a 0.09 percentage point increase in predicted return rate, holding other factors in the model fixed. This result was significant at the 5% level. This allows for a diminishing increase in return rate given additional increases in deposit level, as the percent increase from $0.05 CAD to $0.10 CAD is 100%, while from $0.10 CAD to $0.15 CAD it is 50%.

Synthesis

The table below shows the comparison of what each method produces as the increase predicted return rate of going from $0.05 CAD to $0.10 CAD, $0.10 CAD to $0.15 CAD, $0.05 CAD to $0.20 CAD and $0.10 CAD to $0.20 CAD.

Table 35: Expected Return Rate Increase – Estimates by Method – Percentage Point Increase

	Differentiated Deposit	Deposit Level Change	Continuous Regression	Average
$0.05 CAD to $0.15 CAD	+13 point increase to return rate	+24 point increase to return rate	+10 point increase to return rate	+16 point increase to return rate
$0.10 CAD to $0.15 CAD	+6.5 point increase to return rate	+12 point increase to return rate	+4 point increase to return rate	+7 point increase to return rate
$0.05 CAD to $0.20 CAD	+18 point increase to return rate	+36 point increase to return rate	+13 point increase to return rate	+22 point increase to return rate
$0.10 CAD to $0.20 CAD	+12 point increase to return rate	+24 point increase to return rate	+6 point increase to return rate	+14 point increase to return rate

The continuous regression estimated the least amount of impact, while the deposit level change estimated the greatest. Comparing differentiated deposits in Canada was in the middle in terms of magnitude of change. Each method is meant to estimate the impact of raising the deposit only, it is not meant to reflect other changes. To incorporate the benefits of each method, Eunomia used an average of the three methods to estimate the impact of raising the deposit level. Eunomia therefore:

- Applied a 16-point increase in return rate for containers going from $0.05 CAD to $0.15 CAD in deposit level
- Applied a 7-point increase in return rate for containers going from $0.10 CAD to $0.15 CAD in deposit level
- Applied a 22-point increase in return rate for containers going from $0.05 CAD to $0.20 CAD in deposit level
- Applied a 14-point increase in return rate for containers going from $0.10 CAD to $0.20 CAD in deposit level

Local Context / Impacts

In some programs, the amount of the deposit returned to the consumer is different than the overall deposit. For example, in PEI a consumer places a deposit of $0.10 CAD on plastic non-alcohol containers <5L, but when they return the container they get $0.05 CAD back (this "half-back" system is in place in PEI, Nova Scotia, and Newfoundland and Labrador). For this analysis the amount the consumer gets back is used as a benchmark for the incentive level, therefore the modelling assumes these provinces would move to a "full back" model of $0.15 CAD in this example. In this situation, these government-run programs would need to

add a recycling fee to fund the program or transition to an industry-led program and let a PRO manage program funding (which may or may not include additional fees).

The deposit level across Canada is below $0.15 CAD except for a few larger container sizes such as plastics >1L in Alberta. All provinces would require at least some of the containers in scope to have their deposit level increase. In all government led programs this would require legislation to increase the deposit which may challenging. Industry led programs have more independence to increase the deposit level in their provinces, but in some cases there still may be reluctance to increase the deposit level. BC recently harmonized their deposit level and changing the deposit level again after only a few years may create confusion for consumers.

A 2023 study[103] undertaken by the U.S. based Container Recycling Institute (CRI) and Reloop studied the impact of high deposit values to understand if there were any negative impacts on sales following deposit increases. The study compiled and analysed per capita packaged beverage sales in existing DRS markets before and after the system was introduced or expanded, or the deposit amount was increased, using real-world case studies based on actual, sourced data points from different countries. Findings indicate that there is no direct negative impact to beverage sales and a higher deposit in DRSs. Beverage sales are affected by a complex interplay of factors including seasonal temperatures, economic conditions, and supply chain disruptions. These factors may independently or collectively affect beverage sales and prices. Observed fluctuations in sales across the case studies were well within the scope of normal variation. Sales trends followed a similar pattern whether the jurisdiction experienced a DRS event (e.g. a change in deposit or implementation of a new DRS) or not. Observed fluctuations in sales appear to align with regional trends. Results indicate that in programs with higher deposits there is no discernable impact on sales.

There may be general consumer or political push back against an increased deposit level in some urban areas of the country with significant social issues and potential for concern with some segments of society using containers to fund illicit drug use.[104] However, there is minimal research available on this issue but recently completed research in New York City shows that overall the social impact to the segment of society that have been shut out of the formal labour market is positive and "independent recycling (also referred to as canning) is a low-barrier livelihood for working-age individuals and, notably, fills critical gaps in social safety nets for many who are elderly or coping with chronic physical and mental illness. At the same time, the results show personal benefits derived from the work, especially in relation to mental and physical health."[105] It is likely that an increased deposit level would have more positive societal benefits than negative.

5.2.1.2 Opportunity 2: Increase Scope to Cover All Beverage Containers

Several provinces in Canada include almost all beverage types, including dairy, under deposit. These systems are BC, Alberta, and Northwest Territories. Eunomia modelled the impact nationally if all provinces included the same scope of beverage containers as these three provinces. The effect on overall return rate of containers of expanding the scope this way is found to occur in two steps:

1) **Expanded Scope – Same Return Rate:** Containers which were not under deposit are now under deposit, and have a return rate equal to those which are under deposit, and;

[103] The Container Recycling Institute (CRI), and Reloop International, 2023. The impact of deposit return systems on beverage sales. Accessible at https://www.reloopplatform.org/wp-content/uploads/2023/08/Reloop-Impact-of-DRS-Report.pdf
[104] https://kgw.com/article/news/local/downtown-portland-bottle-drop-locations-close-curb-fentanyl-use/283-ffdc9259-cf92-44a1-8135-ab0061e35cdc
[105] https://static1.squarespace.com/static/5647b691e4b0524134ec6b8c/t/65e1f1c13bbe880ffe2d9be9/1709306311996/REPORT_WEB+%281%29.pdf

2) **Expanded Scope - Overall Return Rate increase from awareness:** If the scope of containers before expansion is small, expanding the scope of containers can result in an increase in the existing return rate on containers already under deposit. This is theorized to occur due to increased awareness of the program when additional beverage types are under deposit.

Rationale for each of these steps and how they were modelled is discussed further in this section.

Effect #1: Expanded Scope – Same Return Rate

For provinces which do not have a full scope of beverage containers, Eunomia modelled the expansion of those system's scopes to match the widest scopes in Canada. Below is a summary of the percent of plastic beverage containers currently in scope for each province.

Figure 19: Proportion of Beverage Containers Currently Under Deposit

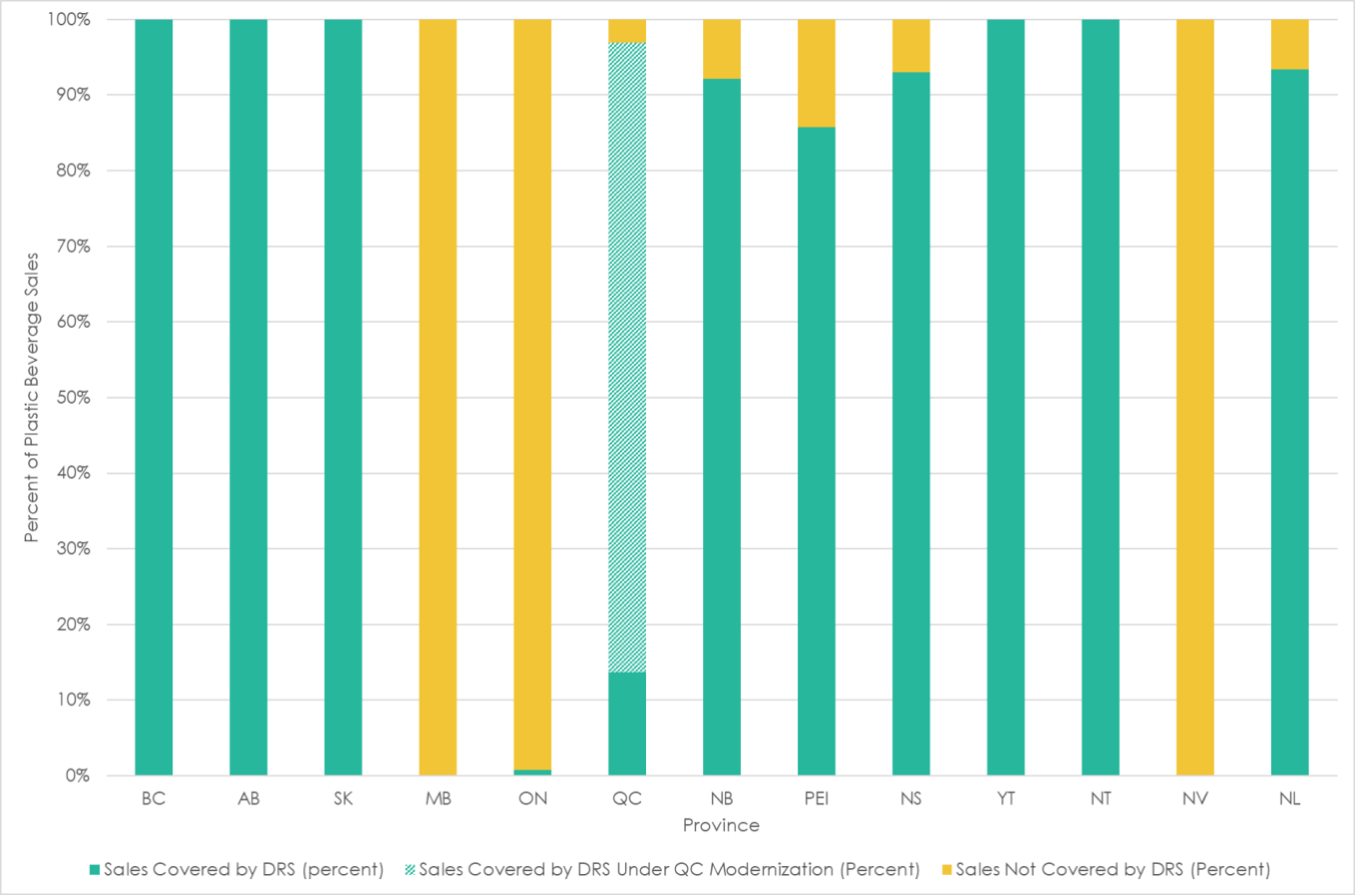


Figure 19 above shows that the provinces this impacts the most are Manitoba, Ontario, and Quebec. The Territory of Nunavut also does not have a DRS but has not been included in the rest of the analysis of modelled opportunities due to the fact that they are very small remote communities not entirely accessible by land, and do not currently have recycling infrastructure in place.

In this first effect of expanding scope, the return rate for the containers newly under deposit was assumed to be the same as the existing return rate if a province already has a deposit system. If the program does not have a deposit system currently (Manitoba, Nunavut), the average return rate of each resin and beverage type from other provinces that have a 10 cent deposit was used.

Effect #2: Overall Return Rate Increase from Additional Awareness

As has been documented by other studies, increasing the scope of beverage containers that are under deposit can lead to an overall increase in the return rate of containers already under deposit.[106] There is no existing public data on a quantifiable impact on the return rate which increasing the scope of a deposit system can achieve. Eunomia therefore sought to calculate its own estimate using data from all global systems and categorizing the scope of every system.

To first identify a trend, Eunomia categorized each deposit system as having either a low, medium or high scope. The definitions for each are shown below:

- High Scope: Most beverage containers under deposit, only dairy and niche beverages not covered (e.g., unprocessed cider), examples include British Columbia, Finland, Croatia
- Medium Scope: Most plastic containers under deposit except for dairy, but glass (or large portions of the glass stream e.g., wines & spirits) are not under deposit. Examples include Norway, California pre-recent expansion, Sweden.
- Low Scope: Large beverage categories of plastic containers did not include such as flat water, non-alcoholic containers. Examples include Ontario, Quebec pre-reform, Massachusetts, Netherlands pre-recent expansion.

Only two provinces in Canada fall into the Low category, and the rest of the provinces fall under the High category.

Globally, Eunomia found that of 36 global programs, 15 had high scopes by this definition, while 13 had medium and 8 had low. After conducting this analysis, Eunomia could then find the average return rate of each type of program. This is shown in the table below:

Table 36: Global Review of DRS by Beverage Container Scope

Scope Group	Number of systems	Average Return Rate
Low Scope	8	67%
Medium Scope	13	81%
High Scope	15	82%

As seen in the Table 36 above, the average return rate for medium and high scopes is only one percentage point, while the increase from low scope to medium scope is 14 points. This seems to suggest there could be a predicted increase in return rate if a program were to expand from a low scope to a medium scope. There are indisputably other factors which could be influencing this increase, however, such as deposit level and convenience. Therefore, Eunomia did not simply use these averages to estimate a return rate increases due to scope increase. Eunomia instead conducted an exercise using regression analysis which could control for other important factors such as deposit level and convenience.

Using the same regression as mentioned in in the Deposit Level factor section, Eunomia found the following marginal differences of a scope on return rate:

[106] RELOOP_Factsheet_Performance_12l2022.pdf (reloopplatform.org)

Table 37: Low and Medium Comparison to High Scope Programs

Comparison	Difference in Return Rate (Percentage Point)	Statistically Significant
Low Compared to High Scope	-11	Y
Medium Compared to High Scope	-1.5	N

As seen in the table above, on average, a low scope program has a predicted return rate that is 11 points lower than a high scope program, holding other things in the model fixed. This result is significant at the 5% level. This 11-point difference is 3 points lower than the difference found when using just the average return rates of each scope group (Table 36). That method found a difference of 14 points. This suggests that there are some other factors influencing the average differences in Table 36. Eunomia therefore used this figure for programs going from low to high scopes. There was no effect found to increase the scope from medium to high.

For future state modelling estimating the impact of implementing an increased scope, the project team assumed that increasing the scope would improve the overall return rate as described above.

Local Context / Impacts

There are several programs that will need to increase their scope to expand programs to include milk products and dairy alternatives, to reach best practice level and improve consistency across DRS programs in Canada. In existing DRS programs, the modelled program scope increase includes milk and dairy beverages and plant-based alternatives (similar to the full program scope of containers included in BC). Milk and dairy containers are included in other DRSs in Canada. There is precedent for this, and the dairy industry in most parts of Canada is now in favour of DRSs for their containers. The most impactful increase in scope is in Ontario, where moving from a curbside program to a DRS would be a key opportunity to increase recovery.

As outlined elsewhere in this report, consumer surveys undertaken in both BC and Alberta have shown that expanding program scope could lead to less confusion and greater participation in DRSs. Other studies reviewed have indicated that systems covering a limited scope of containers can hinder consumer engagement.[107] Ensuring that most beverage containers are included in the DRS reduces consumer confusion regarding which containers can be redeemed and which need to be recycled either through curbside recycling collection or drop-off recycling locations. Analysis of DRS options have shown that excluding common beverage types such as water and soft drinks leads to lower return rates.[108] Covering a wider scope of beverages may motivate greater engagement from consumers, as the more containers they consume are covered by a deposit, the greater the financial incentive to return containers for the deposit.

5.2.1.3 Opportunity 3: Increase Accessibility of Return Network

The final opportunity modelled was an increase in the number of return locations within a program. The number, location, and type of return points are important considerations in designing an accessible redemption network. More return points if implemented well translate to increased return opportunities, reducing the average distance and time consumers must travel to return containers.

The type of return point accepting containers also influences accessibility and volume of returns. In return-to-retail systems, retail establishments selling the containers also accept returns and refund deposits, return to

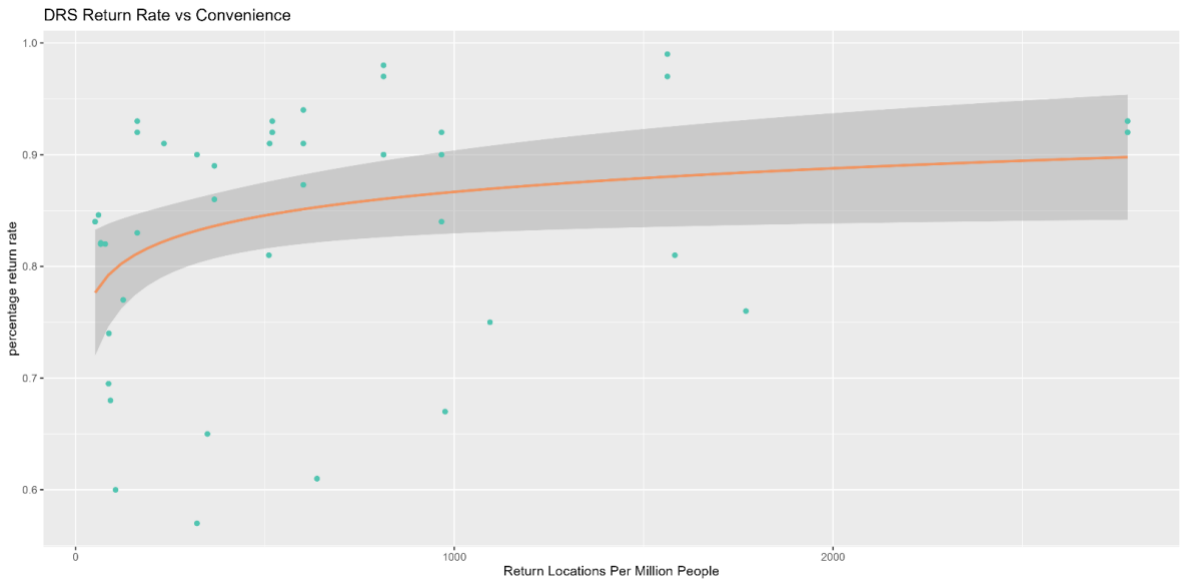
[107] TOMRA_Rewarding_Recycling - English.pdf (hubspotusercontent-na1.net)
[108] Eunomia, 2024. Ontario Deposit Return for Beverage Container Study, prepared for Canadian Beverage Association. In Progress.

retail could include return in a retail store for example through the use of Reverse Vending Machines (RVMs), or return in infrastructure in parking lot that could include bag drop or kiosks, the return is at the same location where the beverage is purchased. In return-to-depot systems, both individual consumers and organizations with large volumes can return containers to a collection center. Hybrid systems enable returns to both depots and participating retail establishments. Having a mix of different return options for all types of consumers (individuals, organizations, ICI), will lead to greater returns. There is no "one size fits all."

For this modelling analysis, a selection was made to increase the number of return points per population, similar to international best practice which recommends between 400 and 1000 people per return point. The Eunomia team decided that this was a criterion that could be modelled to demonstrate how increasing the number of return points could increase return rates. Note, however, that with respect to accessibility, defining the best practice for the number of return locations for a jurisdiction varies based on multiple factors, including geography, population density, and type of return. However, it would be up to each jurisdiction to define exactly what accessibility metric would be most appropriate for their geography and consumer preferences, and how they would propose to improve the number of return locations (this type of analysis although interesting is outside of the scope of this report). As noted in Section 4, it is important to consider the diverse range of users for a redemption network and ensure that both high-volume redemption (e.g. depots) and low volume redemption (e.g. bag drops, satellite locations, or return to retail) are included as a hybrid system, when considering specific improvements to accessibility for specific programs.

As seen in the bivariate chart below, return rates tend to increase as the number of return points increase:

Figure 20: Plot of Global Systems vs Return Locations per Million People



Source: Eunomia Calculations and Reloop Global Deposit Book 2022[109]

The chart above shows only one variable, and there could be other confounding variables explaining the increase in return rate as return locations increase. Therefore, to account for additional variables, Eunomia used its multivariable regression which was discussed in the section on deposit level increases.

[109] Global Deposit Book 2022 - Reloop Platform

To model the impact that expanding the number of return points to equal 1000 people per return point, Eunomia again used regression modelling to estimate the impact of increase convenience while holding other factors in the deposit system fixed. The results of the regression find that a one-point increase in return points per million people relates to a 0.0037-point increase in return rate. A system which has a convenience metric of 14,000 people per return point also has a "return location per million" people metric of 72 by mathematical law. The second metric is found by conducting the following equation:

$$1 \div (Population\ per\ Return\ Point \div 1\ million) = Return\ Points\ per\ Million\ People$$

The regression analysis found that, on average, increasing from 72 return points per million people to 73 return points per million people would result in an increase 0.0037 points in predicted return rate, holding other things in the model fixed. This marginal impact can be extrapolated to increasing convenience to 1,000 people per return location.

A system which has a population per return point metric of 1,000 also has a return point per million people metric of 1,000 as (1 / (1,000 / 1,000,000)) = 1,000). A system which goes from 72 return points per million people to 1,000 return points per million people would therefore see an estimate increase of 3.4 points, holding other things in the model fixed, this is calculated by:

$$\frac{0.037}{point\ increase\ per\ 1\ unit\ increase\ in\ return\ locations\ per\ million\ people} x\ (1000 - 72) = 3.4\ points$$

The table of predicted increases using existing population per return points in Canadian provinces is included in Table 38. In rural areas, a drive time method may be a more appropriate metric for determining accessibility, but this type of data is not available across programs in Canada.

Table 38: Increase in Predicted Return Rate resulting from Increased Accessibility, by Province and Territory

Province	Population Per Return Point (Current)	Increase in Predicted Return Rate from achieving 1,000 people per return point.
BC	3,373	2.57%
AB	21,522	3.48%
SK	16,698	3.43%
MB	N/A	3.65%
ON	11,400	3.33%
QC	1,119	0.39%
NB	12,393	3.35%
PEI	13,527	3.38%
NS	13,850	3.39%
YT	3,225	2.52%
NT	1,865	1.69%
NV	N/A	3.65%
NL	10,197	3.29%

Local Context/ Impacts

Accessibility and convenience are important to achieving a 90% collection rate of plastic beverage containers. As discussed in Section 4 of this report, in addition to the number of return points per population there are other factors which are related to accessibility such as average distance that someone travels to

a return location and whether that trip was part of an already planned visit or a dedicated errand. Within this project the number of return points per return location was the most effective method for modelling accessibility impact, but overall accessibility and convenience could be achieved through strategic planning of a return infrastructure network.

As shown in Table 38 many provinces are far from achieving 1,000 people per return point and to meet best practice level, systems would require thousands of additional return points. In the case of return to depot models, it is already challenging to site new depots due to local zoning requirements. In some provinces more than 5 times more depots would be required, showing that the status quo method of returning beverage containers may not be the most effective way reach a higher number of return points.

Adding other options such as some return-to-retail (R2R) locations, or satellite drop & go points, are "hybrid" models that represent multiple return point options. Return to retail could be a way to increase access and convenience for consumers. As described in Section 4, most deposit systems that achieve a 90% return rate have R2R as part of their return model. As these locations are already sited, it is an effective way to quickly increase the total number of return locations. Return-to-retail is useful for "at home" consumers as it makes return locations broadly the same as sales locations, and so matches return opportunities closely with container origin. This type of system is more integrated in consumers daily life and does not require a dedicated trip to return containers.

There are other opportunities to increase the number of return points to increase accessibility. This could include siting more bag drop style locations similar to Express & Go in British Columbia. These could be sited in the parking lots of retail locations and not require the retailers active participation, but still meet the same accessibility of a R2R model. These return points can be sited at other locations frequented by consumers on a regular basis such as school, post offices, or libraries therefore integrating into a consumer normal travel patterns.

There are additional opportunities to improve accessibility beyond increasing the number of return locations. This may include provided dedicated pick up to households, which could be an option in higher density areas.

5.2.2 Impact of Implementing Primary Opportunities

The following table summarizes how the different opportunities were applied to the programs in Canada. Following this table the estimated impact of these interventions are presented.

Table 39: Summary of Interventions Modelled

Metric #	Metric Description	Applies To
1	Increased deposit level to $0.15 CAD or $0.20 CAD for all containers currently below $0.15 CAD or $0.20	All programs
2	Expanded scope	Ontario and Quebec – existing low scope programs
3	Increased Accessibility	All programs

Increase Scope: If all provinces have a comprehensive scope of materials in their DRS, including provinces without a DRS then the return rate is estimated to reach 72% and the total collection of plastic beverage containers when including curbside collection is estimated to be 79%.

Increase Accessibility with Increased Scope: If the accessibility of the return network is increased to best practice levels in addition to expanding DRS scope in all provinces, then the return rate is estimated to be 75% and the total collection of plastic beverage containers when including curbside is estimated to be 79%.

Increase Deposit Level with Increased Accessibility and Expanded Program Scope in all Programs: If the deposit is increased to $0.15 CAD, the scope of DRS is expanded in all provinces, and best practice levels of access are met then the return rate is estimated to be 84% and the total collection rate is estimated to be 87%. If the deposit level is further raised to $0.20 CAD then the return rate from DRSs is estimated to be 90% and overall collection rate from both DRSs and curbside is estimated to be 93%.

Figure 21 and Figure 22 do not show the impact of only increasing accessibility or deposit level without an increase in scope on the national level. Since the provinces with a full scope of materials already have relatively higher return rates, increasing the deposit level or accessibility without increasing the scope to provinces without a DRS only has marginal benefits to the national return rate.

Figure 21: Estimated Impact of Implementing Primary Opportunities in Canada

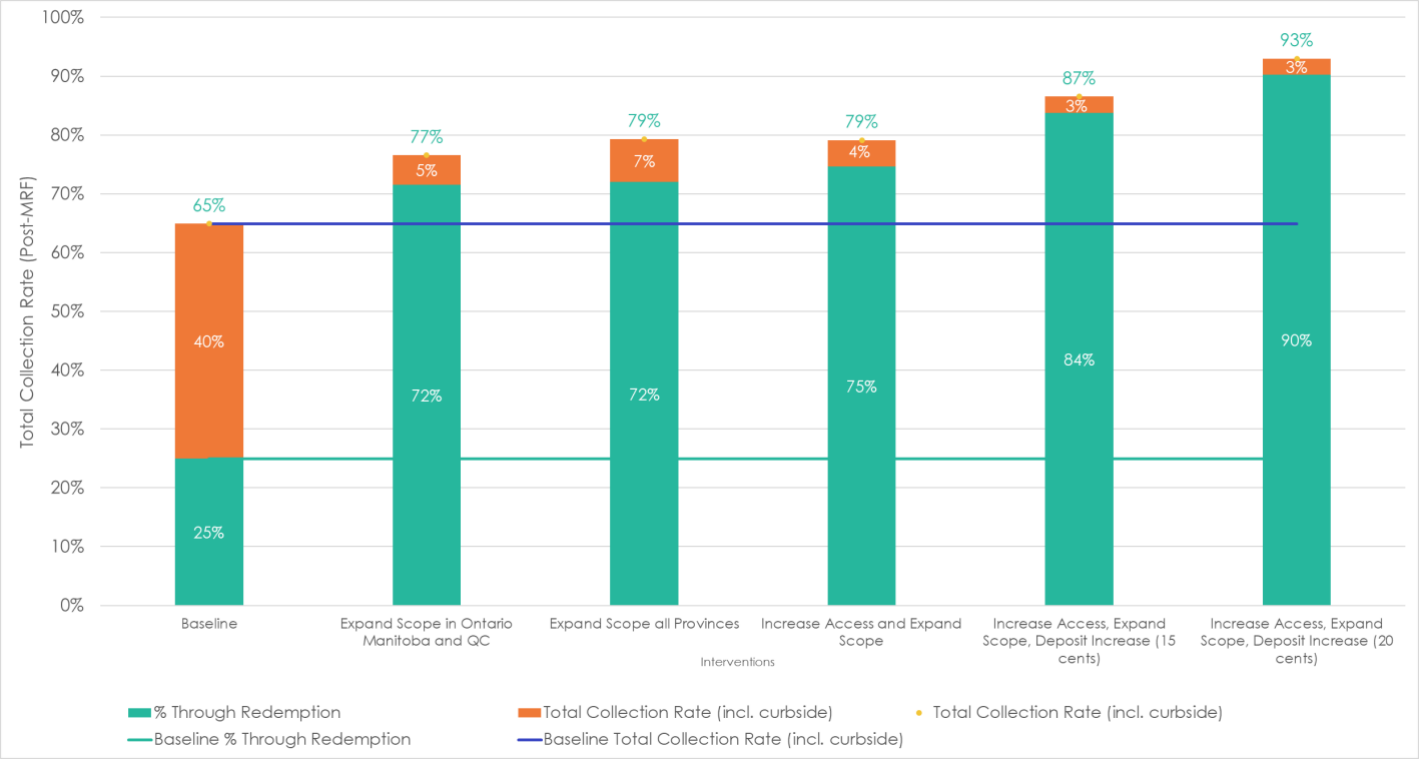


Figure 22 shows the relative impact of the different opportunities compared to baseline and includes recovery through both DRS returns and curbside collection. Implementing all opportunities including a $0.20 CAD deposit level will increase total recovery by 28 percentage points.

Figure 22: Impact of Opportunities Compared to Baseline

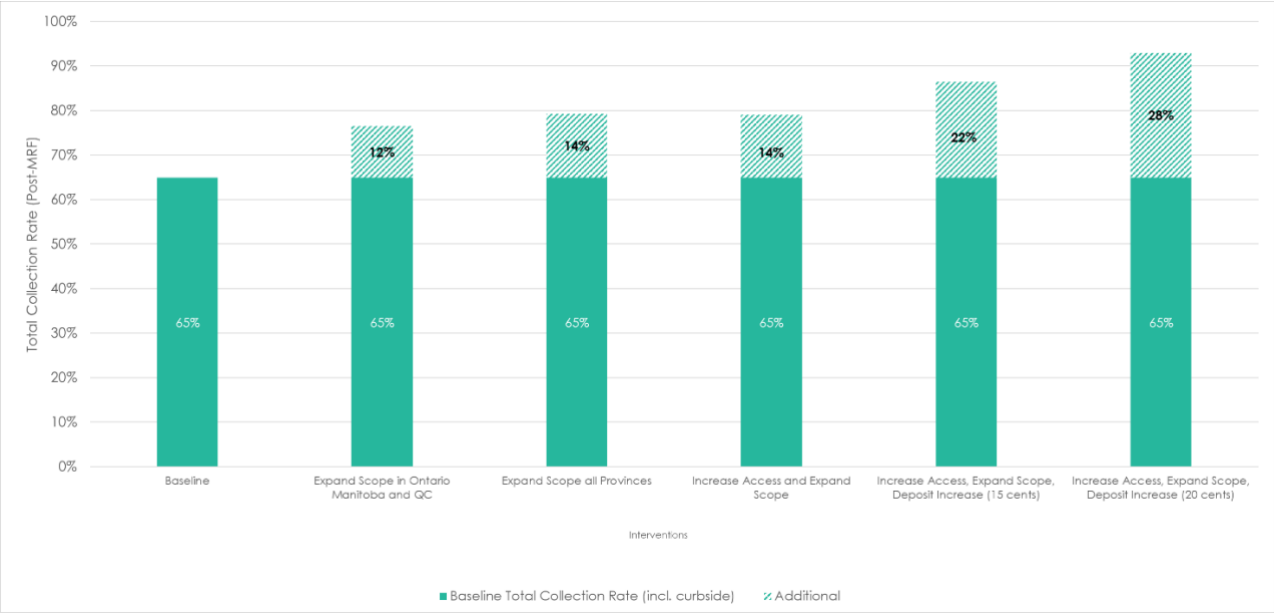
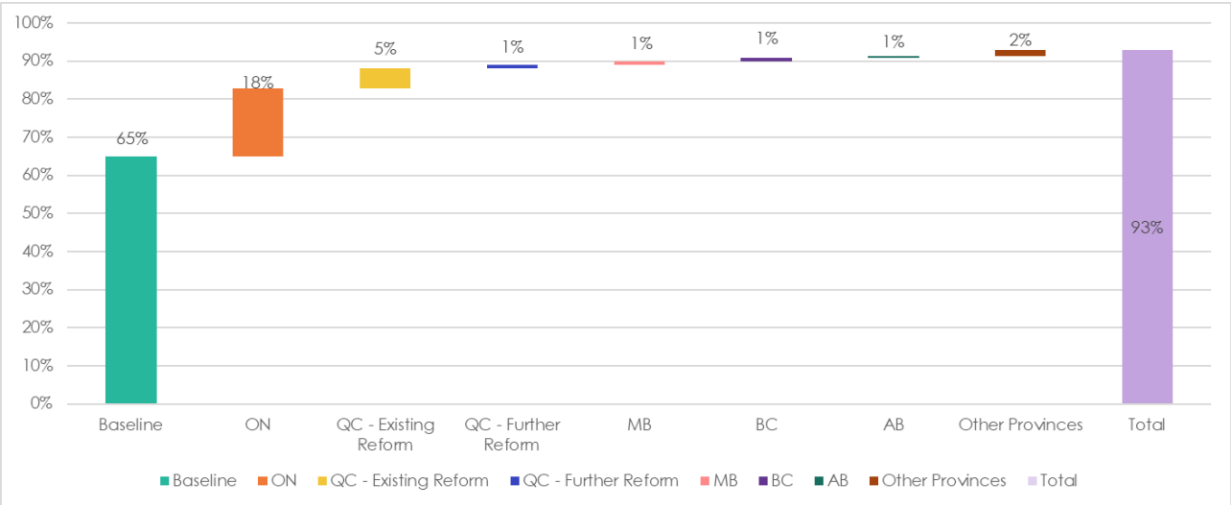


Figure 23 shows the estimated contribution of each province to the overall increase in the collection of plastic beverage containers in Canada if all opportunities were implemented including a $0.20 CAD deposit level. At baseline, Canada collected approximately 65% of plastic beverage containers that are in scope of this analysis. Implementing a best practice DRS in Ontario would contribute an additional 18 percentage points to the overall collection rate, which is by far the greatest contribution of any province. This is not surprising as Ontario is home to 53% of all uncollected plastic beverage containers in Canada. The currently planned reforms in Quebec are estimated to contribute 5 percentage points to the total with additional reforms adding an additional 1 percentage point. Manitoba, Alberta, and British Columbia would contribute approximately 1 percentage point each and all other provinces combined would contribute an additional 2 percentage points.

Figure 23: Estimated Contribution of Each Province to Overall Increase in Collection

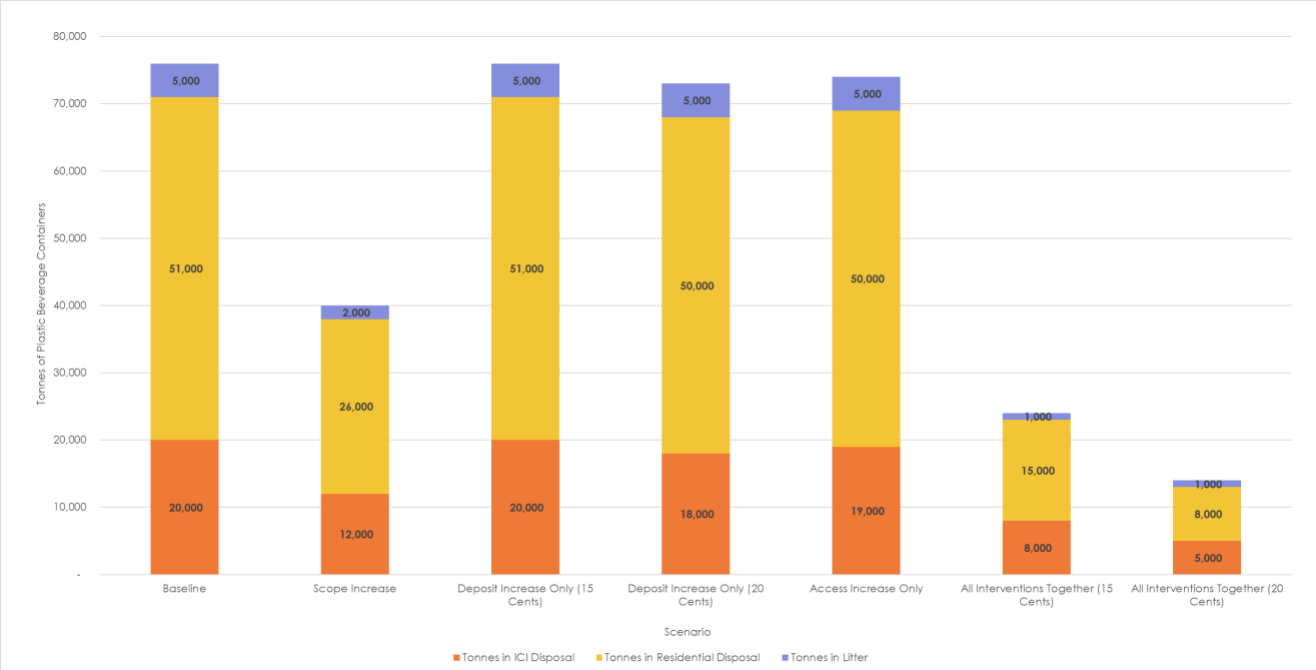


5.2.2.1 National Unrecovered Beverage Containers

Figure 24 shows the estimated volume and most likely sources of unrecovered plastic beverage containers in Canada. At baseline, 20,000 tonnes are estimated to be disposed of in garbage by the ICI sector, 51,000 tonnes are estimated to be disposed of in garbage by residential generators, and 5,000 tonnes are estimated to end up as litter.

The figure shows the potential impact of implementing the opportunities described in the previous section and shows how the volume of unrecovered containers could be reduced. If all opportunities are implemented including a $0.20 CAD deposit, then 5,000 tonnes of plastic beverage containers are estimated to be disposed of in garbage by ICI generators, 8,000 tonnes estimated to be disposed of in garbage by residential generators, and 1,000 tonnes are estimated to end up as litter.

Figure 24: Estimated Volume of Unrecovered Plastic Beverage Containers in Canada



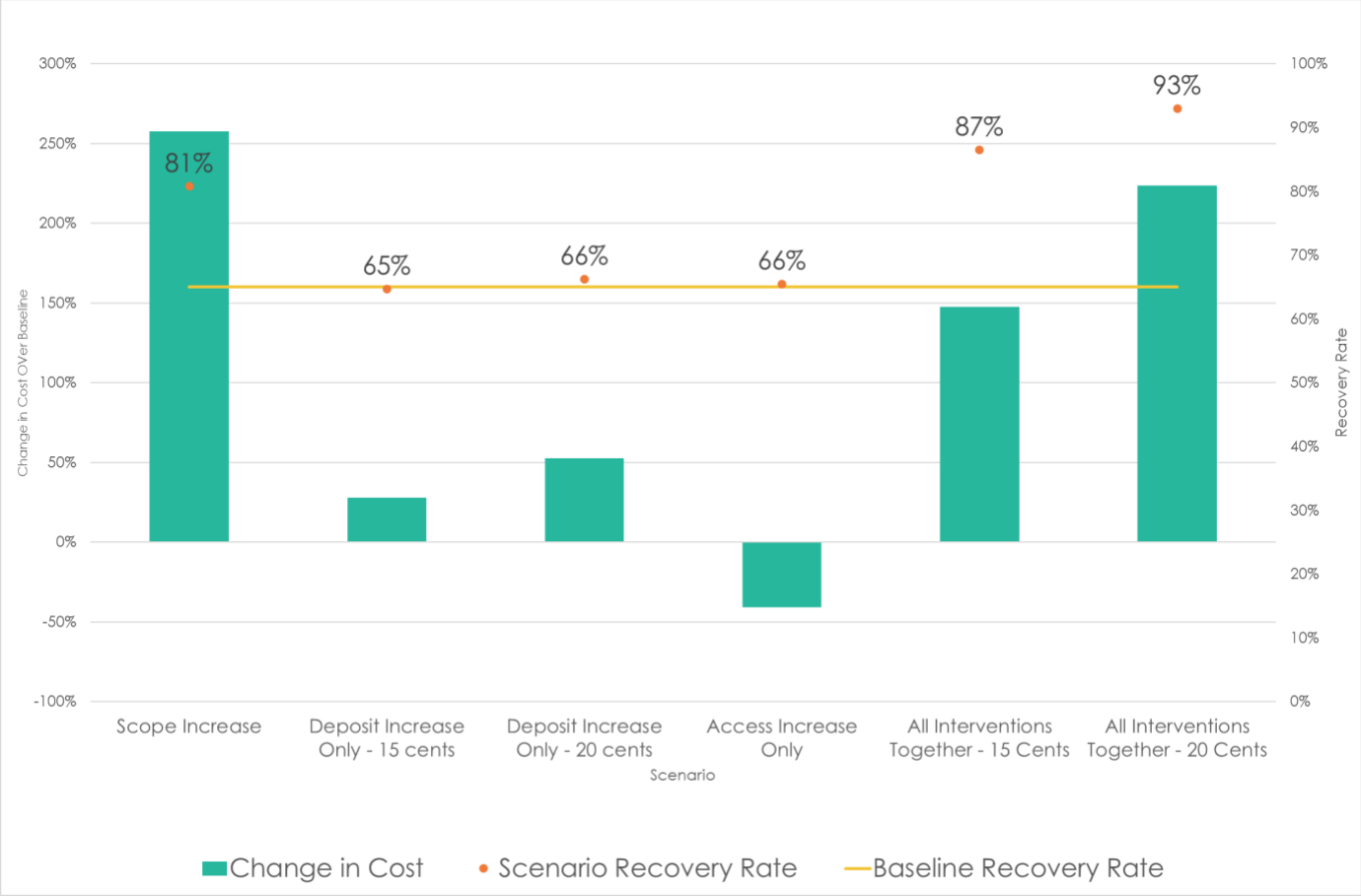
5.2.3 Estimated Cost of Implementing Primary Opportunities

Collecting more beverage containers in existing DRSs, as well as establishing new DRS programs, will require investment and costs into the system infrastructure. These costs can vary depending on the type of program instituted. More manual based collections are generally higher on a cost per container basis, whereas automated systems (e.g., RVMs, automated sorting) require upfront capital expenditure, but are more cost effective when there is enough volume collected, because they are not as labour intensive.

Costs will depend on whether the systems in place are the same but collect more containers or have additional infrastructure, which results in new pathways for beverage containers to be returned. For example, under a system with full access, the most likely way to achieve this access is to add additional retail return points. In a system that might only have depots currently, this would be a new pathway for containers to be returned, and thus have a different cost per container.

The cost changes over the baseline of each scenario is shown in Figure 25, along with the total collection rate of each scenario. The figure shows the relative cost of implementing different opportunities compared to the baseline 2022 cost. All costs are the national costs of the DRS programs only and do not include the curbside collection costs.

Figure 25: Estimated Cost and Performance Changes



Source: Data is from existing cost per container data from published Canadian annual reports, Interviews with RecycleNB, Eunomia modelling.

Scope Increase

Under this scenario, new deposit programs are established in provinces which did not have them before. This adds costs to the system for adding infrastructure, labour and the system support needed for a new deposit program. This scenario also does not have stipulations for access increases, meaning that the assumed programs are depot based, and thus more expensive per container. For this reason, this scenario sees the greatest cost over baseline as it has a 250% increase in costs. The collection rate of this scenario is 81%.

Deposit Increase Only – $0.15 and $.20 CAD

Under this scenario, there are no new programs established. There is an increase in return rate in programs which already exist, however it is minor at the national level. For this reason, the cost increase is only around 25% and 50% for the $0.15 and $0.20 CAD scenarios, respectively. The performance changes less than a

percentage point over the baseline at the national level, as it rounds to 65% for the 15 cent deposit and 66% for the cent deposit scenarios.

Accessibility Increase

The accessibility increase only scenario assumes that provinces establish some automated retail collection for their programs. This would be in addition to the depot networks which are already set up. Establishing an automated retail network can result in cost savings per returned container by reducing the manual labor needed and the number of vehicle trips needed, as containers will be compacted. This scenario therefore sees a cost decrease over baseline of around 45%. The return rate only increases to 65%, however.

All Interventions Together – $0.15 and $0.20 CAD

Under these comprehensive scenarios, the cost impacts from the previous three initiatives are combined. The $0.15 cent scenario sees a cost increase of 150% over baseline, and the collection rate jumps from 65% to 87%. Under the $0.20 cent scenario. Costs increase by 225%, and the overall collection rate increases to 93%. While most costly, the scope increase lever also adds the greatest increase to collection rate of the initiatives. The collection rate does not reach 90% without all three initiatives combined together.

5.2.4 Secondary Opportunities

Secondary opportunities are those that may not have as great of an impact, or are those that are more challenging to include in a quantitative analysis due to limited data availability, but could support additional recovery of plastic beverage containers. These may include:

- Targeted collection and outreach for containers from the ICI sector (including schools, institutions, hotels, restaurants, trade or construction sites, etc.)
- Targeted collection and partnerships with municipalities for public space / event collection
- Legislated collection / recovery targets
- Greater outreach / promotion and education to consumers
- Improved convenience such as offering both cashless and cash refunds, online accounts
- Examining program models - industry-led models can reinvest surplus funds into program improvements which is not done with government-led programs.

Primary opportunity analysis shows that implementing the primary barriers across Canadian provinces are potentially enough to reach a 90% recovery rate for plastic beverage containers. If after implementing the primary opportunities, a 90% recovery is not yet reached then system operators can further identify where unrecovered containers may be to implement the correct secondary opportunity.

5.3 Jurisdictional Overview of Barriers and Opportunities

The following section presents an overview of the barriers and opportunities in each province and territory, along with the estimated impact of implementing the primary opportunities described above .

5.3.1 British Columbia

The BC program includes many of the best practice factors discussed in Section 4 of this report, including a broad scope of beverage containers included, cash and cashless refund payment options, infrastructure for on-the-go collection, comprehensive education and outreach campaigns, and a hybrid return system including multiple return point types (R2R, express and go, and depot) and locations.

Primary Barriers

The primary remaining barrier identified in the BC program is a low deposit/refund level compared to best practice. An additional barrier may be an accessibility rate that is slightly less than best practice as identified in Section 4, with potential improvements in terms of the number of return points.

Deposit Level

British Columbia recently transitioned to a uniform deposit/refund level of $0.10 CAD for all container types and sizes. Prior to this transition, plastic containers over 1 liter had a higher deposit level of $0.20 CAD, the return rate was 85.6%. In 2021, the first full year with the lower uniform $0.10 CAD deposit, the return rate dropped to 79.9%. This 5.7 percentage point drop was greater than the 1.5 percentage point drop for plastic containers under 1L, showing the lower deposit level may have had greater influence on the return rate drop than other external factors such as the COVID-19 pandemic. The $0.10 CAD deposit level is similar to other provinces in Canada but lower than best practice standard of at least $0.15 CADor more.

Accessibility Across Return Network

BC's accessibility (number of return points per population) is better than most other DRS programs in Canada with 163 depots, 2 Drop & Go facilities, 16 express unstaffed facilities, and 455 return-to-retail (R2R) locations serviced by Encorp Pacific. There are approximately 1,000 additional retailers that accept beverage containers that they sell in accordance with regulatory requirements; these retailers are not serviced by Encorp Pacific., but rather by a contracted commercial recycler or hauler, or in some cases, by the depots themselves and are therefore not counted in Encorp's official numbers of serviced return points. Approximately 5% of returns come through these smaller retail outlets. [110]

Encorp Pacific's consumer survey results indicate that convenience from drop & go systems, and not having to wait in line are extremely important to maintain consumer willingness to return containers. The most recent annual report showed that 81% of consumers indicated that depots were the preferred return locations compared to 20% that prefer retail locations.[111] Retail locations make up the largest share of return locations and according to the BC Recycling Regulation, retailers are required to accept the return of used containers of the same brand and size of beverage container that the retailer sells, up to 24 containers per person per day. This may limit the number and type of containers consumers can return at these locations. When including all return locations serviced by Encorp Pacific and small retailers not serviced by Encorp, there are 3,373 people per return point.

The BC Ministry of Environment and Climate Change Strategy requires all EPR programs to provide "reasonable access" to return locations. Encorp Pacific has established accessibility standards in its program

[110] Encorp Pacific, 2006 Stewardship Plan. Accessible at Microsoft Word - 1_Stewardship Plan 2006 November07consolidation_FINAL0308.doc (return-it.ca)

[111] https://ar.return-it.ca/ar2022/pdf/Return-It_2022_Annual_Report.pdf

plan, including a minimum overall percent of population access to a return point, drive time targets for urban and rural areas, and number of return points within a certain distance to urban consumers and rural consumers. According to Encorp Pacific's 15km urban standard and 60km rural standard, 99% of the population has "reasonable access" to a return point. However, the current standard does not meet the international best practice for DRS accessibility, outlined in Section 4, which is a 3 km distance in urban areas and 8 km distance in rural areas or a 10 minute drive time. The B.C. Ministry of Environment and Climate Change is currently developing a framework for measuring reasonable access in the province, which may update the definition or a requirement to measure "reasonable access".

Primary Opportunities

Increase Deposit/Refund Level

Increase the deposit/refund level to a minimum of $0.15 CAD for beverage containers, which is recommended best practice level for achieving 90% recovery.

Increase Accessibility

Encorp Pacific may consider increasing the return network of convenient and accessible serviced locations that align with best practice. To reach 1,000 people per return point, approximately 3,300 additional return locations would be required. This could be accomplished through a combination of return to retail locations, depots, or unstaffed Express & Go locations at other public locations such as schools, libraries, and parks.

Impact of Implementing Primary Opportunities

Eunomia's baseline scenario shows the return rate for plastic rigid containers in BC's DRS is estimated to be 72% and with curbside recovery of these containers included, the total recovery rate is estimated to be 85%. Approximately 78% of this total is managed through Encorp Pacific, this includes some material that is collected by curbside residential and from ICI . In Figure 26, this amount is included as curbside recovery (primarily because they were collected in this manner) which is why the DRS return rate is 72% rather than 78%.

The analysis shows that if all opportunities are implemented in BC, the return rate of rigid plastic containers could reach 88% with a total recovery rate of 93% including containers collected curbside.

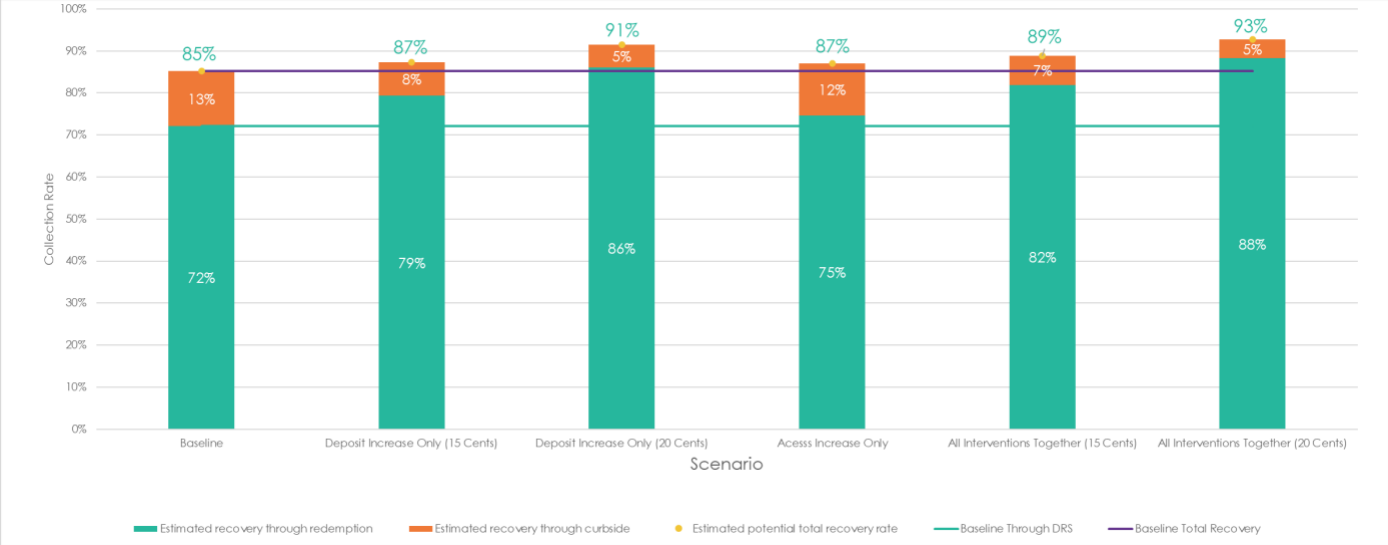
Increase Deposit Level: If the deposit is increased to $0.15 CAD, then the DRS return rate for rigid plastic containers is estimated to be 79%, and with the amount estimated to be collected curbside added in, the total collection of rigid plastic beverage containers is estimated to be 87%. If the deposit is increased to $0.20 CAD then the DRS return rate for rigid plastic containers is estimated to be 86%, and with the amount estimated to be collected curbside added in, the total collection of rigid plastic beverage containers is estimated to be 91%.

Increase Accessibility: If the accessibility of the return network is increased to the international best practice level, then the return rate is estimated to be 75% and the total collection of plastic beverage containers when including curbside is estimated to be 87%.

Implement Both Primary Opportunities: If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.15 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 82% and the total collection of plastic beverage containers when including curbside is estimated to be 89%.

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.20 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 89% and the total collection of plastic beverage containers when including curbside is estimated to be 93%.

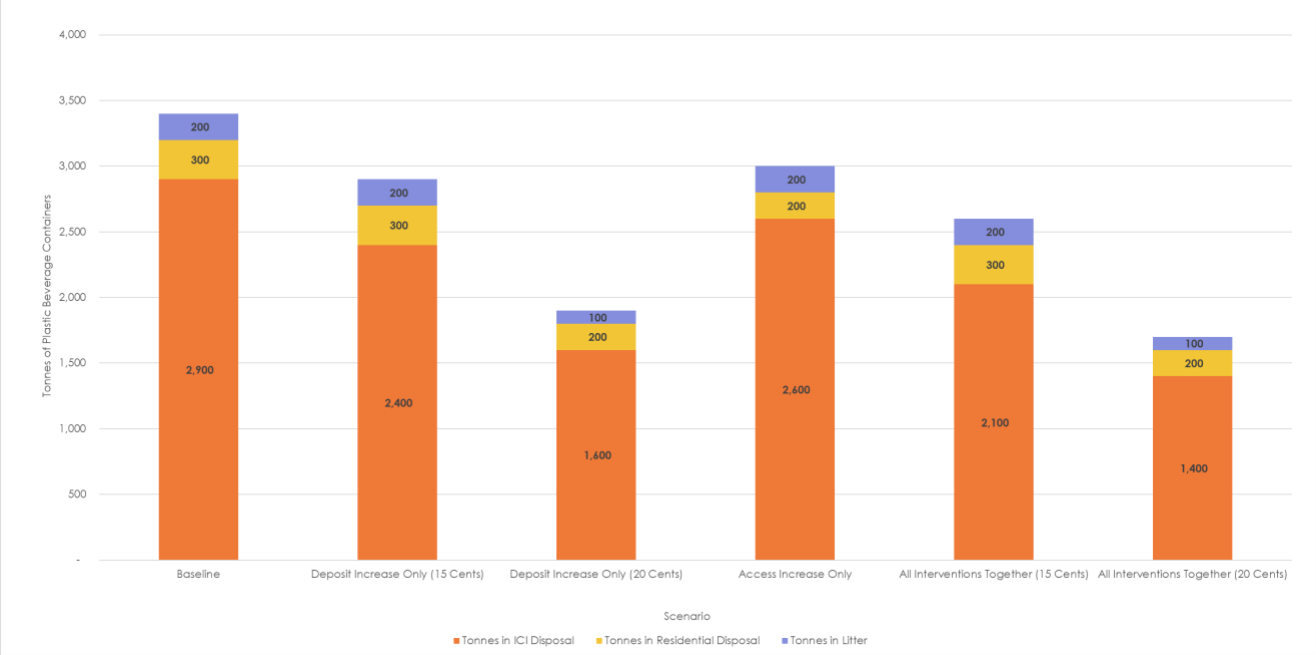
Figure 26: Estimated Impact of Implementing Primary Opportunities in British Columbia



Unrecovered Plastic Beverage Containers

Figure 27 shows the estimated volume and source of unrecovered plastic beverage containers in BC. At baseline, an estimated 29,000 tonnes are disposed of in garbage by ICI generators, an estimated 300 tonnes are disposed of in garbage by residential generators, and an estimated 200 tonnes end up as litter. If all opportunities are implemented including a $0.20 CAD deposit, then this reduces the estimated amount disposed of in garbage by 1,300 tonnes for the ICI sector, 100 tonnes by the residential sector, and 100 tonnes as litter.

Figure 27: Estimated Volume of Unrecovered Plastic Beverage Containers in British Columbia after Implementation of Opportunities



5.3.2 Alberta

Primary Barriers

Deposit Level

Plastic beverage containers in Alberta under 1L have a deposit of $0.10 CAD and containers over 1L have a deposit of $0.25 CAD. This lower deposit level for smaller containers represents more than 80% of plastic beverage containers, falls short of best practice level and constitutes the primary barrier to reaching 90% collection. Historically in Alberta, larger plastic containers with a higher deposit are returned at rates approximately 10 percentage points higher than smaller containers. They have reached a 90% return rate in six of the last ten years, demonstrating the benefit of a higher deposit level.

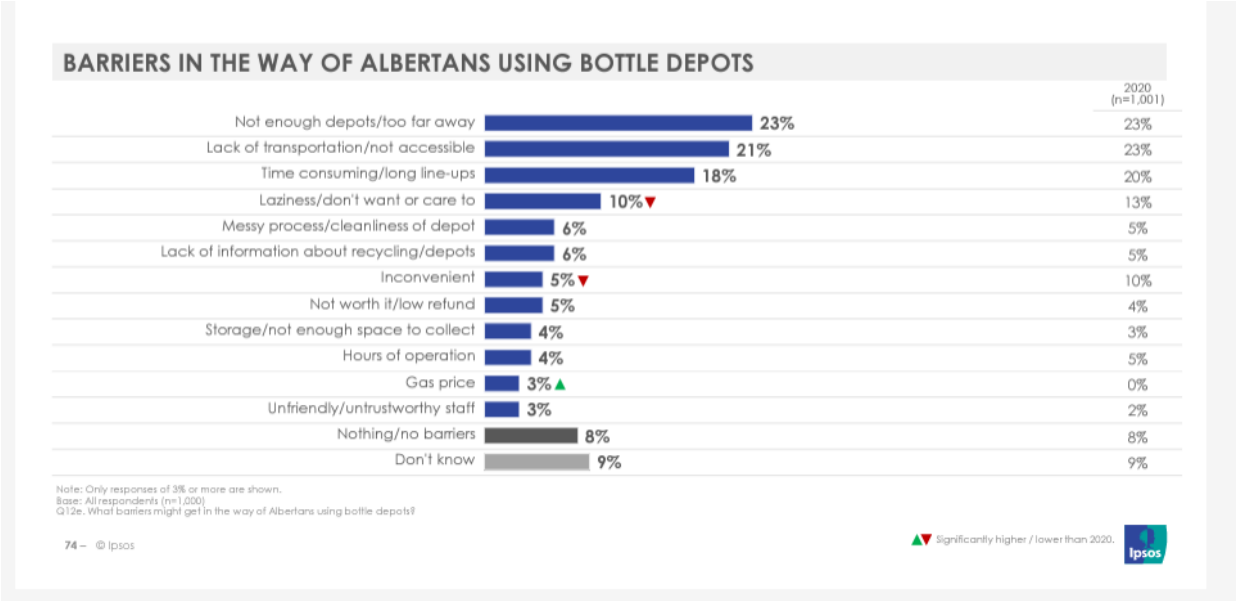
Limited Accessibility of Return Network

Accessibility is a barrier in the Alberta program. Based on the number of return points there are approximately 22,000 people per return point, which is significantly higher than the best practice level of 1 return point per 1,000 people. In addition, there are only depot return points, no express drops or R2R options. According to a 2020 BCMB survey of Albertans ,"among households that infrequently return containers (less than every couple of months), the number one reason for not returning beverage containers more often is inconvenience (58%)"[112]. Additionally, 55% of Albertans indicated that 10 minutes or less is a reasonable drive time to return containers, but only 48% of those surveys indicated their drive time was 10 minutes or less. Overall, 63% of the population is very satisfied with the convenience of their return location and 59% are very satisfied with the waiting time to be served. There is growing interest in Alberta for

[112] https://www.bcmb.ab.ca/uploads/source/Surveys/2022.05.16.BCMB.2022.Survey.of.Albertans.REPORT.pdf

enhanced convenience in services such as drop and go, which would enable consumers to not have to wait in lines and have their refund deposited into an online account. These survey responses show that the overall accessibility and convenience of the return network is not meeting best practice standard and could be limiting higher in returns in Alberta.

Figure 28: Barriers to Returns Identified by Consumers in Alberta (2020)



Primary Opportunities

Increase Deposit/Refund Level

Increase the deposit/refund level to a minimum of $0.15 CAD on beverage containers is recommended best practice level for achieving 90% recovery. Since the deposit level for larger containers is already at $0.25, this deposit level was unchanged for this analysis.

Increase Accessibility

To improve accessibility, Alberta can also expand its return network of convenient and accessible locations in line with best practice standard. This requires both more return locations and a diversity of location types, including ones where consumers can easily drop off containers without needing to wait in line. To reach 1,000 people per return point, approximately 4,100 additional return locations are required. This could be accomplished through a combination of return to retail (either staffed or unstaffed), depots, and placing unstaffed locations such as Express & Go in public locations.

Impact of Implementing Primary Opportunities

Eunomia's baseline scenario shows the DRS return rate in Alberta for rigid plastic containers only is estimated to be 79%, and with curbside returns included the total recovery rate is estimated to be 89%. If all primary opportunities to increase recovery are implemented, the return rate is estimated to be 92% and the total collection rate when also including curbside is estimated to be 94%.

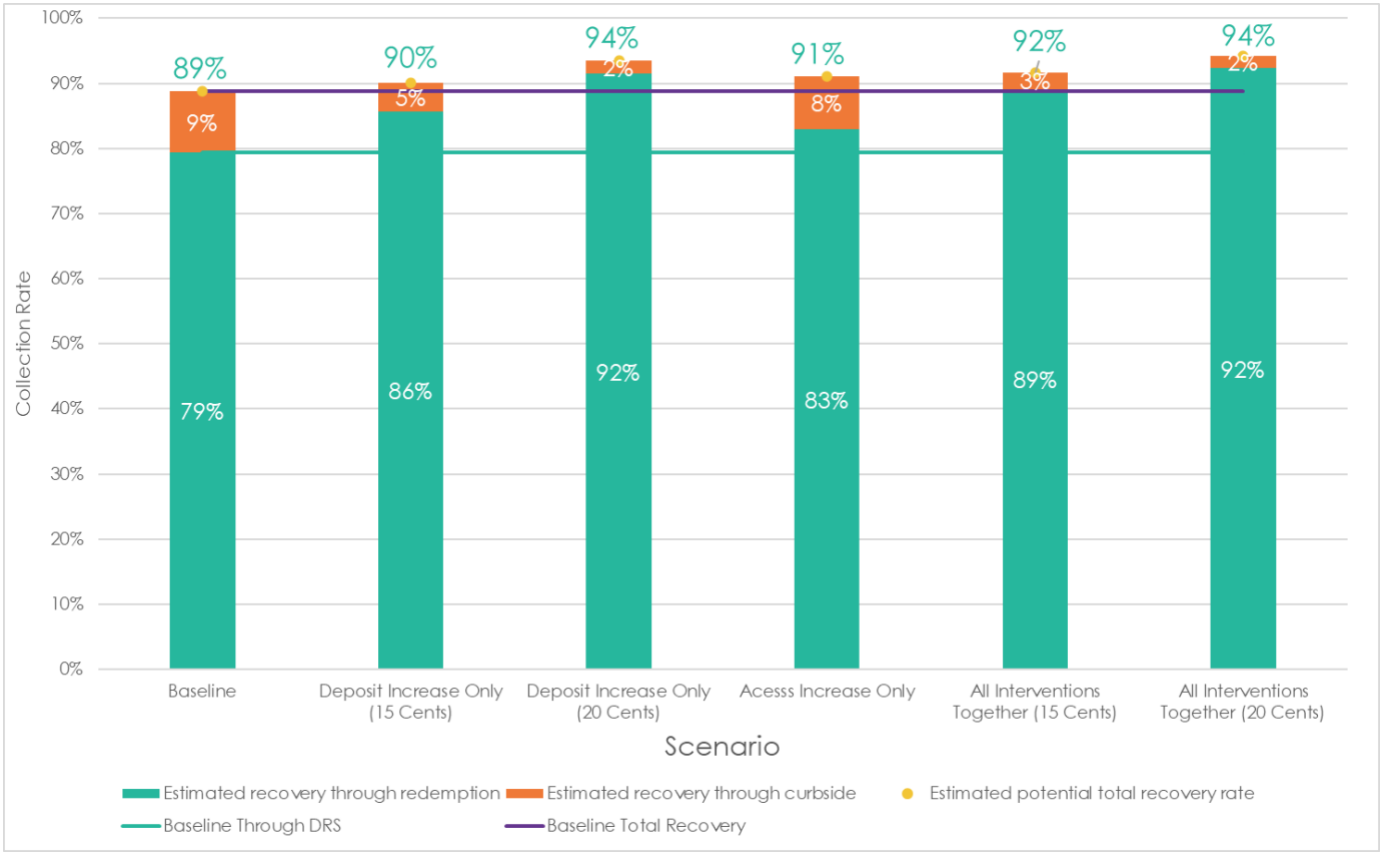
Increase Deposit Level: If the deposit is increased to a minimum of $0.15 CAD then the DRS return rate for rigid plastic containers is estimated to be 86%; with estimated containers collected curbside added in the total collection of plastic beverage containers is estimated to be 90%. If the deposit is increased to a minimum of $0.20 CAD, then the DRS return rate for rigid plastic containers is estimated to be 92%; with the estimated containers curbside collected curbside added in the total collection of plastic beverage containers could reach up to 94%.

Increase Accessibility: If the accessibility of the return network is increased to best practice levels, then the DRS return rate is estimated to be 83% and the total collection of plastic beverage containers when including curbside is estimated to be 91%.

Implement Both Primary Opportunities: If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.15 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 89% and the total collection of plastic beverage containers when including curbside is estimated to be 92%.

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.20 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 92% and the total collection of plastic beverage containers when including curbside is estimated to be 94%.

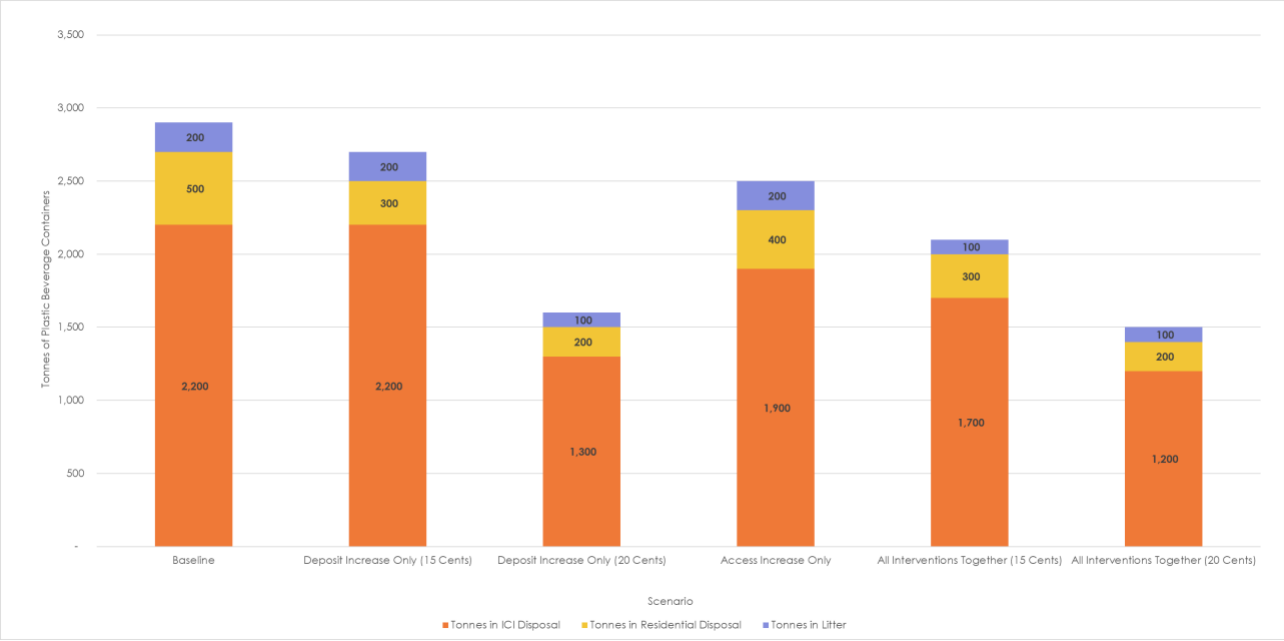
Figure 29: Estimated Impact of Implementing Primary Opportunities in Alberta



Unrecovered Plastic Beverage Containers

Figure 30 shows the estimated volume and source of unrecovered plastic beverage containers in Alberta. At baseline, an estimated 22,000 tonnes are disposed of in garbage by ICI generators, 500 tonnes are estimated to be disposed of by residential generators, and an estimated 200 tonnes end up as litter. If all opportunities are implemented, including a $0.20 CAD deposit, then this could be reduced by an estimated 1,200 tonnes in the ICI sector, 200 tonnes by the residential sector, and 100 tonnes as litter.

Figure 30: Estimated Volume of Unrecovered Plastic Beverage Containers in Alberta after Implementation of Opportunities



5.3.3 Quebec

Barriers Pre Modernization

Program Scope

In Quebec's pre-modernized DRS, the scope of covered beverages was limited to beer, carbonated soft drinks, and energy drinks. Only 14% of rigid plastic beverage container sales fell within this scope, leaving approximately 40,300 tonnes of rigid non-alcoholic containers not included in the DRS. This limited scope is considered to be a barrier to achieving higher recovery in the DRS.

Deposit Level

Before modernization, the deposit/refund value for rigid plastic containers was $0.05 CAD. A 2016 Quebec study found that at this level, approximately 54% of consumers indicated that they always returned their containers. The survey of consumers asked about frequency of returns if the deposit would increase to $0.10

CAD, and 63% of respondents said they would always return containers, 22% said they would return containers more often, and 14% said they would not change their habits.[113] The low deposit level has been increased to a deposit/refund value of $0.10 CAD under the new modernized DRS beginning November 2023. However, this level is still lower than recommended best practice of $0.15 CAD minimum to incentivize potentially higher returns.

Accessibility

Under the pre-modernization system, Quebec's system was 100% return to retail with high accessibility in terms of population per return point. However, consumer surveys indicated that there were challenges with this model, including problems with the equipment used to recover the containers. RVMs would reject some eligible containers, were often full, or out of order. Consumers reported having to make frequent trips to return containers due to long wait times at retailers, as no bulk drop-off options were available. In addition, a lack of return infrastructure for out-of-home consumption of beverages on-the-go was cited as a key challenge in the 2021 survey.[114]

Barriers Post Modernization

The modernization of Quebec's DRS raises deposit levels, expands the scope of covered beverage containers to include many more rigid plastic containers, and sets accessibility standards. These improvements from the previous DRS aligns with best practice standards from high-performing jurisdictions to raise deposits, expand program scope, and improve accessibility with standardization. It should be noted that since these changes to the DRS are currently being implemented, there is no data yet on the impact of these changes on return rates.

Deposit Level

The modernized DRS includes an increase to the deposit levels to $0.10 CAD for rigid plastic beverage containers. This rate does not meet best practice to incentivize additional recovery potential in the range needed to reach return rates over 90%, which would be a minimum of $0.15 CAD.

Accessibility

Program information indicates that consumers would prefer a hybrid system with alternative return points that include some depots for large volume returns, which were not available in the pre-modernized system. A 2021 study of consumer preferences for the DRS found that the most important elements of the DRS to incentivize returns would be to have more drop-off locations, all return points accepting all deposit containers with locations close enough to home or usual shopping areas to be convenient, and the time to return containers should be 10 minutes or less.[115] Current information from the Government of Quebec indicates that for the 2025 year an additional 200 return points are set to open.[116]

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[113] SOM.ca. decembre 2016. "Étude sur la modernisation du système de consigne au Quebec: Rapport présenté à national

[114] Recyc-Quebec. mai 2021. "Perception des Québécois à l'égard de la modernization et de l'élargissement de la consigne." Etude réalisée et rédigée par SOM.

[115] Recyc-Quebec. mai 2021. "Perception des Québécois à l'égard de la modernization et de l'élargissement de la consigne." Etude réalisée et rédigée par SOM.

[116] Personal Communications with Sabrina Charron, Recyc-Quebec June 2024.

Opportunities Pre-Modernization

Scope

Quebec has expanded the scope of its deposit return scheme to include all ready-to-drink beverage containers ranging from 100 milliliters to 2 liters, regardless of whether they are made of plastic, glass, metal, fiber, or a combination of these materials. The expansions to the program scope will come into effect in 2025, when the province will have approximately 90% of its plastic beverage containers under deposit, including for the first-time dairy products as well as water and flavoured water beverages. Therefore, the program will cover a much broader array of beverage containers. There is likely little opportunity for further increasing scope beyond these plans, as the modernized DRS maximizes coverage of plastic beverage containers.

Accessibility

The modernized system has plans to transition to a hybrid model with returns possible at both retail and depot locations, providing flexibility in return options based on geography and population density in Quebec. Additionally, the modernized system mandates container collection services for on-site consumption establishments such as restaurants, bars, and hotels, as well as institutional food services.

Opportunities Post Modernization

Increase Deposit/Refund Level

Post-modernization the key opportunity remaining is to increase the deposit/refund level to a minimum of $0.15 CAD on beverage containers, which is recommended best practice level for achieving 90% recovery.

Impact of Implementing Opportunities

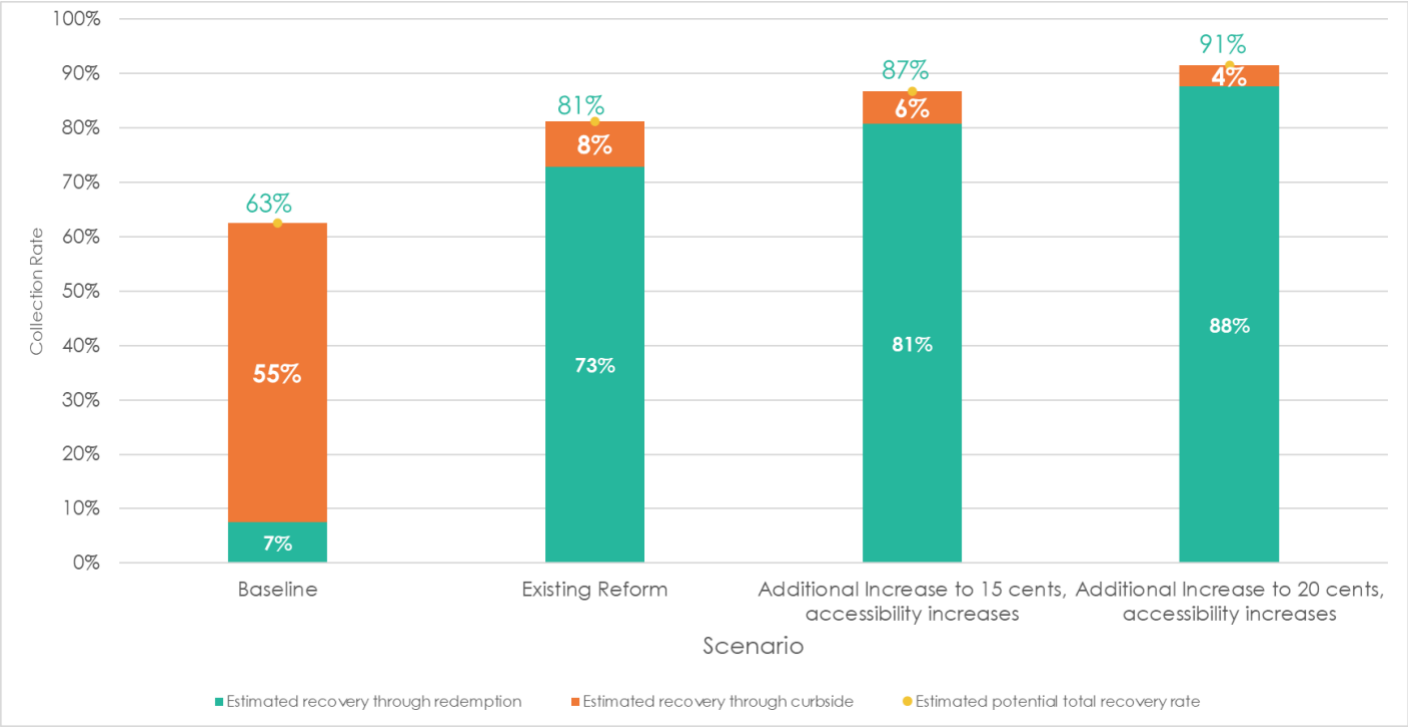
The first bar in the in Figure 31 shows the current pre-modernized program (2022). An estimated 7% of plastic beverage containers are returned through the DRS and in total 63% are collected curbside.

The second bar represents the planned modernization changes with expanded scope and increased deposit and resulting estimated impact. With current modernization plans, an estimated 73% of plastic beverage containers will be collected through the DRS and in total 81% will be collected when including curbside returns.

The third bar represents potential estimated recovery with an increased deposit level to $0.15 CAD and full implementation of the planned hybrid model with extensive accessibility improvements. If these additional measures are implemented, then an estimated 81% of plastic beverage containers will be collected through the DRS, and in total, an estimated 87% will be collected when including curbside.

The final bar on the right shows the recovery rate of plastic beverage containers if the province were to increase the deposit level even further to 20 cents. This would result in an estimated redemption rate of 88%, and a total recovery rate of 91%.

Figure 31: Estimated Impact of Existing Reform and Additional Reform in Quebec



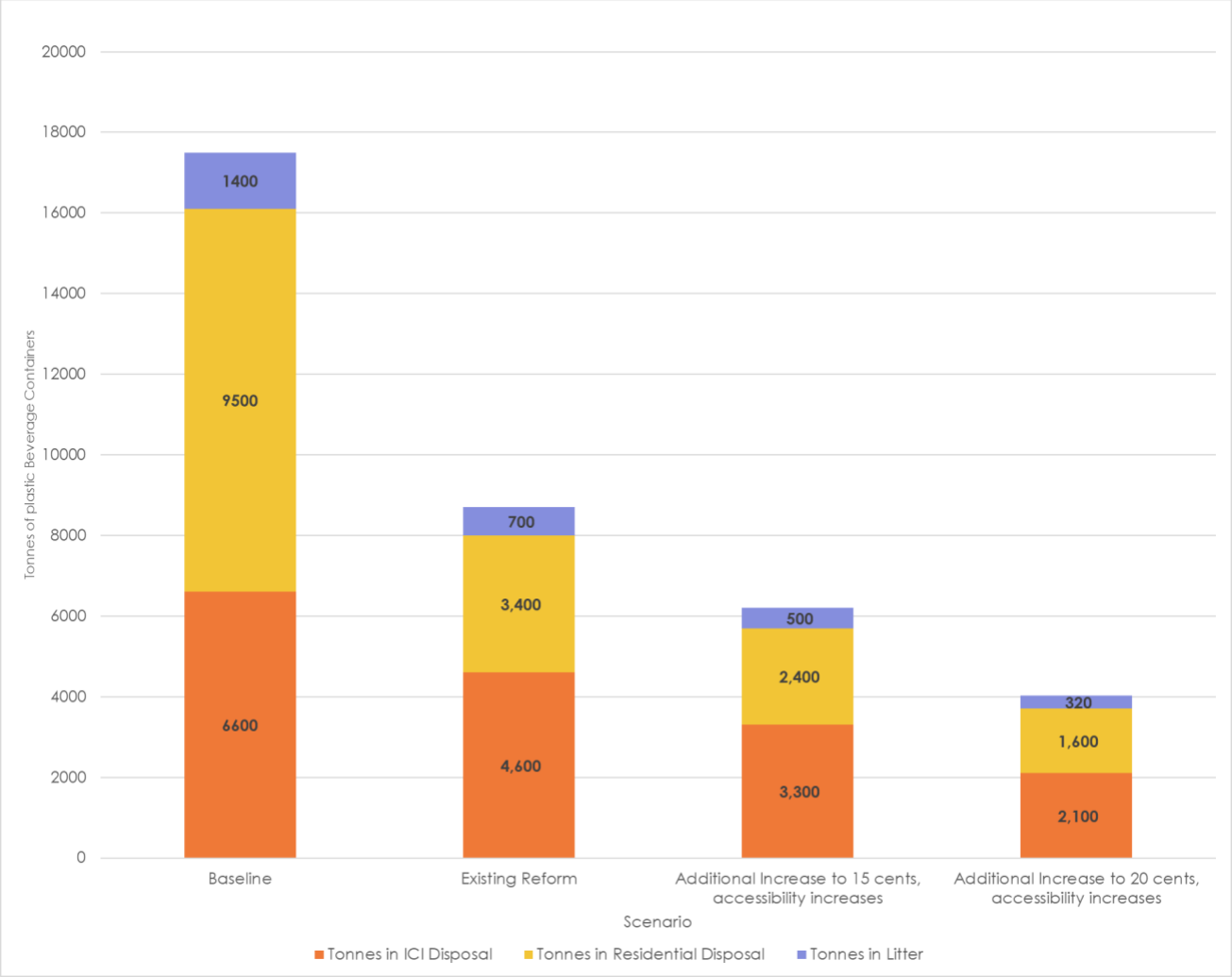
Unrecovered Plastic Beverage Containers

Figure 32 shows the estimated volume and source of unrecovered plastic beverage containers in Quebec. The pre-modernization baseline shows an estimated 6,600 tonnes are disposed of in garbage by ICI generators, an estimated 9,500 tonnes are disposed of in garbage by residential generators, and an estimated 1,400 tonnes end up as litter.

The estimated volume and source of unrecovered plastic beverage containers with the modernized DRS fully implemented shows this tonnage will be reduced to an estimated 4,600 tonnes disposed in garbage by ICI generators, 3,400 tonnes disposed in garbage by residential generators, and an estimated 700 tonnes end up as litter.

If all opportunities are implemented in addition to the planned the program expansion, including a $0.20 CAD deposit then the estimated unrecovered containers decreases to approximately 2,100 tonnes of plastic beverage containers disposed of in garbage by the ICI sector, 1,600 tonnes disposed in garbage by the residential sector, and 320 tonnes could end up as litter.

Figure 32: Estimated Volume of Unrecovered Plastic Beverage Containers in Quebec after Implementation of Opportunities



5.3.4 New Brunswick

Primary Barriers

Deposit Level

Although the deposit refund provided to consumers recently doubled from $0.05 CAD to $0.10 CAD per container, a $0.10 CAD refund– equivalent to around $0.07 USD - is still relatively low when compared to the minimum deposit charged in the top-performing deposit systems worldwide. When the amount of the refund isn't high enough, consumers are less encouraged to return them, flattening return rates.

Program Scope

New Brunswick's deposit regulations currently exclude beverages labelled as milk or milk substitutes as do other Atlantic provinces DRSs; this includes cow and other sources of milk, flavoured or not, as well as plant-based milk product alternatives that are fortified and a source of protein. According to an Auditor General report[117], the reason for their exclusion is the notion that milk is considered a staple food product and that by imposing a deposit on milk, the government would inhibit the ability of low-income residents to purchase milk "because of its increased cost." However, consumers would be getting the refund back from the deposit, so they would not be out of pocket, it would incentivize returns if more containers included in DRS. Not having these containers subject to a deposit not only creates an unlevel playing field for beverage producers, but also increases confusion amongst consumers. Decreasing this confusion was one of the reasons why the Saskatchewan Government decided to expand its system to milk in 2017. In a document explaining the changes to the system, [118] the Government stated that expanding the regulations to milk would "standardize the treatment of milk with other beverages, reduce confusion for consumers, retailers and producers, and enhance milk container diversion rates within the province." One reason why dairy containers have historically been excluded from deposit legislation in some jurisdictions is that they are often seen as presenting a hygiene risk, if containers are returned for recycling without being properly rinsed.[119] However, evidence from other systems that include milk suggest that such issues can be easily mitigated, and that as long as any transport containers are sealed and the containers are collected and processed quickly, hygiene impacts are negligible.[120]

Accessibility

Lack of accessibility and convenience have been identified as barriers to increased participation in New Brunswick's DRS, which up until April 2024 was operated as a depot-only redemption model. The number of redemption centres has consistently dropped over the years, from 108 in 1992 to 69 currently, which not only means there are fewer redemption points per person, but also that some people must travel further to return their containers. [121]

Research carried out by the former system operator over an eight-year period (2014-2022) confirmed that some consumers, especially in rural areas, do not have convenient opportunities to redeem their containers. Surveys undertaken have revealed that consumer fatigue with the program and redemption model in New Brunswick can be attributed, among other things, to "lack of convenience and expediency (limited number of redemption centres and inconvenient hours of operation)." [122]

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[117] Auditor General of New Brunswick. 2004. "Chapter 3 Department of the Environment and Local Government Beverage Containers Program." Accessed from: https://www.agnb-vgnb.ca/content/dam/agnb-vgnb/pdf/Reports-Rapports/2004v2/Chap3E.pdf

[118] Government of Saskatchewan. "2017 Amendments to The Environmental Management and Protection Act Regulations." Accessed from: https://sarm.ca/wp-content/uploads/2022/03/amendments-to-empa-regulations.pdf

[119] Scottish Government. "A Deposit Return Scheme for Scotland - Summary." Accessed from: https://www.gov.scot/binaries/content/documents/govscot/publications/consultation-paper/2018/08/deposit-return-scheme-scotland-summary/documents/00538955-pdf/00538955-pdf/govscot%3Adocument/?inline=true

[120] ibid.

[121] CBC News. 6 March 2024. "Some bottle exchange operators in N.B. are talking about shutting down." Accessed from: https://ca.news.yahoo.com/bottle-exchange-operators-n-b-214744710.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAKwfaokbdhzIV9_E4wnXy9W4lubV2dnjkld7q3jeqvai1JsCbIC-EmgFQYaQZmA6j27OeNevCxWMvqgLUs9WNbVXy7RAblABXiCDBYYJKzOovnOeyR-8oOfLtlCqtFQXRJeTXlzUdp7nR-R3XXT-hJvFuhC-HR2L_ftnKoldIPMl

[122] Encorp Atlantic Inc. 17 September 2018. "Encorp Atlantic's Research to Improve Container Recycling and Redemption Model." Accessed from: https://encorpatl.ca/encorp-atlantics-research-to-improve-container-recycling-and-redemption-model/

The new system operator, Encorp Atlantic as a non-profit organization, is already planning on addressing some of these barriers to make improvements to accessibility through implementation of express drop services, and new service standards for depots to meet. For example, under the new service agreements that redemption centres are required to sign, redemption centres must be open on Saturdays. [123] Encorp Atlantic is also considering adding drop and go return locations in retail parking lots, a type of return point that is considered best practice in high performing international DRSs.

Primary Opportunities

Increase Deposit/Refund Level

Increasing the deposit/refund level to a minimum of $0.15 CAD on beverage containers is recommended best practice level for achieving 90% recovery. On April 1, 2024, the refund level increased from $0.05 to $0.10 CAD when the system transitioned from a half-back to a full-back deposit program. Two weeks after the implementation of the full-back deposit program, one redemption centre reported experiencing double the volume of returned containers.[124] As of April 18, 2024, this centre was averaging 80,000 to 100,000 returned cans per week, compared to the 35,000 to 40,000 cans per week before the change. [125]

Despite this success, for some segments of the population, a 10-cent deposit may still not be sufficient motivation. According to the latest data available, the five best performing global deposit systems for PET bottles (Slovakia, Norway, Lithuania, Denmark, and Finland) [126] reached an average return rate for PET of 91.4% in 2023, and the *minimum* deposit values for PET containers in these jurisdictions ranges from $0.15 CAD to $0.30 CAD per container. Increasing the deposit to a minimum of $0.15 CAD could provide an even greater incentive for consumers to return their beverage containers for recycling.

Expand Scope

Although New Brunswick's program already includes most beverage and material types, expanding the scope to include all dairy and dairy substitute beverage containers is recommended to increase plastic containers recovered via DRS. While these containers may be accepted in the residential curbside system, having them part of the deposit system would increase the rate at which they are returned because of the financial incentive to do so. Several Canadian deposit programs that previously excluded milk – for example, British Columbia, Alberta, and Saskatchewan – made changes to their programs to include milk and dairy containers, as well as other plant-based alternatives, and these three programs are showing high performance in DRS recovery rates. Consumer surveys have shown that when more containers are added to a program's scope, it reduces confusion regarding which containers are accepted and more containers are returned overall.

The impact of expanding Alberta's program to milk in 2009 showed an increase in milk carton recycling rates from 22.5% to 61%, and an increase in plastic milk jugs from 61 per cent to 71%.[127] The dairy industry did not

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[123] Sweet, J. 6 March 2024. "Some bottle exchange operates in N.B. are talking about shutting down." Accessed from: https://www.cbc.ca/news/canada/new-brunswick/several-bottle-depots-consider-closure-1.7135499

[124] Butler, E. 18 April 2024. "Double the refunds means double the returns at Wheaton's All-in-One." Accessed from https://www.chmafm.com/welcome/double-the-refunds-means-double-the-returns-at-wheatons-all-in-one/

[125] Butler, E. 18 April 2024. "Double the refunds means double the returns at Wheaton's All-in-One." Accessed from https://www.chmafm.com/welcome/double-the-refunds-means-double-the-returns-at-wheatons-all-in-one/

[126] Reloop Platform. May 2024. "Fact sheet - Deposit return systems: How they perform." Accessed from: https://www.reloopplatform.org/resources/deposit-return-systems-how-they-perform/

[127] Nagel, J. 16 September 2011. "New push to add recycling deposits to milk." Accessed from: https://www.aldergrovestar.com/news/new-push-to-add-recycling-deposits-to-milk-2185584

report any impact to sales while Alberta cities saw curbside pickup and waste-handling costs drop. A press release published by the Government of Alberta at the time explains the government's reasoning for expanding the system, primarily to increase recycling rates for beverage containers in Alberta .[128]

Similarly, the Saskatchewan Government stated that although milk containers were previously included in the province's Multi-Material Recycling Program, higher deposit rates will provide an incentive for consumers to return their containers for refund, decrease confusion as more containers are redeemable, and increase return rates while diverting waste from landfills.[129]

Improve Convenience and Accessibility

There are several ways in which New Brunswick's deposit system could be made more convenient and accessible for consumers. These include installing bag drops at convenient shopping locations, requiring retailers to take back deposit-bearing containers, as well as installing reverse vending machines at retailers, in public spaces, or at existing depots.

New Brunswick's new system operator, Encorp Atlantic, is planning a number of changes to the deposit program to improve access and convenience to recycling of beverage containers. The new system operator also plans to enhance access to recycling for those living in remote and rural areas by possibly adding express recycling (drop and go) return locations. According to Encorp Atlantic's research and pilot projects, New Brunswick residents support this concept and would like to see it expanded.[130] With *Re-Express,* people returning empties in New Brunswick will be able to sign up online for a free account and drop off their empties at their convenience at any *Re-Express* location, without having to wait in line for a refund. According to Encorp's stewardship plan, it will explore the option of installing *Re-Express* drop-and-go self-serve kiosks inside redemption centre facilities and/or *Re-Express* drop-and-go stations outside redemption centres via the addition of bag-drop windows/facade retrofits or the installation of stand-alone units next to existing return locations and in other locations focussed on consumer convenience.[131]

In addition to improvements to the deposit system, since November 1, 2023, New Brunswick has introduced a new curbside recycling program operated by a PRO, which will further boost beverage container recycling. Historically, Encorp had developed a working relationship with government-funded Regional Service Commissions that provided curbside collection and sorting services for recyclable materials including deposit-bearing beverage containers. As noted in its stewardship plan[132], discussions are currently underway to expand this cooperation with the designated PRO, Circular Materials Atlantic.

Impact of Implementing Primary Opportunities

Eunomia's baseline calculations for rigid plastic containers shows the collection rate in New Brunswick to be at 74%. The vast majority of these, approximately 62%, are collected via DRS, while the remainder (~11%) is

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[128] Government of Alberta and Beverage Container Management Board. 28 May 2009. "Refund available for milk and liquid cream containers: New deposit fee in place beginning June 1." Accessed from: https://www.alberta.ca/release.cfm?xID=2607487D95DF5-DB6B-EAF4-AEF7F5CEF184438C

[129] Saskatchewan Government. "2017 Amendments to the Environmental Management and Protection Act Regulations." Accessed from: https://sarm.ca/wp-content/uploads/2022/03/amendments-to-empa-regulations.pdf

[130] Encorp. 2024. "Stewardship Plan - New Brunswick Beverage Containers Program. Submitted to Recycle NB - August 1, 2023. Finalized - January 30, 2024." Accessed from: https://www.recyclenb.com/static/site-content/files/management-plans/encorp-atlantic/encorp-stewardship-plan-to-recycle-nb-final.pdf

[131] Encorp. "Stewardship Plan – New Brunswick Beverage Containers Program: Submitted to Recycle NB, August 1, 2023. Finalized – January 30, 2024." https://www.recyclenb.com/static/site-content/files/management-plans/encorp-atlantic/encorp-stewardship-plan-to-recycle-nb-final.pdf

[132] Recycle NB, Stewardship Plan. Accessible at https://www.recyclenb.com/static/site-content/files/management-plans/encorp-atlantic/encorp-stewardship-plan-to-recycle-nb-final.pdf

collected through residential curbside programs. If all primary opportunities are implemented and the deposit rate is increased to $0.15 CAD, then the DRS return rate is estimated to increase to 82% and the total collection of plastic beverage containers including volume collected curbside is estimated to reach 84%. If all primary opportunities are implemented and the deposit rate is increased to $0.20 CAD, then the DRS return rate is estimated to increase to 88% and the total collection of plastic beverage containers including volume collected curbside is estimated to reach 90%.

Expand Scope: If the program scope is expanded to be in line with best practice systems by adding milk and milk-based products and plant based alternatives , then the return rate for plastic beverage containers collected via DRS is expected to increase from 62% to 67%. If curbside collected containers are counted, the total collection rate could increase to 77%.

Increase Deposit Level

If the deposit is increased to a minimum of $0.15 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 73%. When plastic beverage containers collected in the curbside system are added , then the total collection rate for plastic beverage containers in New Brunswick is estimated to increase to 77% under an increased deposit level.

If the deposit is increased to a minimum of $0.20 CAD, then the return rate for plastic beverage containers collected via DRS is estimated to increase to 79%. When plastic beverage containers collected in the curbside system are added , then the total collection rate for plastic beverage containers is estimated to increase to 82% under an increased deposit level.

Increase Accessibility

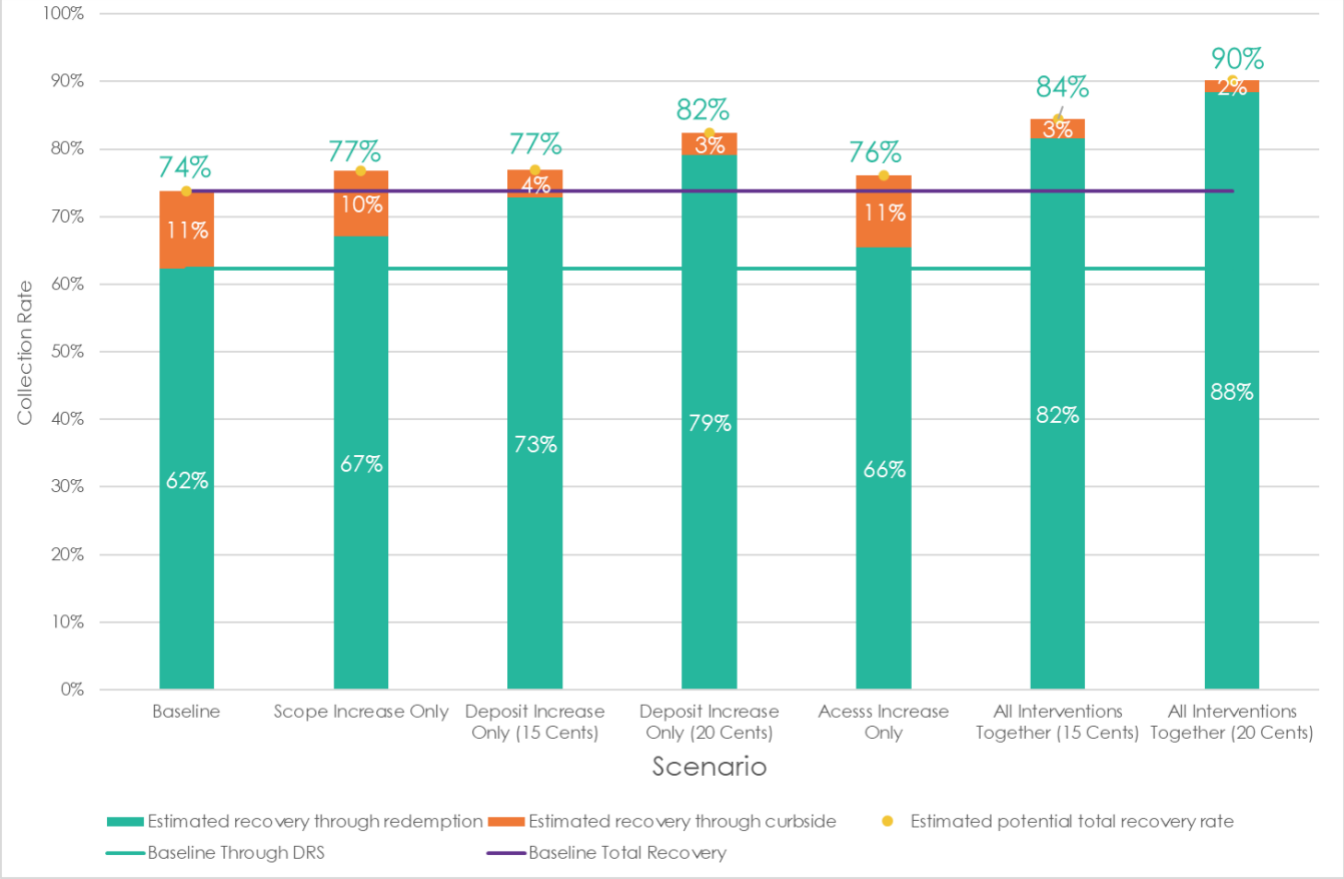
If the accessibility of the return network is increased to best practice levels, then the DRS return rate is estimated to be 66%, and the total collection of plastic beverage containers when including curbside is estimated to be 76%.

Implement All Primary Opportunities

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.15 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 82% and the total collection of plastic beverage containers when including curbside is estimated to be 84%.

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.20 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 88% and the total collection of plastic beverage containers when including curbside is estimated to be 90%.

Figure 33: Estimated Impact of Implementing Primary Opportunities in New Brunswick

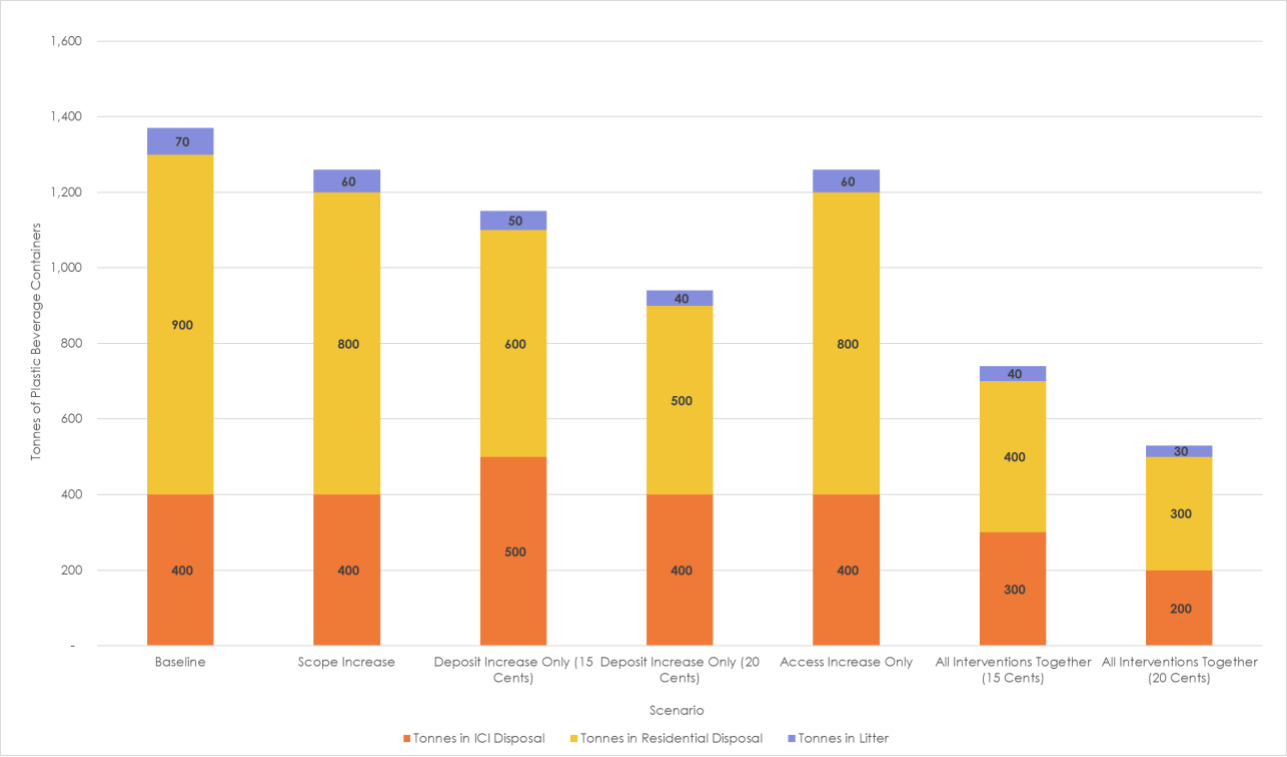


Unrecovered Plastic Beverage Containers

Figure 34 shows the estimated volume and source of unrecovered plastic beverage containers in New Brunswick. At baseline level, it is estimated that 400 tonnes are disposed in garbage by ICI generators, 900 tonnes are estimated to be disposed in garbage by residential generators, and approximately 70 tonnes end up as litter.

If all opportunities are implemented including a $0.20 CAD deposit, then this tonnage is decreased to an estimated 200 tonnes of plastic beverage containers disposed by ICI generators, 300 tonnes disposed by residential generators, and 30 tonnes would end up as litter.

Figure 34: Estimated Volume of Unrecovered Plastic Beverage Containers in New Brunswick after Implementation of Opportunities



5.3.5 Saskatchewan

Saskatchewan has a number of best practice elements in its high-performing DRS, including full program scope of plastic containers including milk, dairy beverages and their alternatives, as well as a targeted out of home recovery program that includes collection bins for schools, mobile collection for public events, and shared collection in public spaces for clip on beverage container holders for public waste bins. However, the low deposit level could be a barrier to increasing returns and a depot-only redemption network that does not meet accessibility best practice for the number of return points per population served.

Primary Barriers

Deposit Level

A key barrier in Saskatchewan's program is the low deposit/refund level ($0.10 CAD), which is less than recommended as best practice to incentivize returns. A secondary barrier that is related to the deposit/refund level in Saskatchewan's system is that the Government keeps revenue from unredeemed deposits, which is not best practice and reduces available funding for re-investment in the program such as establishing new return points, or new technologies to improve convenience.

Accessibility Network

Currently, Saskatchewan's program has one return point for approximately 16,700 residents. Improving accessibility such as additional return points is needed to align with best practice in high-performing systems, which is 1,000 people per return point. In addition, the type of return points are important considerations in designing an accessible redemption network, with more variety (i.e. a hybrid system) being recommended. Having a variety of types of return points accepting containers influences accessibility and volume of returns. Having a mix of different return options for all types of consumers (individuals, organizations, ICI), is also recommended for higher returns.

Primary Opportunities

Increase Deposit/Refund Level

Increasing the deposit/refund level to a minimum of $0.15 CAD on beverage containers, which is recommended best practice level for achieving 90% recovery.

Improve Accessibility: Number and Type of Return Points

Improving the number of return points per population closer to meeting best practice will help improve convenience for consumers as wells as municipal partners participating in the public space collection program, and the schools participating in the out of home recovery program. Given the low number of return points (measured by total population) and yet the fact that Saskatchewan has the highest return rates for plastic containers across all DRSs in Canada, it is likely that the high recoveries are due to the implementation of the following convenience elements to their program.

SARCAN has implemented the convenience of drop and go at every depot, and SARCAN uses online portals that provide environmental impact information for customers. Approximately 16% of the volume collected across the province is from the drop and go facilities, they now have 45,000 online account holders that use drop and go, with 12% being new users since drop and go was introduced recently. They also offer cashless returns, including e-transfers and PayPal payments as well as cash.

Impact of Implementing Primary Opportunities

Eunomia's baseline calculations for rigid plastic beverage containers shows the deposit return system return rate in Saskatchewan to be at 79%. When plastic beverage containers collected in the curbside system are added, the collection rate is 88%.

Increase Deposit Level

If the deposit is increased to a minimum of $0.15 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 85%. When plastic beverage containers collected in the curbside system are added to this number, then the total collection rate for plastic beverage containers in Saskatchewan is stagnates at 88%. If the deposit is increased to a minimum of $0.20 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 90%. When plastic beverage containers collected in the curbside system are added to this

number, then the total collection rate for plastic beverage containers in Saskatchewan is estimated to increase to 92% under an increased deposit level.

Increase Accessibility

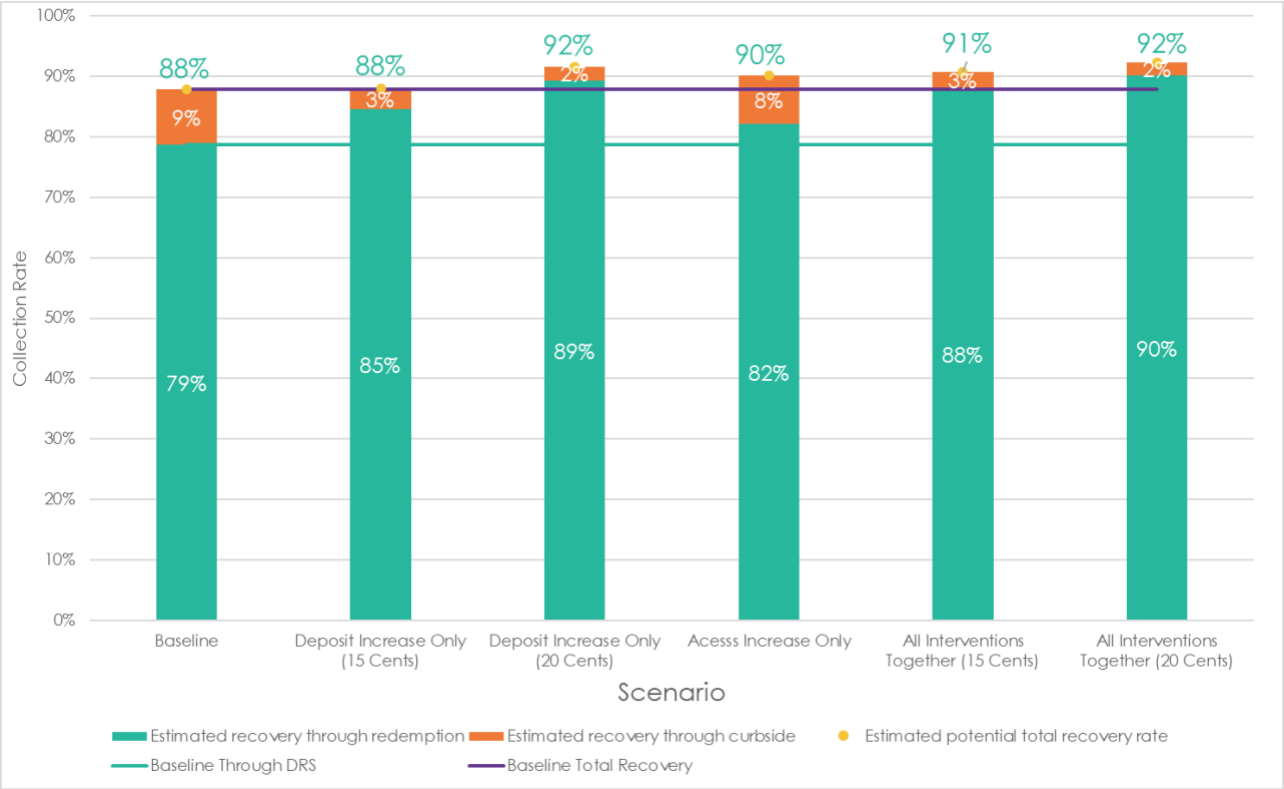
If the accessibility of the return network is increased to best practice levels, then the DRS return rate is estimated to be 82%, and the total collection of plastic beverage containers when including curbside is estimated to be 90%.

Implement All Primary Opportunities

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.15 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 88% and the total collection of plastic beverage containers when including curbside is estimated to be 91%.

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.20 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 90% and the total collection of plastic beverage containers when including curbside is estimated to be over 92%.

Figure 35: Estimated Impact of Implementing Primary Opportunities in Saskatchewan

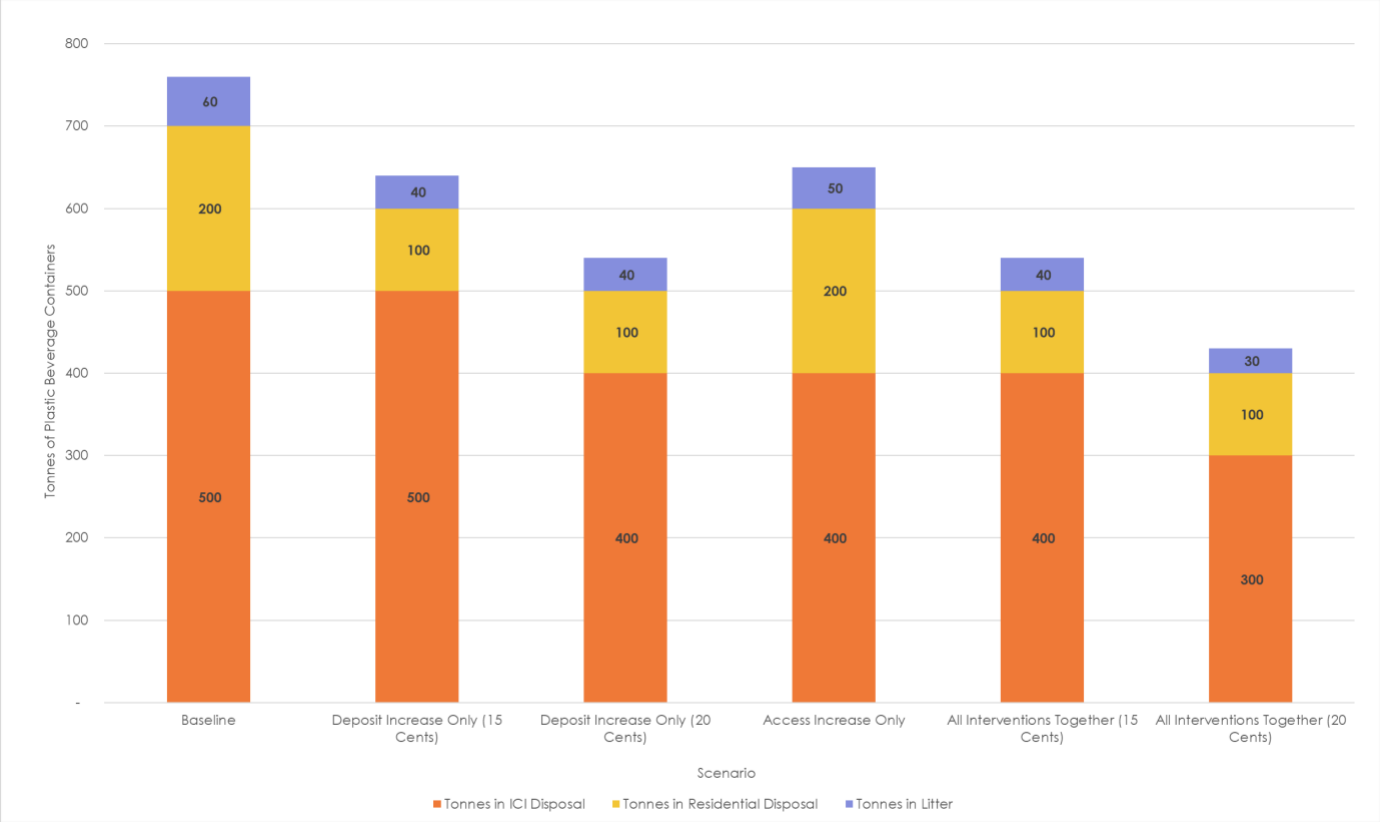


Unrecovered Plastic Beverage Containers

Figure 36 shows the estimated volume and source of unrecovered plastic beverage containers in Saskatchewan. At baseline level, an estimated 500 tonnes are disposed in garbage by ICI generators, 200 tonnes are disposed in garbage by residential generators, and 60 tonnes end up as litter.

If all opportunities are implemented including a $0.20 CAD deposit, then tonnage disposed of is reduced to approximately 400 tonnes containers are disposed by ICI generators, 100 tonnes disposed by residential generators, and 30 tonnes would end up as litter.

Figure 36: Estimated Volume of Unrecovered Plastic Beverage Containers in Saskatchewan after Implementation of Opportunities



5.3.6 Manitoba

Primary Barriers

Regulatory

Manitoba does not have DRS for non-alcohol containers sold in the province. Manitoba has a population of 1 million, with an estimated 1500 tonnes of non-alcoholic plastic beverage containers uncollected annually through the curbside system. Manitoba's curbside system is operating through a PRO with a standardized methodology to estimate beverage containers collected curbside. This methodology includes regular audits at MRFs to count beverage containers in curbside recycling collection as well as in waste disposed. The CBCRA program in Manitoba has a substantial outreach program for the ICI sector and partners with municipalities for public space collection in urban areas, and it is focussed on both curbside and out of home recovery in public spaces and from ICI partners.

Primary Opportunities

Implement DRS

Curbside recycling systems and DRS are considered to be complementary programs in leading jurisdictions that achieve over 90% beverage container recovery, as presented in Section 4. When carefully designed

and implemented, both systems can contribute to sustainable material management of beverage container recovery. However, not implementing a DRS and looking to curbside recycling as the primary method to recovery beverage containers will result in sub-optimal outcomes. Comparisons of the performance of curbside recycling systems globally and increasing access to curbside recycling has had only marginal impacts on the percentage of beverage containers that are collected and recycled. Plastics collected in many curbside recycling programs (especially single-stream recycling, where paper, cans, bottles, and plastics are collected together) are no longer considered food grade due to the high levels of contamination in single-stream systems, so typically cannot directly be used in container-to-container recycling.[133]

Implementing a full program scope under a DRS is considered a best practice. Having an expanded program scope to include all dairy and dairy substitute beverage containers would be best practice, as shown in other high performing DRSs. While these containers may be accepted in the residential curbside system in Manitoba, having them part of the deposit system would increase the rate at which they are returned because of the financial incentive to do so. In addition, it would allow for enhanced end of life marketing opportunities since material collected via DRS is less contaminated than material collected curbside.

Impact of Implementing Primary Opportunities

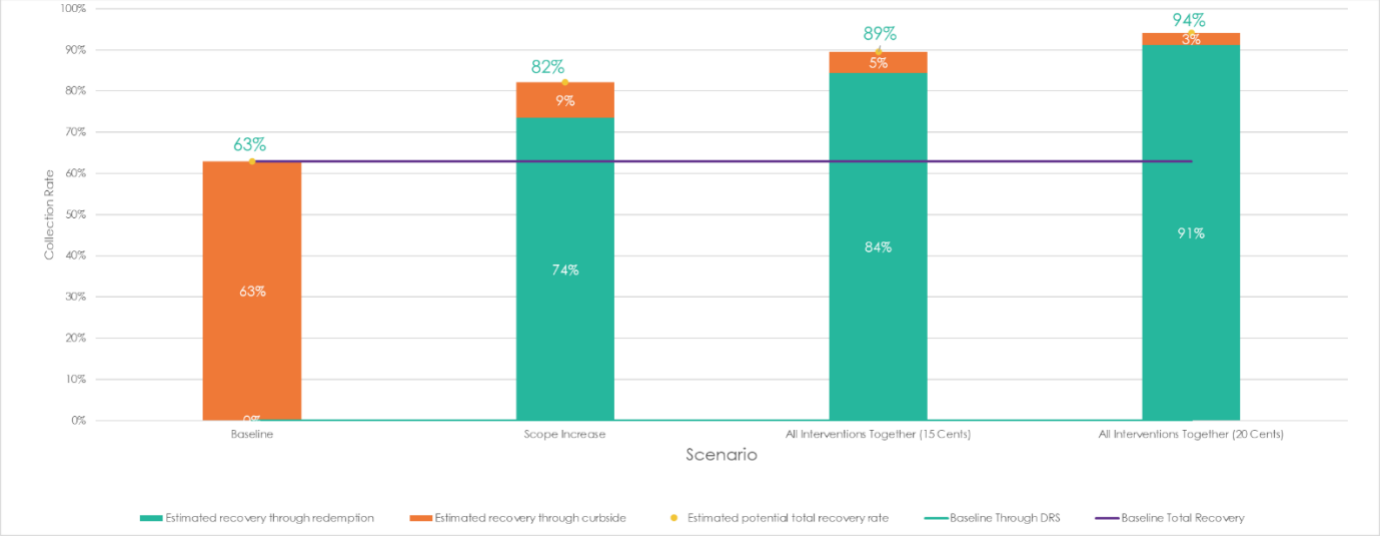
Eunomia's baseline calculations for plastic beverage containers shows the collection rate in Manitoba via curbside to be 63% (this calculation is estimated from sales and recovery information for both PET and HDPE).

Implement DRS

If a best practice DRS is implemented and the deposit/refund level is set to a minimum of $0.15 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 84% and the total collection of plastic beverage containers when including curbside is estimated to be 89%. If all primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.20 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 91% and the total collection of plastic beverage containers when including curbside is estimated to be 94%.

[133] Reloop, 2022. Bottle Bill Reimagined. Accessible at https://bottlebillreimagined.org/wp-content/uploads/2022/03/Reimagining-the-Bottle-Bill-REPORT.pdf

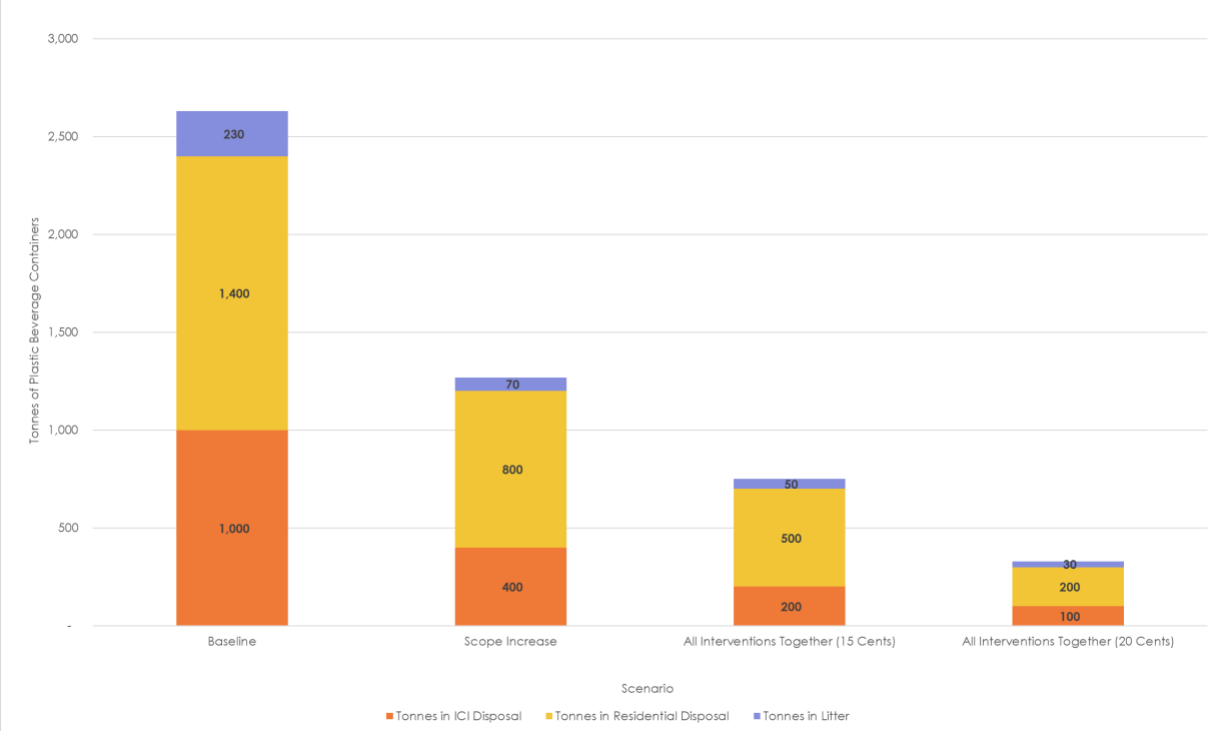
Figure 37: Estimated Impact of Implementing Primary Opportunities in Manitoba



Unrecovered Plastic Beverage Containers

Figure 38 shows the estimated volume and source of unrecovered plastic beverage containers in Manitoba. At baseline level, an estimated 1,000 tonnes are disposed in garbage by ICI generators, 1,400 tonnes are disposed in garbage by residential generators, and 230 tonnes end up as litter. If all opportunities are implemented including a $0.20 CAD deposit, then the unrecovered containers is reduced to approximately100 tonnes disposed in garbage in the ICI sector, 200 tonnes disposed by residential generators, and 30 tonnes would end up as litter.

Figure 38: Estimated Volume of Unrecovered Plastic Beverage Containers in Manitoba after Implementation of Opportunities



5.3.7 Ontario

Key Barriers

Regulatory

Ontario does not have a DRS for non-alcohol containers sold in the province. DRS systems and curbside recycling systems complement each other in reducing litter and increasing waste diversion. To achieve a "circular economy" manufacturers need systems that retain material quality, and DRSs provide a mechanism for effectively capturing beverage containers to reduce litter and produce a high-quality material to feed into a circular economy. There are many international examples where DRSs and household recycling together achieve high collection rates, but no case of high rates where household recycling is the sole collection system.

Ontario has a population of almost 16 million, with an estimated 75,400 tonnes of non-alcoholic plastic beverage containers generated annually, less than half of this amount is estimated to be collected through the curbside system. Ontario currently is estimated to have the country's lowest beverage container recovery rate.[134] The Canadian Beverage Association (CBA) has publicly advocated that without a beverage container recycling program in Ontario, the province will not meet the beverage container management targets of 75% by 2026 and 80% by 2030.

[134] Canadian Beverage Association, 2024. Ontario's Beverage Association Leading to a Circular Economy. Accessible at Ontario-Budget-Submission-2024-Canadian-Beverage-Association.pdf (canadianbeverage.ca)

Ontario is currently in the process of transitioning to a 100% full EPR curbside system, with a new blue box recycling regulation, and new producer responsibility requirements. New PROs managing the curbside system in Ontario, may not be in favour of DRS for beverage containers as this would remove a significant amount of their anticipated funding from beverage producers, and they have already designed their stewardship plan based on this anticipated revenue. This situation in Ontario is the most significant barrier to increasing the recovery of plastic beverage containers in Canada.

In addition, Ontario's current curbside recycling program does not include out of home recovery requirements as Manitoba's does, nor is there any programming for partnerships with ICI to improve beverage container recycling from commercial spaces, schools, or restaurants again, unlike Manitoba's system. Ontario's current system is inherently lacking in all aspects of recycling performance to date. The CBA states that the provincial government, municipal governments and the beverage sector operating in the province has long supported the same "blue box" system to collect more paper and packaging, however Ontario's beverage container recovery rate remains stalled at 50% recovery rate for years – far off from the target of 80% by 2030.[135]

Primary Opportunities

Implement a DRS for Plastic Beverage Containers

In 2019, a study conducted by Eunomia and Reloop found that implementing a DRS for non-alcoholic beverage containers in Ontario, alongside improvements in the Blue Box program, would recycle an additional 118,000 tonnes of materials every year, as well as generating overall savings of $12 million. The report found that a $0.15 CAD returnable deposit on non-alcoholic beverage containers would result in over 90% of non-alcoholic beverage containers being collected for recycling. The deposit program would not only divert waste from landfill but also reduce beverage container-related litter by around 80%.[136]

The study estimated that introducing a deposit system for non-alcoholic beverage containers would cost $34 million CAD annually, resulting in a cost of less than a penny ($0.0091) per container returned. Overall, the system would generate savings of $12 million CAD, provided that the DRS was combined with an optimized Blue Box program. Operating an optimized Blue Box program alongside a convenient deposit program for non-alcoholic beverages would reduce the overall cost per tonne of material recycled from $314 to $269 and push up Ontario's packaging recycling rate to around 74%.

Implementing a full program scope under a DRS is considered a best practice. Having an expanded program scope to include all dairy and dairy substitute beverage containers would be best practice, as shown in other high performing DRSs. While these containers may be accepted in the residential curbside system, having them part of the deposit system would increase the rate at which they are returned because of the financial incentive to do so, and in addition, would allow for enhanced end of life marketing opportunities since material collected via DRS is less contaminated than material collected curbside.

To build the best system for Ontario, the CBA supports the five core design principles, inherent to DRS. These include: (1) high performing, (2) cost-efficient for consumers and stakeholders, (3) convenient to support high levels of consumer participation, (4)effective implementation to establish the necessary collection

[135] Canadian Beverage Association, 2024. Ontario's Beverage Association Leading to a Circular Economy. Accessible at Ontario-Budget-Submission-2024-Canadian-Beverage-Association.pdf (canadianbeverage.ca)

[136] https://eunomia.eco/new-drs-for-ontario-to-increase-recycling-and-save-millions/

network to meet the 2030 target of 80%, and (5) evidence-based decision-making, developing a DRS on evidence, data, and beverage industry expertise.

Adding a financial value to the used container motivates people to recycle and communicates that the materials also have value to society as a resource. The reintegration of recycled PET into producers packaging supports the broader development of a circular economy framework, and is necessary for meeting food grade recycled content requirements by the federal government in the future. It also ensures this valuable material is kept within Canada and continues to provide economic benefits. Recovering all used beverage containers is a significant priority for beverage producers in Canada.[137]

Impact of Implementing Primary Opportunities

Eunomia's baseline calculations for plastic beverage containers shows the collection rate in Ontario to be at 52%. If a best practice DRS was implemented the total collection rate is estimated to be 88% ($0.15 CAD deposit) or up to 93% with a higher deposit level($0.20 CAD).

Expand Scope

If the program scope is expanded to be in line with best practice systems by adding milk and milk-based products and plant based alternatives like in other Canadian DRSs, then the return rate for plastic beverage containers collected via the deposit system is expected to increase to 73% and an additional 7% would be collected through curbside for a total collection rate estimated to reach 81%.

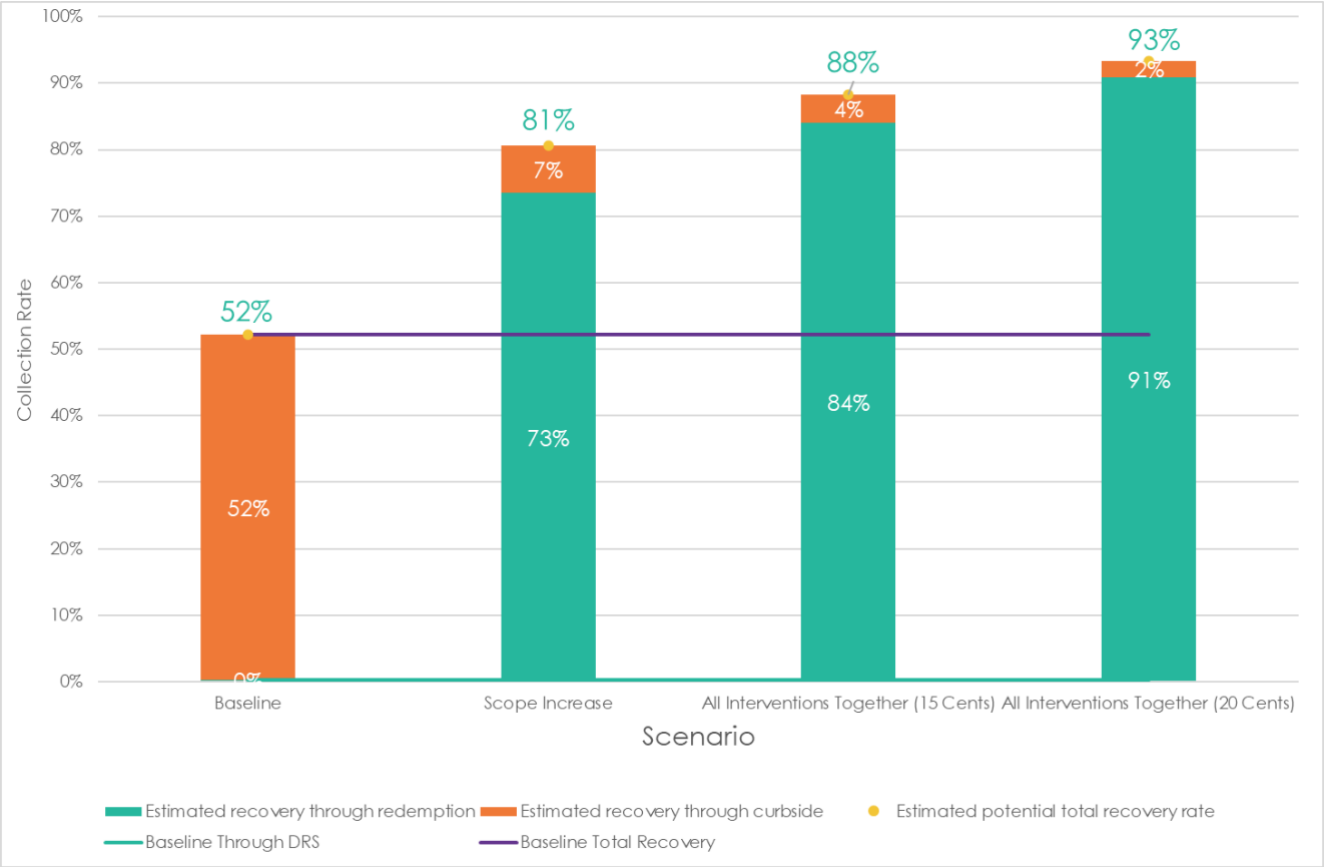
Implement All Primary Opportunities

If the scope was increased and the deposit/refund level is increased to a minimum of $0.15 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 84% and the total collection of plastic beverage containers when including curbside is estimated to be 88%.

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.20 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 91% and the total collection of plastic beverage containers when including curbside is estimated to be 93%.

[137] Canadian Beverage Association, 2024. Ontario's Beverage Association Leading to a Circular Economy. Accessible at Ontario-Budget-Submission-2024-Canadian-Beverage-Association.pdf (canadianbeverage.ca)

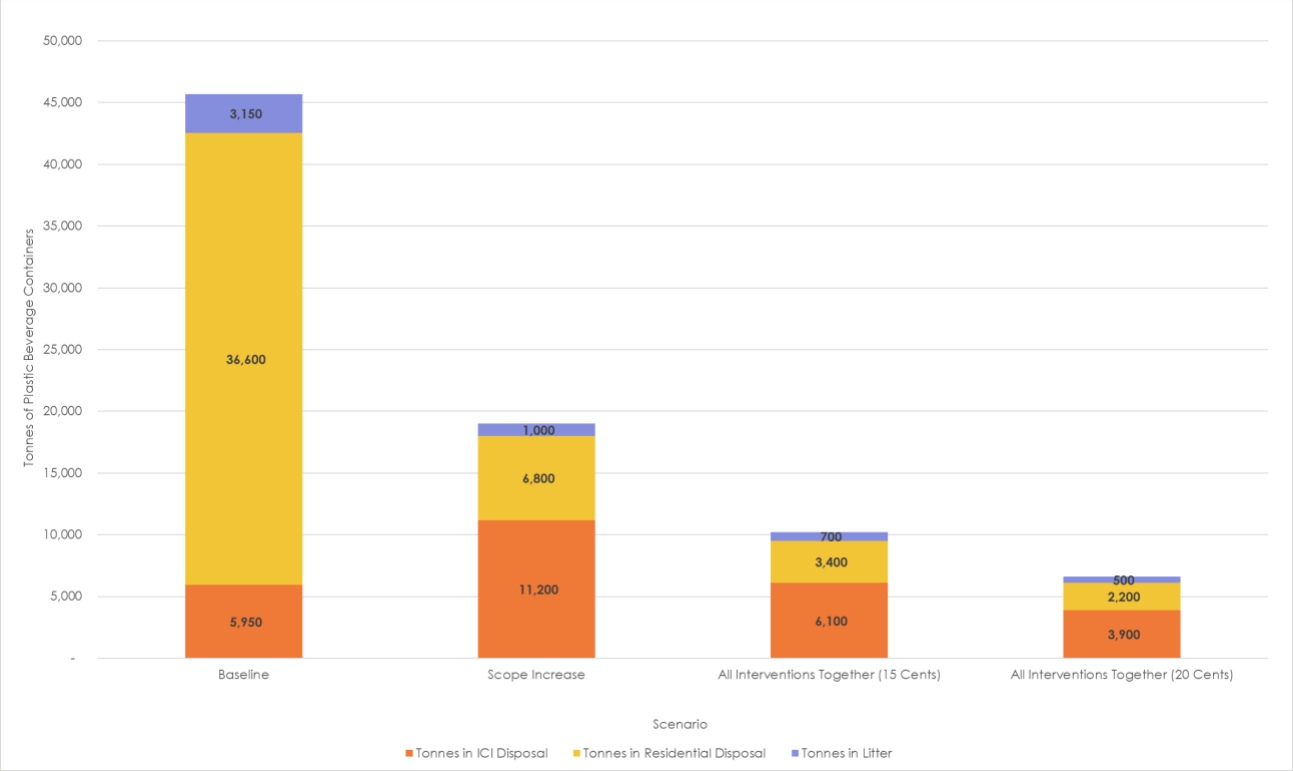
Figure 39: Estimated Impact of Implementing Primary Opportunities in Ontario



Unrecovered Plastic Beverage Containers

Figure 40 shows the estimated volume and source of unrecovered plastic beverage containers in Ontario. At baseline level, an estimated 5,950 tonnes are disposed in garbage by ICI generators, 36,600 tonnes are disposed in garbage by residential generators, and 3,150 tonnes end up as litter. If all opportunities are implemented including a $0.20 CAD deposit, then this tonnage is decreased to an estimated 3,900 tonnes of disposed in garbage by ICI generators, 2,200 tonnes disposed in garbage by residential generators, and 500 tonnes would end up as litter.

Figure 40: Estimated Volume of Unrecovered Plastic Beverage Containers in Ontario after Implementation of Opportunities



5.3.8 PEI

Primary Barriers

Deposit/Refund Level

A key barrier in PEI's program is the lower deposit level ($0.10 CAD), and the even lower refund level. The refund in PEI is only $0.05 (less than $0.04 USD), which is significantly less than recommended as best practice to incentivize returns.

The Government is the system operator, revenue from material sales and unredeemed deposits fund the system in addition to the half-back portion of the deposit. Surplus revenue flows to government revenue, which is not best practice and reduces available funding for re-investment in the program such as increases in handling fees to depot operators, establishing new return points, or new technologies to improve convenience.

Limited Program Scope

Program scope is limited, no milk, dairy products, or dairy substitute containers are included in the program. Interviews with Government representatives have indicated that this was part of the original program design as milk products and fortified beverages were viewed as an essential food especially for children, and for this reason they have historically always been excluded from the program. The exclusion is harmonized across Atlantic Canada provinces of NB, PEI, NS, and NL.

Limited Access

The accessibility of the DRS in PEI is estimated to be 13,500 persons per return point which is much lower than best practice level of 1,000 persons per return point.

Primary Opportunities

Increase Deposit/Refund

Increasing the deposit/refund level to a minimum of $0.15 CAD on beverage containers is recommended best practice level for achieving 90% recovery.

If PEI remained a government-operated half back system (and did not transition to an industry-run DRS with a CRF), then there may be a need to increase the deposit to $0.20 CAD and refund $0.15 to ensure financial viability of the system. In this government-operated program, the portion of the deposit which is not redeemed is used to fund program operations (e.g. payment of handling fees to depot operators, etc.). Alternatively, keeping harmonized deposits regionally is possible, with the addition of a CRF to fund the system instead of a half-back funding model.

Expand Program Scope

Expand program scope to include all dairy and dairy substitute beverage containers. Although PEI's program already includes most beverage and material types, expanding the scope to include all dairy and dairy substitute beverage containers is recommended to increase plastic containers recovered via DRS. While these containers may be accepted in the residential curbside system, having them part of the deposit system would increase the rate at which they are returned because of the financial incentive to do so. Several Canadian deposit programs that previously excluded dairy beverage containers (BC, AB, SK) but have added them, show high performance in DRS recovery rates. Consumer surveys have shown that when more containers are added to a program's scope it reduces confusion regarding which containers are accepted, and more containers are returned overall. The Dairy industry in western provinces was in support of moving these containers into the DRSs in BC, AB and SK, as it costs them less than having them placed in curbside systems under a full EPR program.

Increase Accessibility

PEI can improve accessibility to 1,000 persons by return point by introducing approximately 140 additional new return locations, which could include drop & go unstaffed or other forms of return to retail hybrid options.

Impact of Implementing Primary Opportunities

Eunomia's baseline calculations for plastic beverage containers shows the DRS return rate in PEI to be at 67%. When including curbside collection the baseline collection rate is 82%. If all primary opportunities are implemented, then the DRS return rate is estimated to be 93% and the total collection rate would be 95%.

Expand Scope

If the program scope is expanded to be in line with best practice systems by adding milk and milk-based products and plant based alternatives like in other Canadian DRSs, then the return rate for plastic beverage containers collected via the deposit system is expected to increase from 67% to 75%. When including curbside collection, the total collection rate is estimated to be 88%.

Improve Access

If accessibility was increased to best practice levels, then the DRS return rate is estimated to be 70% and the total collection rate is estimated to be 87%.

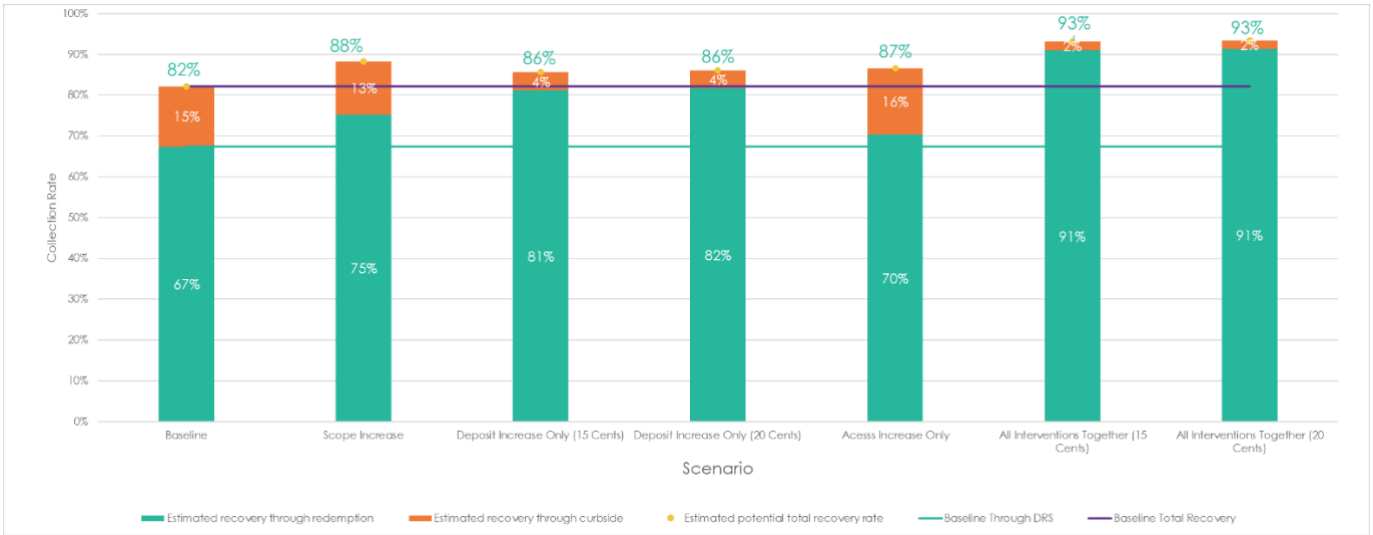
Increase Deposit Level

If the deposit is increased to a minimum of $0.15 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 81%. When plastic beverage containers collected in the curbside system are added to this number, then the total collection rate for plastic beverage containers in PEI is estimated to increase to 86% under an increased deposit level. If the deposit is increased to a minimum of $0.20 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 83%. When plastic beverage containers collected in the curbside system are added to this number, then the total collection rate for plastic beverage containers in PEI is estimated to increase to 86% under an increased deposit level.

Implement All Primary Opportunities: If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.15 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 91% and the total collection of plastic beverage containers when including curbside is estimated to be 92%.

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.20 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 91% and the total collection of plastic beverage containers when including curbside is estimated to be 92%.

Figure 41: Estimated Impact of Implementing Primary Opportunities in PEI

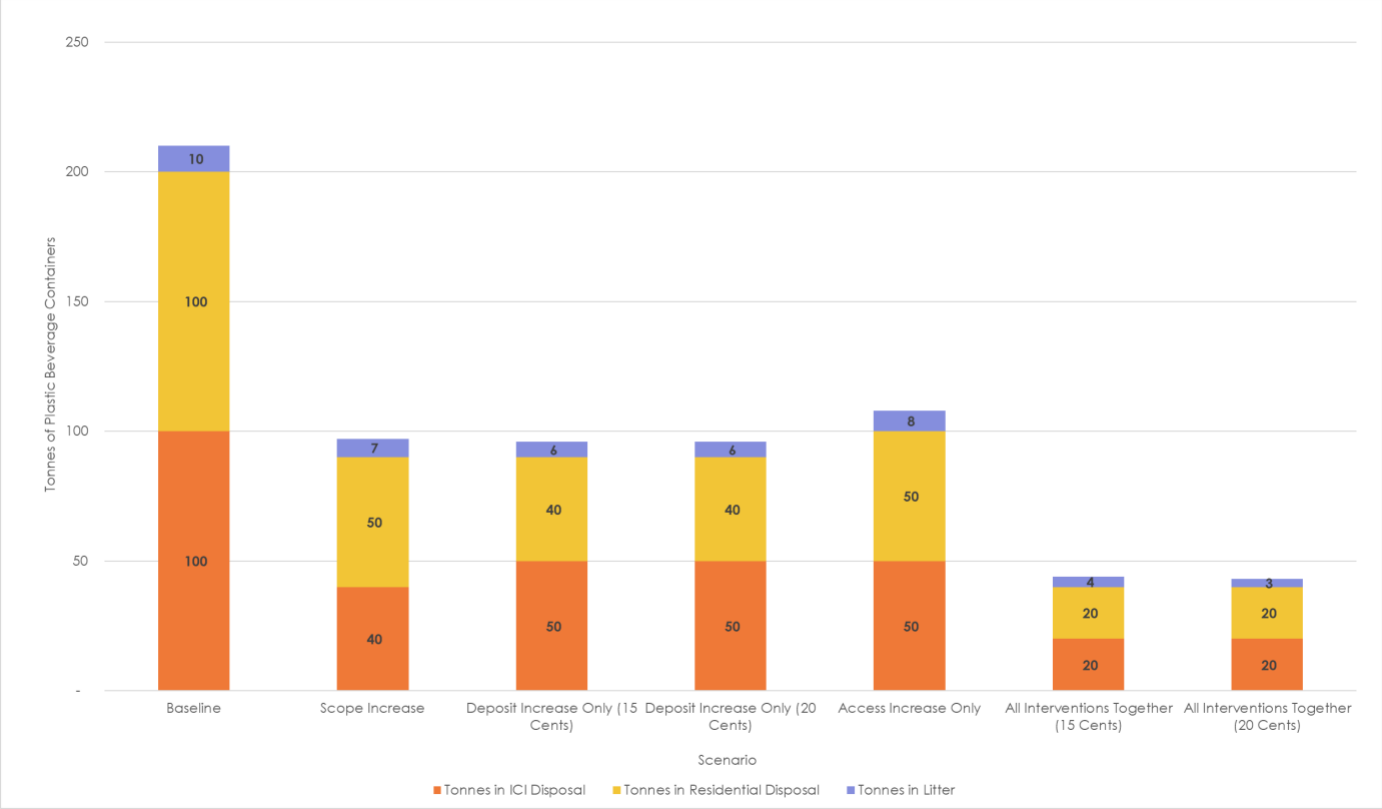


Unrecovered Plastic Beverage Containers

Figure 42 shows the estimated volume and source of unrecovered plastic beverage containers in PEI. At baseline level, an estimated 100 tonnes are disposed in garbage by ICI generators, 100 tonnes are estimated to be disposed in garbage by residential generators, and 10 tonnes end up as litter. If all opportunities are implemented including a $0.20 CAD deposit, then this tonnage is estimated to decrease to

20 tonnes of plastic beverage containers disposed by ICI generators, 20 tonnes disposed by residential generators, and 3 tonnes would end up as litter.

Figure 42: Estimated Volume of Unrecovered Plastic Beverage Containers in Prince Edward Island after Implementation of Opportunities



5.3.9 Nova Scotia

Primary Barriers

Deposit/Refund Level

A key barrier in NS's program is the low deposit level ($0.10 CAD), and the even lower refund level. The refund in NS is only $0.05, less than $0.04 USD), which is significantly less than recommended as best practice to incentivize returns.

There is a third party system operator in NS, appointed by the provincial government. Revenue from material sales and unredeemed deposits fund the system in addition to the half-back portion of the deposit. Surplus funds are used by the system operator to disperse to municipalities in a system of diversion credits earned, and to fund research studies and pilot programs to increase diversion in other material streams that the third party operator decides upon. In this model, there is a risk of cross-subsidization of surplus beverage container deposits funding other waste diversion initiatives rather than reinvesting into the program.

Limited Program Scope

Program scope is limited, no milk, dairy products, or dairy substitute containers are included in the program. Interviews with Government representatives have indicated that this was part of the original program design as milk products and fortified beverages were viewed as an essential food especially for children, and for this reason they have historically always been excluded from the program. The exclusion is harmonized across Atlantic Canada provinces of NB, PEI, NS, and NL.

Access

In Nova Scotia, several challenges affect the accessibility and convenience of drop-off points for beverage containers covered by the DRS system. There are 72 return points per a population of 1,019,725 people. Although Divert NS has considered introducing drop-and-go services and RVMs, these innovations have not yet been put into practice. Moreover, there are no mandatory requirements for improvements to service standards, impacting both consumer convenience

Primary Opportunities

Increase Deposit/Refund

Increasing the deposit/refund level to a minimum of $0.15 CAD on beverage containers, which is recommended best practice level for achieving 90% recovery.

If NS remained a government-operated half back system (and did not transition to an industry-run DRS with a CRF), then there may be a need to increase the deposit to $0.20 CAD and refund $0.15 to ensure financial viability of the system. In this government-operated program, the portion of the deposit which is not redeemed is used to fund program operations (e.g. payment of handling fees to depot operators, etc.). Alternatively, keeping harmonized deposits regionally is possible, with the addition of a CRF to fund the system instead of a half-back funding model.

Expand Program Scope

Expand program scope to include all dairy and dairy substitute beverage containers in NS, and across all Atlantic provinces. Although NS's program already includes most beverage and material types, expanding the scope to include all dairy and dairy substitute beverage containers is recommended to increase plastic containers recovered via DRS. While these containers may be accepted in the residential curbside system, having them part of the deposit system would increase the rate at which they are returned because of the financial incentive to do so. Several Canadian deposit programs that previously excluded milk but now accept dairy containers show high performance in DRS recovery rates. Consumer surveys have shown that when more containers are added to a program's scope it reduces confusion regarding which containers are accepted, and more containers are returned overall. As noted already, the dairy industry is open to considering moving containers into DRSs as it costs them less than having them placed in curbside systems under a full EPR program.

Improve Convenience and Access

Expand the number of drop off locations and upgrade existing ones to improve convenience. Improving the number of return points per population closer to meeting best practice will help improve convenience for consumer. Upgrading existing drop off locations to be convenient and user-friendly, for example by adding Drop & Go systems to minimize wait times, can further bolster collection rates.

Impact of Implementing Primary Opportunities

Eunomia's baseline calculations for rigid plastic beverage containers shows the deposit return system return rate in Nova Scotia to be at 61%, and when including containers collected curbside the total recovery rate is 74%.

Expand Scope

If the program scope is expanded to be in line with best practice systems by adding milk and milk-based products and plant based alternatives like in other Canadian DRSs, then the return rate for plastic beverage containers collected via the deposit system is expected to increase from 61% to 67%.

Increase Deposit Level

If the deposit is increased to a minimum of $0.15 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 76%. When plastic beverage containers collected in the curbside system are added to this number, then the total collection rate for plastic beverage containers in Nova Scotia is estimated to increase to 80% under an increased deposit level. If the deposit is increased to a minimum of $0.20 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 82%. When plastic beverage containers collected in the curbside system are added to this number, then the total collection rate for plastic beverage containers in Nova Scotia is estimated to increase to 85% under an increased deposit level.

Increase Access

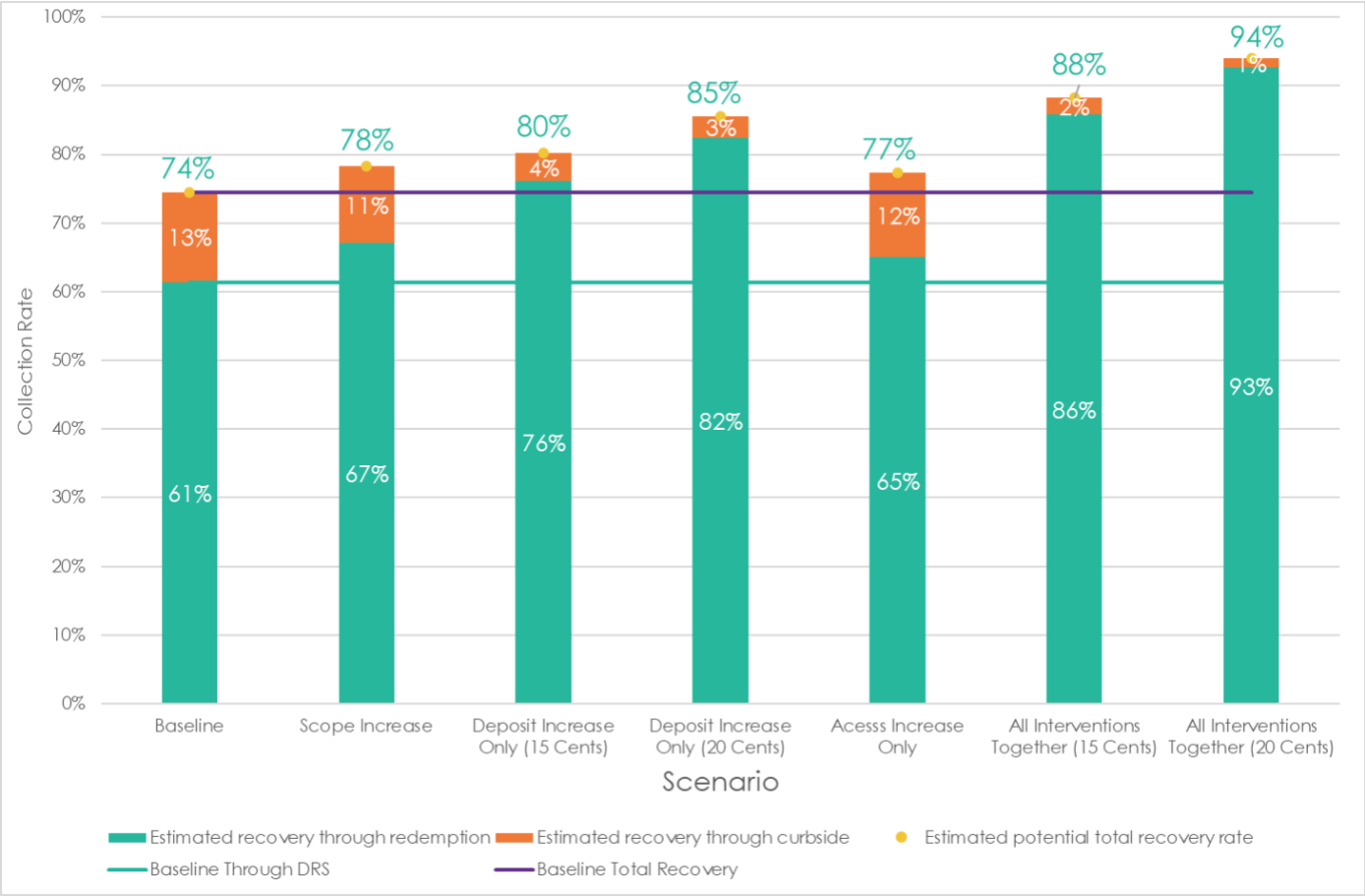
If accessibility was increased to best practice level, then the DRS return rate is estimated to be 65% and the total collection rate when containers collected curbside are included, is estimated to be 77%.

Implement All Primary Opportunities

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.15 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 86% and the total collection of plastic beverage containers when including curbside is estimated to be 88%.

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.20 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 93% and the total collection of plastic beverage containers when including curbside is estimated to be 94%.

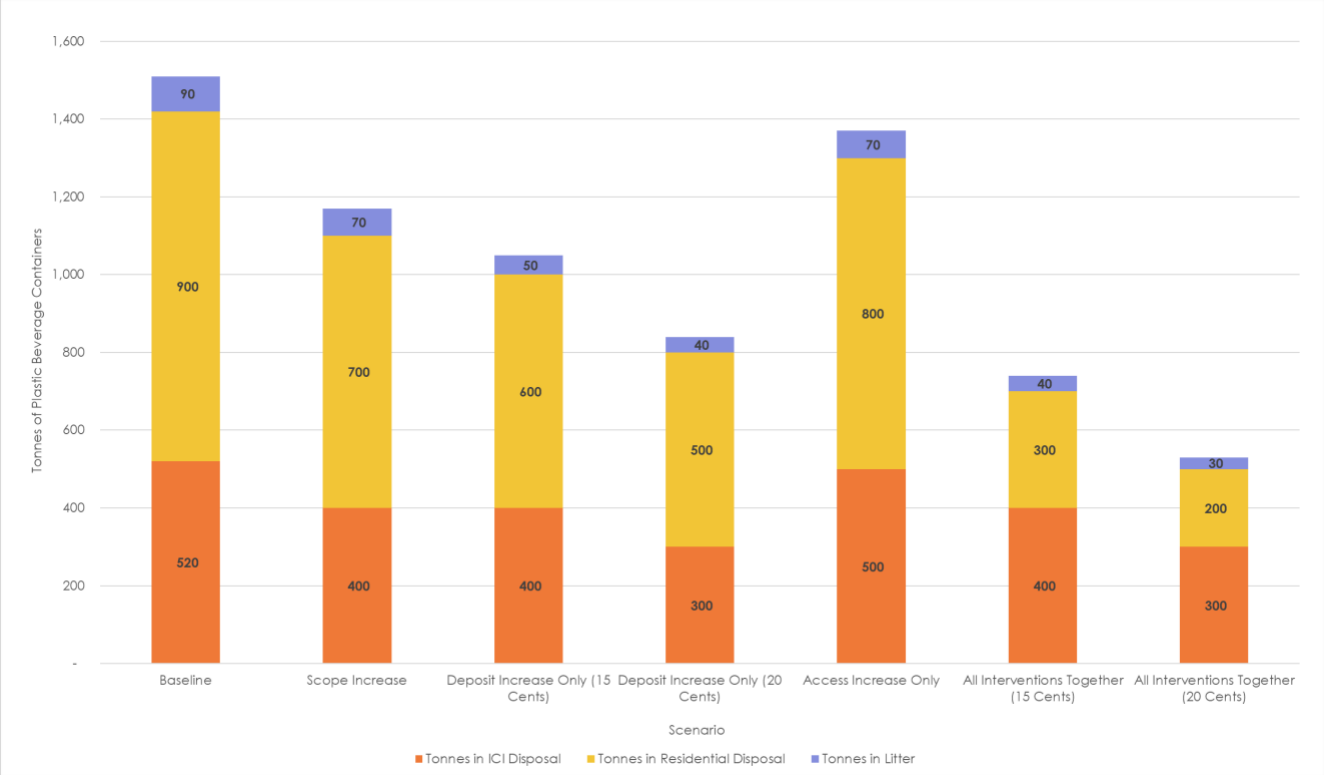
Figure 43: Estimated Impact of Implementing Primary Opportunities in Nova Scotia



Unrecovered Plastic Beverage Containers

Figure 44 shows the estimated volume and source of unrecovered plastic beverage containers in Nova Scotia. At baseline level, an estimated 520 tonnes are disposed in garbage by ICI generators, 900 tonnes are disposed in garbage by residential generators, and 90 tonnes end up as litter. If all opportunities are implemented including a $0.20 CAD deposit then this amount is decreased to an estimated 300 tonnes of disposed in garbage by ICI generators, 200 tonnes disposed in garbage by residential generators, and 30 tonnes would end up as litter.

Figure 44: Estimated Volume of Unrecovered Plastic Beverage Containers in Nova Scotia after Implementation of Opportunities



5.3.10 Newfoundland and Labrador

Primary Barriers

Deposit Level

A significant barrier is NL's DRS the low deposit/refund level, with a deposit set at $0.08 CAD (approximately $0.06 USD) and refund rate at $0.05 CAD (less than $0.04 USD), which falls far short of best practice recommendations for incentivizing returns.

As well, NL's DRS system is operated by a third party, with revenue from material sales and unredeemed deposits funding the system, and surplus funds used to support other waste diversion programs, this allocation reduces the available funding for reinvestment in the DRS program itself. Consequently, opportunities for increasing handling fees for depot operators, establishing new return points, or introducing new technologies to enhance convenience are limited.

Limited Scope

The program's scope is limited as it does not include dairy or dairy substitute products. This exclusion further restricts the effectiveness of the DRS as described previously.

Access

Newfoundland and Labrador has 53 depot locations, around one return point for approximately 10,200 residents. Improving accessibility such as additional return points is needed to align with best practice in high-performing systems, which is 1,000 people per return point.

Primary Opportunities

Increase Deposit/Refund

Increase deposit/refund level on single serve sized beverage containers. Since this is a government-operated half-back refund system, there would be a need to increase the deposit to $0.20 CAD and refund $0.15 to ensure financial viability of the system. Alternatively, keeping harmonized deposits regionally is possible, with the addition of a CRF to fund the system instead of a half-back funding model.

Expand Scope

Expanding the scope to include all dairy and dairy substitute beverage containers is recommended to increase plastic containers recovered via DRS. As stated previously, DRS that have added milk and dairy containers, as well as other plant-based alternatives, are showing high performance in DRS recovery rates. Consumer surveys have shown that when more containers are added to a program's scope, it reduces confusion regarding which containers are accepted and more containers are returned overall.

Improve Convenience and Accessibility

If Newfoundland had an additional 480 return locations, including return to retail, unstaffed drop & go express, then they would meet best practice level of one return location per 1,000 people.

Impact of Implementing Primary Opportunities

Eunomia's baseline calculations for rigid plastic containers shows the deposit return system return rate in Newfoundland and Labrador to be at 61% and when including containers returned via curbside system the total recovery rate of rigid plastic containers is 66%.

Expand Scope

If the program scope is expanded to be in line with best practice systems by adding milk and milk-based products and plant based alternatives like in other Canadian DRSs, then the return rate for plastic beverage containers collected via the deposit system is expected to increase from 61% to 66%. When including curbside the total recovery rate is estimated to be 70%.

Increase Deposit Level

If the deposit is increased to a minimum of $0.15 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 75%. When plastic beverage containers collected in the curbside system are added to this number, then the total collection rate for plastic beverage containers in Newfoundland and Labrador is estimated to increase to 77% under an increased deposit level.

If the deposit is increased to a minimum of $0.20 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 81%. When plastic beverage containers collected in the curbside system are added to this number, then the total collection rate for plastic beverage containers in Newfoundland and Labrador is estimated to increase to 83% under an increased deposit level.

Increase Accessibility

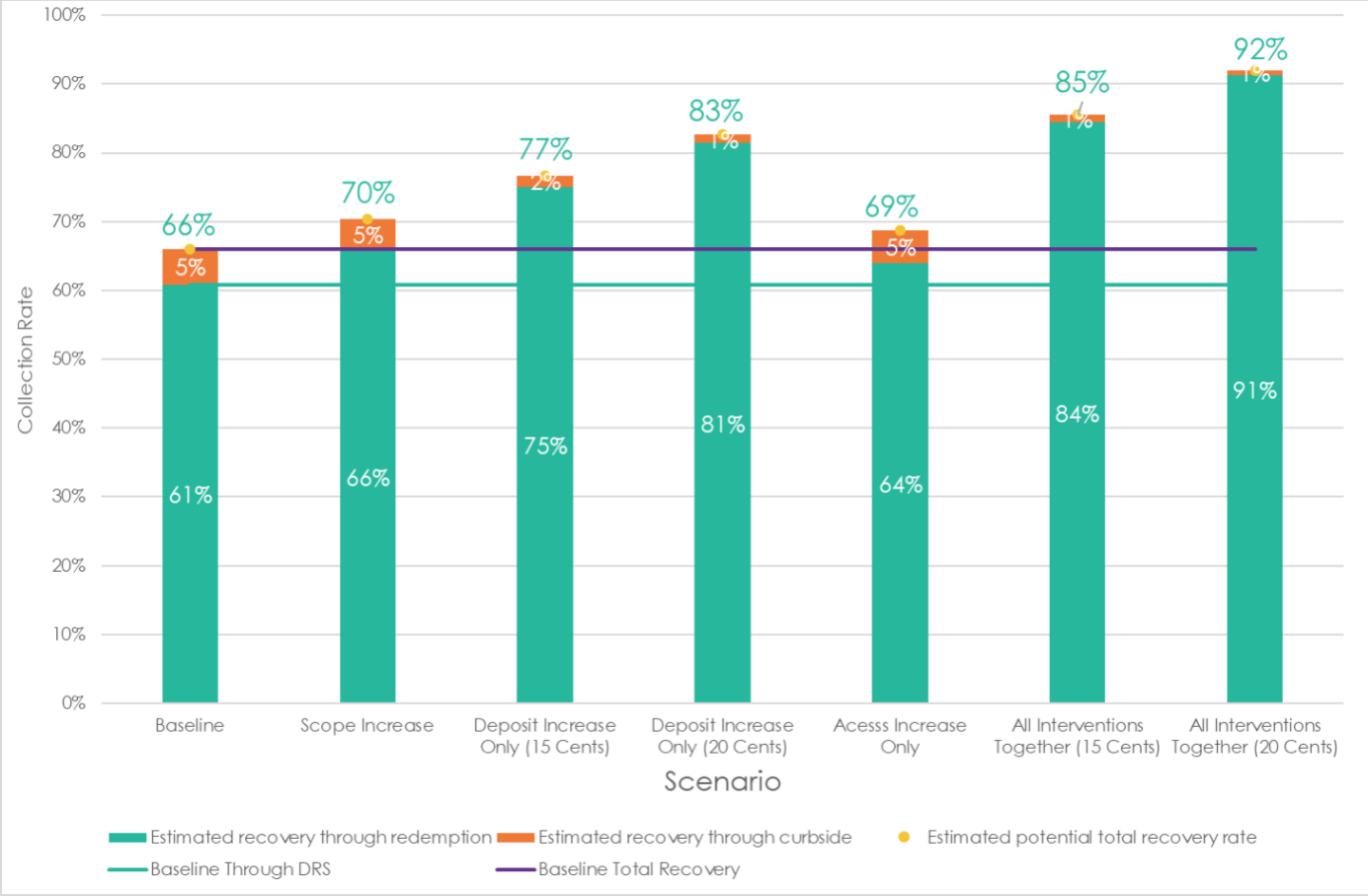
If the accessibility of the return network is increased to best practice levels, then the DRS return rate is estimated to be 64%, and the total collection of plastic beverage containers when including curbside is estimated to be 69%.

Implement All Primary Opportunities

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.15 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 84% and the total collection of plastic beverage containers when including curbside is estimated to be 85%.

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.20 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 91% and the total collection of plastic beverage containers when including curbside is estimated to be 92%.

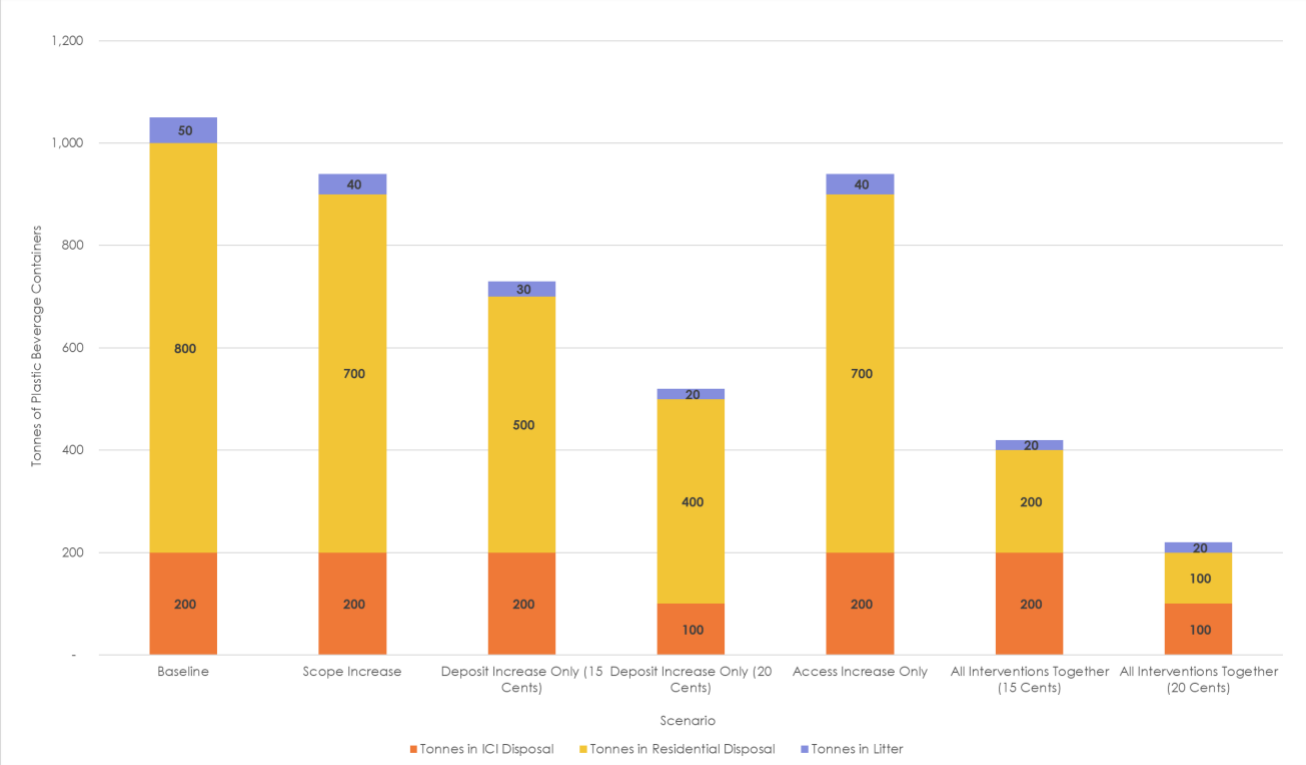
Figure 45: Estimated Impact of Implementing Primary Opportunities in Newfoundland and Labrador



Unrecovered Plastic Beverage Containers

Figure 46 shows the estimated volume and source of unrecovered plastic beverage containers in NL . At baseline level, an estimated 200 tonnes are disposed in garbage by ICI generators, 800 tonnes are disposed in garbage by residential generators, and 50 tonnes end up as litter. If all opportunities are implemented including a $0.20 CAD deposit, then this volume would decrease to an estimated 100 tonnes of plastic beverage containers disposed in garbage by ICI generators, 100 tonnes disposed in garbage by residential generators, and 20 tonnes would end up as litter.

Figure 46: Estimated Volume of Unrecovered Plastic Beverage Containers in Newfoundland and Labrador after Implementing Opportunities



5.3.11 Yukon

Primary Barriers

Deposit Level

A key barrier is the low deposit level ($0.10 CAD). The refund in Yukon is only $0.05, less than $0.04 USD), which is significantly less than recommended as best practice to incentivize returns.

The Government of Yukon is the system operator, revenue from material sales and unredeemed deposits fund the system, surplus flows to government revenue, which is not best practice and reduces available funding for re-investment in the program such as increases in handling fees to depot operators, establishing new return points, or new technologies to improve convenience.

Accessibility

Yukon currently has 14 depot locations which is approximately 1 return location per 3,200 people. This does not meet best practice level of 1 return location per 1,000 people. In addition, there are no targeted ICI collection initiatives or public space collection programs, and there are no express service options available, only traditional return to depot.

Primary Opportunities

Increase Deposit Level

Increase deposit/refund level on single-serve sized beverage containers. Since this is a government-operated half-back refund system, the deposit would need to be increased to $0.20 CAD and the refund to $0.15 to ensure the system's financial viability. Alternatively, implement a CRF to fund the system instead of a half-back funding model to harmonize with other regional programs.

Increase Accessibility

If Yukon introduced 31 more return locations, then the province would meet best practice level of 1 return location per 1,000 people.

Impact of Implementing Primary Opportunities

Eunomia's baseline calculations for rigid plastic containers shows the deposit return system return rate in Yukon to be at 69%, and if containers estimated to be collected curbside is included, then the total recovery rate is 85%.

Increase Deposit Level

If the deposit is increased to a minimum of $0.15 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 81%. When plastic beverage containers collected in the curbside system are added to this number, then the total collection rate for plastic beverage containers in Yukon is estimated to increase to 86% under an increased deposit level.

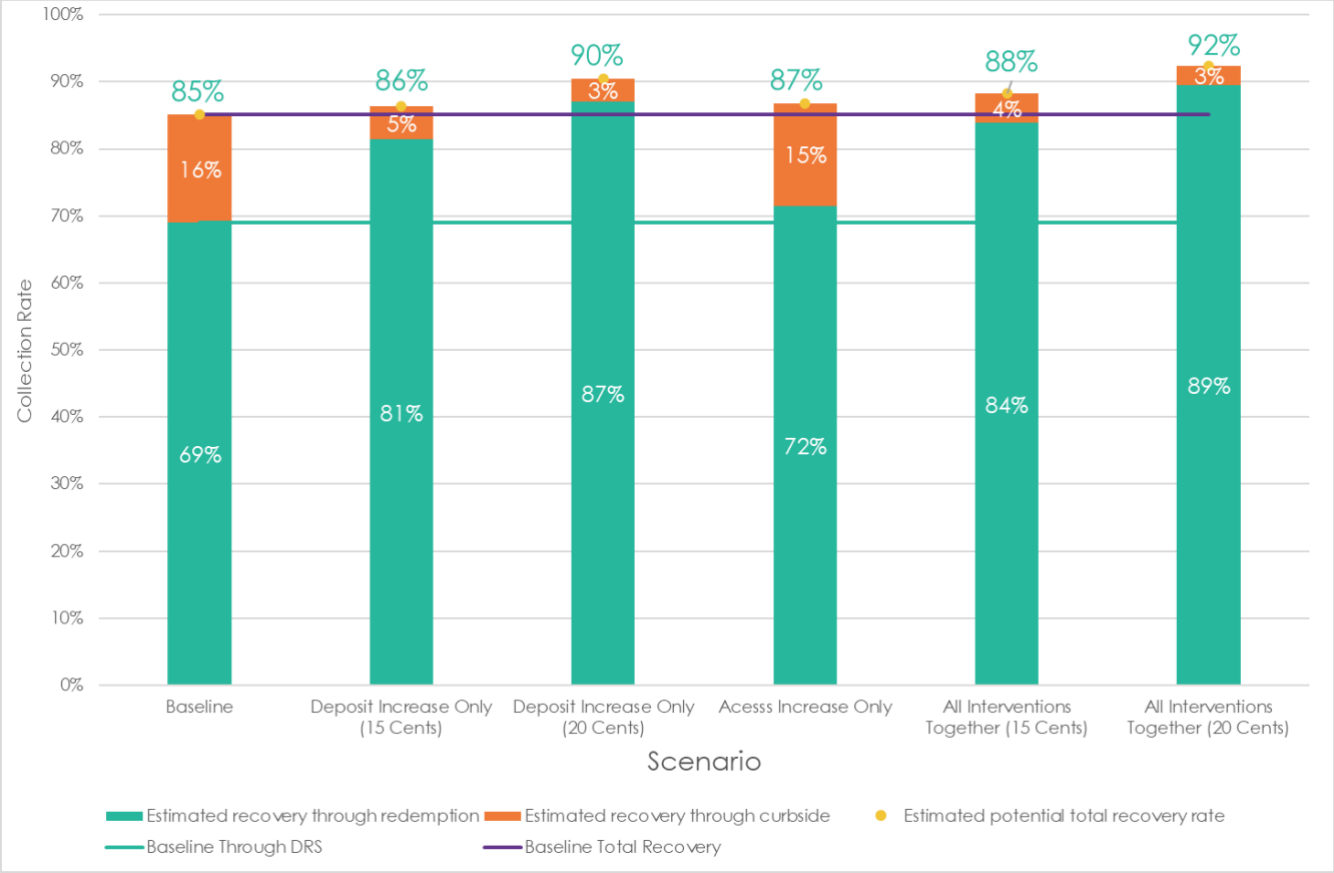
If the deposit is increased to a minimum of $0.20 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 87%. When plastic beverage containers collected in the curbside system are added to this number, then the total collection rate for plastic beverage containers in Yukon is estimated to increase to 90% under an increased deposit level.

Implement All Primary Opportunities

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.15 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 84% and the total collection of plastic beverage containers when including curbside is estimated to be 88%.

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.20 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 89% and the total collection of plastic beverage containers when including curbside is estimated to be 92%.

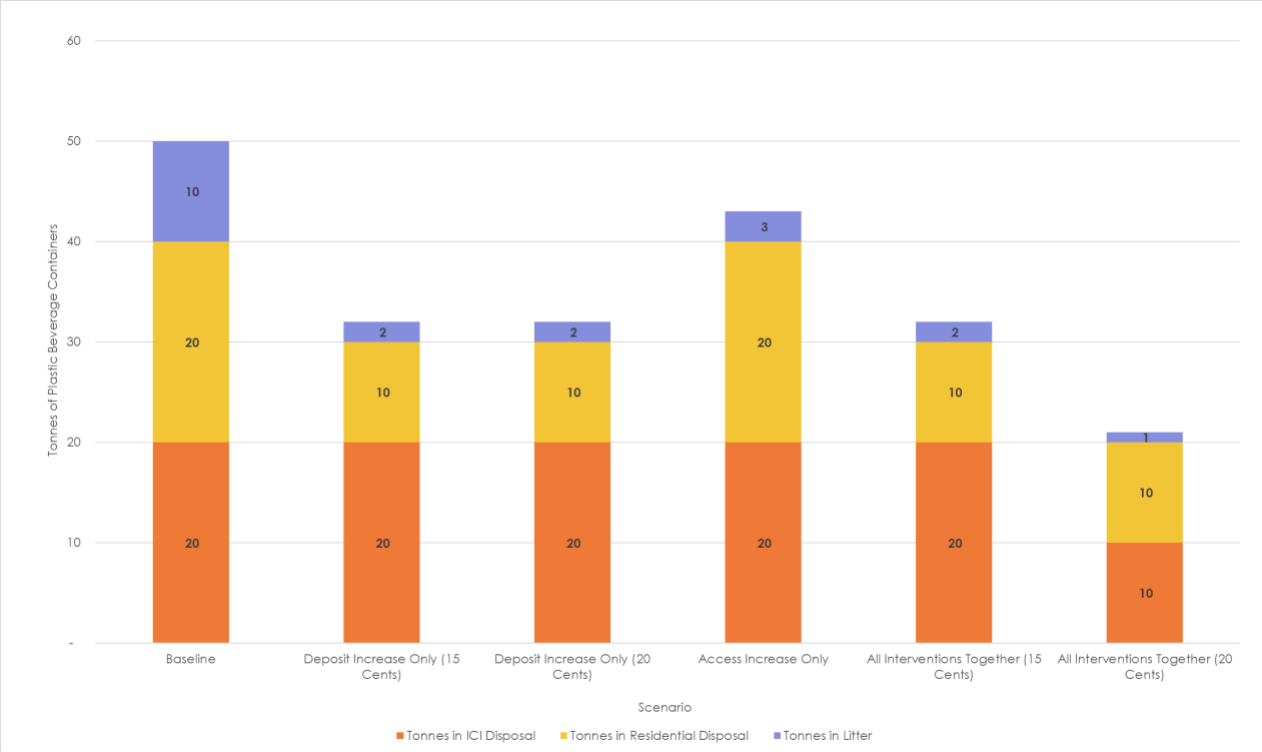
Figure 47: Estimated Impact of Implementing Primary Opportunities in Yukon



Unrecovered Plastic Beverage Containers

Figure 48 shows the estimated volume and source of unrecovered plastic beverage containers . At baseline level, an estimated 20 tonnes are disposed in garbage by ICI generators, 20 tonnes are disposed in garbage by residential generators, and 10 tonnes end up as litter. If all opportunities are implemented including a $0.20 CAD deposit, then this is decreased to an estimated 10 tonnes disposed by ICI generators, 10 tonnes disposed by residential generators, and 1 tonne would end up as litter.

Figure 48: Estimated Volume of Unrecovered Plastic Beverage Containers in Yukon after Implementing Opportunities



5.3.12 Northwest Territories

Key Barriers

Deposit Level

A key barrier is the low deposit/refund level ($0.10 CAD). This is less than recommended as best practice to incentivize returns. The Government of Northwest Territories operates the DRS, with revenue from material sales and unredeemed deposits funding the system. However, any surplus flows into government revenue, which is not considered best practice. This approach reduces the available funding for reinvestment in the program, such as increasing handling fees for depot operators, establishing new return points, or implementing new technologies to improve convenience.

Accessibility

There are currently 21 depot and 3 satellite stations in Northwest Territories. This is about 1,900 people per return location slightly above best practice level. In addition, there are no targeted ICI collection initiatives or public space collection programs, and there are no express service options available, only traditional return to depot. Consumer surveys report lack of awareness of drop & go express option at depots.

Primary Opportunities

Deposit

Increase deposit/refund level in line with best practice.

Increase Accessibility

If an additional 20 return locations were made available in the Northwest Territories then it would meet best practice with 1 return location per 1,000 people.

Impact of Implementing Primary Opportunities

Eunomia's baseline calculations for rigid plastic containers shows the deposit system return rate in the Northwest Territories to be at 66% and when curbside containers are included the total recovery rate is 78%.

Increase Deposit Level

If the deposit is increased to a minimum of $0.15 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 72%. When plastic beverage containers collected in the curbside system are added to this number, then the total collection rate for plastic beverage containers in Northwest Territories is estimated to increase to 77% under an increased deposit level.

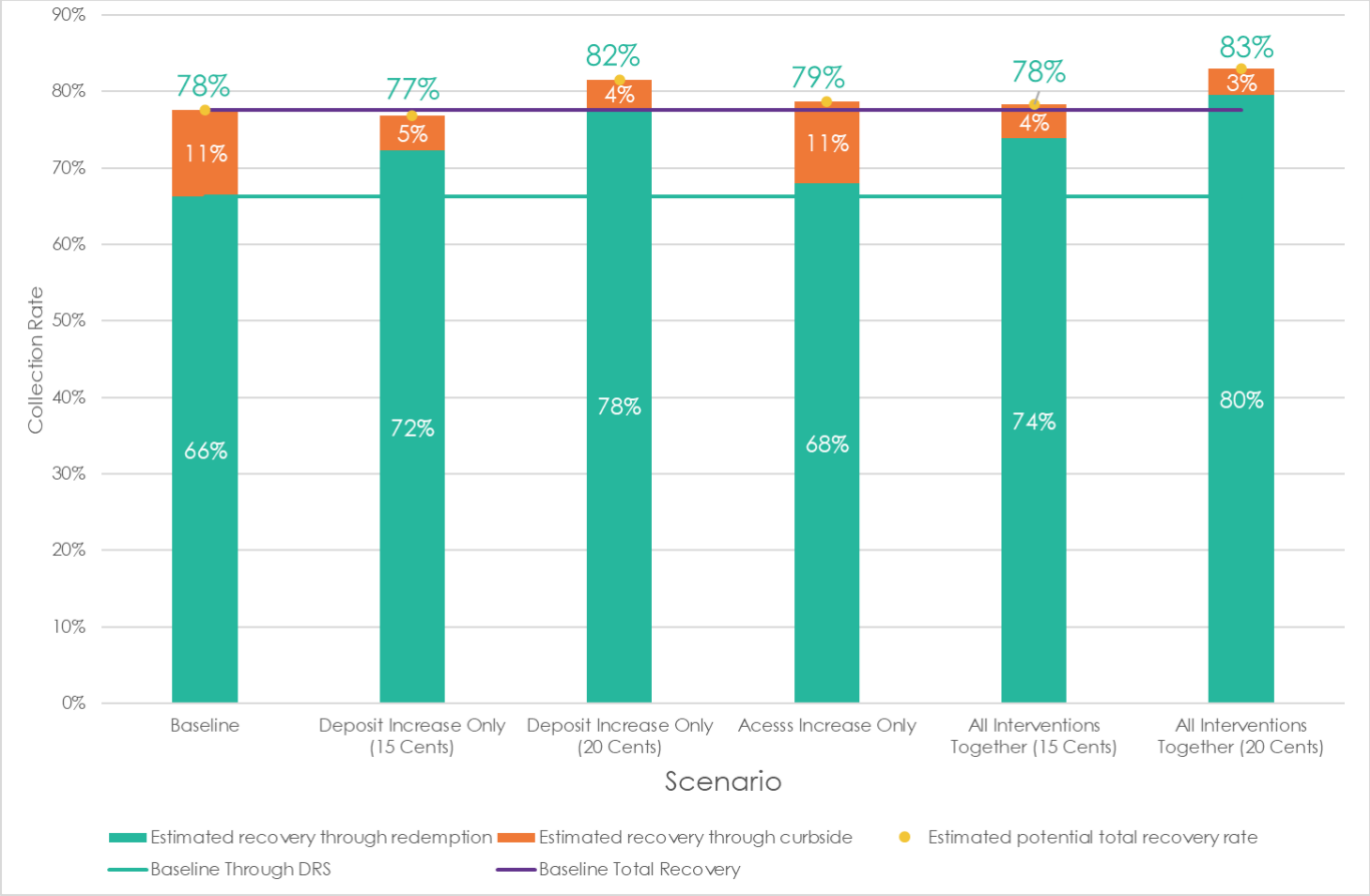
If the deposit is increased to a minimum of $0.20 CAD, then the return rate for plastic beverage containers collected via the deposit system is estimated to increase to 78%. When plastic beverage containers collected in the curbside system are added to this number, then the total collection rate for plastic beverage containers in Northwest Territories is estimated to increase to 82% under an increased deposit level.

Implement All Primary Opportunities

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.15 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 74% and the total collection of plastic beverage containers when including curbside is estimated to be 78%.

If both primary opportunities are implemented and the deposit/refund level is increased to a minimum of $0.20 CAD for all eligible beverage containers, then the DRS return rate for rigid plastic containers is estimated to be 80% and the total collection of plastic beverage containers when including curbside is estimated to be 83%.

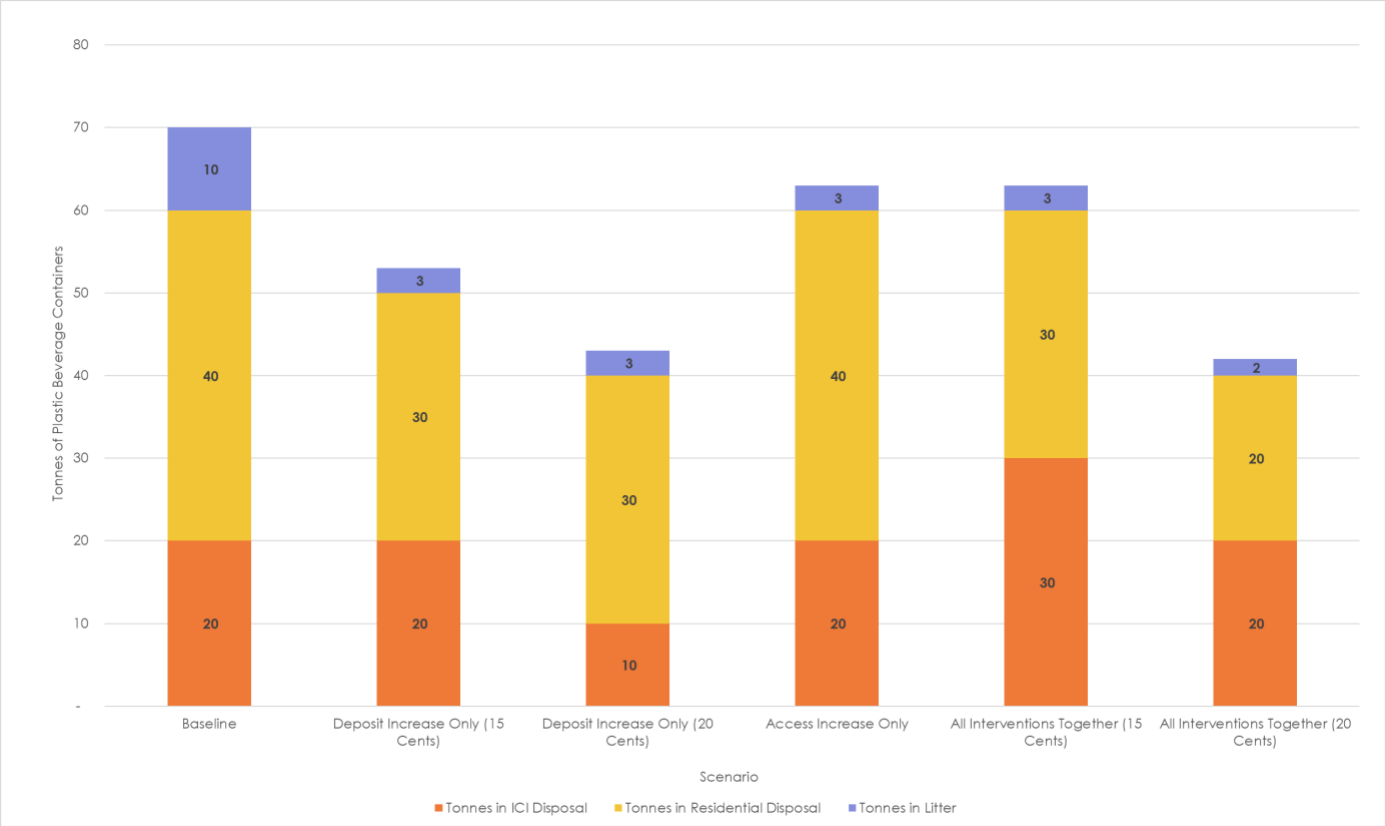
Figure 49: Estimated Impact of Implementing Primary Opportunities in the Northwest Territories



Unrecovered Plastic Beverage Containers

Figure 50 shows the estimated volume and source of unrecovered plastic beverage containers in the Northwest Territories. At baseline level, an estimated 20 tonnes are disposed in garbage by ICI generators, 40 tonnes are disposed in garbage by residential generators, and 10 tonnes end up as litter. If all opportunities are implemented including a $0.20 CAD deposit, then this tonnage would increase to 20 tonnes disposed in garbage by ICI generators, 20 tonnes disposed by residential generators, and 2 tonnes would end up as litter.

Figure 50: Estimated Volume of Unrecovered Plastic Beverage Containers in the Northwest Territories after Implementing Opportunities



6.0 End Markets for Recycling Plastics in Canada

This section presents information on the status of plastic resins reported as supplied, collected, and recycled in Canadian beverage container recycling programs, and it also provides an overview of the drivers and status of plastic processing markets in Canada, for different resins. This is relevant to the overall study because if Canada can reach a 90% recovery rate for plastic beverage containers there needs to be acceptable end markets for the material.

6.1 Drivers to Increase Plastic Recycling

In Canada, the plastic packaging sector held the largest share in the plastics market in 2021 and the demand for plastic packaging is estimated to continue rising in the coming years.[138] Plastics are used in various industries and about 39% of plastics are used in packaging, 33% in construction, 14% in automotive and 14% in other applications such as electronics, leisure products, agriculture, textiles, and pharmaceuticals.[139] In Canada, plastic production is a $35 billion industry employing close to 100,000 people in nearly 2,000 businesses that make and recycle plastic products, yet in 2021 it was estimated that every year over 3 million tonnes of plastic waste is disposed in Canada, with packaging being almost half of that amount.[140]

As part of Canada's plan to move toward the goal of zero plastic waste by 2030, in 2022 the Government of Canada announced a new comprehensive initiative to reduce plastic waste and help drive a more circular economy. The Government of Canada has also committed to working with industry to reach at least 50 percent recycled content in plastic products, where applicable, by 2030. The aim is to increase the amount of plastic waste re-circulated in the economy and to consequently reduce the amount being landfilled or littered. Another element included in this initiative is the establishment of a Federal Plastics Registry that will require companies to report annually on the quantity and types of plastic they manufacture, import, and place on the market. Producers of plastic products and service providers will also be required to report on the quantity of plastic collected for diversion, reused, repaired, remanufactured, refurbished, recycled, processed into chemicals, composted, incinerated, and landfilled. Reporting on the amount of packaging and other plastic waste generated on industrial, commercial and institutional (ICI) premises will be mandatory. The Federal Plastics Registry sets a clear pathway to collect critical information that will inform and support the implementation of Canada's evidence-based plan and help measure progress over time to prevent plastic pollution and protect the environment. At the same time, a multi-sector collaborative initiative began in 2021, with a group of more than 40 Canadian companies, government organizations, waste management firms, and environmental groups developed the Canada Plastics Pact (CPP). The CPP is a multi-stakeholder organization driven to collaborate in conducting research and developing solutions to overcome barriers regarding use of plastics, reducing plastic waste, and recycling plastics. The CPP is part of an international aligned effort to eliminate plastic waste and drive a more circular economy for plastics in other countries and regions that have established plastic pacts (e.g. Europe, United States, United Kingdom, and Central America).

To date there are approximately 100 partners in the CPP, and the organization has been involved in baseline studies to enhance circularity, setting voluntary targets for recycled content in plastic packaging, and developing roadmaps for Canada through engagement with partners, collaboration and taking action.[141]

In 2023, the Government of Canada proposed a new regulatory framework for recycled content and labelling rules for plastic packaging, which will help address barriers to expand recyclable plastic processing markets in Canada.[142] At the same time, some provincial governments have recently established new recycling targets which producers must meet.

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[138] Industry Arc. 2024. Canada Plastics Market 2024 – 2030. Accessible at https://www.industryarc.com/Report/19562/canada-plastics-market.html#:~:text=Packaging%20sector%20held%20the%20largest,market%20growth%20of%20Canada%20plastics.
[139] Industry Arc. 2024. Canada Plastics Market 2024 – 2030. Accessible at https://www.industryarc.com/Report/19562/canada-plastics-market.html#:~:text=Packaging%20sector%20held%20the%20largest,market%20growth%20of%20Canada%20plastics.
[140] Environment and Climate Change Canada, 2021. "Zero Plastic Waste, the Need for Action" website. Accessible at https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/reduce-plastic-waste/need-action.html
[141] Canada Plastic Pact website, accessible at https://plasticspact.ca/
[142] Environment and Climate Change Canada (2023). Recycled content and labelling rules for plastics: Regulatory Framework Paper. Available at www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/recycled-content-labelling-rules-plastics.html.

Canada is also impacted by plastic recycling markets in the U.S., due to the close proximity of many processing markets. Recyclers in the U.S. have indicated that post-consumer resin (PCR) demand will remain flat unless there are new minimum-PCR content legislation which will increase demand for processors to produce PCR. Recycled content legislation has passed in New Jersey, California, and Washington in addition to Colorado requiring a recycled content target to be set in the EPR producer plan. New Jersey for example, which enacted a recycled-content law in January 2024, requires rigid plastic container producers to include at least 10% PCR content; plastic beverage containers require at least 15% PCR; plastic carryout bags require at least 20%; and trash bags require 5%-20% PCR. The required PCR amounts for each category will increase incrementally, with rigid containers and plastic beverage containers requiring 50% PCR content by 2036 and 2045, respectively.[143]

6.2 Rigid Plastic Container Reprocessing Capacity in Canada

Polyethylene terephthalate (PET) is often a strong, lightweight plastic that is used for packaging foods and beverages, especially for soft drinks, juices and water. Virtually all single-serving and 2-liter bottles of carbonated soft drinks and water sold in North America are made from PET.[144] High-Density Polyethylene (HDPE) is also commonly used for other food and some beverage containers. HDPE is also readily recyclable. PET, clear HDPE, and polypropylene (PP) are the main resins currently used in food grade packaging as well as processed into recycled Post Consumer Resin (PCR) for use in food grade packages. Coloured HDPE is not used as food grade resin due to the use of contaminant from inks from the packaging itself, as some packages use heavy metals to produce saturated colours. The use of recycled plastics in food-contact containers is governed by Health Canada and the United States Food and Drug Administration (FDA) in the U.S. In Canada and the U.S., the vast majority of plastic products and packaging produced each year and placed on the market are not suitable for processing into food grade PCR. The only sources of suitable plastic for use in PCR for food contact applications are rigid plastics - predominantly PET and clear or natural white HDPE bottles.[145] While companies may have LNO's for their processes, this does not guarantee that they are actually producing food grade resin. [146]

Canada's domestically recycled "secondary" plastics output accounted for approximately CAD $350 million in sales in Canada in 2016 (this is the most recent year with data available for domestic plastic recycling).[147] PET is the highest recycled plastic in the U.S. and Canada and has the highest likelihood to be recycled multiple times compared to other resins. Rising demand for the use of PET in food and beverage packaging has contributed to the growth of the plastics reprocessing market in Canada. [148]

There is a significant flow of plastic material at each state of the plastics value chain between the U.S. and Canada. The U.S. generates the majority share of the feedstock of PET, HDPE, and PP containers used to make both food grade and non-food grade PCR in North America, there is an estimated 660 million kilograms of capacity to produce PET food grade PCR in the U.S. and Canada. This represents 60% of the total PET processing capacity in the U.S. reported in 2019. The remaining 40% of capacity is currently used to

[143] Recycling Today, article by Chris Voloschuk, January 31, 2024. Accessible at https://www.recyclingtoday.com/news/glimmers-of-hope-amid-flat-demand-for-recycled-plastics/#:~:text=%E2%80%9CDemand%20is%20picking%20up%20compared,sought%20after%20as%202024%20progresses.
[144] PET Resin Association website. Accessible at https://petresin.org/an-introduction-to-pet/
[145] ECCC, 2021. Food Grade Recycled Resin, Prepared by Stina. Accessible at https://www.plasticsmarkets.org/jsfcontent/ECCC_Food_Grade_Report_Oct_2021_jsf_1.pdf
[146] Ibid.
[147] ECCC 2019. Economic Study of the Canadian Plastic Industry, Markets and Waste. Summary Report Prepared by Deloitte and Chem Info. Accessible at https://publications.gc.ca/collections/collection_2019/eccc/En4-366-1-2019-eng.pdf
[148] ECCC 2019. Economic Study of the Canadian Plastic Industry, Markets and Waste. Summary Report Prepared by Deloitte and Chem Info. Accessible at https://publications.gc.ca/collections/collection_2019/eccc/En4-366-1-2019-eng.pdf

process PET that is not used for food grade end uses. This differs significantly from the estimated capacity to process food grade HDPE recycled resin, which is less than 20% of the 2019 total reported HDPE bottle processing capacity.[149]Previous analysis from Eunomia found that although Canada collects a greater share of available PET bottles than the U.S., Canada is still a net importer of PET plastic bales as there is additional capacity to manage the material. A majority of the processed PET flake is then shipped back to the U.S. for integration into plastic packaging. [150]

The market for food grade PCR resin is growing in Canada. A 2021 ECCC funded study found that a lack of supply of suitable food grade feedstock to process into PCR was identified as the key challenge to expanding production in Canada. To address this issue, findings from the study indicated that there is recent growth in vertical integration – where resin producers and converters are buying reclamation capacity and brand owners and reclaimers are buying equipment to make their own packaging. This integration gives companies more control over feedstocks and the PCR levels best suited to their products and goals.[151]

6.3 Barriers to Increased Food Grade PCR

The 2021 ECCC report identified the following barriers to expanding availability of food grade PCR in Canada[152]:

- Lack of suitable supply: expand supply of suitable feedstock by increasing recovery rates of non-contaminated food grade PET and clear HDPE.
- Lack of PCR recycled content verification requirements: there is currently a lack of any verification requirements for use of post-consumer material either in regulation or by industry. Many companies include false PCR claims when they are really using off-spec industrial material not post-consumer material.[153]
- Lack of economic drivers: low cost disposal (e.g., low landfill tipping fees), low cost virgin resin process, and little market accountability for producing non-recyclable products.

The key reasons that food grade plastic resin may not be recycled into food grade post-consumer resin are that the package or product was initially produced using non-food grade resin, or non-food safe additives were added during packaging production. [154] Currently, rPET is the predominant resin used in food grade applications. The available supply of material to make food grade recycled high-density polyethylene (rHDPE) is currently limited to only clear HDPE bottles. In Canada there is only a very small amount of food grade HDPE containers available, as these are only accepted in approximately half of DRS programs. Furthermore, many jurisdictions in eastern Canada including Ontario and Quebec, and the Atlantic provinces do not typically sell milk in jugs, rather they sell it in film bags which reduces the availability of food grade HDPE. Therefore, there is not enough food grade HDPE collected in Canada to meet the demand, and this material is being imported by manufacturers.[155]

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[149] ECCC, 2021. Food Grade Recycled Resin, Prepared by Stina. Accessible at https://www.plasticsmarkets.org/jsfcontent/ECCC_Food_Grade_Report_Oct_2021_jsf_1.pdf
[150] Eunomia
[151] ECCC, 2021. Food Grade Recycled Resin, Prepared by Stina. Accessible at https://www.plasticsmarkets.org/jsfcontent/ECCC_Food_Grade_Report_Oct_2021_jsf_1.pdf
[152] ECCC, 2021. Food Grade Recycled Resin, Prepared by Stina. Accessible at https://www.plasticsmarkets.org/jsfcontent/ECCC_Food_Grade_Report_Oct_2021_jsf_1.pdf
[153] BNQ is now working on the development of a certification program consisting of the document BNQ 3840-900 Recycled Plastic Content Products - Certification Protocol and certification requirements available at https://bnq.qc.ca/en/standardization/environment/recycled-plastic-content-products.html
[154] ECCC, 2021. Food Grade Recycled Resin, Prepared by Stina. Accessible at https://www.plasticsmarkets.org/jsfcontent/ECCC_Food_Grade_Report_Oct_2021_jsf_1.pdf
[155] ECCC, 2021. Food Grade Recycled Resin, Prepared by Stina. Accessible at https://www.plasticsmarkets.org/jsfcontent/ECCC_Food_Grade_Report_Oct_2021_jsf_1.pdf

The 2021 ECCC study recommended increasing the supply of suitable food grade post-consumer material by increasing the recovery volume from segregated collection programs such as DRSs. Plastic from DRSs is well known to provide a high quality of material that is not contaminated with non-food grade resins, making it easier and less costly to process to higher quality PCR for use in food grade packaging.[156]

6.4 Canadian Plastic Processors

The Canadian plastic reprocessing market for HDPE and PET currently includes[157]:

- Ontario: twenty-four (24) processing facilities
- Quebec: nine (9) processing facilities
- BC: three (3) processing facilities
- Alberta: two (2) processing facilities.

All of these facilities make either flake, pellets, or granules from HDPE and PET that can be used in new plastic packaging, but not all of these facilities currently produce food grade suitable flake or pellet. Known facilities that do produce food grade recycled material are discussed in the following paragraphs.

In Ontario there are several plastic processors that produce food grade recycled plastic, particularly PET. These include Ice River Springs, they operate their own recycling facility to produce 100% rPET bottles for water products. EFS-plastics Inc. specializes in recycling post-consumer plastic into high-quality resin pellets, including non-PET plastics. They focus on producing resins that can be used in various applications, including food-grade packaging. GreenMantra Technologies converts post-consumer plastics into high-value polymers that can be utilized in food-grade applications, though this is not their primary market. ReVital Polymers Inc. produce high-quality recycled resins. Enviroplast Inc. produces recycled plastics that can be used in food-grade applications, although their primary focus is broader.

In Quebec there are both new and established plastic processors that produce food grade recycled plastic. Plastrec Inc. Joliette, is a recycler of PET plastics in Quebec, specializing in the production of high-quality rPET that is suitable for food-grade applications. Plastrec buys roughly 2 billion PET containers per year from different municipal programs in Quebec, Ontario and the United States. They have partnered with water bottling company Eska and are now producing 100% rPET bottles in Quebec. Other players producing rPET include Nu-b in Vaudreil-Dorion.

Merlin Plastics is the largest plastics processer in Western Canada. The facility in Gifford, BC. is a container sortation plant where the materials from the curbside blue bins collected in Western Canadian programs are sorted into their respective streams along with DRS plastic containers. The Delta, BC location is the processing plant that processes the various plastic container packaging into recycled flake and pellet. Merlin Plastics also has a facility in Calgary, AB that processes PET into recycled flake and pellet and then ships it to California for bottling into new products.[158] Other plastic containers, such as coloured PET or HDPE are recycled into pellets for use in the manufacture of new non-food plastic products.[159]

Innovative technology for recycling white/natural HDPE from milk jugs into food-grade plastic has just been introduced by Merlin Plastics. In their BC facility, the natural plastic is further processed and then turned back into new jugs.

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[156] ECCC, 2021. Food Grade Recycled Resin, Prepared by Stina. Accessible at https://www.plasticsmarkets.org/jsfcontent/ECCC_Food_Grade_Report_Oct_2021_jsf_1.pdf
[157] ENF Recycling, 2024 website. Accessible at https://www.enfplastic.com/directory/plant/Canada
[158] Merlin Plastics, accessed April 10, 2024 https://merlinplastics.com/
[159] ABCRC website accessed April 10, 2024 https://albertadepot.ca/recycling101/container-types-and-refunds/

In addition, NOVA Chemicals and Merlin Plastics have teamed up to repurpose recycled polyethylene into resin for food packaging applications. This is one of several collaborations NOVA Chemicals is pursuing to build its post-consumer recycled polyethylene (rPE) and post-consumer recycled (PCR) product line. Ultimately, NOVA Chemicals plans to offer 100% PCR polyethylene and PCR blended with its virgin grades, including high-quality LLDPE, LDPE, and HDPE. This partnership with NOVA is one of several important relationships that Merlin has built with industry leaders to enhance recycling.[160]

Novapet is the largest plastic processor in Atlantic Canada, owned by Evergreen. Novapet processes both PET and HDPE. PET and HDPE from Atlantic provinces DRS programs is sent to this facility for processing. Novapet processes more than 5,400 tonnes of recycled PET annually. Novapet also sells PET and HDPE to other Canadian and U.S. markets.[161] In 2021, Divert NS provided $238,000 in funding to Novapet Inc. to upgrade their second recycling processing line, this upgrade will allow Novapet to expand its throughput by 50%.

Evergreen has a network of four plants across North America focused on recycling plastic and converting post-consumer bottles and containers into high-quality food-grade recycled polyethylene terephthalate (rPET). Evergreen is one of the leading U.S. manufacturers of rPET. They offer certifications compliant with the U.S. Food and Drug Administration (FDA) for food grade recycled polyethylene terephthalate (FDA rPET) resin in pellet format. The company has an annual recycling capacity of 11.6 billion PET bottles and food-grade rPET capacity of 231 million pounds, they are among the three largest rPET producers in North America.[162] They have facilities in Nova Scotia, New York, Ohio, and California. PET plastic beverage containers returned for refund in Nova Scotia, Prince Edward Island, and New Brunswick are processed by Novapet in Nova Scotia.

6.5 Market Demand Limitations for Circularity

6.5.1 PET and HDPE

The Canada Plastic Pact reported that in 2022, the PCR content in its members PET bottles was 38%.[163] The members' portfolio as a whole reported a 12% PCR content. This means that PET bottles have a PCR content that is 26 points higher than the average of the packaging portfolio. This was a 9 point increase over the PCR content rate for PET bottles which was quoted in the Pact's 2020 Baseline Report.[164] There appears to be a demand to increase the circularly of PET bottles. The Pact reported a 12% PCR rate for HDPE bottles in 2020, and did not reveal one for 2022.

The limitations to circularity for PET bottles is therefore the competition which the sector sees from non-packaging businesses such as the textile and fiber markets. About 30% of the rPET market in North America is secured by vertically integrated textile/fiber manufacturers.[165] These facilities purchase bales of PET bottles and process them in-house. This material is therefore never made available to resin converters for production of bottles.

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[160] Nova Chemicals , 2020. "NOVA Chemicals and Merlin Plastics Join Forces to Use Curbside Recycling for Consumer Packaging" https://www.novachem.com/media-center/news-releases/nova-chemicals-and-merlin-plastics-join-forces-to-use-curbside-recycling-for-consumer-packaging/

[161] Divert NS news, accessed April 12, 2024 Value-Added Manufacturing Funding Announced for NovaPet | Divert NS

[162] Evergreen website, accessed April 12, 2024 https://www.evergreentogether.com/locations/

[163] CPP_2022_Annual-Report-EN.pdf (plasticspact.ca)

[164] CPP-2020-Baseline-Report.pdf (plasticspact.ca)

[165] Email correspondence with NAPCOR, March 2024.

For PET and HDPE resins, their respective primary and secondary plastic markets compete against each other, based on price and quality of resins. This competition is difficult for the recycling industry, which struggles with quality due to uneven feedstock composition and price. Although secondary plastics producers have lower upfront investment than virgin plastic production companies for the same resins, there are other market driven factors affecting prices. During periods of low oil prices, the price for virgin resins is lower compared to secondary resins because the secondary material cost structure is more labor-intensive.[166] Therefore, when oil prices fall virgin resins have a cost advantage compared to secondary plastics.

With respect to other plastic resins such as opaque HDPE, polystyrene, and multilayer plastics, there are limited markets currently available in Canada for domestic processing and in some instances these materials are either shipped long distances to U.S. processors or used for energy recovery.

A 2020 report by Resource Recycling Systems (RRS) in the U.S. estimated that in the U.S., a 30% PET recycling rate supports a 9% PCR usage rate in using PCR for beverage containers. RRS calculated that for the U.S. to meet 25% PCR use in beverage containers, the U.S. PET recycling rate would have to be 52%, and a similar rate would be expected for Canada.[167]

This result is similar to findings from the National Association for PET Container Resources which estimated that in order to reach a 25% recycled content percent the recycling rate would need to be 45% and the process yield would need to be 70% (See Table 40).[168]

Table 40: Collection Rate and Investment Costs Needed to Meet RPET Content

	2022	2025	2030	2035	2040
rPET Content %	15%	25%	50%	70%	80%
Process Yield %	62.8%	70%	72%	72%	72%
Recycle Rate %	39.6%	45.3%	77.7%	104.7%	117.9%

6.5.2 Other Rigid Plastics

For non-PET plastics, the market limitations for using postconsumer resin include competition with other non-packaging sectors. Polypropylene is the most frequent resin for non-PET or non-HDPE beverage containers.[169] However, most of recycled polypropylene is used in the automotive or other durable good sectors.[170] Despite there being some recyclers who have FDA LNO's for their polypropylene processes, the demand from non-food grade sectors appears to be greater than the demand to pay for food-grade recycled resin.

[166] ECCC 2019. Economic Study of the Canadian Plastic Industry, Markets and Waste. Summary Report Prepared by Deloitte and Chem Info. Accessible at https://publications.gc.ca/collections/collection_2019/eccc/En4-366-1-2019-eng.pdf
[167] International Bottled Water Association / Resource Recycling Systems, 2020. Analysis of Food Grade Recycled PET (rPET) and Recycled HDPE (rHDPE) in the United States.
[168] NAPCOR_2020RateReport_FINAL.pdf
[169] Eunomia Interview with Merlin Plastics, April, 2022.
[170] w151_q2_sp161_0_2021_PostConsumerPlasticBottleRecycling_Canada_FINAL.pdf (stinainc.com)

6.6 Supply Barriers to Circularity

Value recovery options for secondary plastics in Canada are only as strong as their weakest link in the value chain and are affected by the following barriers[171]:

- Low-cost alternatives such as landfilling
- Low collection rates in curbside systems which is linked to access to services plus participation from households
- Limited access for ICI in some provinces
- Lack of reliable local markets
- Cost of transporting materials to end processors
- Process losses from single-stream collection resulting in a high contamination rate requiring additional quality control at sortation within material recovery facilities, and
- Process losses at processing and reprocessing stages of recycling.

Ontario and Manitoba's reliance on a single-stream collection system for all recyclable material curbside results in the potential for contamination of collected plastic beverage containers. Additional sorting and quality control are thus necessary at material recovery facilities in programs that rely on single-stream curbside collection, and additional technologies to remove contaminants at plastic recycling plants.[172]

The main processing challenges faced by plastic processors undertaking mechanical recycling operations for plastic resins in Canada have been documented as the following[173]:

- Low prices of virgin resins (affecting markets for reprocessed flake/pellets)
- Below specification bale quality received from some single stream MRFs resulting in higher operating costs and lower profitability for processors
- Prevalence of poor packaging design by producers (not easily recyclable), and
- Increasing costs to transport bales from municipalities to processors.

6.7 Recycling Verification Requirements

With regards to reporting on the recycling rate, there will always be a process loss rate of material sent for recycling, so the amount collected will always be more than the amount recycled. Note that there are no programs in Canada that regularly report both the collection rate and recycling rate (however, starting in 2026 Quebec will be the first jurisdiction to report on its recycling rate as well as collection rates by material). Currently, there are no requirements to verify that recycling has taken place for post-consumer non-hazardous material such as plastic (verification of recycling is only required for hazardous material recycling in Canada). Once material is sold to a processor, Canadian programs no longer have ownership of that material and do not currently verify the actual amount recycled once its been sent to processors.[174]

In Canada there is now the CAN/BNQ 3849-100 Standard. The purpose of the standard is to specify the requirements for determining the content of recycled plastic introduced into the production process of the end product.

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[171] ECCC 2019. Economic Study of the Canadian Plastic Industry, Markets and Waste. Summary Report Prepared by Deloitte and Chem Info. Accessible at https://publications.gc.ca/collections/collection_2019/eccc/En4-366-1-2019-eng.pdf
[172] ECCC 2019. Economic Study of the Canadian Plastic Industry, Markets and Waste. Summary Report Prepared by Deloitte and Chem Info. Accessible at https://publications.gc.ca/collections/collection_2019/eccc/En4-366-1-2019-eng.pdf
[173] ECCC 2019. Economic Study of the Canadian Plastic Industry, Markets and Waste. Summary Report Prepared by Deloitte and Chem Info. Accessible at https://publications.gc.ca/collections/collection_2019/eccc/En4-366-1-2019-eng.pdf
[174] Interviews undertaken in support of the current study for BCRNC.

The information in the below table, unless otherwise referenced, has been extracted from the latest version of the standard CAN/BNQ 3840-100/2023.[175]

Table 41: Summary of CAN/BNQ 3840-100/2023

Scope	*This standard applies to any products containing a claimed recycled plastic content of at least 5%, which is either credited according to the Chain of Custody (CoC) mass balance model or actual physical recycled content.*
Materials covered	*Plastic*
Alignment with international standards	*Documents from standards bodies* *ISO 14021 Environmental Labels and Declarations – Self-Declared Environmental Claims (Type II Environmental Labelling), ISO 22095 Chain of Custody – General Terminology and Models*
Definitions of recycled content	*The PCR definition references CSA ISO 14021, with adapted wording:* ***PCR**: Plastic material generated by households or by commercial, industrial or institutional facilities in their role as end users of the product which can no longer be used for its intended purpose, including returns of material from the distribution chain* ***PRE**: Plastic material diverted from the waste stream during a manufacturing process that cannot be reclaimed within the same process that generated it, or that requires processing through which it undergoes a phase change in order to be reclaimed.*
Compliance mechanisms	There is no reference to audits. ***Evaluation and Claim verification*** *All parties involved in the supply chain including the converter and/or the brand owner of the end product shall maintain and retain records that meet the following requirements:* *a) a list of the end products containing recycled content with a unique alphanumeric identification code and the trade name for each product, if applicable;* *b) the complete bill of materials of each component composing each end product containing recycled content, including the list and quantity of each plastic component and the unique alphanumeric identification code of each component;* *c) the calculation of the recycled content and result for each component and recipe (recyclate, virgin material, colouring and any other additives);* *d) the sources of the virgin material and recyclate as well as the information about the sources identifying them unequivocally, including the organization's name, address and phone number, as well as the name of a contact person (vendor).*
Traceability	*The recyclate considered as part of the calculation of a product's recycled plastic content shall originate exclusively from PRE or PCR whose original source is validated by material traceability records issued by the recyclers.* *The converter of a product shall ensure to document its CoC in such a way as to allow a validation of the authenticity as well as the traceability, with its feedstocks' suppliers, of the statements on the materials entering the manufacture of the end products.*
Method of measuring	There are specific formulas to "*calculate the total recycled content of each component considering their specific status of either PRE or PCR of an end product composed of a blend of plastic materials. The total recycled content of a product is the sum of the recycled content reported under the various chains of custody (CoC)…"*
Chain of custody	*Chapter 7.3 in the* Standard *provides a detailed description of the Chain of Custody requirements. General requirements:* *Each stakeholder involved in the CoC shall document supporting evidence to ensure material traceability and to support recycled content statements. The converters shall establish and implement one of the CoC models with material mixing as per the requirements of Clause 5.4 of the document ISO 22095 and shall be transparent about the selected CoC model.*

[175] Bureau de normalisation du Québec, CAN/BNQ 3840- 100/2023, Recycled Plastic Content Products

	The converter's material suppliers shall use the same level of CoC model or higher level that is classified according to the physical presence of the characteristics specified in Clause 5.1 of the document ISO 22095.
Accounting period	Reconciliation period – The inventory control and reconciliation period for end products containing recycled plastics shall be determined by the converter, although it shall have duration not exceeding twelve months with a continuous monthly balancing process. A converter using a mass balance model with credit method as a CoC shall have maximum of three-month reconciliation period.
Reference in Government Policies and/or Regulations	The Bureau de normalisation du Québec (BNQ) published the standard to guarantee recycled plastic content in new products manufactured in Canada.[176]

Studies undertaken for the Canada Plastic Pact found typical final recycling rates for deposit bearing beverage containers based on container format and resin, based on interviews with processors across Canada. Table 42 and Table 43 present the average low and high yield range for calculating recycling rates for beverage containers collected in DRSs, and curbside, respectively. Table 42 and Table 43 shows that the yield is fairly consistent for PET and HDPE rigid containers, but more variable for flexible plastics; and the low estimate of the recycling yield is higher in DRSs compared to curbside systems. This is due to the fact that DRS generate resins with less contamination and are preferred source material among processors compared to curbside packaging collected.

Table 42: Yield Factor to Estimate Recycling Rates for Beverage Packaging Collected in DRS[177]

Resin	Low Estimate of Yield	High Estimate of Yield
PET	80%	85%
HDPE	80%	85%
Flexible Plastics	50%	75%

Table 43: Yield Factor to Estimate Recycling Rates for Beverage Packaging Collected in Curbside Systems[178]

Bale	Low Estimate of Yield	High Estimate of Yield
PET	70%	85%
HDPE, PP, Tubs & Lids, PS	75%	85%
Mixed Plastics, MRP	50%	67%
Film Plastic	50%	75%

The 2024 CPP study estimated that the 2022 recycling rate of rigid plastic containers from DRSs in Canada is approximately 60%, based on a 73% collection rate. Eunomia estimated a recovery rate of 72% for plastic

[176] https://www.quebec.ca/en/news/actualites/detail/new-canadian-standard-published-by-the-bnq-on-products-with-recycled-plastic-content-50062

[177] CPP, 2024. Deliverable 1: Deposit Return and Residential Recycling Systems Performance. January 2024. Accessible at https://plasticspact.ca/wp-content/uploads/2024/01/CPP_Canadian-Plastics-Flow_2023-Progress-Report.pdf

[178] ibid

beverage containers for this study. Eunomia applied the yield factors from the Canada Plastic Pact report to the modelled collection rates for beverage containers in the section below.

6.8 Recycling Definitions

There is no consistent definition of recycling rate used in Canadian regulated recycling programs. A clear definition of recycling is important to both policymakers that are seeking to measure outcomes associated with recycling programs and to the regulated community that must deliver them. There has been a multi-stakeholder working group led by the Canadian Standards Association (CSA) that published *Defining Recycling in the Context of Plastics. A Principled and Practical Approach* in 2021.[179] The definition of what is "recycled" delineates the disposition of materials that may be included in the calculation of performance against the recycling target. If the definition of recycled is inconsistent with circular economy principles, then it can be expected that recycling supply chains might employ materials management solutions that are inconsistent with those principles.[180]

Due to provincial policymakers' lack of experience with producer responsibility and limited technical depth with material management systems in Canada when recycling regulations were first drafted decades ago, they chose to utilize narrowly scoped regulations that relied on producers and their producer responsibility organizations to prepare plans describing their proposed approach to comply with the regulation for government review and approval. This approach leaves the choice of terminology and definitions of the chosen terminology to regulated producers.[181]

The critical outstanding question to evaluate recycling programs effectively is what counts as recycled in the calculation of recycling performance. In addition to differing definitions of key terminology for "recycling" among jurisdictions, tracking of performance against those definitions utilizes differing measurement points and calculation methodologies. The lack of a standard approach to tracking and measurement of performance results in datasets that cannot be integrated to assess a jurisdiction's progress against its policy objectives and that cannot be used to benchmark among jurisdictions. Similarly, the definition for "recovery" has a variety of meanings across jurisdictions such as collection, resource recovery, materials shipped from processing facilities, and energy recovery, which cause confusion.[182]

Table 44 presents various recycling and recovery definitions for plastics applicable to beverage container packaging in Canada.

Table 44: Recycling Definitions for Regulated Plastic Beverage Containers

Jurisdiction	Definitions of Recycling, Recovery, and Recycling Rates for Plastics
Canadian Standards Association (CSA)	Recycling: the reclamation of plastics (as polymer, monomer, or constituent chemical building blocks) in such a manner that they displace the primary or raw materials that are used as chemical building blocks in the production of plastics and plastic products and packaging.

[179] Canadian Standards Association. 2021. Defining Recycling in the Context of Plastics. A Principled and Practical Approach. Accessible at Defining Recycling in the Context of Plastics (csagroup.org)
[180] Canadian Standards Association. 2021. Defining Recycling in the Context of Plastics. A Principled and Practical Approach. Accessible at Defining Recycling in the Context of Plastics (csagroup.org)
[181] Canadian Standards Association. 2021. Defining Recycling in the Context of Plastics. A Principled and Practical Approach. Accessible at Defining Recycling in the Context of Plastics (csagroup.org)
[182] Canadian Standards Association. 2021. Defining Recycling in the Context of Plastics. A Principled and Practical Approach. Accessible at Defining Recycling in the Context of Plastics (csagroup.org)

Jurisdiction	Definitions of Recycling, Recovery, and Recycling Rates for Plastics
ECCC	Recycling: a process that requires collection, sorting and re-processing of end-of-life plastics into material that can be used in new products.
BC	No definition of recycling rate in legislation, only a definition for "recyclable material". Encorp Pacific reports on the amount recycled in weight diverted from landfill, but not a recycling rate (only recovery rate). Recovery is defined as the amount of product collected. Recovery performance is measured as the amount of product collected divided by the amount of product produced (i.e., reported as supplied by obligated producers), expressed as a percentage.
AB	The Beverage Container Management Board (BCMB) is authorized to approve recycling methods for purposes of managing approved beverage containers. Recycling rate will quantify % of residual loss compared to containers collected (measured net of residuals lost during the processing of materials).
SK	Recovery is defined as the "recycling rate" which means packaging and paper products recycled as a percentage of household packaging and paper products in products supplied to the market. There are no recycling rate definitions or requirements to report end of life recycling.
MB	Recycling: to do anything, including reuse or recover, that results in providing a use for a thing that otherwise would be disposed of or dealt with as waste, including collecting, transporting, handling, storing, sorting, separating, and processing the thing, but does not include the disposal of waste in land, the use of a thermal destruction process or any other activity prescribed by regulation. Recovery performance: recovery performance is measured as the total amount of product collected as a percentage of the total amount of product supplied. There are no recycling rate definitions or requirements to report end of life recycling.
ON	Recovery: the extraction of useful materials or other resources from things that might otherwise be waste, including through reuse, recycling, reintegration, regeneration, or other activities. There are no recycling rate definitions or requirements to report end of life recycling.
QC	Recycling is defined as the reclamation of residual materials for the manufacture of new containers, packaging, or printed matter in order to promote closed-loop circularity. There is a recycling rate target of 50% (following process loss) for plastic beverage containers.
NB	There are no recycling definitions in the regulation.
NS	There are no recycling rate definitions or requirements to report end of life recycling.
PEI	Recycling: The practice of accepting, collecting, storing, sorting, handling, and preparing for transport or transporting, recyclable material for the purpose of the use or incorporation of the material in the manufacture of secondary products, and includes (i) compacting, (ii) bundling, (iii) baling, (iv) shredding, and (v) crushing. There are no recycling rate definitions or requirements to report end of life recycling.
NL	A process by which a post-use material is collected with the intent of processing that material to transform it into another material or substance or for another use. There are no recycling rate definitions or requirements to report end of life recycling.

Jurisdiction	Definitions of Recycling, Recovery, and Recycling Rates for Plastics
NWT	There are no recycling rate definitions or requirements to report end of life recycling.
YT	There are no recycling rate definitions or requirements to report end of life recycling.

Using the CSA standard for recycling, Eunomia calculated the difference between the national recovery rate which was calculated for Section 5 and the estimated recycling rate when taking into account further losses. This is a different point of measurement than the "recovery rate" which is what DRS programs generally report.

A worked example of these calculations is shown below, followed by the results when applied to each of the modelled scenarios. In the scenario below, there are 100 total tonnes of plastic beverage containers sold. 30 tonnes of these beverage containers are recovered through a DRS program, and 30 are recovered through a curbside program. This would lead to a recovery rate of 60% ((30 + 30)/100). The table then applies the average recycling yields that are DRS and curbside specific to the recovered tonnes. This results in 25 tonnes of DRS collected material being recycled, and 23 tonnes of curbside collected tonnes being recycled. These are then added together to arrive at a total recycled tonnage of 48, resulting in a 48% recycling rate overall. The recycling rate is lower as it is measured at a different (later) point in the recycling chain.

Table 45: Worked Example of Applying Recycling Yields

	Total Sales	DRS Recovered Tonnes	Curbside Recovered Tonnes	Total
Tonnes Recovered	100	30	30	60
Average Recycling Yield	--	84%	77%	--
Tonnes Recycled (Yield x Tonnes Recovered)	---	25	23	48

The results of these calculations when applied to the modelling results are shown below:

Table 46: Comparison of Recovery vs Recycling Rate (Using CSA Definition)

Scenario	From DRS		From Curbside		Total (DRS + Curbside)	
	Recovery Rate	Recycling Rate	Recovery Rate	Recycling Rate	Recovery Rate	Recycling Rate
Baseline	25%	21%	40%	31%	65%	52%
Expand scope in Ontario and Quebec. Implement DRS in Manitoba.	72%	59%	5%	4%	77%	63%
Expand scope or implement a DRS in all provinces.	72%	59%	7%	5%	79%	64%

Scenario	From DRS		From Curbside		Total (DRS + Curbside)	
	Recovery Rate	Recycling Rate	Recovery Rate	Recycling Rate	Recovery Rate	Recycling Rate
Expand scope or implement a DRS in all provinces and improve accessibility.	75%	62%	4%	3%	79%	65%
Expand scope or implement a DRS in all provinces, improve accessibility, and implement a minimum $0.15 CAD deposit.	84%	69%	5%	2%	87%	71%
Expand scope or implement a DRS in all provinces, improve accessibility, and implement a minimum $0.20 CAD deposit.	90%	74%	3%	2%	93%	76%

Source: Eunomia Modelling, Canada Plastic Pact Recycling Yields.

The recycling rate across scenarios varies from 63% to 76%.

6.9 Summary of Key Points – End Markets

The 2021 ECCC report identified the following barriers to expanding availability of food grade PCR in Canada:

- Lack of suitable supply of post-consumer PET as a key barrier to expanding availability of domestic rPET.
- Lack of PCR recycled content verification requirements across all Canadian programs.

Previous Eunomia studies found that there is plenty of capacity within Canada to expand production of recycled material:

- Due to increased proportional processing capacity for PET and HDPE recycling in Canada compared to the U.S., Canada is a net importer of baled PET and HDPE bottles to meet processing needs.
- Nearly 70% of Canada's recycled PET and HDPE pellets and flake is exported to the U.S. whereas only 1%-2% of U.S. processed pellets and flakes are exported to Canada.

Findings from both these reports indicate that capacity to produce food grade rPET and recycled HDPE in Canada exceeds supply, and that expanding supply of suitable feedstock by increasing recovery rates of DRS food grade PET and HDPE from domestic sources will help expand domestic production of recycled content at processor facilities. Implementation of recycled content requirements for beverage container packaging in Canada will help drive this market in Canada and the U.S., as producers operate using a perspective of a North America integrated market.

6.10 Summary of Key Points – Recycling Verification and Definitions

- Since recycling verification is not currently being required in any beverage container recycling programs in Canada, this requirement will help expand the market for recycled food grade post consumer resin in Canada. This could be:
    - A new requirement set in provincial recycling regulations if exact verification is desired to be reported.
    - Alternatively, the low end of the average recycling yield rate as identified in the CPP study could be reported for any jurisdictions that do not put a verified requirement in place: 80% recycling rate (low end of yield) for PET recycled from DRS; and 70% recycling rate (low end of yield) for PET recycled from curbside systems.

- In Canada there is now the CAN/BNQ 3849-100 Standard. The purpose of the standard is to specify the requirements for determining the content of recycled plastic introduced into the production process of the end product.
- Since there isn't a consistent definition of recycling (and what counts as recycling) across Canada, it is important that jurisdictions adopt a consistent definition of recycling, such as the finalised CSA draft recycling standard for the context of plastics in particular currently in draft form as:
    - *"Recycling: the reclamation of plastics (as polymer, monomer, or constituent chemical building blocks) in such a manner that they displace the primary or raw materials that are used as chemical building blocks in the production of plastics and plastic products and packaging."*[183]
- This CSA definition is based on circular economy principles, and - for fossil-based plastics - needs to be applied at the point of the supply chain where it can be verified that the yield of plastics (as polymers, monomers, or constituent chemical building blocks) will displace fossil resources in the production of plastics and plastic products and packaging. This point is typically after the final stage of processing and where the final yield is shipped to manufacturing.
- Using the CSA standard, if Canada implements all primary opportunities and achieves a 93% recovery rate of plastic beverage containers Canada can achieve a 76% recycling rate.

7.0 Conclusion

Environment and Climate Change Canada identified a 90% collection rate for the plastic packaging recycling stream as a pathway to support Canada's Zero Plastic Waste goal. To this end, the Beverage Container Recycling Network of Canada (BCRNC) Commissioned Eunomia Research & Consulting in partnership with Giroux Environmental Consulting and Millette Environmental to review the current state of beverage container recycling in Canada, estimate the current flow of plastic beverage containers, analyze factors that contribute to high performing systems internationally and within Canada, and identify key opportunities to achieve a 90% collection rate of plastic beverage containers.

Canada currently recovers 65% of plastic beverage containers. Overall, the provinces with deposit return systems (DRS) have a higher average recovery rate (72%) compared to provinces without a DRS (53%). Of

[183] Canadian Standards Association. 2021. Defining Recycling in the Context of Plastics. A Principled and Practical Approach. Accessible at Defining Recycling in the Context of Plastics (csagroup.org)

the 77,000 tonnes of plastic beverage containers that were not recovered in 2022, more than half were in Ontario, Canada's largest province by population and currently only has a DRS for alcoholic containers.

Three factors were identified as having the greatest opportunity for supporting Canada to reach a 90% recovery of plastic beverage containers. These included 1) increase the deposit level to $0.15 CAD or $0.20 CAD, 2) increase DRS program scope to cover the same beverage containers including milk and milk substitutes in addition to implementing a DRS in in Ontario and Manitoba, and 3) increase the number of return locations to improve accessibility. This report found that by implementing these three opportunities, Canada could reach a recovery rate of 93% for plastic beverage containers.

Appendix

A.1.0 Detailed Current State Results

Additional data on the current state of plastic beverage containers (from Section 3) is provided here.

Table A - 1: Plastic Beverage Containers Recovered and Unrecovered (2022)

	Tonnes returned through DRS	DRS Return Rate for in scope Sales	DRS Return Rate of Total Sales	Recovery Through Curbside ICI Recycling (tonnes)	Recovery Through Curbside Residential Recycling (tonnes)	Non Recovery Through Curbside ICI Garbage (tonnes)	Non Recovery Through Curbside Residential Garbage (tonnes)	Tonnes Littered	Total Recovered (tonnes)	Total Unrecovered (tonnes)
BC	16,600	72%	72%	1,600	1,400	2,900	300	200	19,600	3,400
AB	20,700	79%	79%	2,200	300	2,200	500	200	23,200	2,900
SK	5,000	79%	79%	500	100	500	200	100	5,600	800
MB	0	0%	0%	1,000	3,400	1,000	1,400	200	4,400	2,600
ON	300	42%	0%	5,050	44,520	5,950	36,600	3,140	49,870	45,700
QC	3,500	54%	7%	3,500	22,400	6,600	9,500	1,400	29,400	17,500
NB	3,200	68%	63%	600	0	400	900	100	3,800	1,400
PEI	480	76%	68%	70	60	100	0	10	610	110
NS	3,500	66%	61%	400	400	520	900	100	4,300	1,520
YT	200	64%	64%	30	20	20	20	0	250	40
NT	200	69%	69%	30	0	20	40	0	230	60
NV	0	0%	0%	0	0	0	200	0	0	200
NL	1,800	64%	59%	200	0	200	800	0	2,000	1,000
Total	55,000	72%	25%	15,000	73,000	20,000	51,000	**5,000**	**143,000**	**77,000**

In addition to establishing the waste flow of plastic beverage containers at the provincial level, Eunomia calculated the flow nationally of plastic beverage containers at the resin and beverage type level. The designated beverage containers included in DRS across the country are decided upon at the beverage type level, therefore reviewing program detail on which beverage types are not under deposit can reveal where there is a gap in the collection of plastic beverage containers overall.

Most annual reports do not break down sales and returns by beverage and resin type. Eunomia therefore had to estimate the breakdown of beverage containers for provinces which do not report at the resin and beverage type level by using two main sources. Those sources are:

1. Extrapolating from jurisdictions which do report data at the resin and beverage level (Alberta, Nova Scotia, Newfoundland and Labrador);

2. Waste characterizations which break down curbside and disposal streams by resin; and

3. Adjusting for differences in common beverage sales in a province (e.g., milk bags in Quebec instead of HDPE milk containers)

Table A - 1: Estimated Uncollected Plastic Beverage Containers by Stream, by Resin (2022)

	Tonnes returned through DRS	DRS Return Rate for in scope Sales	DRS Return Rate of Total Sales	Recovery Through Curbside ICI Recycling (tonnes)	Recovery Through Curbside Residential Recycling (tonnes)	Non Recovery Through Curbside ICI Garbage (tonnes)	Non Recovery Through Curbside Residential Garbage (tonnes)	Total Littered	Total Unrecovered (tonnes)
PET Soft Drink	44,600	72%	27%	11,100	52,500	15,400	35,500	3,970	54,870
PET Dairy	0	0%	0%	0	0	0	0	0	0
PET Alcoholic	1,500	66%	46%	200	700	300	400	60	760
HDPE Soft Drink	6,300	75%	17%	2,400	14,000	3,200	9,700	990	13,890
HDPE Dairy	2,400	83%	19%	900	4,200	1,000	3,700	330	5,030
HDPE Alcoholic	1	76%	16%	0	3	1	2	0	2
Other Soft Drink	700	51%	15%	400	1,100	500	1,900	200	2,600
Other Dairy	0	0%	0%	0	0	0	0	0	0
Other Alcoholic	0	0%	0%	10	20	10	20	0	30
Total	55,501	72%	25%	15,000	72,500	20,400	51,200	5,550	77,000

Table A - 2: Sources of Unrecovered Containers by Resin (2022)

	Residential Garbage Containers (tonnes)	ICI Garbage Containers (tonnes)	Littered (tonnes)	Total Unrecovered Containers (tonnes)
PET Soft Drink	35,500	15,400	3,970	54,870
PET Dairy	0	0	0	0
PET Alcoholic	400	300	60	760
HDPE Soft Drink	9,700	3,200	990	13,890
HDPE Dairy	3,700	1,000	330	5,030
HDPE Alcoholic	2	1	0	2
Other Soft Drink	1,900	500	200	2,600

	Residential Garbage Containers (tonnes)	ICI Garbage Containers (tonnes)	Littered (tonnes)	Total Unrecovered Containers (tonnes)
Other Dairy	0	0	0	0
Other Alcoholic	20	10	0	30
Total	51,200	20,400	5,550	77,000

To investigate whether more containers end up in different ICI sectors, Eunomia used the Canada Plastic Pact data. The data provides estimates for beverage containers in ICI disposal and recycling by sector, which Eunomia then compiled to get a total picture by sector type.

Table A - 3 shows five different ICI sectors and the containers which go uncollected from those sectors, as presented in CPP data used for this study. The sectors were an aggregation of sectors analyzed by CPP research. The individual sectors and their aggregated groups cross referenced by Eunomia are shown in the table.

Table A - 3: Categories of Business Types Based on NAICS Codes

Canada Plastic Pact Sector (Based on North American Industry Classification System i.e. NAICS)	BCRNC Study ICI Group
Construction	Other
Manufacturing	Other
Trade[184]	Trade
Transportation & Warehousing	Other
Administration and offices	Office
Educational Services	Office
Elementary & Secondary Schools	Campus
Post Secondary Schools	Campus
Health Care & Social Assistance	Campus
Arts, Entertainment, Recreation	Hospitality
Accommodation	Hospitality
Food services	Hospitality

[184]Trade refers to wholesale trade establishments, including merchants, durable goods, equipment and any other wholesale good

Table A - 4: Estimated Volume of Unrecovered Plastic Beverage Containers in the ICI Sector

	Trade	Office	Campuses (Schools, hospitals)	Hospitality	Other (Manu., Warehouse, Construction)
BC	630	900	600	1,070	1,420
AB	780	800	620	760	1,460
SK	210	210	190	180	270
MB	280	330	320	290	730
ON	1,770	2,260	1,510	1,640	3,830
QC	1,310	1,910	1,340	1,700	3,790
NB	150	160	160	120	370
PEI	20	20	20	20	40
NS	190	160	180	160	210
YT	10	20	10	10	10
NT	10	20	10	10	10
NV	-	-	-	-	-
NL	80	60	70	60	90
Total	**5,000**	**7,000**	**5,000**	**6,000**	**12,000**

A.2.0 Case Studies with Best Practice Factors

This section presents five international case studies that achieve a 90% or higher collection rate for beverage containers. Five countries that have attained remarkable success in their beverage container recycling efforts are profiled. These case studies not only highlight the impressive outcomes achieved in terms of collection but also reveal the multifaceted strategies and best practice factors employed to realize such high performance.

Table A - 5 and Table A - 6 provide a summary of how each of the country's DRS is designed compared to the factors reviewed.

Table A - 5: Case Study Summary (Norway, Lithuania, and Denmark)

	Norway	Lithuania	Denmark
Overall Collection Rate	91% (2022)	92% (2023)	92% (2023)
Plastic Collection Rate	92% (2022)	91% (2023)	91% (2023)
Deposit Level	*Variable*: NOK 2 to NOK 3 (CAD$0.25 to $0.38)	*Fixed:* €0.10 (CAD$0.15)	*Variable:* 1 to 3 DKK (CAD$0.20 to $0.59)
Scope of Beverages and Container types	• *Volume:* 125ml to 4.9L • *Materials:* Plastic, metal • *Beverages:* All, except for milk products, juices, dietetic products, and products exclusively for infants	• *Volume:* 100ml to 3L • *Materials:* Plastic, metal, glass • *Beverages:* All	*Container sizes:* <20L *Materials:* Plastic, metal, glass *Beverages:* All, except for milk and milk-based products, wine, spirits, plastic bottles >10L containing water
Legislated Targets	Yes (collection targets)	Yes (material-specific collection targets)	No
Accessibility to redemption network	*Return-to-retail:* • 15,000 return points • Return point to consumer ratio: 1 : 361	*Return-to-retail:* • 2,600 return points • Return point to consumer ratio: 1 : 1,099	*Return-to-retail:* • ~13,292 return points • Return point to consumer ratio: 1:443
Convenience at redemption facilities	Highly automated: 94% of containers returned via RVMs	Highly automated: 91% of containers returned via RVMs	Highly automated: 90% of containers returned via RVMs .
Refund payment options	Cash, option to purchase a lottery ticket that benefits charity	Cash, store credit, donation	Cash, deposit on customer's credit card, donation to charity
Infrastructure and requirements for on-the-go collection	Infinitum places recycled oil drums in schools, parks, offices, special events, etc. Special 'deposit rings' have been installed on public waste / recycling bins.		Deposit return bins attached to public waste bins in City of Copenhagen
Infrastructure and requirements for ICI collection	Infinitum places recycled oil drums in places like schools, parks, offices, special events, etc. Schools, restaurants, and catering establishments can also sign up for a free collection service that Infinitum offers	700 HORECA collection points	Offices and restaurants must take back deposit containers from end customers. System operator collects the containers free of charge and refunds the deposits after the packaging has been counted.

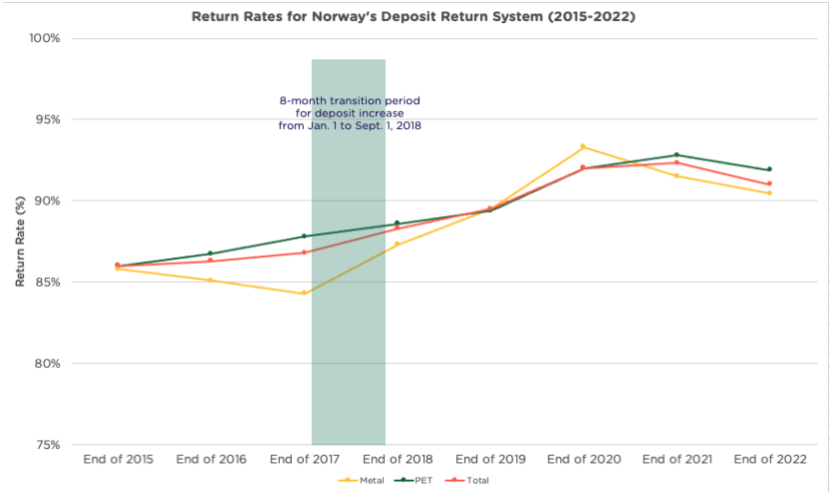
Consumer education, promotion, and awareness activities		System operator must allocate at least 1% of annual revenue to public awareness campaigns to promote the system	
System funding	Material revenues, unredeemed deposits, producer fees	Material revenues, unredeemed deposits, producer fees	Material revenues, unredeemed deposits, producer fees
Variable handling fees	Yes, vary by material and method of collection	Yes, vary by material and method of collection	Yes, vary by material and method of collection
Depot ownership	Not applicable – system is R2R	Not applicable – system is R2R	Not applicable – system is R2R
Strength of curbside recycling	Norway does not have any statutory producer obligations for packaging. However, binding agreements were concluded between the Environment Ministry and packaging manufacturers in 1995, which were renewed in 2003. As part of this agreement, industry committed to meet recycling and recovery targets. Producers have established a Green Dot recycling system, GPN (Grønt Punkt Norge) to meet those targets. Non-deposit containers are collected through GPN together with non-beverage packaging. Glass is collected in bring containers, while plastic and cartons are collected either in bring containers or kerbside.	Separate collection system for both household and non-household municipal waste has been in place since 2002. Total packaging recycling rate: 61.9% in 2019 Plastics packaging recycling rate: 69.6% (54.9% if new calculation rules are applied) Aluminum packaging recycling rate: 73.8% (63.5% if new calculation rules are applied) Glass packaging recycling rate: 57.3% (54.4% if new calculation rules are applied)	EPR scheme for packaging will come into force in July 2025 Scheme will cover all types of packaging, regardless of material, shape or purpose

Table A - 6: Case Study Summary (Slovakia and Finland)

	Slovakia	Finland
Overall Collection Rate	92% (2023)	97% (2023)
Plastic Collection Rate	93% (2023)	90% (2023)
Deposit Level	*Fixed:* €0.15 (CAD $0.22)	*Variable:* €0.10 to €0.40 (CAD $0.15 to $0.59)
Scope of Beverages and Container types	• *Volume:* 100ml to 3L • *Materials:* Plastic, metal • *Beverages:* All, except for milk and milk-based drinks, syrups, drinks containing >15% alcohol (i.e. spirits)	• *Volume:* 100ml to 3L • *Materials:* Plastic, metal, glass • *Beverages:* All, except for milk
Legislated Targets	*Yes* (overall collection targets that increase over time)	Yes (overall recycling target)
Accessibility to redemption network	*Return-to-retail:* • 3,269 return points • Return point to consumer ratio: 1 : 1,661	*Return-to-retail:* • 4,000 return points • Return point to consumer ratio: 1:1,391
Convenience at redemption facilities	Highly automated: 74% of containers returned via RVMs	Highly automated: 97% of containers returned via RVMs
Refund payment options	Cash, store credit	Cash, option to purchase a lottery ticket that benefits charity
Infrastructure and requirements for on-the-go collection	'Alternative collection points' have been set up at sports centres, restaurants, hotels, aquaparks, schools, festivals and other cultural events. In cooperation with the national parks authorities, the system operator has also installed concrete containers at popular tourist stops and locations across seven National Parks to capture deposit containers generated by tourists.	Commercial event organizers are involved in container collection. E.g. At Helsink's Flow Festival, which sees over 70,000 visitors, festivalgoers are prompted to bring their empties back to specific booths on the festival grounds, where the deposit money is donated to the Finnish Association for Nature Conservation.
Infrastructure and requirements for ICI collection		There are 9,000 collection points in HORECA outlets. Hotels, restaurants, offices, and schools return deposit packages through beverage suppliers. The beverage supplier picks up bags of empty containers at the same time of the beverage delivery (reverse logistics).

Consumer education, promotion, and awareness activities	The system operator has a consumer-facing website which aims to educate consumers on the importance of returning empties, what containers are included, how the whole process works, etc., through a FAQ section as well as promotional videos and social media contests.	
System funding	Material revenues, unredeemed deposits, producer fees	Material revenues, unredeemed deposits, producer fees
Variable handling fees	Yes, vary by material and method of collection	Yes, vary by material and method of collection
Depot ownership	Not applicable – system is R2R	Not applicable – system is R2R
Strength of curbside recycling	EPR scheme for packaging introduced in 2016 Material fractions falling under EPR are separately collected via bring points from housing properties with multiple apartments, but in individual properties bring points and door-to-door collection are both used. Door-to-door collection is mostly organized using a bag system, but also a container-based system is used in many municipalities. Packaging wastes and non-packaging plastic, paper and glass wastes are typically collected using the same bin. Overall recycling rate for packaging waste: 67.5% in 2019 (if the new calculation rules are applied, this drops to 59.7%). Plastic packaging recycling rate: 52.8% in 2019 (reduced to 41.7% if new calculation rules are applied) Aluminum packaging recycling rate: 20.7% in 2019 (reduced to 17.8% if the new calculation rules are applied)	Mandatory system of separate collection and EPR applies to all packaging Overall packaging waste recycling rate: 70.6% in 2019 Plastic packaging recycling rate: 42% in 2019

4.4.1 Norway - DRS

Background	Established in 1999, Norway's deposit return system (DRS)consistently ranks as one of the top-performing beverage container collection systems in the world. The system is operated by Infinitum, a non-profit organization owned by Norwegian bottlers and retailers. Norway's DRS includes metal cans (aluminum and steel) and plastic PET and HDPE containers 125ml to 4.9L in volume. Most beverage types are included (the Regulations relating to the recycling of waste [Waste Regulations] under the Product Control Act do not specify the types of drinks covered by the DRS). The only exclusions are milk products, fruit and vegetable juices, dietetic products, and products exclusively for infants. It's worth noting that Norway's DRS is voluntary; producers are not obliged to participate, however an environmental tax applies on all producers and importers placing plastic containers (and metal cans) on the market. For producers that are not a member of the DRS, this tax makes it very costly to put a can or PET bottle onto the market. There is a variable environmental tax that is reduced as return rates increase. As of 2024, the variable tax rates are 4.06 NOK (CAD$0.51) per plastic bottle and 6.71 NOK (CAD$0.84) per metal can. To be exempt from this tax, the return rate must be 95%. This tax incentivizes producers and importers to participate in the DRS that achieves significantly higher collection rates than the curbside collection program.
Collection rate	Overall collection rate: 91% | Plastic containers: 92% (2022)
Best Practice Factors	Deposit value Accessibility to redemption network: Return to Retail (R2R) Model, Home delivery service that includes some ICI sectors. Convenience at redemption facilities: Reverse Vending Machines Packaging tax levied if producers do not participate in DRS Refund payment options
Deposit Value	Norway's variable rate deposit structure recognizes the higher purchase price of larger beverages and ensuring the deposit value is proportionate. In Fall 2018, the deposit on plastic and metal containers <500ml increased from 1 NOK (CAD$0.13) to 2 NOK (CAD$0.25), and from 2.5 NOK (CAD$0.31) to 3 NOK (CAD$0.38) for containers 500ml and greater. The overall return rate increased from 88.3% in 2018 to 92% in 2020. The return rate for PET bottles increased from 88.6% in 2018 to 92.0%. 
Accessibility to redemption network	R2R: The DRS is primarily operated via a "return-to-retail" model, where all retailers selling deposit-bearing beverages are required to take them back for recycling; there are no opt-out provisions or exemptions. The redemption network consists of approximately 3,700 automated return points and

	approximately 11,300 manual return points, for a total of 15,000. This equates to a ratio of one redemption location for every 361 persons. Home delivery service: To make the system even more convenient for consumers, Norway has made provision for consumers to return their empty containers via a home delivery service provided by retailers. To use this service, consumers can purchase special bags which are barcoded and embedded with a code to track the bag and its contents. This means that people who do not have the time, or capacity due to health issues, to visit a retailer can still return their containers and receive their refund. Approximately 1% of returns are made via home delivery. Away-from-home (AfH): Infinitum places collection bins in places like schools, parks, offices, special events, arenas, restaurants, and catering events.
Convenience at redemption facilities	In 2022, many retailers installed new RVMs that allow customers to empty whole bags of containers into the machine at once, rather than inserting them one at a time; these machines make the redemption process simpler and faster, improving customer experience. Around 94% of containers are collected via RVMs, while 6% are collected at manual return points. The 6% also includes HORECA (hotels, restaurants, and cafes) on-site consumption sales, where the uncompacted empties are returned to the system operator's processing center.
Variable handling fees	To compensate retailers, handling fees vary both by material type and collection method. Retailers offering manual collection receive a handling fee of NOK 0.10 (CAD$0.012) per plastic container. A higher fee of NOK 0.25 (CAD$0.031) per plastic bottle is paid to retailers with a RVM.
Refund payment options	Consumers can obtain their deposit refund as cash or can use it to purchase a lottery ticket. A 2023 consumer research report by TOMRA found that a large share of consumers choose to participate in this 'recycling lottery' (15%).
Sources:	https://infinitum.no/media/vanibhxu/infinitum_annualreport_2022_pages.pdf https://www.tomra.com/en/reverse-vending/media-center/feature-articles/norway-deposit-return-scheme https://www.zalohujme.cz/wp-content/uploads/2019/01/A-Deposit-Refund-System-for-the-Czech-Republic.pdf https://infinitum.no/skoler/ https://infinitum.no/articles-in-english/more-plastic-beer-kegs-to-be-returnable/ https://infinitum.no/media/vanibhxu/infinitum_annualreport_2022_pages.pdf https://www.skatteetaten.no/en/rates/beverage-packaging-tax/ https://one.oecd.org/document/ENV/WKP(2022)20/en/pdf https://www.nepc.gov.au/sites/default/files/2022-09/att-b-appendix-b-best-practice-intl-packaging-approaches.pdf https://www.tomra.com/-/media/project/tomra/tomra/solutions/bottle-and-can-recycling/Downloads/TOMRA_Collection_Consumer_Insights_Report_2023?utm_campaign=EuroShop&utm_medium=email&_hsenc=p2ANqtz-8La57SDv99nlKFzcbzBAUoK9ZSF9cdevJFBlU9sUEizx0N14MmwpM99wtTSc1f8ZpY8qJE8Z-8QqTjZTCWJXWYiMOgyDRORnzOOj_AErWR3B5_5pE&_hsmi=69209612&utm_content=69209612&utm_source=hs_automation

4.4.2 Lithuania's DRS

Background	Lithuania's DRS for single-use beverage containers came into force on February 1, 2016. The system is operated by Užstato sistemos administratorius (USAD), a not-for-profit organisation founded by the Lithuanian Association of Breweries, the Association of Lithuanian Trade Enterprises, and the Lithuanian Natural Mineral Water Manufacturers' Association [combined, these organisations are responsible for more than 80% of drinks containers sold in Lithuania]). Under Lithuania's system, consumers are charged a flat-rate deposit of €0.10 (CAD$0.15) on eligible containers. This value is appropriate for the Lithuanian economy and cost of living and provides an equal incentive for consumers to return all containers. Consumer research carried out in 2019 showed that there is a high level (98%) of public support for the system.
Collection rate	Overall: 92% | Plastic containers: 91% (2023)
Best Practice Factors	Program scope Implementation of DRS vs curbside (deposit value) Accessibility to redemption network: Return to Retail (R2R) Model Convenience at redemption facilities: Reverse Vending Machines Legislated Targets, Legislated Public Awareness Spending Variable handling fees Refund payment options

Program Scope	Lithuania's DRS covers plastic (PET), metal (aluminum, steel), and glass beverage containers ranging from 100ml to 3L in size. The law does not define any exclusions, which means all beverage types including beer, beer cocktails, cider and other fermented drinks, mixed alcohol and non-alcohol drinks (including water, soft drinks, juices, nectars, fruit wine) are included.
Implementation of DRS	Prior to the system's launch, less than 33% of PET beverage containers were being recycled curbside; at the end of the first year, this had increased to 74.3%, and by the end of the second year, 91.9%. As of 2023, the return rate for PET beverage bottles is 91% (overall collection rate 92%).
Accessibility to redemption network:	R2R: The DRS is primarily operated via a "return-to-retail" model. As of March 2024, there were a total of 2,600 retail collection points (1 for every ~1,099 people). There is an exclusion for retailers with less than 60m^2 (in smaller cities and rural areas) and 300m^2 (in bigger cities) of retail space. Consumer research carried out in October 2020, four years after the system was launched, found that 95% of Lithuanian consumers felt there was enough collection points across the country.
Convenience at redemption facilities	The majority (91%) of containers are returned via RVMs while the rest are collected through manual collection sites (including 700 HORECA collection points).
Legislated Targets	Legislated collection target of 90%. Penalties are applied to producers and importers who fail to comply with the targets in the form of a pollution fee for the amount of packaging not processed under the system. A unique aspect of Lithuania's DRS is that the system operator must, by law, allocate at least 1% of annual revenue to public awareness campaigns to promote the system. As a result of this, by the end of 2016 (the first year of DRS implementation), 99.8% of citizens were aware of the system, and 89% had used it at least once (58% on several occasions).
Variable handling fees	The Lithuanian system operator (Užstato Sistemos Administratorius [USAD]) pays retailers a handling fee to cover collection-related costs. Manual return points receive a lower handling fee per container (€0.0245) (CAD $0.0292) for PET; than those with RVMs receive €0.0297 (CAD $0.043) for PET containers.
Refund payment options	Consumers receive their refund in the form of vouchers which can be redeemed in store as cash or credit towards their purchase; they also have the option to donate it to charity via a button on RVMs.
Sources:	https://www.reloopplatform.org/wp-content/uploads/2019/03/USAD-ppt.pdf https://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=8892522&fileOId=8892602 https://grazintiverta.lt/en/system/funding/98 https://www.reloopplatform.org/wp-content/uploads/2020/07/Deposit-return-system-DRS-in-Lithuania-2020-06-17.pdf https://www.tomra.com/en/reverse-vending/media-center/feature-articles/lithuania-exceeds-container-return-rate-expectationsSpinter Research. October 2020. "Šalies Gyventojų Nuomonės Tyrimas Dėl Vienkartinių Pakuočių Užtato Sistemos." PowerPoint presentation provided to Reloop

4.4.3 Slovakia's DRS

Background	On January 1, 2022, Slovakia launched its DRS for single-use plastic and metal beverage containers. The system is operated by Správca zálohového systému (SZS), a non-profit organisation established through a consortium of four entities [the Soft Drinks Association, the Malt and Breweries Association, Trade Union of Slovakia, the Slovak Alliance of Modern Commerce] that represent producers of non-alcoholic beverages, mineral waters, and beer, and representatives from the wholesale and retail sectors; together, their members represent almost 80 % of all deposit packaging placed on the market, encompassing >3,000 retail stores). According to a 2023 survey by the system operator, 82% of Slovakian consumers use the system regularly; only 1% of respondents admitted in the survey that they do not return packaging at all. The system has had a positive impact on litter reduction; in summer 2020, prior to the introduction of the DRS, cans made up to 20.5% and PET bottles 15% of the litter identified in litter surveys. After

	the introduction of the DRS, a litter survey undertaken in summer of 2023 identified 2.2% deposit cans and 3.2% of deposit PET containers.
Collection rate	Overall: 92% | Plastic containers: 92% (2023) Prior to the DRS, only 60% of PET bottles sold in Slovakia were being collected for recycling curbside. By the end of the first year of operation, this had increased to 72% using the DRS, and by end of 2023, 92% of all plastic beverage containers were being collected. When combined with beverage cans, the system achieved an overall collection rate of 92% in 2023.
Best Practice Factors	Deposit Value Program Scope Accessibility to redemption network Convenience at redemption facilities Legislated Targets Variable handling fees Consumer promotion and education
Deposit Value	A top contributing factor to Slovakia's high collection rate is its relatively high deposit, which is a fixed-rate of €0.15 (CAD $0.22) per container (there are only a few other jurisdictions worldwide that have a minimum deposit of €0.15 or more, two of which are Norway and Germany). A survey conducted in July 2023 found that 80% of the Slovak population perceives a deposit of €0.15 as sufficiently motivating to return the used packaging to the collection point.
Program Scope	The system includes most beverage types except for milk and milk-based drinks and beverages containing more than 15% alcohol. Legislation does not specify which beverage products are included and uses the definition of beverage as per the Food Code, which defines beverages as "liquid beverages containing more than 80% water and capable of satisfying the physiological need for water, including non-alcoholic and alcoholic varieties."
Accessibility to redemption network:	R2R: Slovakia's DRS is highly convenient and accessible for consumers, as all retailers over 300m^2 are required by law to take back containers and return the deposit, regardless of whether they sell the product. As of April 2024, there were a total of 3,269 collection points, which equates to a ratio of about 1 for every 3,269 people. Away from home & ICI: To increase convenience, the system operator has established alternative collection points in locations where a higher concentration of deposit containers is expected to accumulate due to high foot traffic. This includes, for example, sports centres, restaurants, hotels, aquaparks, schools, festivals and other cultural events.
Convenience at redemption facilities	About 74% of containers are returned automatically via RVM, with the remaining 26% being returned to manual collection sites.
Variable handling fees	Retailers offering manual collection services receive a per unit handling fee of €0.03 (CAD $0.44) regardless of material type, whereas those offering automated collection receive a fee that depends on how many containers they collected during the previous year. Collection points that received a monthly average of ≥50,001 units receive a fee of €0.023/unit (CAD $0.03); collection points that received a monthly average of 25,001-50,000 units receive a fee of €0.029/unit (CAD $0.04); and those that received a monthly average of ≤25,000 units receive a fee of €0.039 (CAD $0.06).
Legislated Targets	Overall collection targets of 80% by 2023, 85% by 2024 and 90% 2025.
Promotion & Education	According to a March 2022 study, the overall high level of participation in the system correlates with a high degree of consumer awareness, which reached 99.2% among survey respondents. The system operator has a consumer-facing website, which aims to educate consumers on the importance of returning empties, what containers are included, how the whole process works, etc., through a FAQ section as well as promotional videos and social media contests (on TikTok, LinkedIn, Facebook, and Instagram).

Refund payment options	Depending on the type of collection point (mandatory or voluntary), consumers can choose to receive their refund in cash, or as a discount towards their purchase.
Sources:	https://www.tomra.com/en/reverse-vending/media-center/feature-articles/slovakia-deposit-return-scheme https://www.reloopplatform.org/wp-content/uploads/2023/11/presentations%E2%80%94exploring-circular-solutions-for-beverage-containers.pdf https://www.tomra.com/en/reverse-vending/media-center/feature-articles/new-survey-shows-deposit-return-system-is-exceeding-all-expectations https://www.recycling-magazine.com/2022/05/09/slovakia-has-launched-its-deposit-return-system/ https://www.reloopplatform.org/wp-content/uploads/2023/11/presentations%E2%80%94exploring-circular-solutions-for-beverage-containers.pdf https://www.reloopplatform.org/wp-content/uploads/2023/11/presentations%E2%80%94exploring-circular-solutions-for-beverage-containers.pdf

4.4.4 Finland

Background	Established in March 1996, Finland's deposit system is recognized as one of the top performing systems in the world for achieving exceptional rates of beverage container collection. The system is operated by Suomen Palautuspakkaus Oy (PALPA), a not-for-profit company that is owned 50/50 between retailers and drinks producers. It's worth noting that Finland's DRS is voluntary; producers are not obliged to participate, however, if they don't create or join an approved DRS, they must pay a packaging tax to the government. This tax, in place since 1994, is currently levied on soft drinks and alcohol drinks; the rate is €0.51/L (CAD $ 0.75) for product lines not part of the DRS. The opportunity for tax exemption creates a strong incentive to join the system. Packaging producers are also exempted from some obligations regarding EPR on packaging if they join the DRS.
Collection rate	Overall: 97% | Plastic containers: 90% (2023) In 2008 – the first year in which PET bottles were subject to the deposit – the return rate for PET was 73%. This increased to 89% by the end of 2009 and has remained at 90% or higher since 2010.
Best Practice Factors	Deposit value Program scope Accessibility to redemption network Convenience at redemption facilities Legislated targets Variable handling fees
Deposit Value	A contributing factor to Finland's high return rates is undoubtedly its variable-rate deposit structure and meaningful deposit levels. Plastic ≤350ml is subject to a €0.10 (CAD $0.15) deposit, while larger plastic containers (351ml to 999ml, or those ≥1L) are subject to a higher deposit of €0.20 (CAD $0.29) or €0.40 (CAD $0.59). Beverage cans and glass bottles are subject to a different deposit rate of €0.15 (CAD $0.22) and €0.10 (CAD $0.15), respectively.
Program scope	Initially encompassing only metal (aluminum) beverage containers, the system was expanded to PET plastic bottles in 2008, and glass bottles in 2012. The system has a comprehensive scope and includes almost all beverages in eligible containers 100ml to 3L in volume, with the exception of milk.
Accessibility to redemption network:	R2R: A key factor in the success of Finland's DRS is its convenient collection model, characterized by a widespread network of return points embedded within retail outlets, kiosks, and service stations. By law, all retailers, kiosks, and service stations that sell in-scope drinks are obliged to take back the empties. As of April 2024, there are ~4,000 RVMs in operation with 4,000 retail collection points for consumers. This equates to 1 collection point for every 1,391 people, ensuring accessibility and ease of participation for consumers. ICI collection: In addition to retail collection points, there are 9,000 collection points in HORECA outlets. Hotels, restaurants, offices, and schools return deposit packages through beverage suppliers. The beverage supplier picks up bags of empty containers at the same time of the beverage delivery (reverse logistics). The driver of the beverage supplier reads the barcodes and delivers the bags to the operator. Commercial event organizers are also involved in container

	collection, such as festivals, where participants are prompted to bring their empties back to specific booths on the festival grounds, where the deposit money is donated to the Finnish Association for Nature Conservation.
Convenience at redemption facilities	The majority (97%) of containers are returned via RVMs, while 3% of returns are done via manual collection points.
Legislated Targets	Finnish law requires 90% (by weight) of beverage containers put on the market to be recycled.
Variable handling fees	Finland's handling fees are differentiated by material type and collection method. For manual collection, plastic, containers attract compensation rates of €0.0201 (CAD $0.03) per unit processed. Retailers with RVMs receive higher handling fees, incorporating both processing compensation and device compensation. Plastic containers processed through RVMs receive compensation rates of €0.0252 (CAD $0.04) per unit. Furthermore, retailers equipped with RVMs receive a fixed compensation fee of €99.04 (CAD $145) that is paid out twice per month, incentivizing the adoption of automated collection systems.
Refund payment options	Consumers are refunded in cash, and an innovative option to contribute to charity through lottery ticket purchases further incentivizes participation.
Sources:	https://www.palpa.fi/beverage-container-recycling/deposit-refund-system/#recycling-is-cooperation https://www.palpa.fi/static/studio/pub/Materiaalipankki/Palautuspisteet/MAN_TLK_KMP_KLP_EN.pdf https://finland.fi/life-society/circular-economy-success-finlands-recycling-program-keeps-bottles-and-cans-off-the-streets/ European Environment Agency. June 2022. "Finland: Early warning assessment related to the 2025 targets for municipal waste and packaging waste." https://www.eea.europa.eu/publications/many-eu-member-states/early-warning-assessment-related-to https://danskretursystem.dk/en/for-companies/information-about-signup-for-stores-offices-and-restaurants/

4.4.5 Denmark

Background	Denmark's DRS for single-use beverage containers was established in 2002 and is operated by Dansk Retursystem, a private non-profit organisation established by several breweries together with the Danish retail trade. According to the system operator, 91% of the population expressed support for the system in 2021.
Collection rate	Overall: 92% | Plastic containers: 91% (2023)
Best Practice Factors	Deposit value Program scope Accessibility to redemption network Convenience of redemption facilities Variable handling fees
Deposit Value	The system adopts a variable-rate deposit system. Metal and glass containers below 1 liter carry a deposit of 1 DKK (CAD$0.20), while plastic containers of the same volume incur a slightly higher deposit of 1.5 DKK (CAD$0.29). Larger containers, spanning 1 to 20 liters, command a deposit of 3 DKK (CAD$0.59).
Program scope	The system has a comprehensive scope, encompassing plastic, metal, and glass beverage containers <20L. The system has undergone multiple expansions, notably in 2005, 2008, and most recently in 2020, to include a diverse array of ready-to-drink alcohol and non-alcohol beverages. From beer to mineral water, lemonade to syrup, the system now covers a broad spectrum of drinks, fostering inclusivity and maximizing recycling opportunities.
Accessibility to redemption network:	Denmark's redemption network includes a total of approximately ~13,292 return points, which equates to 1 for every ~446 residents.

	R2R: At the heart of Denmark's DRS lies a robust return-to-retail model, where retailers equipped with RVMs are mandated to accept all types of single-use beverage packaging. Even stores without RVMs are required to accept returns of packaging they sell, ensuring uniformity and accessibility for consumers. Depots: The introduction of 'Pantstations', dedicated facilities for bulk returns, further enhances convenience, allowing consumers to return up to 90 bottles and cans at a time across 12 towns and cities nationwide. Consumers are offered a variety of refund payment options, including cash, credit card deposits, and the opportunity to donate to charity. ICI Collection: Offices and restaurants are also obliged to take back deposit containers from end customers. Dansk Retursystem collects the containers free of charge and refunds the deposits after the packaging has been counted. Away from home: Denmark's DRS extends beyond traditional retail channels with innovative initiatives for "away-from-home" collection such as deposit return bins attached to public waste bins in Copenhagen. Before these bins were installed, 166 million kroner (CAD $24.6 million) of bottle deposit money went unclaimed each year—meaning city residents had purchased deposit-bearing bottles and cans and then did not return them. In 2015, Danish news channels reported that the pilot project had cut down on the city's missing containers by 49%.
Convenience of redemption facilities:	The majority (90%) of containers are collected via RVMs, with the remaining 10% collected manually.

Variable handling fees	Denmark's handling fees are differentiated by material type and collection method as follows:
	• Manual:
	  ○ Metal: 4.6 øre (CAD$0.009)
	  ○ Plastic <1L: 7.5 øre (CAD$0.015)
	  ○ Plastic >1L: 10.8 øre (CAD$0.021)
	• RVM with compaction:
	  ○ Metal: 2.7 to 3.7 øre (CAD$0.005 to $0.007)
	  ○ Plastic <1L: 3.2 to 4.1 øre (CAD$0.006 to $0.008)
	  ○ Plastic >1L: 3.5 to 5.6 øre (CAD$0.007 to $0.011)
	  ○ Glass: 4.0 to 7.9 øre (CAD$0.008 to $0.015)
	• RVM with collection bags:
	  ○ Metal: 4.6 øre (CAD$0.009)
	  ○ Plastic <1L: 4.4 øre (CAD$0.009)
	  ○ Plastic >1L: 9.4 øre (CAD$0.018)
	  ○ Glass: 5.2 øre (CAD$0.010)

Sources:	https://www.bloomberg.com/news/articles/2015-10-27/how-copenhagen-s-new-trash-cans-help-the-homeless https://danskretursystem.dk/en/sustainability/ https://danskretursystem.dk/en/for-companies/information-about-signup-for-stores-offices-and-restaurants/ Reloop. "Global Deposit Book 2022: An Overview of Deposit Return Systems for Single-Use Beverage Containers." https://www.reloopplatform.org/wp-content/uploads/2023/05/RELOOP_Global_Deposit_Book_11I202.pdf https://danskretursystem.dk/app/uploads/2024/03/Aarsrapport-2023-samlet.pdf Dansk Retursystem A/S. "Driftsgebyrer 2024." https://danskretursystem.dk/app/uploads/2023/11/Driftsgebyrer_2024.pdf

A.3.0 Data Sources and Methodology for Calculating Current State by Province

Province	Main Data Sources

Alberta	• Deposit return data was provided by ABCRC • Curbside collection rates were taken from previous Eunomia studies for Recycling Council of Alberta, accessible at: RCA_Economic_Analysis_Report_Final.pdf (recycle.ab.ca)
British Columbia	• Deposit return data was taken from Encorp Pacific's 2022 annual report: Return-It_2022_Annual_Report.pdf • Curbside data was taken from RecycleBC's 2022 annual report: RecycleBC_AR2022_FINAL.pdf
Yukon Territory	• Yukon data for both curbside and deposit containers was taken from the Yukon Government's "Recycling in the Yukon Report" for 2022: 2022https://emrlibrary.gov.yk.ca/environment/recycling-in-the-yukon/2022.pdf
Quebec	• Quebec deposit data was taken from Recyc-Quebec's website https://www.recyc-Quebec.gouv.qc.ca/sites/default/files/documents/statistiques-ventes-recuperation-cru.pdf • Quebec curbside data was taken from Eco-Enteprises Quebec data: EEQT2022FinalWeb_FR.xlsx (live.com)
New Brunswick	• New Brunswick deposit data was sourced from the Encorp Atlantic Stewardship Program data, compiled by RecycleNB: https://www.recyclenb.com/static/site-content/files/management-plans/encorp-atlantic/encorp-stewardship-plan-to-recycle-nb-final.pdf • This data includes both deposit and curbside collected tonnages
Northwest Territories	• Northwest Territories deposit data was sourced from the Waste Reduction Program Annual Report from the Northwest Territory Government: https://www.gov.nt.ca/ecc/sites/ecc/files/resources/waste_annualreport_2022-23_web.pdf • Non-deposit collected data was taken from the Statcan Pilot Physical Flow Account for 2020, and scaled to 2022.
Ontario	• Ontario Deposit Data was sourced from The Beer Store's annual report for 2022: StewardshipReport2022_FINAL-compressed.pdf (thebeerstore.ca) • For non-deposit beverage containers Eunomia used RPRA Resource Recovery Data on beverage container sales: Resource Recovery Reports - RPRA

	• Curbside recovery rates were taken from Stewardship Ontario's Four Step Fee Model for 2021. The tonnages from this data were not used as it is not in the study year, but the rates were applied to 2022 data: 2021-SO-Four-Step-Fee-Model-ABC.xlsx (live.com)
Manitoba	• Manitoba beverage data was taken from CBCRA's annual report: CBCRA_2021_AnnualReport.pdf (cbcra-acrcb.org). This data does not include all beverage containers, and thus product gaps were modelled for 2022. • Manitoba curbside data was taken from Multi Material Stewardship Manitoba annual report for 2022: Reports - MMSM (stewardshipmanitoba.org)
Saskatchewan	• Deposit data for Saskatchewan was taken from SARCAN's 2022 annual report: SARC Annual Report 2022 - 2023 by SARC/SARCAN - Issuu • Curbside data was taken from Multi-Material Stewardship Western's 2022 annual report: MMSW_AR2022.pdf (mmsk.ca)
Prince Edward Island	• Prince Edward Island deposit data was provided via email communication from the Prince Edward Island Government • Curbside collection rates were estimated using Statcan's Pilot Physical Flow account
Nova Scotia	• Combined deposit and curbside data for beverage containers was obtained via email communication with DivertNS.
Nunavut	• Data from Statcan's Pilot Physical Flow account was used for Nunavut and scaled to 2022. Nunavut does not have a deposit return program.
Newfoundland and Labrador	• Newfoundland and Labrador data was obtained through communication with MMSB

A.4.0 Detailed Technical Appendix

The following section provides details on how baseline recovery rates were estimated per province.

A.4.1 Alberta

A.4.1.1 Sales

Sales of beverage containers for Alberta were taken from 2023 data provided by the Alberta Beverage Container Recycling Corporation (ABCRC). The data reported the sale of containers in the following plastic categories:

Table A - 7: 2023 Beverage Container Data from ABCRC

Container Type	Total Sales of Beverage Containers
PET 0 - 1 Litre	690,510,644
PET Over 1 Litre	71,953,105
HDPE 0 - 1 Litre	78,930,817
HDPE Over 1 Litre	57,289,041
Other Plastics 0 - 1 Litre	10,425,524
Other Plastics Over 1 Litre	43,550
Total	909,152,681

The year of data for this study is 2022. The data in the table above for Alberta was mostly reported for 2023. The splits of containers in the 2023 data were therefore applied to the total sales of beverage containers sold in Alberta in 2022 (885 million containers) reported by ABCRC. This was done to achieve a granular estimate of container sales for 2022. The sales estimated for 2022 are shown in the table below:

Table A - 8: 2023 Beverage Container Type Splits Applied to 2022 Sales

Container Type	Total Sales of Beverage Containers
PET 0 - 1 Litre	670,463,869
PET Over 1 Litre	71,264,963
HDPE 0 - 1 Litre	76,639,312
HDPE Over 1 Litre	56,741,143
Other Plastics 0 - 1 Litre	10,122,852
Other Plastics Over 1 Litre	43,133
Total	885,275,273

Slightly fewer containers were sold in 2022 as compared to 2023.

The container numbers were then transformed into tonnages by using an average weight (in # containers per tonne). This average weight was calculated by taking the number of containers recovered as reported

by the Beverage Container Management Board (BCMB) and dividing it by the same quantity of tonnage which BCMB says is captured.

Statistic	Figure
Tonnes Recovered	20,708 tonnes
Containers Recovered	702,630,000 containers
Containers per Tonne	33,930 containers per tonne

The number of containers sold in 2022 (885 million) were then divided by the average containers per tonne weight (33,930) to estimate that 26,000 tonnes of plastic beverage containers were sold in Alberta in 2022.

A.4.1.2 Deposit Returns

Deposit return data for 2022 was also taken from ABCRC's data. The 2022 data reported return rates by plastic container size (either greater than or less than 1 liter):

Size	Reported Return Rate
<1 Liter	78%
>1 Liter	88%

The sales data was then grouped by size and multiplied by the reported return rates from the ABCRC data to achieve an overall returned tonnage:

Statistic	Figure
Sales (tonnes)	26,000
Return Rate	79%
Returns (Tonnes)	20,727

A.4.1.3 ICI Collection

ICI Data for Alberta was taken from unpublished compiled audit data. The data gave a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Québec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

Table A - 9: Beverage Containers in ICI

	Tonnage of Plastic Beverage Containers in Recycling	Tonnage of Plastic Beverage Containers in Disposal
High	3,200	3,300
Medium	1,200	1,200
Average of High and Medium	**2,100**	**2,300**

A.4.1.4 Residential Collection

Residential collection was calculated by first taking the tonnage of containers sold, and subtracting the tonnage returned through the deposit return system, recycled in ICI collections, or disposed in ICI collections. This then left over the tonnage of containers consumed by the residential sector but not returned for a deposit.

		Figure
A	Tonnes Sold	26,000
B	Tonnes Returned	20,700
C	Tonnes in ICI Recycling	2,100
D	Tonnes in ICI Garbage	2,300
E	Tonnes In Residential (A-B-C-D)	900

Eunomia then used a residential collection rate of 29% for curbside recyclables sourced from the Recycling Council of Alberta's Quantifying the Economic Value of Recycling report and Eunomia's Foundational Study for the Commission for Environmental Cooperation.[185] Multiplying the 29% figure by the tonnage in residential yields a collected tonnage of 270 tonnes.

A.4.2 British Columbia

A.4.2.1 Sales

Sales of beverage containers were taken from Encorp Pacific's 2022 Annual Report. The report provides the sale of beverage containers in both number of containers and tonnage of containers. Those statistics are shown below:

[185] RCA_Economic_Analysis_Report_Final.pdf (recycle.ab.ca)

	Sales (# of Containers)	Sales (Tonnage of Containers)
Plastic Beverage Containers	659,505,125	22,988

A.4.2.2 Deposit Returns

Deposit returns are report in the same Encorp Pacific Annual Report. The return rate quoted in the report is inclusive of returns from Material Recovery Facilities (MRFs). Eunomia therefore removed this tonnage from the return rate. This is shown in the calculation below

	Figure
Return Rate by Weight, plastic beverage containers	78%
Percent of Containers Returned That are Returned through MRFs	7.7%
Returns Through Deposit System	72% (78% x (1-7.7%)

A.4.2.3 ICI Collection

ICI Data for British Columbia was taken from the unpublished compiled audit data and Encorp Pacific. The data gave a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Québec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

Table A - 10: Beverage Containers in ICI

	Tonnage of Plastic Beverage Containers in Recycling	Tonnage of Plastic Beverage Containers in Disposal
High	2,200	4,100
Medium	900	1,600
Average of High and Medium	**1,500**	**2,900**

A.4.2.4 Residential Collection

Residential collection was calculated by first taking the tonnage of containers which sold, and subtracting the tonnage returned through the deposit return system, recycled in ICI collections, or disposed in ICI collections. This then left over the tonnage of containers consumed by the residential sector but not returned for a deposit.

	Figure

A	Tonnes Sold	22,988
B	Tonnes Returned	16,579
C	Tonnes in ICI Recycling	1,300
D	Tonnes in ICI Garbage	3,534
E	Tonnes In Residential (A-B-C-D)	1,964

Eunomia then used a residential collection rate of 60% for rigid plastic sourced from the RecycleBC's 2022 annual report.[186] Multiplying the 60% figure by the tonnage in residential yields a collected tonnage of 1,400 tonnes.

A.4.3 Quebec

A.4.3.1 Sales

Sales data for Quebec was taken from data compiled by Recyc-Quebec for its 2021 report on the modernization of Deposit Return Systems in Quebec.[187] This report estimated 1.3 billion plastic beverage containers sold in 2021 inclusive of soft drinks and water. This figure was then scaled to 2022 using the growth in beverage containers under deposit in Quebec. The growth in sales under deposit revealed a 15% growth from the time of the Recyc-Quebec study to 2022 for a total of 1.5 billion containers. Eunomia then added an estimate of alcoholic plastic containers based on per capita sales from other provinces This added an extra 200k containers for a total of 1.7 billion plastic beverage containers sold in Quebec in 2022.

A.4.3.2 Returns

Beverage containers returned through the existing deposit return system were taken from Recyce-Quebecs Statistques Ventes Recuperation Cru report from Recyc-Quebec's website.[188] The report showed the following data for plastic beverage containers in 2022:

Table A - 11: Recyc-Quebec Deposit Return Statistics

	Sales (# of containers)	Returns (# of containers)	Return Rate
Plastic 5 ¢	264,011,570	142,802,005	54%

To estimate an associated tonnage, Eunomia used an average PET soft drink weight of 24 grams per container. This weight was multiplied by the sales and returns data to get the following statistics:

	Sales (tonnes)	Returns (tonnes)	Return Rate
Plastic 5 ¢	6,400	3,500	54%

[186] RecycleBC_AR2022_FINAL.pdf
[187] rapport-eunomia-options-couts-systeme.pdf (gouv.qc.ca)
[188] statistiques-ventes-recuperation-cru.pdf (gouv.qc.ca)

A.4.3.3 ICI Collections

ICI Data for Quebec was taken from the unpublished compiled audit data. The data gave a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Quebec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

Table A - 12: Beverage Containers in ICI

Statistic	Tonnage of Plastic Beverage Containers in Recycling	Tonnage of Plastic Beverage Containers in Disposal
High	5,200	9,800
Medium	1,800	3,300
Average of High and Medium	**3,500**	**6,600**

An estimated 3,500 tonnes of plastic beverage containers end up in ICI recycling streams in Quebec, while an estimated 6,600 tonnes of plastic beverage containers reach end of life in the ICI disposal streams.

A.4.3.4 Residential Collections

Residential collection was calculated by first taking the tonnage of containers which sold, and subtracting the tonnage returned through the deposit return system, recycled in ICI collections, or disposed in ICI collections. This then left over the tonnage of containers consumed by the residential sector but not returned for a deposit.

		Figure
A	Tonnes Sold	46,660
B	Tonnes Returned	3,488
C	Tonnes in ICI Recycling	3,499
D	Tonnes in ICI Garbage	8,511
E	Tonnes In Residential (A-B-C-D)	33,113

Eunomia then used a residential collection rate of 68% for PET and HDPE plastic beverage containers, and 44% for other rigid plastic beverage containers. These capture rates were sourced from Eco Enterprises Quebec.[189] Multiplying the capture rate figures by the tonnage in residential yields a collected tonnage of 22,200 tonnes, or a 67% collection rate of plastic beverage containers overall.

[189] EEQT2022FinalWeb_FR.xlsx (live.com)

A.4.4 New Brunswick

A.4.4.1 Sales

Sales data for New Brunswick beverage contains were provided by the Encorp Atlantic Stewardship Program.[190] The data provides sales data in both number of units sold and kilograms sold. A summary of the data for plastic beverage containers is shown below:

Table A - 13: Encorp Atlantic Stewardship Program Sales Data for New Brunswick (2022)

Container Type	Units Sold	Kilograms Sold
PET (Non-Alcohol) & HDPE Translucent	150,455,000	3,317,800
PET (Alcohol)	3,860,600	152,300
Plastic (Other)/ Pouches	5,740,300	153,200

Eunomia used these figures as the number of containers and total weight sold of plastic beverage containers in New Brunswick.

A.4.4.2 Returns

Deposit return volumes were taken from the same Encorp Atlantic report, which also reported the quantity of plastic beverage container returns in both number of containers and kilograms. These returns are shown with the sales data in the table below:

Container Type	Units Sold	Units Returned	Kilograms Sold	Kilograms Returned	Return Rate
PET (Non-Alcohol) & HDPE Translucent	150,455,000	102,289,800	3,317,800	2,577,700	68%
PET (Alcohol)	3,860,600	2,443,600	152,300	96,400	63%
Plastic (Other)/ Pouches	5,740,300	1,957,500	153,200	52,200	34%

[190] https://www.recyclenb.com/static/site-content/files/management-plans/encorp-atlantic/encorp-stewardship-plan-to-recycle-nb-final.pdf

As the data was already reported in tonnages and number of containers, there was no weight transformation needed for the New Brunswick data.

A.4.4.3 ICI Collections

ICI Data for New Brunswick was taken from the unpublished compiled audit data. The data a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Quebec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

Table A - 14: Beverage Containers in ICI

	Tonnage of Plastic Beverage Containers in Recycling	Tonnage of Plastic Beverage Containers in Disposal
High	900	600
Medium	200	200
Average of High and Medium	**550**	**400**

An estimated 550 tonnes of plastic beverage containers end up in ICI recycling collections in New Brunswick, while an estimated 400 tonnes end up in ICI disposal streams.

A.4.4.4 Residential Collections

Residential collection was calculated by first taking the tonnage of containers which sold, and subtracting the tonnage returned through the deposit return system, recycled in ICI collections, or disposed in ICI collections. This then left over the tonnage of containers consumed by the residential sector but not returned for a deposit.

Row Letter	Statistic	Figure
A	Tonnes Sold	5,052
B	Tonnes Returned	3,160
C	Tonnes in ICI Recycling	428
D	Tonnes in ICI Garbage	567
E	Tonnes In Residential (A-B-C-D)	939

No published data could be found on a collection rate of plastic beverage containers outside of the deposit return system in New Brunswick. As a result, only a small fraction of the residential beverage containers which are not return was assumed to be collected for recycling. Eunomia checked the tonnage of plastic bottles returned through the deposit program versus the Statcan Pilot Physical Flow tonnage for all

plastic packaging collected in New Brunswick. [191] Subtracting the deposit returns from all plastic packaging sorted for recycling in the Statcan data only leaves an estimated 420 tonnes of plastic beverages recovered outside of the deposit program. This relates to a collection rate of around 1%.

A.4.5 Northwest Territories

A.4.5.1 Sales

Sales data for the Northwest Territories was taken from the territorial government's Waste Reduction Program Annual Report.[192] The report gives the total sales of beverage containers in the territory. A summary of the plastic beverage container sales from the report is shown below:

Table A - 15: Plastic Beverage Containers Sold in Northwest Territories (2022)

Beverage Container	Number of Containers Sold
Plastic < 1 Litre	8,870,110
Plastic > 1 Litre	943,317
Total Plastic Containers	9,813,427

The plastic beverage container numbers were then converted to weights using an average weight by size and beverage type. An average weight of around 40,000 containers per tonne waste used for smaller containers, while an average of around 17,000 containers per tonne was used for larger containers.

After applying these average weights, a total of 289 tonnes of plastic beverage containers were estimated to be sold in the Northwest Territories in 2022.

A.4.5.2 Deposit Returns

The same territorial report provides return data for beverage containers as well. Those figures are summarized below:

Table A - 16: Northwest Territories Return Data

Container	Sales	Returns	Return Rate
Plastic < 1 Litre	8,870,110	5,714,759	64%
Plastic > 1 Litre	943,317	745,923	79%
Total Plastic Containers	9,813,427	6,460,682	66%

[191] https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810015001&pickMembers%5B0%5D=1.5&pickMembers%5B1%5D=2.3&cubeTimeFrame.startYear=2020&cubeTimeFrame.endYear=2020&referencePeriods=20200101%2C20200101

[192] https://www.gov.nt.ca/ecc/sites/ecc/files/resources/waste_annualreport_2022-23_web.pdf

A total of 6.4 million plastic beverage containers were returned in the Northwest Territories in 2022. This relates to an overall plastic beverage container return rate of 66%.

A.4.5.3 ICI Collections

ICI Data for The Northwest Territories was taken from the unpublished compiled audit data. The data gave a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Quebec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

Table A - 17: Estimated Tonnage of Beverage Containers in ICI Collections in Northwest Territories (2022)

Statistic	Tonnage of Plastic Beverage Containers in Recycling	Tonnage of Plastic Beverage Containers in Disposal
High	36	32
Medium	27	12
Average of High and Medium	31	22

An estimated 31 tonnes of plastic beverage containers end up in ICI recycling streams in the Northwest Territories, while an estimated 22 tonnes of plastic beverage containers reach end of life in the ICI disposal streams.

A.4.5.4 Residential Collections

No data could be found on residential recycling apart from the deposit return program. As a result, it was assumed no beverage containers were collected in residential recycling programs in the Northwest Territories.

A.4.6 Ontario

A.4.6.1 Sales

Sales of plastic beverage containers were taken from Eunomia's Deposit Return Study for the Consumer Beverage Association. In that study, Eunomia estimate that there were a total of 3.1 billion plastic beverage containers sold in Ontario in 2022. This figure was checked with stakeholders within Ontario as a reasonable figure for total sales of beverage containers.

A.4.6.2 Deposit Returns

Only alcoholic beverage containers are currently under deposit in Ontario. Therefore, the only beverage containers returned for deposit are those sold through the Ontario Deposit Return Program (ODRP) for beverage containers. Of the 3.1 billion plastic beverage containers sold in Ontario, The Beer Store reports that only around 29 million of them are alcoholic. [193] The Beer Store also reports that around 13 million of these alcoholic containers are returned for their deposit, for an overall plastic beverage container return rate of 45% for containers under deposit. The rest of the ~3.07 billion plastic beverage containers must be collected through curbside and ICI programs.

A.4.6.3 ICI Collections

ICI Data for Ontario was taken from the unpublished compiled audit data. The data gave a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Quebec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

Table A - 18: Estimated Tonnage of Beverage Containers in ICI Collections in Ontario (2022)

Statistic	Tonnage of Plastic Beverage Containers in Recycling	Tonnage of Plastic Beverage Containers in Disposal
High	7,517	8,811
Medium	2,578	3,097
Average of High and Medium	5,047	5,954

An estimated 5,047 tonnes of plastic beverage containers wind up in ICI recycling collections in Ontario, while just under 6,000 tonnes of plastic beverage containers are sent for disposal by ICI generators.

A.4.6.4 Residential Collections

Residential collection was calculated by first taking the tonnage of containers which sold, and subtracting the tonnage returned through the deposit return system, recycled in ICI collections, or disposed in ICI collections. This then left over the tonnage of containers consumed by the residential sector but not returned for a deposit.

[193] StewardshipReport2022_FINAL-compressed.pdf (thebeerstore.ca)

Table A - 19: Residential Plastic Beverage Container Tonnage

Row Letter	Statistic	Figure
A	Tonnes Sold	95,585
B	Tonnes Returned	315
C	Tonnes in ICI Recycling	5,033
D	Tonnes in ICI Garbage	7,586
E	Tonnes In Residential (A-B-C-D)	84,268

Eunomia used residential collection rates from Ontario's Activity Based Costing Model to estimate the percentage of residential bottles which are collected for recycling.[194] The data showed a 54% collection rate for PET bottles, and a 54% collection rat for HDPE bottles. Using this data, Eunomia estimated around 45,000 tonnes of plastic beverage containers were collected for recycling in the residential sector.

A.4.7 Manitoba

A.4.7.1 Sales

Sales for beverage containers sold under Manitoba's Canadian Beverage Container Recycling Association program. This data provides a subset of all plastic beverage container sales, as it includes all non-alcoholic and non-dairy plastic beverage containers. To estimate the remaining beverage container categories for Manitoba, Eunomia used the average proportion of each resin category which non-alcoholic, non-dairy containers comprise from other provinces, and scaled these to Manitoba. This is shown in the table below.

Table A - 20: Beverage Container Scale Up in Manitoba

	A Sales (CBCRA Data)	B % of Category Which are Non-Alcohol and Non-Dairy	C Sales After Scaling Up (Column A divided by Column B)
PET	257,502,134	97%	264,929,672
HDPE	4,691,534	71%	6,624,121
Other Plastic	1,348,762	99%	1,349,540
Total	**263,542,430**	**97%**	**272,903,333**

The CBCRA data makes up an estimated 97% of all plastic beverage containers, thus there is only 3 percentage points of volume added. This sales data was then converted to tonnage based on an overall average weight of 39,000 containers per tonne. Manitoba appears to have a lower volume of HDPE sales

[194] 2021-SO-Four-Step-Fee-Model-ABC.xlsx (live.com)

compared to other provinces, giving it a less dense average weight of plastic beverage containers overall. In total, an estimated 7,000 tonnes of plastic beverage containers were sold in Manitoba in 2022.

A.4.7.2 Returns

Manitoba does not have a beverage deposit system, and thus no deposit returns were calculated for Manitoba.

A.4.7.3 ICI Collection

ICI Data for Manitoba was taken from the unpublished compiled audit data. The data gave a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Quebec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

Table A - 21: ICI Tonnages in Manitoba

Statistic	Tonnage of Plastic Beverage Containers in ICI Recycling	Tonnage of Plastic Beverage Containers in ICI Disposal
High	1,413	1,462
Medium	504	511
Average of High and Medium	**958**	**987**

A roughly even split of containers are estimated to end up in ICI recycling (958) and disposal (987) in Manitoba.

A.4.7.4 Residential Collection

The residential collection of beverage containers was estimated using the published collection rates from Multi-Material Stewardship Manotiba's annual report. The report shows a recovery rate of 68% for PET Containers and Bottles and 77% for HDPE Containers and Bottles. These collection rates were applied to the tonnage of containers assumed to be consumed by the residential sector. The tonnage sold into the residential sector is calculated below:

Row Letter	Statistic	Figure
A	Tonnes Sold	6,939
B	Tonnes Returned	0
C	Tonnes in ICI Recycling	869
D	Tonnes in ICI Garbage	1,263
E	Tonnes In Residential (A-B-C-D)	4,994

Apply the curbside collection rates for residential households would produce an estimated 3,400 tonnes of beverage containers collected for recycling from the residential sector.

A.4.8 Saskatchewan

A.4.8.1 Sales

Sales data from Saskatchewan were taken from SARCAN annual reports.[195] The reports provide two pieces of data:

1) The weight of containers returned by material type

2) The return rate of the containers returned by material type

From this data, it is possible to back calculate the tonnage of containers sold into the market in Saskatchewan, this is shown in the table below:

Table A - 22: Saskatchewan Plastic Beverage Containers Sold Calculation

Beverage Container Material	Million lbs collected (from 2022 SARCAN report)	Return Rate (from SARCAN report)	Million lbs Sold (calculated)
Plastic	10	80%	12.9

An estimated 12.9 million pounds of plastic beverage containers were sold in Saskatchewan in 2022. This relates to around 6,000 tonnes.

A.4.8.2 Returns

As mentioned in the previous section, SARCAN annual reports provide the weight of containers returned through the deposit system. Eunomia therefore used that data as the tonnage of material return through a DRS. The report stated 10 million pounds, or around 5,000 tonnes, of plastic beverage containers were returned in 2022.

A.4.8.3 ICI Collections

ICI Data for Saskatchewan was taken from the unpublished compiled audit data. The data gave a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Quebec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

[195] SARC Annual Report 2022 - 2023 by SARC/SARCAN - Issuu

Table A - 23: ICI Collections Data for Saskatchewan

Statistic	Tonnage of Plastic Beverage Containers in ICI Recycling	Tonnage of Plastic Beverage Containers in ICI Disposal
High	778	771
Medium	266	287
Average of High and Medium	**522**	**529**

An estimated 522 tonnes of plastic beverage containers are placed in ICI recycling collections in Saskatchewan, while 529 tonnes were placed in ICI disposal.

A.4.8.4 Residential Collections

Residential collection rates for packaging are published for Saskatchewan by Multi-Material Stewardship Western (MMSW) in their annual reports. Eunomia used their 2022 annual report for this study.[196] In that annual report, MMSW report a 12% collection rate for plastic packaging. This 12% collection rate was applied to the tonnage estimated to be generated by the residential sector but not returned through the deposit program. Eunomia estimated the tonnage generated by the residential sector but not returned through the deposit program by doing the following calculation:

Table A - 24: Estimating Tonnage Generated by Residential Sector in Saskatchewan (2022)

Row Letter	Statistic	Figure
A	Tonnes Sold	6,369
B	Tonnes Returned	5,012
C	Tonnes in ICI Recycling	554
D	Tonnes in ICI Garbage	655
E	Tonnes In Residential (A-B-C-D)	306

A.4.9 Prince Edward Island (PEI)

A.4.9.1 Sales

Sales data for Prince Edward Island's deposit return program were obtained via email communication with the PEI government. The government provided the number of containers sold and return for 2022 on the island. The plastic data is summarized below:

[196] MMSW_AR2022.pdf (mmsk.ca)

Table A - 25: Beverage Container Sales and Returns Data in PEI (2022)

Beverage Container Type	Sold	Returned	Recovery Rate
PETE	24,553,206	18,767,265	76%
Other Plastics	599,067	324,582	54%
Total Plastics	**25,152,273**	**19,091,847**	**76%**

These container figures were then converted into tonnages by using an average containers per tonne metric of 37,000. This relates to a total estimate of 710 tonnes of plastic beverage containers sold in PEI in 2022.

A.4.9.2 Returns

Deposit return data was also provided by the PEI government. The average plastic beverage container return data as seen in the previous section was 76% for PEI in 2022. This relates to just over 400 tonnes of plastic beverage containers returned for deposit.

A.4.9.3 ICI Collections

ICI Data for PEI was taken from the unpublished compiled audit data. The data gave a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Quebec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

Table A - 26: ICI Collections Data for PEI

Statistic	Tonnage of Plastic Beverage Containers in ICI Recycling	Tonnage of Plastic Beverage Containers in ICI Disposal
High	109	84
Medium	22	31
Average of High and Medium	**65**	**57**

An estimated 65 tonnes of beverage containers were collected for recycling by the ICI sector in PEI. Meanwhile, an estimated 57 tonnes of beverage containers were disposed by the ICI sector in PEI.

A.4.9.4 Residential Collections

The residential collection rate for beverage containers was estimated using data from Statcan's Pilot Physical Flow Account. The pilot physical flow account estimated a 35% collection rate of plastic packaging

in the province for 2020. Subtracting the share of this which Eunomia estimated as deposit returns, a non-deposit collection rate of 35% was estimated for all plastic packaging. This number could then be applied to the overall tonnage estimated to be generated from the residential sector but not returned through the deposit program. That calculation is shown below:

Table A - 27: Residential Tonnage Calculation for PEI (2022)

Row Letter	Statistic	Figure
A	Tonnes Sold	710
B	Tonnes Returned	478
C	Tonnes in ICI Recycling	61
D	Tonnes in ICI Garbage	81
E	Tonnes In Residential (A-B-C-D)	110

Applying the 35% rate to the 110 tonnes estimates a total tonnage in residential recycling of 40 tonnes for 2022.

A.4.10 Yukon Territory

A.4.10.1 Sales Data

Sales data for Yukon was taken from the Yukon government's 2022 Recycling in the Yukon Report.[197] The report provides sales data for all beverage containers combined in the territory. For 2022, the report stated that 29 million beverage containers were sold in the Yukon. Eunomia did not have territory specific composition data to then split this data into all material types. Therefore, Eunomia used an average from other provinces which do report by beverage material type. These provinces include Alberta British Columbia. Eunomia found that an average of 33% of beverage containers sold are estimated to be plastic. Eunomia then applied this 33% to the Yukon data to estimate a total of just over 9 million plastic beverage containers sold in Yukon in 2022.

A.4.10.2 Returns Data

The same 2022 Recycling in the Yukon report which was used for sales data also provides a return rate for all beverage containers in the territory. The report states there was a 69% return rate for beverage containers in 2022. Eunomia used this return rate and multiplied it by the total number of plastic containers sold to estimate that 6.3 million containers were redeemed in 2022.

[197] 2022.pdf (gov.yk.ca)

A.4.10.3 ICI Collections Data

ICI Data for Yukon was taken from the unpublished compiled audit data. The data provided gave a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Quebec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

Table A - 28: ICI Data for Yukon

Statistic	Tonnage of Plastic Beverage Containers in ICI Recycling	Tonnage of Plastic Beverage Containers in ICI Disposal
High	34	30
Medium	26	12
Average of High and Medium	30	21

An estimated 30 tons of plastic beverage containers were collected for recycling by the ICI sector in Yukon, while an estimated 21 tonnes were disposed.

A.4.10.4 Residential Collections Data

The residential curbside collection rate for Yukon was taken from the Territory's 2023 Economic/Financial Analysis of Development and Implementation of EPR in Yukon report. [198] That report stated Yukon had an estimated collection rate of 28%. This 28% residential collection rate could then be applied to the tonnage estimated to end up in residential waste streams. This tonnage waste calculated as follows:

Row Letter	Statistic	Figure
A	Tonnes Sold	275
B	Tonnes Returned	190
C	Tonnes in ICI Recycling	20
D	Tonnes in ICI Garbage	25
E	Tonnes In Residential (A-B-C-D)	35

Applying the collection rate to the Tonnes in Residential statistic gives the overall residential collected tonnage, while the remainder gives the tonnage which is in garbage or littered.

[198] env-economic-analysis-development-implementation-epr-yukon.pdf

A.4.11 Nova Scotia

A.4.11.1 Sales Data

Sales data for Nova Scotia was taken from data provided by DivertNS. The data provided included the number of containers by material type sold and returned in the province. The data classified plastic beverage containers as either:

- PET
- PET > 500 mL
- HDPE - Translucent
- Other plastics

A summary of the plastic beverage container data is shown in the table below:

Table A - 29: Sales and Returns Data Provided by DivertNS (April 2022 – March 2023)

Material	Sold	Returned
PET	196,886,472	151,125,013
PET > 500 mL	1,674,215	1,358,949
HDPE - Translucent	745,804	0
Other Plastics	7,056,087	1,716,268
Total All Plastic Beverage Containers	**206,362,578**	**154,200,230**

A total of 206 million plastic beverage containers were sold in Nova Scotia from April 2022 to March 2023. Sales data of containers were then converted to tonnage using average weights for PET, HDPE and other plastics, shown below:

- PET – 41,000 containers per tonne
- HDPE – 17,000 containers per tonne
- Other plastic – 18,000 containers per tonne

Using a weight average of these weights based on number of container sales, the overall average weight for the plastic beverages sold in Nova Scotia was 37,000 containers per tonne. This results in a total of 5,700 tonnes of plastic beverage containers sold.

A.4.11.2 Returns Data

The same data source for sales data was used for returns data for Nova Scotia. Therefore, a total of 154 million containers were returned in Nova Scotia.

A.4.11.3 ICI Collections Data

ICI Data for Nova Scotia was taken from the unpublished compiled audit data. The data gave a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Quebec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

Table A - 30: ICI Data for Yukon

Statistic	Tonnage of Plastic Beverage Containers in ICI Recycling	Tonnage of Plastic Beverage Containers in ICI Disposal
High	560	768
Medium	204	281
Average of High and Medium	382	524

An estimated 382 tons of plastic beverage containers were collected for recycling by the ICI sector in Nova Scotia, while an estimated 524 tonnes were disposed.

A.4.11.4 Residential Collections Data

The residential curbside collection rate in Nova Scotia was estimated using Statcan's Pilot Physical Flow data. The flow data provides estimates for the tonnage of all plastic bottles collected in Nova Scotia. The tonnage which was returned through the DRS program was then subtracted from this total, and what remains is the percent collected through the curbside programs. The data shows a 29% collection rate overall for plastic bottles. However, after subtracting the deposit data, this lowers to a 19% collection rate. This 19% collection rate the basis for finding the recycled tonnage generating from residential waste streams.

The tonnage generated in residential waste streams was estimated using the calculation below:

Table A - 31: Residential Tonnage Calculation in Nova Scotia

Row Letter	Statistic	Figure
A	Tonnes Sold	5,719
B	Tonnes Returned	3,518
C	Tonnes in ICI Recycling	557

Row Letter	Statistic	Figure
D	Tonnes in ICI Garbage	738
E	Tonnes In Residential (A-B-C-D)	1,295

An estimated 1,295 tonnes of plastic beverage containers were consumed and not returned through the DRS by the residential sector in Nova Scotia.

A.4.12 Nunavut

No data was found on sales, returns or curbside collections for Nunavut. Eunomia therefore took an average generation per capita metric from the other provinces and applied it to Nunavut's population to estimate total sales. Recycling was assumed to be zero in the territory. An estimated 224 tonnes were sold in Nunavut in 2022.

A.4.13 Newfoundland and Labrador

A.4.13.1 Sales Data

Sales data for Newfoundland and Labrador (NL) was taken from data provided via email from government officials, as well as data received under a Freedom of Information request. These data provided the total weight recovered, as well as the return rate for PET and Other plastics separately. That return data is shown below:

Table A - 32: Return Rates Provided by NL

Material	Return Rate (including MRF collection)
PET	73%
Other Plastics	25%

The return data also gives more granular material categories for returns, however these are only expressed in weights. Eunomia therefore matched the return weight to a return rate based on whether the material was of PET or another plastic. The return weight could then be divided by the return rate to estimate the total weight sold of each plastic material.

Table A - 33: Return Weight Data and Calculating Sales Data

Material	Returns (lbs)	Matched Return Rate	Estimated Sales (lbs) (Returns/return rate)
PET - Clear Non-Alcoholic	2,520,029	73%	3,452,095
Green PET	302,716	73%	414,679

Other Plastics Non-Alcoholic	94,682	27%	350,674
HDPE Translucent	5,452	27%	20,193
Blue PET	501,006	73%	686,310
PET Clear Alcoholic	207,588	73%	284,367
Other Plastics Alcoholic	5,469	27%	20,256
Total	**3,636,942**	**--**	**5,228,573**

In total, an estimated 5.2 million pounds of rigid plastic beverage containers were sold in Newfoundland and Labrador in 2022.

A.4.13.2 Returns Data

Eunomia used the returns data mentioned in the subsection above as the total weight recovered through the deposit program. The program data also provided an estimate for what percentage of PET and other plastics were returned via the MRF stream. 3% of all PET containers sold were returned through the MRF stream, while 2% of other plastics were returned through the MRF stream. This proportion was removed from the overall collection rate to calculate only the DRS return rate.

Table A - 34: Return Rate from DRS versus MRF Stream

	Return Rate - DRS	Return Rate MRF to DRS	Total Return Rate
PET	70%	3%	73%
Other Plastics	25%	2%	27%

A.4.13.3 ICI Collections Data

ICI Data for NL was taken from the unpublished compiled audit data. The data gave a low, medium and high estimate for tonnage in both ICI garbage and recycling. In comparing the data to studies conducted on the ICI waste stream in Quebec and other provinces, it was determined that an average of the high and medium values aligned closest with published data.

Table A - 35: ICI Data for Newfoundland and Labrador

Statistic	Tonnage of Plastic Beverage Containers in ICI Recycling	Tonnage of Plastic Beverage Containers in ICI Disposal
High	223	305
Medium	81	112
Average of High and Medium	152	208

An estimated 152 tonnes of plastic beverage containers were collected for recycling by the ICI sector, while an estimated 208 tonnes were estimated to be placed in the disposal stream by the ICI sector.

A.4.13.4 Residential Collections Data

No data was found for the diversion rate of residential plastics aside from the deposit program in NL. Eunomia estimated the total tonnage of plastic in the residential stream in NL by performing the following equation:

Table A - 36: Residential Tonnage in NL

Row Letter	Statistic	Figure
A	Tonnes Sold	3,034
B	Tonnes Returned	1,849
C	Tonnes in ICI Recycling	221
D	Tonnes in ICI Garbage	293
E	Tonnes In Residential (A-B-C-D)	824

An estimated 824 tonnes were generated but not returned by the residential sector in NL. This tonnage can end up either in recycling programs, garbage, or litter.

Missing data or information in Eunomia Feasibility Study

Project Title: Achieving 90% Recovery of Plastic Beverage Containers
Prepared By: Eunomia Research and Consulting in partnership with Giroux Environmental Consulting and Millette Environmental
Date: August 2024

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1. Barriers and Opportunities to 90% Recovery, page iv

- **Description of Omission:**
  "If a DRS was expanded in Ontario and Quebec with no changes to other systems, Canada would recover an estimated 77% of plastic beverage containers. **Include: While Manitoba does not have a DRS, it recovers around 78% of plastic per year since 2021.** Approximately **72%** would be recovered through a DRS and ~~5%~~ **7%** would be recovered through curbside programs.

  If a comprehensive DRS was implemented in all provinces but accessibility and the deposit level remained the same, Canada would recover an estimated 79% of plastic beverage containers. Approximately **75%** ~~72%~~ would be recovered through a DRS and **4%** ~~7~~% would be recovered through curbside programs."

2. Table 1: Plastic Single-Use (Non-Refillable) Beverage Container Collection Rates Across Canada, 2019-2023[1] (Data Available as of April 1, 2024), page 29

- **Description of Omission:**
  2023 New Brunswick (non-alcohol) should read PET/HDPE: 67.5%

3. 5.2.1.2 Opportunity 2: Increase Scope to Cover All Beverage Containers, Local Context/Impacts, page 87

Description of Error/Omission:
"…the dairy industry in most parts of Canada is now in favour of DRSs for their containers."
Should read: The dairy industry is no longer challenging deposit return systems for milk containers.

Prepared by:
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Beverage Container Recycling Network of Canada / Réseau canadien de recyclage des contenants de boissons