

WHO PAYS WHAT?

AN ANALYSIS OF BEVERAGE CONTAINER COLLECTION AND COSTS IN CANADA

2018



Author's Note

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List of Abbreviations

| | | | |
|-----------------|---|--------------------------|---|
| ABCRC | Alberta Beverage Container Recycling Corporation | IWMC | Island Waste Management Corporation |
| ABCC | Alberta Beer Container Corporation | LCBO | Liquor Control Board of Ontario |
| ABDA | Alberta Bottle Depot Association | LDB | Liquor Distribution Branch |
| ADC | Alberta Dairy Council and Atlantic Dairy Council | LLDPE | Low-density polyethylene |
| AfH | Away-from-home | MEBCalcTM | Measuring the Environmental Benefits Calculator |
| AGLC | Alberta Gaming and Liquor Commission | MMRP | Multi-Material Recycling Program |
| BCMB | Beverage Container Management Board | MMSB | Multi-Materials Stewardship Board |
| BDL | Brewers Distributor Limited | MMSM | Multi-Material Stewardship of Manitoba |
| BGE | Boissons Gazeuses Environnement | MMSW | Multi-Material Stewardship Western |
| BIB | Bag-In-Box | MRF | Material Recovery Facility |
| CBCRA | Canadian Beverage Container Recycling Association | MtCO₂e | Metric tonnes of carbon dioxide equivalent |
| CHF | Container Handling Fee | NewBRI | Newfoundland Beverage Recovery Inc. |
| CRF | Container Recycling Fee | OI | Owens-Illinois |
| CSA | Collection System Agent | PER | Processing Efficiency Rate |
| CSP | Collection Service Provider | PET | Polyethylene terephthalate |
| DRS | Deposit-return system | PPP | Printed Paper and Packaging |
| ÉE | Éco Entreprises Québec | PVC | Polyvinyl chloride |
| EfW | Energy-from-waste | R2R | Return-to-Retail |
| EHC | Environmental Handling Charge | RFF | Recycling Fund Fee |
| EPR | Extended Producer Responsibility | RPRA | Resource Productivity & Recovery Authority |
| GHG | Greenhouse Gas | RRFB | Resource Recovery Fund Board Inc. |
| GJ | Gigajoule | RVM | Reverse Vending Machine |
| HDPE | High-density polyethylene | SO | Stewardship Ontario |
| IC&I | Industrial, Commercial, and Institutional | TBS | The Beer Store (aka Brewers Retail, Inc.) |
| IFO | Industry Funding Organization | UDRS | Unified Dairy Recycling System |
| ISO | International Organization for Standardization | WDO | Waste Diversion Ontario |
| ISP | Industry Stewardship Plan | | |

Province Short Codes

| | |
|------------|---------------------------|
| AB | Alberta |
| BC | British Columbia |
| MB | Manitoba |
| NB | New Brunswick |
| NL | Newfoundland and Labrador |
| NS | Nova Scotia |
| NT | Northwest Territories |
| NU | Nunavut |
| ON | Ontario |
| PEI | Prince Edward Island |
| QC | Québec |
| SK | Saskatchewan |
| YT | Yukon |

Who Pays What 2018: An Analysis of Beverage Container Collection & Costs in Canada

A Primer

Canadians are proud of their success when it comes to recovering beverage containers. In 2016, approximately 10 billion non-refillable beverage containers sold in Canada were collected for reuse and/or recycling. The vast majority of these containers were collected via deposit return mechanisms.

The first province to introduce mandatory deposits on beverage containers was British Columbia in 1970. Fast-forward to today and nearly all provinces have followed suit. With the goal of documenting these initiatives and offering valuable insight into the field of beverage container recycling, CM Consulting developed the *Who Pays What* report in 2002. Now in its 9th edition, this report has proven to be an invaluable tool for government officials and those in the beverage industry and recycling sectors seeking to understand how these systems work, how their performance is measured, and how they are financed. In addition to providing a comprehensive overview and analysis of program performance and system costs, this report delves into the economic and environmental benefits of beverage container reuse and recycling, including avoided greenhouse gas emissions and municipal cost savings. A discussion on recycling processes, end-markets, and the use of recycled content is also included.

Over the past few years, there has been renewed interest in deposit return systems (DRSs) as a tool to collect high quantities of beverage containers, which, as a class of packaging has evolved to now include aseptic containers, gable top cartons, and even coffee cups. From North America to Australia and across Europe, there are now over 40 jurisdictions worldwide that have implemented DRSs for beverage containers, and the governments of England, Scotland and Malta have announced that they will soon follow suit.

Governments are also becoming more aware of the inaccuracies of the data being provided, more specifically the impact of contaminants and losses which occur after materials are sorted in non-deposit systems. Determining those downstream losses is a critical step to attaining real recycling values. This is clearly outlined in the Canadian Standards Association's Recycling Guideline¹ as well as being a legislative change within the European Union's new Waste Framework Directive.

With this in mind, CM Consulting aims to provide the best and most reliable data possible. We aim to ensure that the data is robust and applied methodologies are made fully transparent. Today more than ever, as producers have a greater responsibility for managing and financing their collection programs, there must be checks and balances with non-vested informed oversight.

Due to data being unavailable, we are disappointed that this 2018 version of *Who Pays What* will exclude collection and recycling rates for Quebec's and Manitoba's non-deposit containers collected via curbside and

public space recycling programs. In the case of Quebec, we rely on waste characterization studies to derive our recycling rates, and the most recent year for which Quebec data is available is 2012-2013. The study was updated for 2016 but is not yet publicly available.

Similarly, after a series of correspondence with the producer responsibility organization that provides non-alcohol beverage container collection rates for Manitoba, we were unable to receive data suitable for entry into our report. Due to lack of transparency, granularity and methods and analysis behind the rate, as well as lack of transparency regarding audits, we made a decision to omit Manitoba data from this year's report because we have no reason to believe the numbers that have been officially reported by the producers.

We trust you will find this report both useful and informative. Please contact us if you require other data or further analysis, or have comments or suggestions that might make the report more helpful to you in the future.

Respectfully yours,

A handwritten signature in black ink, appearing to read 'Clarissa Morawski'.

Clarissa Morawski, Principal

Key Findings

Beverage Container Recycling Rates for 2016

Refillable Beer Bottles

The recycling rate for refillable beer bottles in Canada has been consistently high. CM Consulting can no longer obtain exact sales and returns numbers for each province, but the national collection rate is approximately 95%.

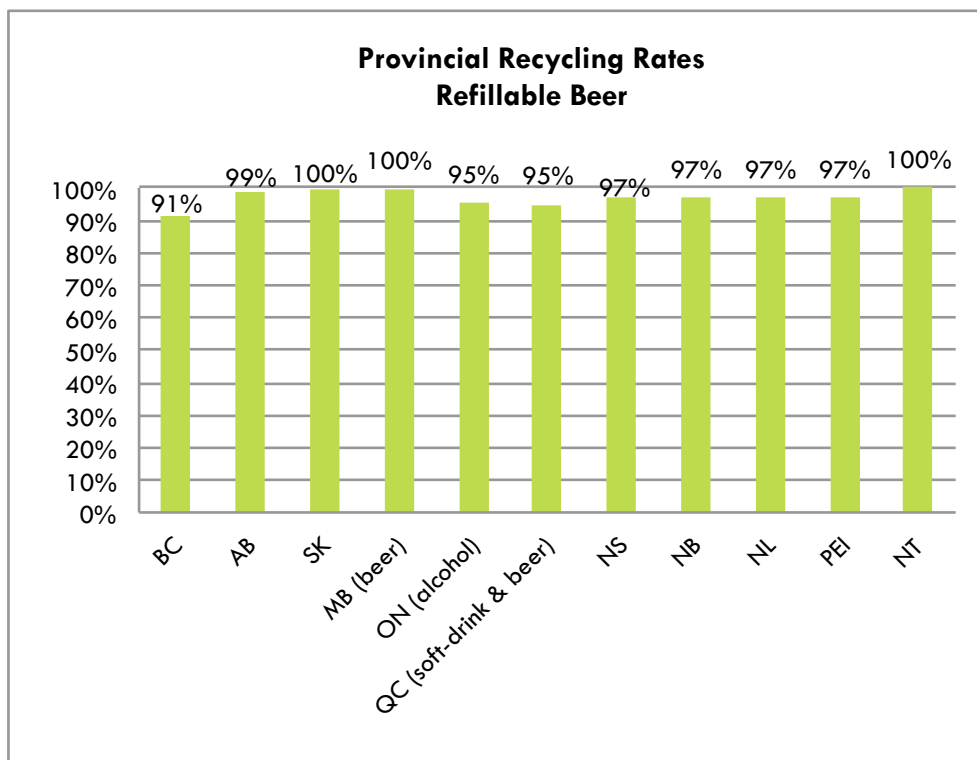


Figure 1 Provincial Recycling Rates, Refillable Beer (2016)

Non-Refillable Containers

Non-refillable containers (also called one-way or single-use containers) include aluminum and steel cans, PET bottles, glass bottles, and gable top/aseptic cartons. Regardless of material type, these containers are always recycled at higher rates in jurisdictions that have DRSs. For example, Alberta and Saskatchewan achieved recycling rates of 85.7% and 82.1%, respectively, in 2016. During the same period, Ontario's recycling rate for

non-refillable, non-alcohol containers was only 45%. Reliable performance rates for non-deposit containers in Manitoba and Quebec were not available for 2016.

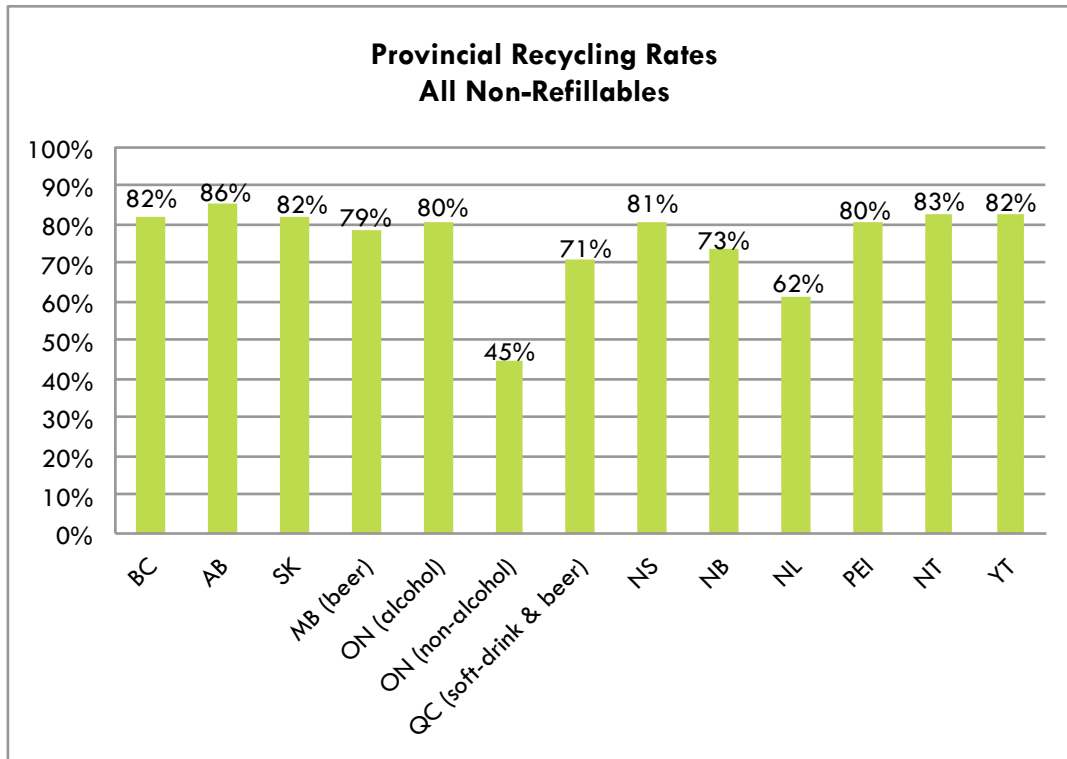


Figure 2 Provincial Recycling Rates, All Non-Refillables (2016)

Environmental Benefits

There are many benefits to reusing and recycling beverage containers. Not only does it keep valuable materials out of landfills, it also reduces greenhouse gas emissions and the energy required to produce new containers from raw materials. In 2016, Canadians recycled and/or reused approximately 11 billion beverage containers. This level of diversion saved over 18 million GJ of energy and eliminated over a million metric tonnes of CO₂ equivalent emissions, equal to taking nearly 250,000 cars off the road.

Economic Benefits

In terms of economic benefits, DRSs for beverage containers create jobs and result in significant cost savings for municipalities. In this report, we present a compilation of 27 studies that examined the costs and benefits of implementing or expanding DRS for beverage containers, all of which show net positive effects on municipal budgets.

Part 1: Program Performance

Measuring what Matters

We've all heard the expression, "You can't manage what you don't measure." It may be an old management adage, but it also applies to recycling. Without performance measurement, it is difficult—if not impossible—for governments and organizations to design and implement effective recycling programs and to ensure that they are meeting their objectives.

When it comes to beverage containers, program performance is typically measured using the collection rate, a calculated value derived from dividing the amount of material collected by the amount of material sold. For DRSs, using the collection rate as an indicator of performance makes sense because the accounting is in units, and because beverage containers are collected separately from other types of packaging. Determining the collection rate is simple since the refund provides an opportunity to track sales and collection to the last unit.

Measuring the success of multi-material collection systems, on the other hand, is much more complex. The complexity lies in that beverage containers are collected commingled with other types of containers, including PET from non-beverage sources, like ketchup bottles and PET thermoformed packaging for foods. Adding to this complexity is the fact that contaminants (e.g., food or liquid left in containers, non-recyclables) are included in the weight of collected containers. This makes the usefulness of the collection rate as a performance measure meaningless since it does not reflect the actual recycling of beverage containers. In order to measure what is actually recycled in these programs, the weight of non-beverage container material must be subtracted from the total tonnage. For this reason, CM Consulting uses *recycling rates* to measure the performance of programs in this report. In order to estimate recycling rates for beverage containers collected via the multi-material program in Ontario, the authors applied reasonable and important assumptions to all available data (see Appendix).

Getting the Numbers Right: Accounting for Contamination

Although it has increased participation and the volume of recyclables collected, one of the challenges of single-stream (also called "commingled") recycling collection is the increase in contamination. Contamination occurs when non-recyclables are mixed with recyclables, or when recyclable items are sorted improperly before they are shipped for processing. For recyclers, higher contamination rates mean higher costs, lower yields, and more material to dispose of. Contamination also leads to downtime in production processes, which costs machine maintenance, work hours, and lost time.

Compared to DRSs, the material collected via single-stream collection is of much lower quality, with more residuals and out-throws. A study of glass recycling showed that only 40% of glass from single-stream

collection is used in the production of new containers and fiberglass. In contrast, colour-sorted glass recovered via deposit systems results in 98% being recycled and only 2% marketed as glass fines.² For plastics, recyclers report yield rates of about 68-70% for material collected from single-stream programs, compared to bales of PET from DRSs which generally have a yield rate of about 85%.³

Process Loss

All bales of beverage containers will experience some level of yield loss due to the caps, labels, and glue that remain on the containers after sorting. This is true even in DRSs. PET bottles, for example, can lose up to 15% by weight of their material in the system. Some of these losses are fines, which can be sold as a by-product, but most are disposed of in landfill. When it comes to aseptic containers, 20% of the material (by weight) is aluminum and plastic and is considered process loss because it is disposed of after separation from the pulp.

As program operators seek to increase the recovery of beverage containers, it is important that they account for process loss by ensuring that both the numerator (i.e. amount of beverage container material collected) and denominator (i.e. amount of beverage container material sold) include or exclude the weight of this material in a consistent manner. This requires applying the processing efficiency rate (PER) to the collection rate (see Table 1 for definitions). It should be noted, however, that this step is only required for collection rates that are measured in weight, as is the case in Manitoba, Ontario, and Quebec (for non-carbonated beverages), since recycling rates for these programs decrease as the level of contamination rises. Collection rates reported for DRSs are not affected by processing efficiency because they are based on unit counts.

Table 1 Rate Definitions

| | |
|---|--|
| Collection Rate (CR) | <p>The amount of beverage container material collected (by weight or unit) that is shipped to the recycler by the primary processor (e.g. MRF) expressed as a percentage of the amount of beverage container material placed on the market, excluding exports. Some programs use “recovery rate” and “collection rate” interchangeably.</p> <p>Note: If material is measured by weight, the weight of caps, labels, and glue should be considered in both the numerator and denominator.</p> |
| Processing Efficiency Rate (PER) | <p>The amount of beverage container material received by the recycler that is used in the recycling process (excluding energy-from-waste) expressed as a percentage of the amount of material shipped to the recycler. The higher the PER, the lower the level of contamination, and vice versa.</p> |
| Recycling Rate (RR) | <p>The amount of beverage container material used in the recycling process (excluding energy-from-waste) expressed as a percentage of the amount of beverage container material placed on the market, excluding exports. The RR takes into account the weight of materials rejected due to contamination.</p> <p>Note: In DRSs, the collection rate and the recycling rate are the same, because the accounting is in units.</p> |

Knowing the PER is critical for accurate performance measurement because it sheds light on what was *actually* recycled, not just how much material was collected and then sent to disposal after secondary processing. CM Consulting estimated PERs based on rates published by industry and through interviews with recyclers that

process beverage container material in Canada. Figure 3 presents typical contamination rates (low and high) that are common in today's bales of recyclables shipped to recyclers.

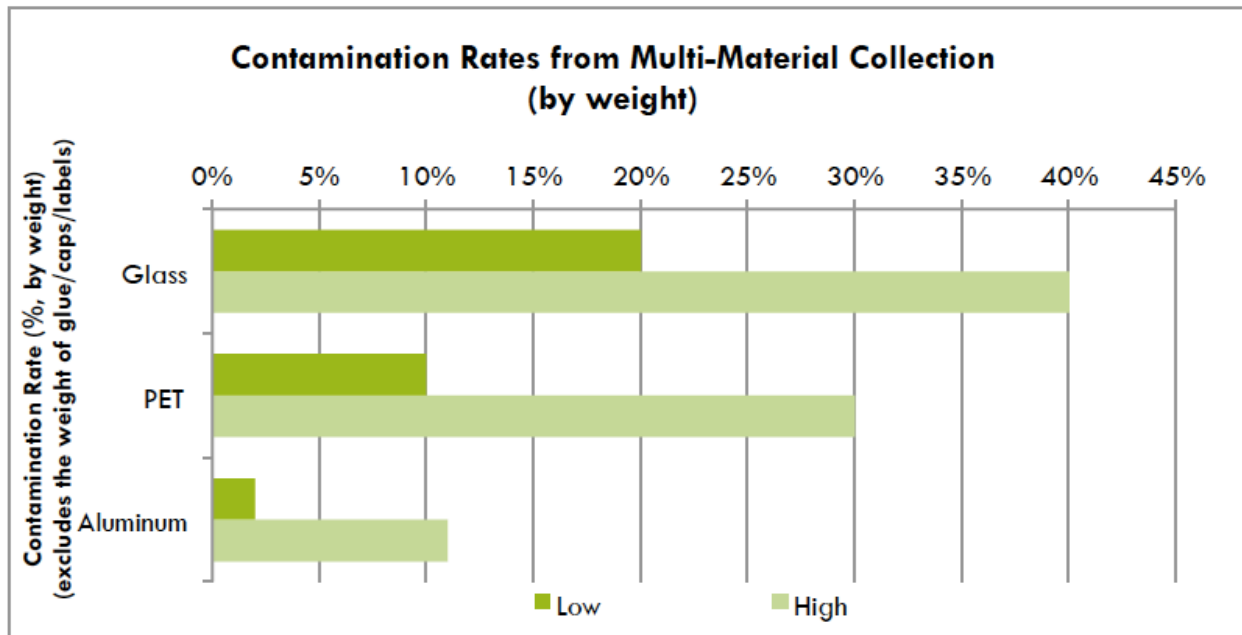


Figure 3 Contamination Rates from Multi-Material Collection (by weight)

Material-Specific Recycling Rates

Refillable Beer Bottles

Provincial operating agencies and the Brewers Association of Canada (BAC) are responsible for monitoring and reporting the collection/recycling rates for refillable beer bottles. These bottles are recycled at a very high rate, both nationally and on a provincial level. The recycling rate of refillable containers has a considerable influence on the trippage rate, which, in turn, determines the environmental benefit to be gained from reuse. “Trippage” is the term used to describe the average number of trips a container makes before it is recycled by the bottler, damaged by the consumer (and thus not returned for deposit), or otherwise landfilled. In Canada, the average trippage rate for industry standard beer bottles (ISB) is 15 times.

Figure 4 summarizes the recycling rates for refillable beer bottles collected through brewer-run provincial programs in fiscal year 2016. Although other types of beverages also come in refillable bottles, including other alcoholic and non-alcoholic beverages like water, milk and soft drinks, collection/recycling rates for these containers are not reported and so are not available to the public.

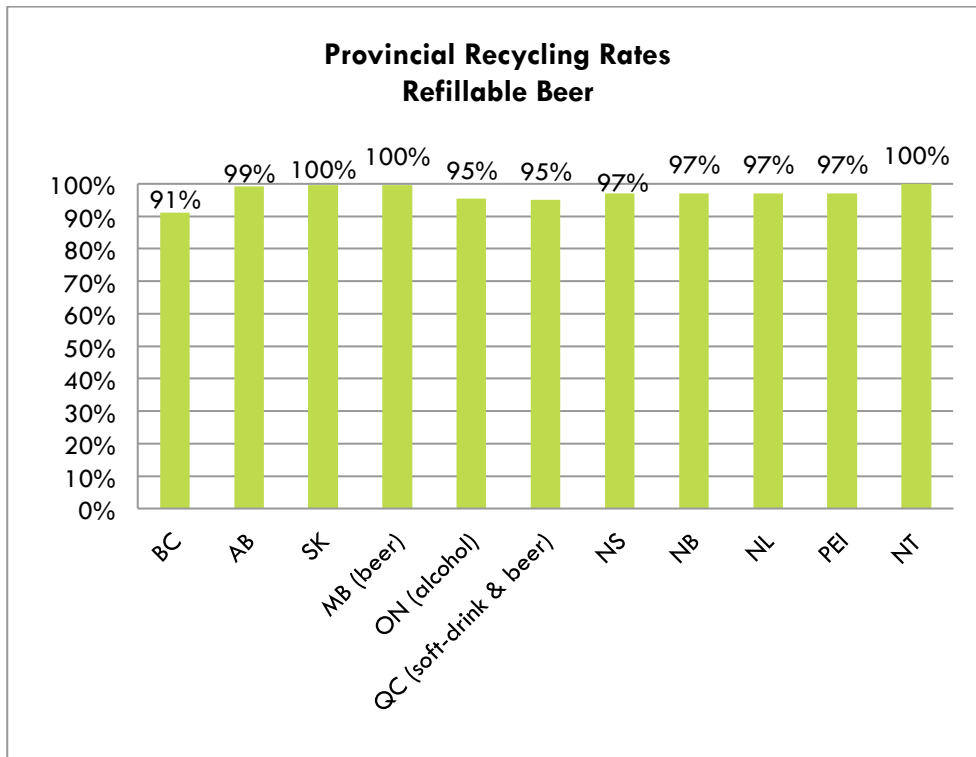


Figure 4 Provincial Recycling Rates, Refillable Beer (2016)

The Decline in Refillable Beer Bottles

Historically, the majority of beer sold in Canada has been sold in The Beer Store's ISB. However, in recent years there has been a dramatic decline in the use of such refillable containers. Statistics from the BAC show that from 2009 to 2017, nationwide market share for beer sold in glass bottles dropped from 59% to 30% of overall hectoliters sold.

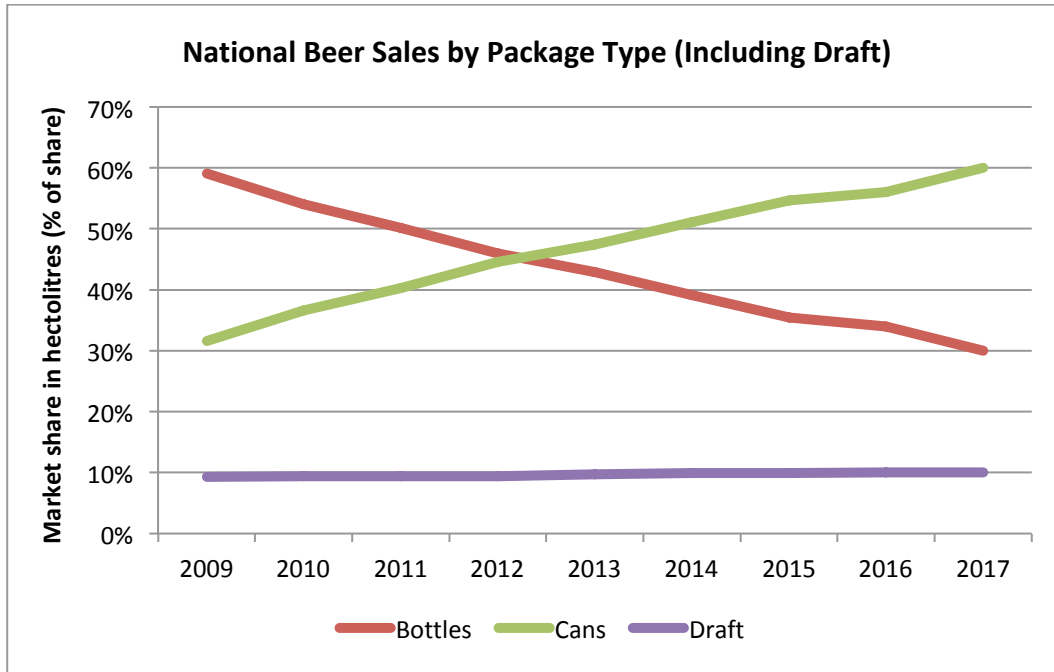


Figure 5 National Beer Sales by Package Type (Including Draft) (2009-2017)

Only in Ontario and Quebec does the refillable beer bottle remain popular, but it is in these two provinces where the greatest decline has occurred. In Quebec, in 2009, 83% of packaged beer was sold in refillable bottles. By 2017, the market share for all glass bottles (including imports) share had dropped to 32%. From 2008 to 2016, the percentage of beer sold in ISBs in Ontario dropped from 76% to 54%. B.C. has experienced a similar decline.

Figure 6 shows how the ISB's market share has declined in Quebec, Ontario, and B.C. from 2009 to 2017. It is worth noting that this only represents sales of domestic bottles vs. domestic cans.

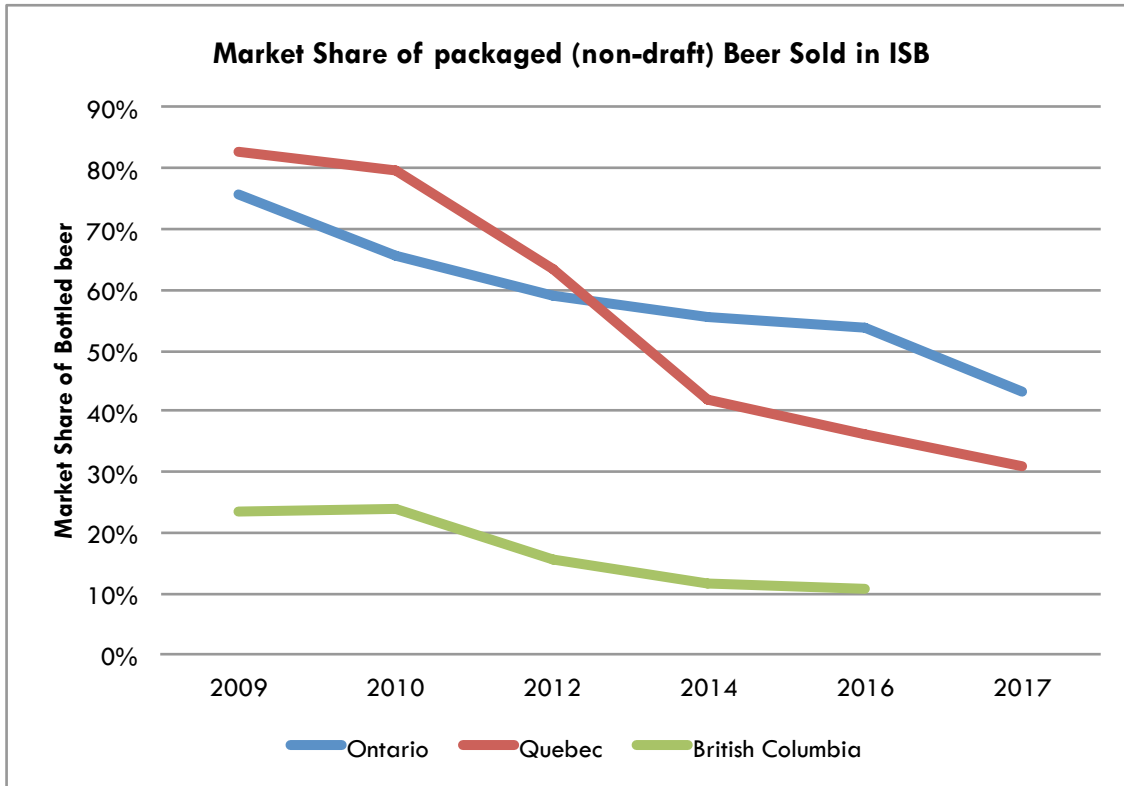


Figure 6 Market Share of Packaged (Non-Draft) Beer Sold in ISB in Ontario, Quebec, and British Columbia (2009-2017)

Several factors can explain this decline, one of which is a shift in the retail landscape towards large retailers or “big box” stores. Without policies in place to promote them, retailers have stopped carrying refillables in an effort to reduce the labour, space and general management requirements associated with having to take them back. Another contributing factor to the decline in refillable beverage packaging and corresponding increase in one-way containers is that refillable systems require a greater level of cost internalization by beverage producers. Whereas producers of beverages in one-way packaging generally only incur a share of the end-of-life management costs, producers of refillable beverage containers incur the full costs of collection and refill. This un-level playing field creates an economic incentive to use one-way containers over reusable ones. Other reasons for the decline include changes in the relative costs of container materials (aluminum and plastic), a shift to lighter packaging, and a change in consumer preference and behavior.

Non-Refillable Containers

Table 2 shows recycling rates for different types of non-refillable containers collected in each province for 2016. Entries of “-” indicate that data for that category of containers was either not available or not applicable for that province. The table includes data for only one non-deposit beverage container collection program, the Blue Box program in Ontario. We can see that nearly all of the deposit programs are running recycling rates of 80% or higher, but that the Ontario Blue Box program has a recycling rate of 45%.

Table 2 Provincial Recycling Rates, Non-Refillable Containers (2016)

| | BC | AB | SK | MB (beer) | ON (alcohol) | ON (non-alcohol) | QC (soft-drink & beer) | NS | NB | NL | PEI | NT | YT |
|------------------------------|------------|------------|------------|------------|--------------|------------------|------------------------|------------|------------|------------|------------|------------|------------|
| Aluminum Cans | 87% | 91% | 88% | 79% | 80% | 41% | 71% | 89% | 79% | 65% | 87% | 84% | - |
| Non-Refillable Glass | 89% | 94% | 79% | - | 85% | 42% | 70% | 86% | 73% | 66% | 77% | 101% | - |
| PET Bottles | 74% | 81% | 79% | - | 53% | 44% | 70% | 78% | 69% | 65% | 78% | 84% | - |
| Other Plastics | 74% | 81% | - | - | - | 45% | - | 21% | 69% | 18% | - | 84% | - |
| Bi-Metal/Stetl Cans | 85% | 75% | - | - | - | 64% | - | 44% | - | 53% | - | 64% | - |
| Gable top/Aseptic/BIB | 58% | 72% | 52% | - | 25% | 35% | - | 56% | 57% | 46% | 48% | 62% | - |
| Total Non-Refillables | 82% | 86% | 82% | 79% | 80% | 45% | 71% | 81% | 73% | 62% | 80% | 83% | 82% |

Figure 7 summarizes the total non-refillable recycling rate, by province, for 2016. The visual clearly shows the stark difference between the performance of Ontario's curbside program and the deposit systems, which are much more successful.

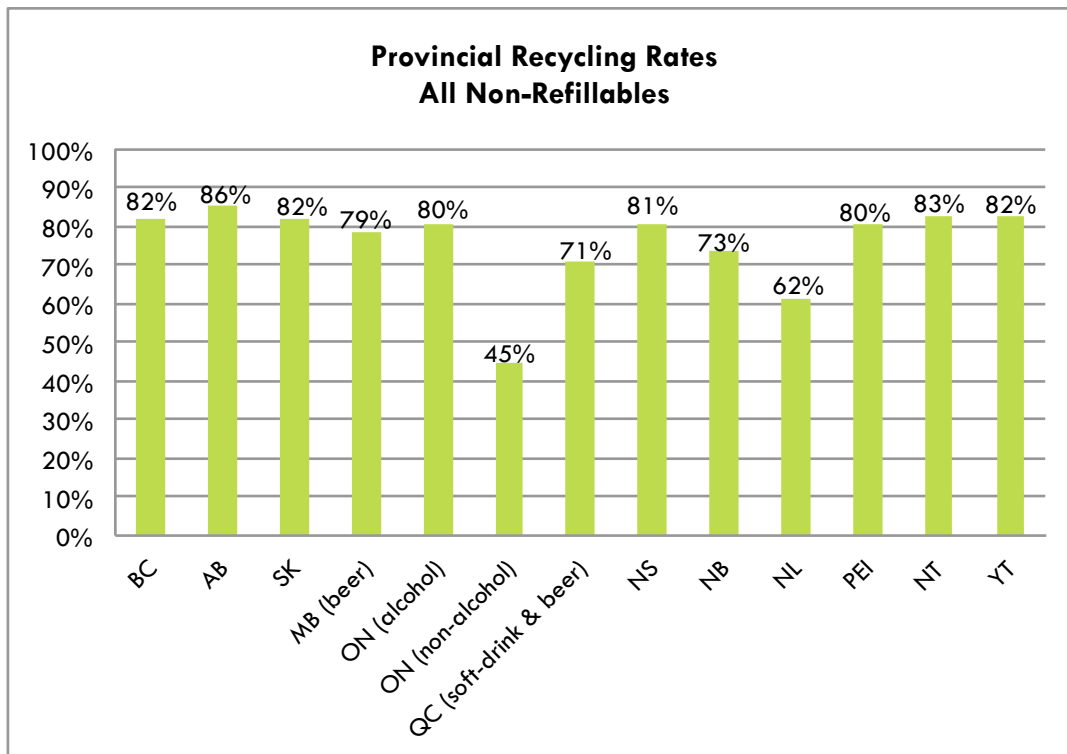


Figure 7 Provincial Recycling Rates, All Non-Refillables (2016)

Figure 8 provides historical data on non-refillable recycling rates for the years 2004 to 2016. Most provinces have seen their rates increase gradually. Alberta stands out with an 11 point increase since 2008, while Ontario, with no DRS, has seen a fall in beverage container recycling rates from 56% in 2012 to 45% (lowest of all available rates) in 2016.

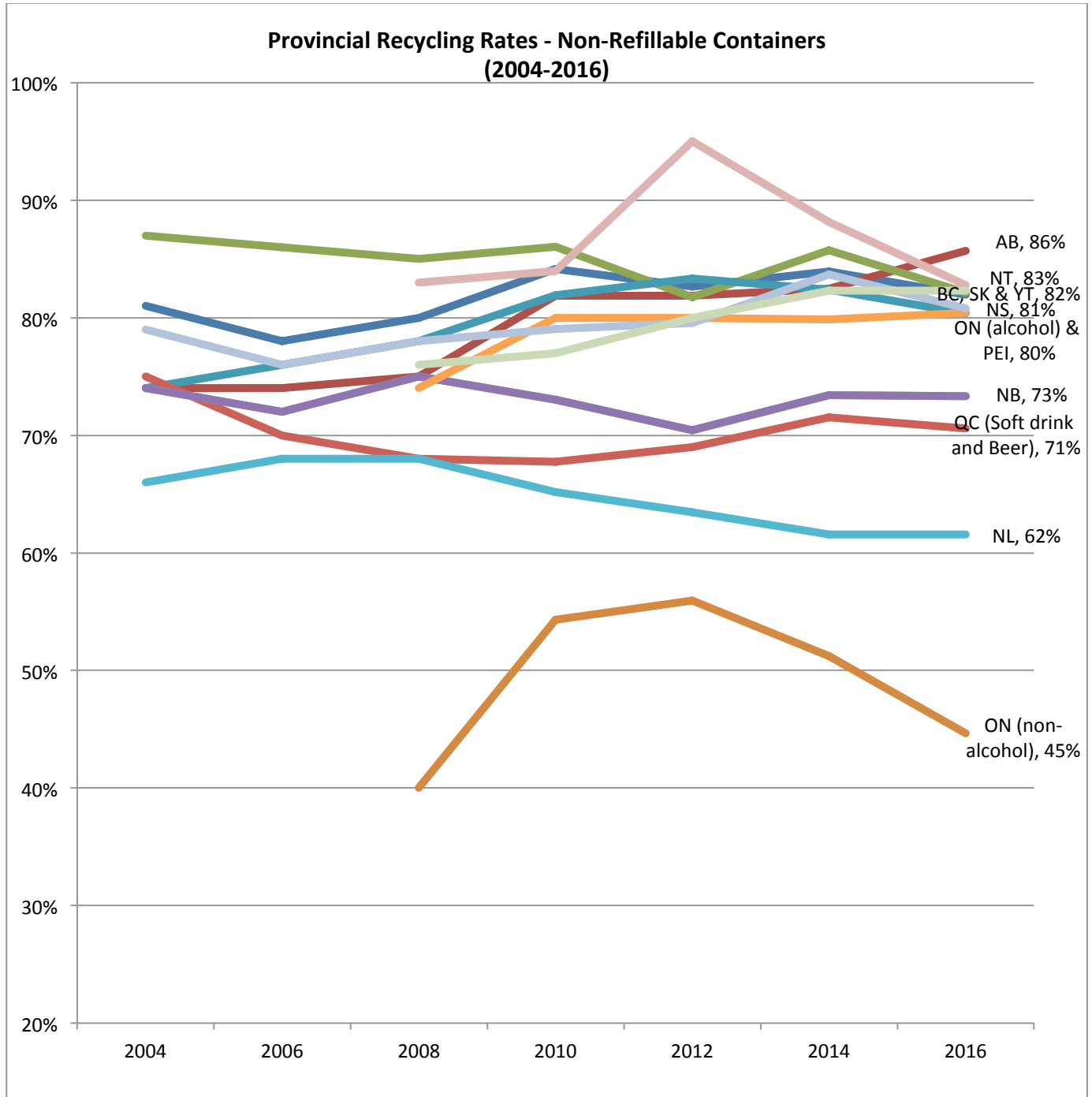


Figure 8 Provincial Recycling Rates, Non-Refillable Containers (2004-2016)

Aluminum Cans

Figure 9 presents 2016 recycling rates for aluminum cans by province. The outlier in the chart is the low rate of curbside collected aluminum cans in Ontario. The aluminum can recycling rate in B.C. is higher than that presented by Encorp because this number also includes beer cans (see Figure 10).

It is worth pointing out Quebec's recycling rate of 71%, which, compared to other deposit jurisdictions, is relatively low. Quebec's poor performance for these containers is likely attributable to the low deposit on beer cans (5-cents, which is expected to be raised to 10-cents, possibly after the 2018 provincial election), which is half the value of the deposit in most other provinces. Another contributing factor is the fact that Quebec's DRS is limited to carbonated beverage cans (i.e. soft drinks and beer). This creates confusion for consumers, which in turn lowers overall performance.

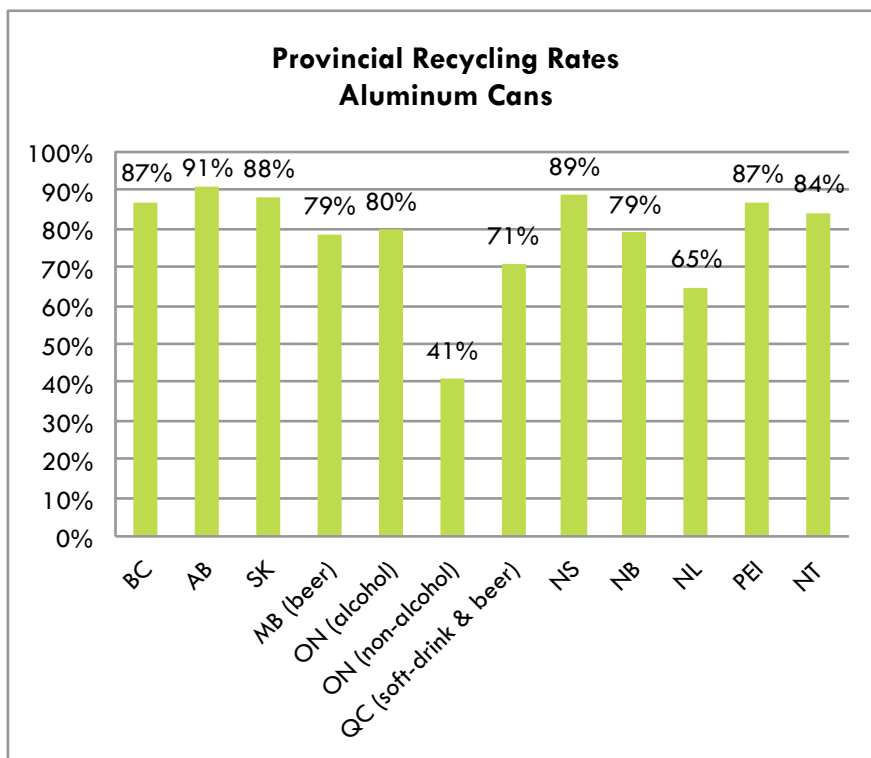


Figure 9 Provincial Recycling Rates, Aluminum Cans (2016)

Figure 10 shows 2016 recycling rates for aluminum beer cans vs. non-alcoholic beverage cans in Ontario and B.C. When comparing these rates, it is important to consider deposit levels, which have a significant influence on rates of return. In B.C., the deposit on beer cans, which show a 91% recycling rate, is 10-cents. This is double the deposit charged on non-alcoholic beverage containers (5-cents), which only show a recycling rate of 82%. It is also important to consider the collection system used to recover each type of container. As shown in the table, there is a clear difference in recycling rates for beer and soft drinks cans in Ontario (80% vs. 41%), where beer cans are on deposit and soft drink cans are collected curbside.

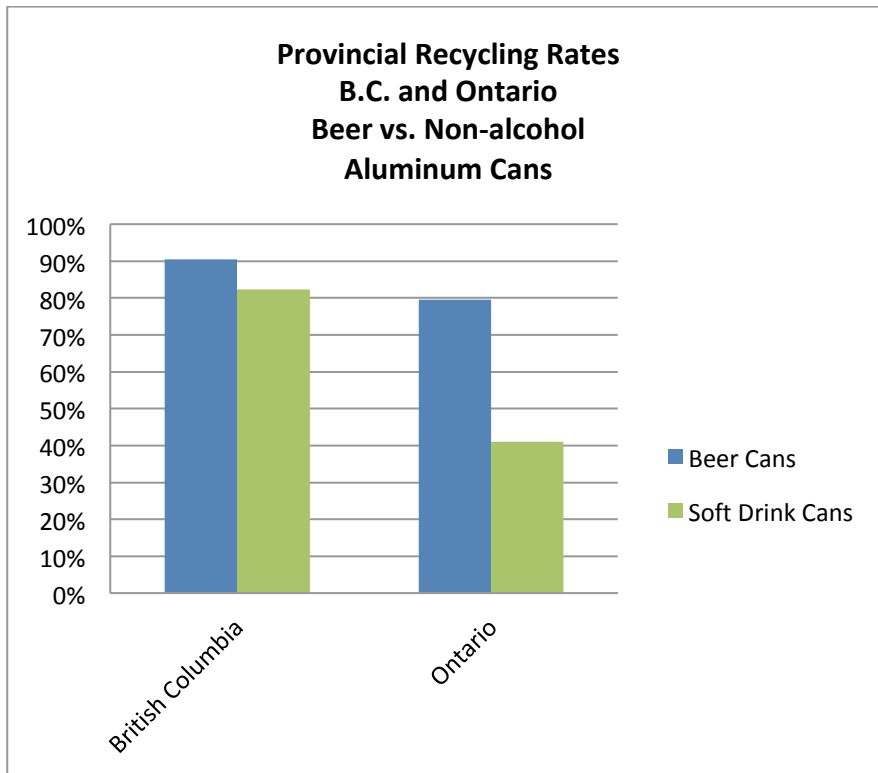


Figure 10 Provincial Recycling Rates, Aluminum Beer Cans vs. Soft Drink Cans, in Ontario and BC (2016)

Figure 11 shows how recycling rates for aluminum beverage cans have changed over time. Some provinces, like Alberta, have seen a significant increase from 2004 to 2016. Alberta now has the highest aluminum can recycling rate in the country due to the higher deposit of 10 cents on all cans. Ontario has seen its aluminum can recycling rate from the curbside system decline rapidly in the last four years. Most other provinces are showing slight increases or declines. The extremely high rate of 100% in Northwest Territories in 2012 is an anomaly that is likely explained by containers being stored longer than usual, rather than put through the system, and creating a bulge in returns during that year.

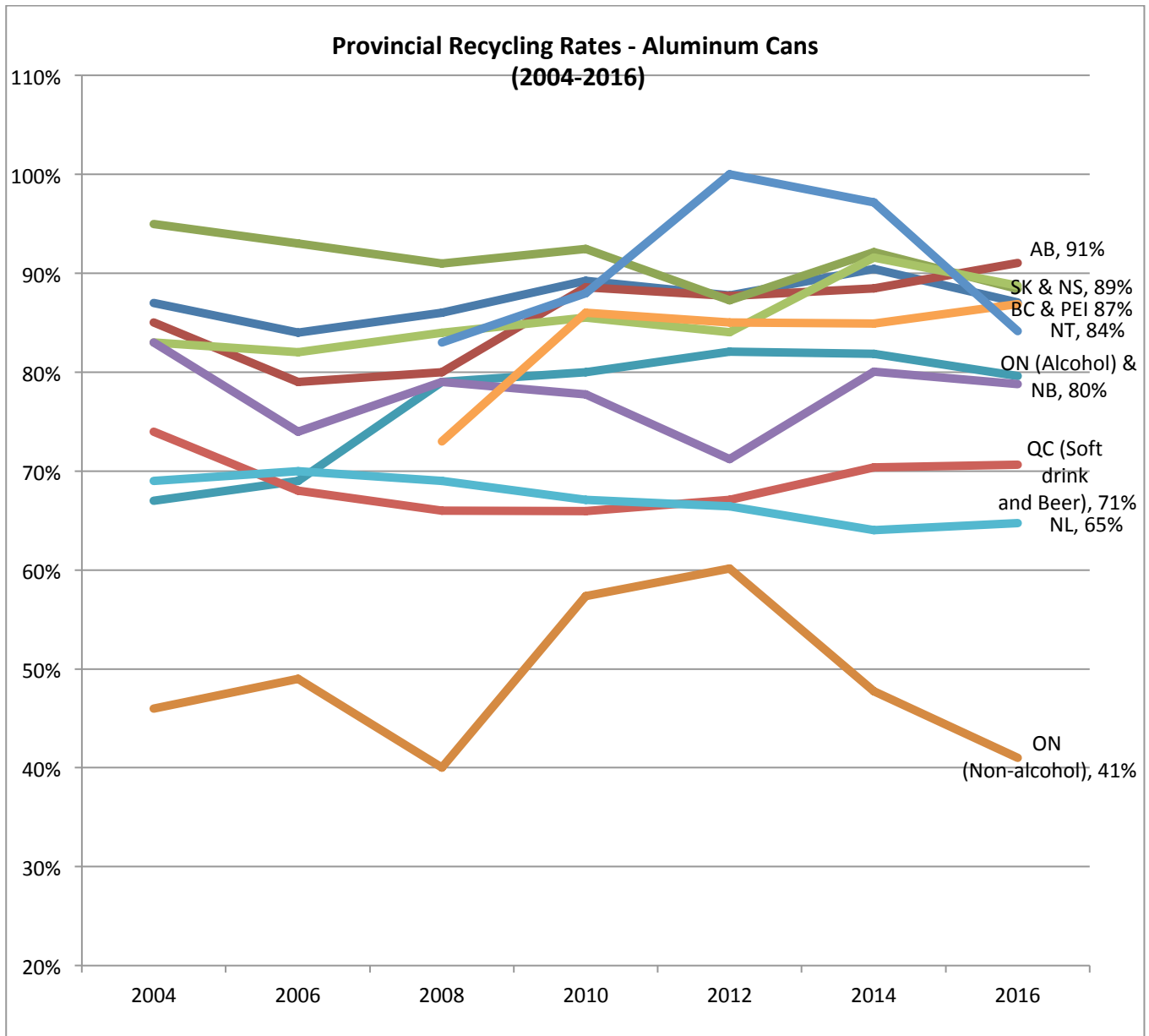


Figure 11 Provincial Recycling Rates, Aluminum Cans (2004-2016)

Non-Refillable Glass

Figure 12 presents provincial recycling rates for non-refillable glass in 2016. The province with the highest recycling rate for this material is Alberta at 94%, followed by B.C. at 89% (It is obvious that the Northwest Territories has a counting issue in this year). For this category of materials, dependable rates could not be obtained for the curbside collection programs in Manitoba or Quebec. It is worth noting that in Manitoba, none of the recovered glass is actually recycled, but is recovered and turned into roadbed.

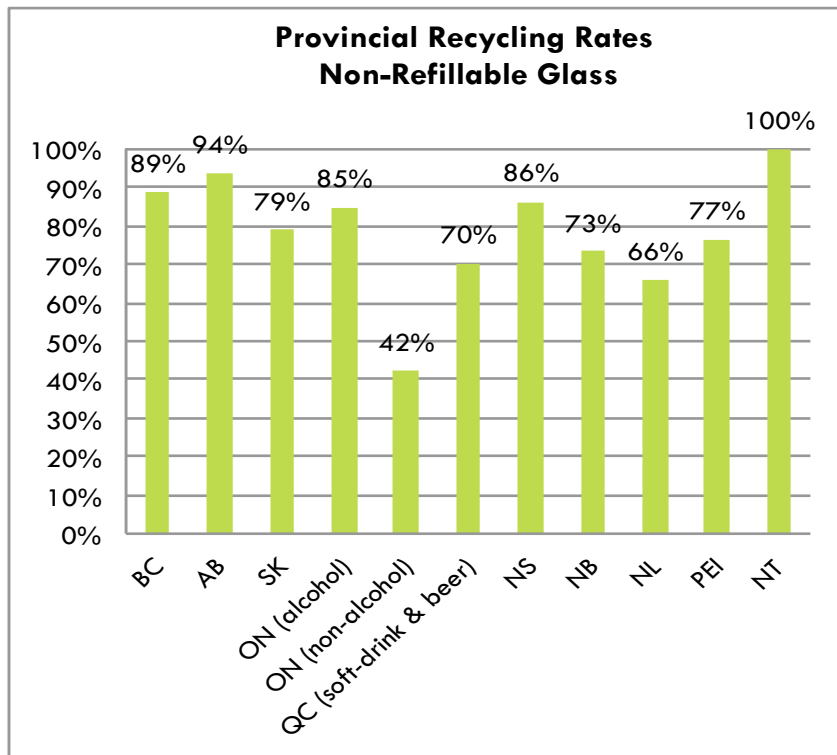


Figure 12 Provincial Recycling Rates, Non-Refillable Glass (2016)

As shown in Figure 13, some provinces have seen recycling rates for non-refillable glass bottles change significantly over the last 12 years. Consider Alberta, for example, whose recycling rate went from 79% in 2004 to 94% in 2016, or New Brunswick, whose rate dropped from 78% to 73% during the same time period.

There are a number of reasons why return rates fluctuate over time. For example, the drop in Ontario from 2006 to 2008 can be explained by the introduction of the Ontario Deposit Return Program (ODRP), which expanded the scope of containers subject to deposit. While the 2006 recycling rate includes only non-refillable glass from beer bottles, the 2008 rate includes glass from wine, spirit, and cooler bottles, which were collected at a lower rate in the early years of the program (2007 and 2008).

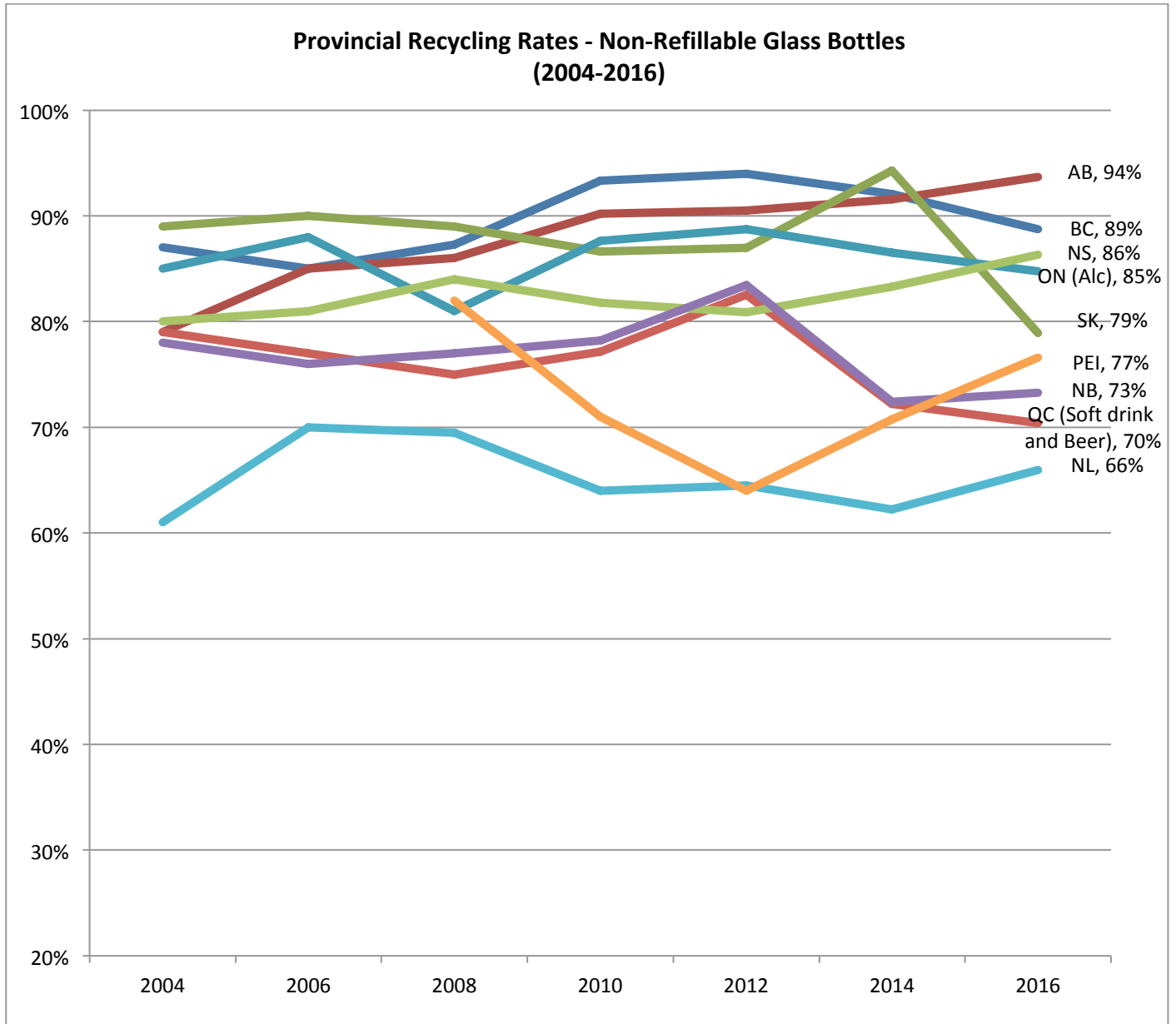


Figure 13 Provincial Recycling Rates, Non-Refillable Glass (2004-2016)

PET Bottles

Figure 14 shows provincial recycling rates for PET beverage bottles in 2016. Like for other materials, dependable rates were not available for curbside programs in Manitoba and Quebec. Most deposit programs show a recycling rate of 70% to 80% for this material. Ontario's ODRP shows the lowest PET recycling rate of all deposit systems, but it only covers PET alcohol containers.

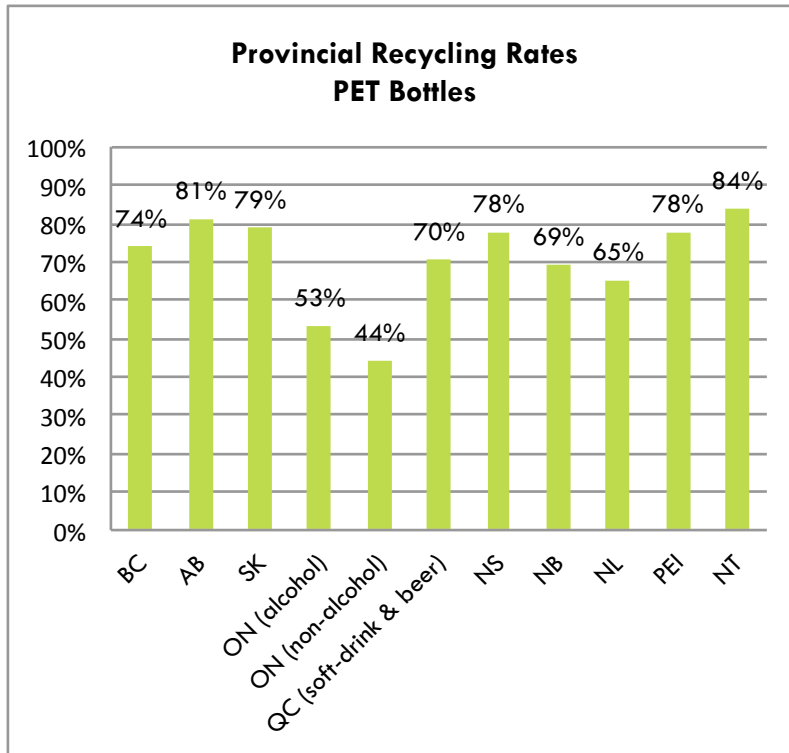


Figure 14 Provincial Recycling Rates, PET Bottles (2016)

Figure 15 shows how PET bottle recycling rates have changed over time. From 2004 to 2016, we can see the recycling rate has increased substantially in Alberta (11 percentage points), while it has decreased in Saskatchewan (9 points) and New Brunswick (6 points). Most other provinces have seen small increases or small decreases during that same time frame.

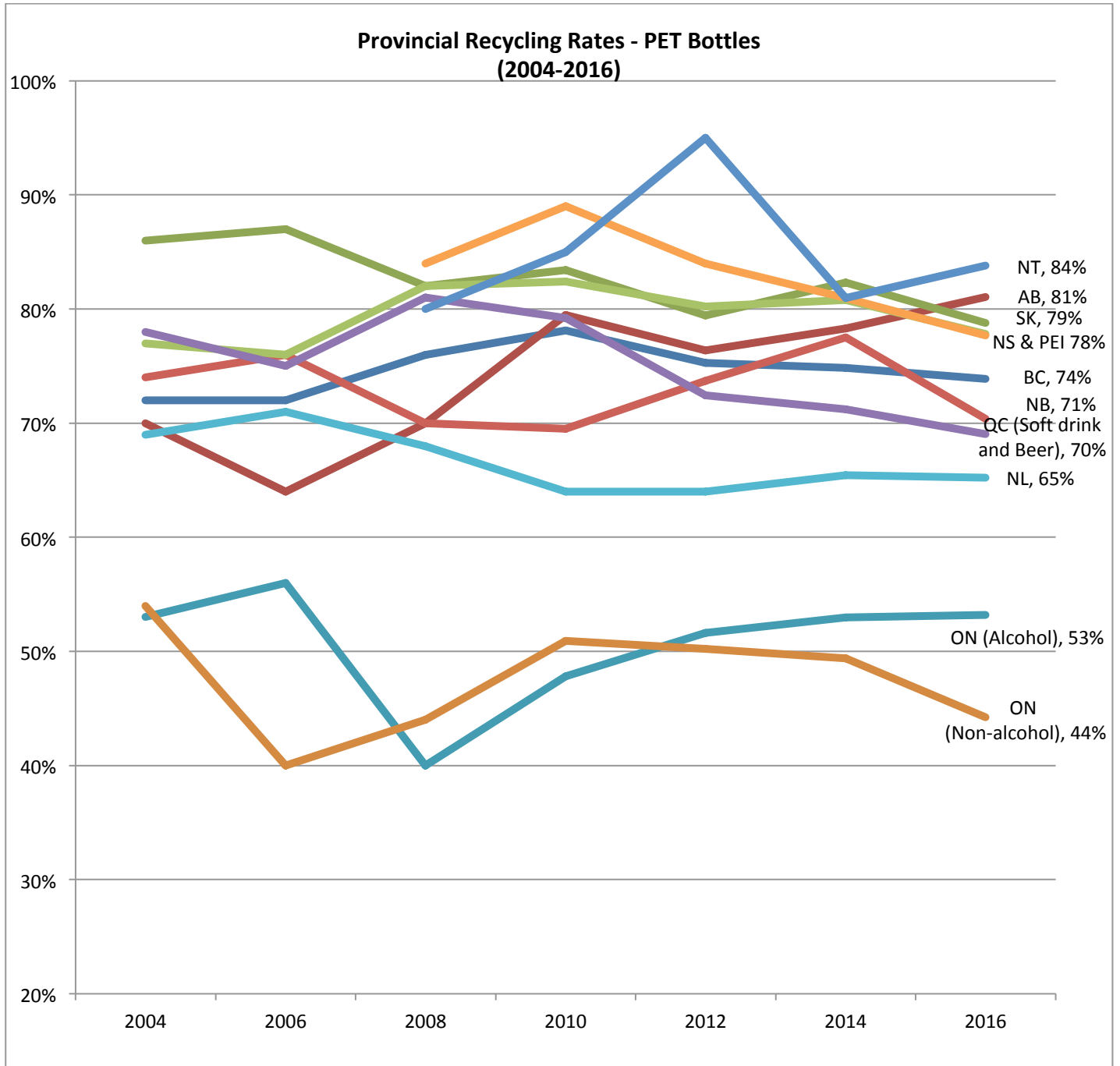


Figure 15 Provincial Recycling Rates, PET Bottles (2004-2016)

Gable Top and Aseptic Cartons, Bi-Metal Cans, and Other Plastics

Overall, the recycling rates for gable top and aseptic cartons, bi-metal cans, and other plastics are on the rise. Most provinces show increases in recycling rates since the last version of this report, which covered 2014 data. Figures 16 and 17 show 2016 recycling rates for these materials in provinces that report them.

When it comes to gable top and aseptic containers, Alberta reports the highest recycling rate at 72%. With the exception of Northwest Territories, all other provinces have recycling rates below 60%.

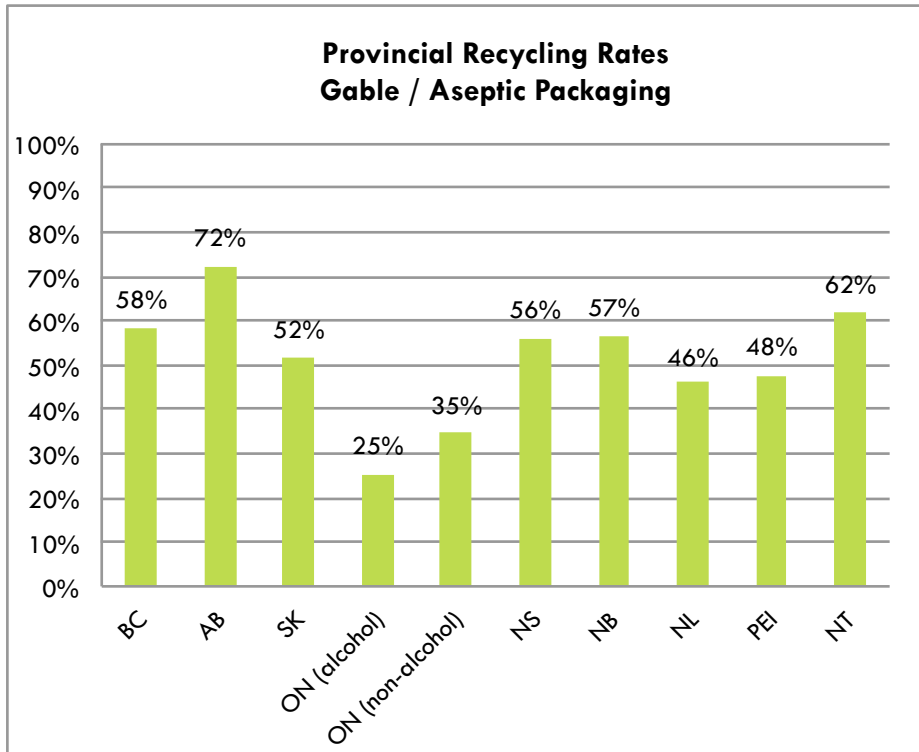


Figure 16 Provincial Recycling Rates, Gable/Aseptic Packaging (2016)

For bi-metal cans, the highest recycling rate was reported in B.C. (85%). Other provinces report rates of between 44% and 75% (see Figure 17).

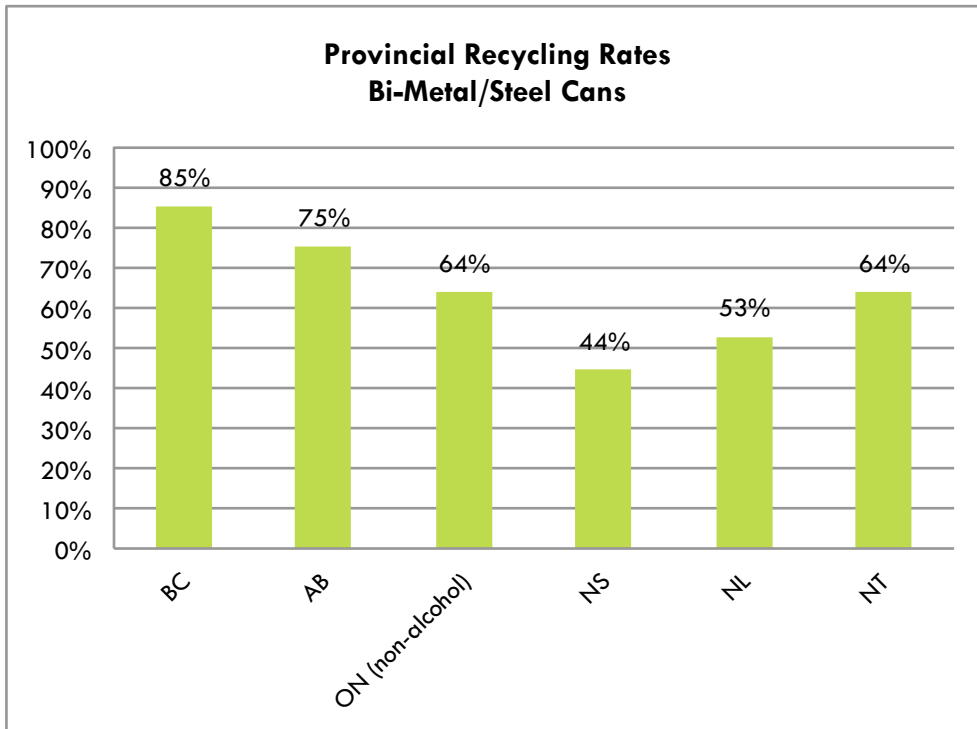


Figure 17 Provincial Recycling Rates, Bi-Metal/Steel Cans (2016)

Milk Containers

Most milk containers are made from high-density polyethylene (HDPE). Overall, milk jugs have a much higher recycling rate than cartons. This may be due to several factors, including the fact that there is a strong secondary market for HDPE material.

The way in which milk container recycling rates are calculated varies by province. In some provinces, the calculation is based on waste audit data, while in others it is based on actual sales and collection data. In some cases, the recycling rates are estimated by extrapolating from the collection rates of a more wide ranging material category, such as “cartons”, which include aseptic and gable top containers. Where milk containers are collected as part of a multi-material collection system, one collection rate is reported for the entire category of materials and no distinction is made between, for example, milk containers and orange juice containers.

In Alberta, because recycling rates are reported by material as opposed to by beverage type, it is impossible to determine a specific rate for milk containers.

The Northwest Territories used to report milk containers alone, but no longer does. As such, no rate is available.

In B.C., Manitoba, Ontario, and Québec, the majority of (if not all) milk containers are collected through municipal curbside programs along with other materials like paper and non-beverage packaging. Because of this, it is impossible to calculate a recycling rate specific to beverage containers. The same can be said for milk container recycling rates in the provinces of PEI and New Brunswick.

While Nova Scotia also collects milk containers via curbside, specific collection rates have historically been available from the Atlantic Dairy Council (ADC). According to the ADC, the collection rate for gable top cartons and HDPE milk jugs was 70.5% in 2012-2013. More recent data is not available at this time.

Part 2: Away-from-Home Recycling

How Much is Generated Away-from-Home?

The last decade has seen a significant shift in the way that Canadians consume beverages. While the majority of beverages continue to be consumed in households, it is estimated that 30-40%⁴ of beverages are consumed and discarded away-from-home (AfH), and as the Millennial generation (as a percentage of Canada's total population) continues to grow, this number is likely to rise. According to Coca-Cola's 2016 Away-from-Home Beverage Landscape Study, Millennials consume twice as many beverages AfH than older generations.⁵

Table 3 Examples of Away-from-Home (AfH) Locations Where Containers are Discarded

| Location Category | Examples |
|---|--|
| Public Spaces | Parks, streets, transit stops, greenways |
| Industrial, Commercial, and Institutional (IC&I) | Bars, restaurants, hotels, amusement parks, shopping malls, convenience stores, offices (and other workplaces), gas stations, coffee shops, some multi-residential units (with private waste service), government buildings, arenas, libraries, public daycares, community centres, colleges, universities, elementary and secondary schools |
| Special Events | Outdoor music festivals, sporting events, concerts, fairs, markets |

Knowing how many beverage containers are discarded AfH is critical to determining accurate recycling rates and designing effective recovery programs. Despite this importance, data on AfH beverage recovery is extremely limited. There are several reasons for this, one being the lack of information available on the number of IC&I establishments in each province that participate in beverage container recycling programs. Another reason is that waste and recycling services for IC&I buildings, events, hospitals, schools, and other AfH locations are typically contracted to private companies, for which there are no regulatory requirements to track and report volumes collected at each location. Unless volumes are estimated at the point of collection by the hauler, it is difficult to know how much material was collected at a specific location since standard practice is to weigh loads at the end of a route.

Table 4 summarizes some of the research that has been conducted to assess the percentage of beverage containers consumed AfH, including a brief description of the methodologies used to arrive at those estimates. CM Consulting relies on these findings to estimate a recycling rate for containers discarded AfH.

Table 4 Estimated Away-from-Home Beverage Container Market Share

| Source | Study Methodology | AfH Beverage Container Market Share (%) |
|--|--|--|
| <i>The Environmental and Economic Performance of Beverage Container Reuse and Recycling in British Columbia, Canada, prepared by Container Recycling Institute, August 2015</i> | Not available to the public | <i>All beverage containers: 30-40%</i> |
| IPSOS Study conducted in Ontario for CBCRA in 2012 ⁶ | Not available to the public | <i>By container type:</i> Glass: 28% Aluminum cans: 28% PET: 28% HDPE: 20% Gable top cartons: 10% <i>All beverage containers:</i> 26% (estimated range is between 15 and 30%) |
| <i>Australian Beverage Packaging Consumption, Recovery and Recycling Quantification Study, prepared by Clare Davey, 2008</i> | Based on sales data. Containers purchased at grocery stores were considered to be consumed at-home. The difference between at-home sales and total sales is assumed to represent containers consumed away-from-home. | <i>By container type:</i> Glass: 25% Aluminum: 25% Plastic: 45% |
| Beverage Packaging Environmental Council (BPEC) study, 2006 ⁷ | Not available to the public | <i>By container type:</i> Glass: 33% Aluminum: 24% Plastic: 42% <i>All beverage containers: 37%</i> |
| <i>Understanding Beverage Container Recycling: A Value Chain Assessment, prepared by R.W. Beck, in collaboration with Franklin Associates, Tellus Institute, Boisson & Associates, and Sound Resource Management, 2002</i> | Figures for PET and aluminum are based on carbonated soft-drink point of sale data from the Container Consulting Inc. Sales at vending machines, venues, and convenience stores are assumed to be consumed away-from home, while sales at food stores are assumed to be consumed at home. Figures for glass are R.W. Beck estimates based on an understanding of the types of beverages packaged in glass. | <i>By container type:</i> Glass: 34% Aluminum cans: 13% PET: 63% |
| American Beverage Association (ABA) report | Not available to the public | <i>All beverage containers: 30-34%</i> |
| <i>Mise en Marché et Récupération des Contenants de Boisson au Québec prepared by Francois Lafortune</i> | Based on methodology used for 2002 report by R.W. Beck (see above) | <i>By beverage type:</i> Milk containers: 5% Soft-drink containers: 17% Juice containers: 22% Wine/spirits containers: 22% |

Existing Initiatives to Enhance Away-from-Home Collection

A number of Canadian jurisdictions have implemented pilot projects and long-term programs in an effort to encourage the recycling of beverage containers consumed AfH. Many of these initiatives are based on a cost-sharing model in which an industry partner or non-governmental organization sponsors a program in partnership with a community.⁸ Examples of public spaces recycling in Canada are described below.

Manitoba

Canada's first province-wide AfH beverage container recycling program was Recycle Everywhere. Created and administered by the Canadian Beverage Container Recycling Association (CBCRA)—a not-for-profit, industry-funded organization whose members include beverage brand owners and distributors—Recycle Everywhere distributes recycling bins free of charge to public spaces to encourage recycling outside of the home. In 2016, around 7,000 Recycle Everywhere bins were distributed to 774 locations, including 68 municipal sites, 498 IC&I sites, 6 parks, 178 schools, 16 government buildings, and 8 First Nation communities.⁹ According to CBCRA's 2016 annual report, the cumulative total of bins distributed since the program began in 2010 had reached 52,000 by the end of 2016.

Québec

Québec's AfH recovery program ended on December 31, 2016. Co-founded by Éco Entreprises Québec (ÉEQ) and the Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC), the program provided funding to municipalities to install recycling equipment in indoor and outdoor public spaces, such as libraries, arenas, commercial arteries and parks. In total, 70% of the purchase price was reimbursed, up to a maximum of \$840 per unit. In its eight years of operation, over 800 municipalities benefited from the program, receiving over \$8 million in funding to install close to 20,000 recycling installations.¹⁰ This equipment helped to collect 2,000 tonnes of materials per year.¹¹ According to ÉEQ's website, an analysis is currently underway to set out next steps and extend the program.

British Columbia

B.C.'s first public spaces recycling program "Go Recycle!" started off as a pilot project in 2011. Launched in the City of Richmond by the Canadian beverage industry, the pilot included over 80 strategically placed bins, and specially designed instructional and promotional signage.¹² To measure the program's effectiveness, the city conducted pre- and post-implementation waste audits of the pilot area and found that the number of recyclable beverage containers placed in trash bins decreased by 27%.¹³ The study also found a 29% reduction of recyclable non-beverage containers in the garbage, and a 35% overall reduction in the amount of waste generated.

Encorp also runs an outdoor public spaces recycling program. Since 2009, the organization has been supplying municipalities and B.C. parks with dedicated beverage container recycling bins free of charge. These bins are placed in high pedestrian traffic areas where beverages are consumed on-the-go. The bins are non-locking and are accessible to anyone that wants to collect the containers and return them for a refund of the deposit. Based on audits conducted by local municipalities, up to 99% of the beverage containers are diverted from the trash.¹⁴

More recently, in August 2016, Recycle BC in partnership with the City of Vancouver launched a nine-month pilot project aimed at reducing litter and the amount of waste sent to landfill. The program, which has been extended to the end of 2017, has seen 31 new recycling bins installed in public spaces around Vancouver's West End. The majority of the recycling bins have three adjoining receptacles: one for mixed paper recycling, one for containers recycling, and one for garbage. With the pilot project now complete, an audit was done to evaluate the waste collected and how much the bins were used. The results showed contamination rates of up to 30% "suggesting that streetscape packaging and paper collection may not be recoverable under current market conditions."¹⁵ This information will be presented to council, who will then decide on whether to expand the program to other locations around the municipality.¹⁶

Other Initiatives

- In 2010, the city of Sarnia, ON launched the first phase of its pilot public spaces program in three park locations, achieving an average collection rate of 75% for beverage containers—a 73.5% increase over the previous result. The second phase of the same program took place in 3 Sarnia arenas and 8 convenience stores/gas bars and achieved beverage container collection rates of 73% and 84%, respectively.
- Niagara's public spaces recycling pilot, dubbed "Niagara Recycles on the go!" achieved similar results. This program was launched in March 2010, when about 24 recycling bins were installed at two arenas in St. Catherine's. Follow-up waste and visual audits showed collection rates to be an average of 65% -- a 35% increase over baseline levels.
- A pilot project conducted on the Halifax Waterfront generated even more promising results. After just three months of placing bins and signage along the Halifax Harbourwalk, the pilot project collected approximately 95% of all containers discarded in the area. Another highly successful public spaces pilot project took place in the city of Calgary in 2012. The program, which saw a total of 48 recycling bins installed in 3 different areas of the city, resulted in a significant increase in the diversion rate of recyclables—including beverage containers. In one pilot neighborhood, the number of beverage containers found in the garbage decreased by 89%.¹⁷
- In November 2016, the city of Airdrie approved phase 2 of an enhanced recycling program which will see bins for organics, mixed recycling, and beverage containers installed in Airdrie's public spaces and facilities. Waste audits from phase 1 of the project showed that there was 33% contamination in the beverage container bin and 21% contamination in the recyclable paper bin.¹⁸
- In September 2017, the city of Regina announced that it would install blue recycling bottle baskets—attached to existing garbage cans—in the downtown core and along 13th Avenue in the Cathedral neighborhood. The project is being sponsored by SARCAN Recycling through a public space recycling grant.¹⁹

Share of Beverage Containers Discarded Away-From-Home in Deposit Vs. Non-Deposit Jurisdictions

While each of the pilots showed that recycling of beverage containers in AfH locations was enhanced by the addition of bins and signage, it is important to point out the difference in the findings between Richmond, B.C. where all beverage containers bear a deposit, and Sarnia and Niagara, ON, where most beverage containers are collected at curbside.

In Sarnia and Niagara, audits revealed that recyclable beverage containers made up over 15.7% and 16.2% (by weight), respectively, of the materials deposited in the waste bins. (PET beverage containers alone represented over 8% of the waste stream in each of the pilots). These numbers are significantly higher than those reported in the Richmond study, where recyclable beverage containers were found to make up only 1.8% of the total waste stream (Figure 18).

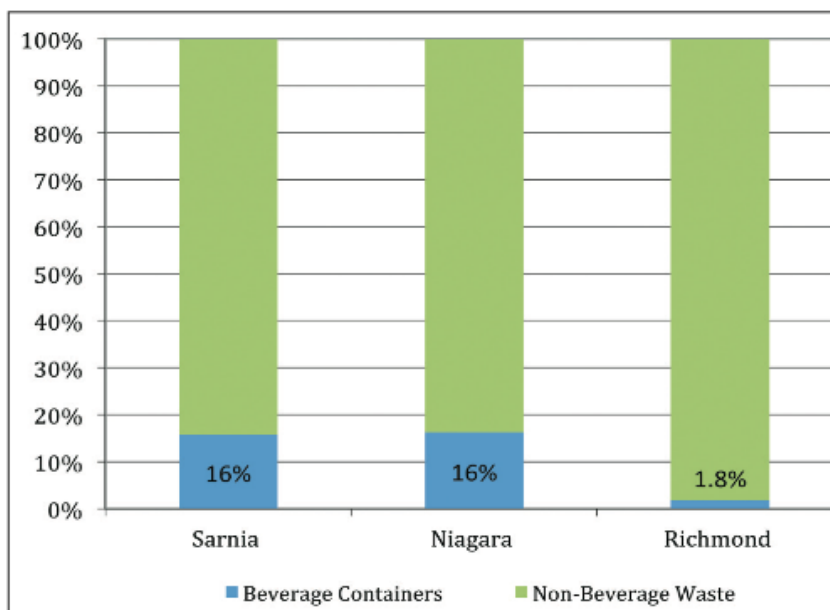


Figure 18 PET & Aluminum Beverage Containers as a Percentage (by Weight) of Waste and Recycling Streams in Away-from-Home Locations – Non-Deposit Jurisdictions (Sarnia and Niagara, Ontario) vs. Deposit Jurisdictions (Richmond, BC)

When viewed in terms of volume, the results are even more striking. In Sarnia and Niagara, beverage containers make up 34% and 38%, respectively, of the AfH combined waste and recycling streams, whereas in Richmond they make up only 3% (Figure 19). This data demonstrates that where deposit programs exist, beverage containers make up a smaller portion of the AfH waste and recycling stream.

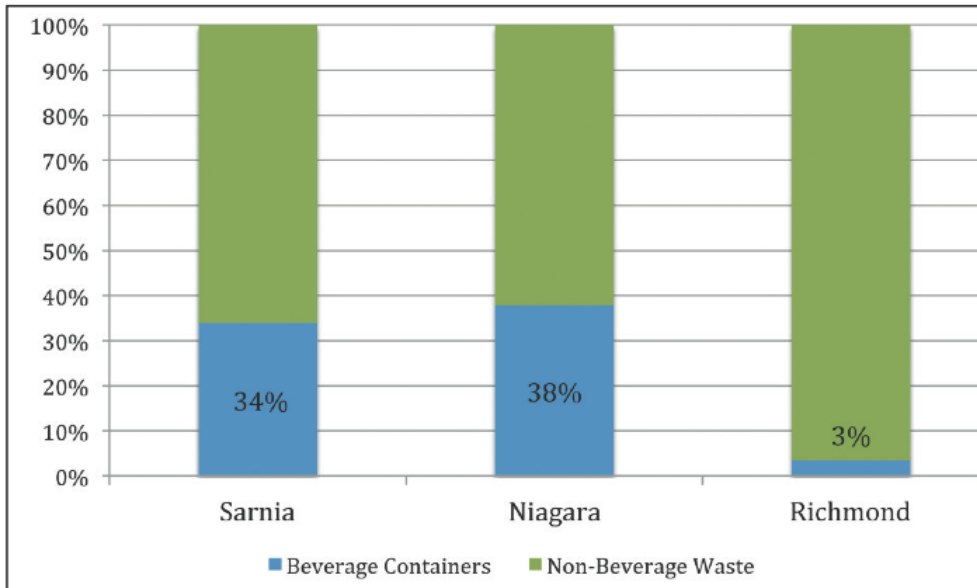


Figure 19 PET & Aluminum Beverage Containers as a Percentage (by Volume) of Total Combined Waste and Recycling Streams in Away-from-Home Locations – Non-Deposit Jurisdictions (Sarnia and Niagara, Ontario) vs. Deposit Jurisdictions (Richmond, BC)

Who Pays For Away-From-Home Recycling?

The primary cost drivers associated with starting and operating a public spaces recycling program are the same as residential collection, and include the purchase of recycling bins and signage, new collection vehicles and/or modifications to existing vehicles, hauler fees, program monitoring and management, labour, costs to sort and process materials, and ongoing promotion and education.

In general, the costs of AfH recycling are borne by the entity (public or private) responsible for waste management at the location in question. For example, recycling in an office building is the responsibility of the property manager or owner. Similarly, recycling initiatives undertaken by a school are the responsibility of the school board or principal. When it comes to publicly owned and serviced areas, like parks, arenas, and municipal buildings, recycling is financed directly by the municipality. Only in Manitoba, Ontario and Québec does industry bear a share of AfH recycling costs.

Unlike municipal curbside recycling or deposit systems, the costs associated with AfH collection are rarely studied or discussed. It is therefore difficult – if not impossible – to determine how much of taxpayers' money goes towards these programs. That being said, collection of recyclables from public spaces is much more expensive, ton for ton, than at-home collection. Collecting recyclables from parks containers, for example, requires staff to exit their vehicles and walk from container to container, emptying each one as they go. Compared to residential automated collection where one driver can service hundreds of homes in one day, this is extremely time-consuming.²⁰ Another factor to consider is collection frequency. Public space receptacles are typically emptied 5 to 7 times per week, whereas residential trash and recycling bins are usually only picked up once a week. Lastly, the cost to purchase public space recycling bins is also more expensive.

According to a 2014 report by the Massachusetts Sierra Club²¹, the total average minimum cost to municipalities for public recycling bins is estimated at USD\$216,829 per year. For the City of Boston, it is estimated that adding public recycling bins adjacent to waste bins would add \$7 to \$12 million to the city's collection costs. Cities such as Lowell and Worcester would see added costs of up to \$2 million and \$3.4 million, respectively.

Part 3: Provincial Program Summaries

Beverage container recycling programs in Canada are varied. Despite some commonalities, each has their own set of strategic objectives as well as their own rates of effectiveness and costs. This section of the report provides a summary of the salient features of each province's program, including a description of the regulatory framework under which the program operates, a description of the program's scope (including the types of beverages and materials covered), a listing of key performance targets, a description of the agents responsible for managing and operating the program, an explanation of how the program is funded, as well as a description of the collection system and performance rates achieved. Some provinces also include a "What's New" section describing the latest updates since the 2016 edition of *Who Pays What*[™].

British Columbia



Regulatory Framework

Established in 1970 under the province's *Litter Act*, British Columbia (B.C.)'s DRS is the oldest EPR program in the province and is one of the longest-standing beverage container recycling programs in the world. In 1998, to address changes in beverage container packaging, the province replaced the *Litter Act* with the *Beverage Container Stewardship Program* regulation, which expanded the program's scope to all ready-to-drink beverages, except for milk and milk substitutes. This regulation was replaced in 2004 with new legislation – the *Recycling Regulation* – that consolidated all B.C. product stewardship regulations into one.

The *Recycling Regulation* sets out the requirements that apply to all producers and stewardship programs with specific product category provisions listed in schedules. Most of the provisions of the original beverage container program are now contained in Schedule 1 of the *Recycling Regulation*. Under this regulation, product stewards (usually the producer or brand-owner, or an agency operating on their behalf) are required to submit stewardship plans that describe the structure and operation of a system for collecting and recycling beverage containers that meets various criteria, including convenient and free consumer access to collection facilities. It is also worth noting that Section 7 and 8 of the *Recycling Regulation* require that all redeemed containers be refilled or recycled, and that no redeemed containers be landfilled or incinerated.

In 2009, the Canadian Council of Minister of the Environment (CCME) approved a Canada-wide Action Plan for Extended Producer Responsibility (EPR) where jurisdictions, including B.C., committed to working towards the development of EPR programs for an agreed-to list of product categories. To meet this commitment, B.C. amended its *Recycling Regulation* in 2011 to include packaging and printed paper (PPP). Under the updated

regulation, producers of PPP that enters the residential waste stream were given until November 2012 to submit their stewardship plans (or be included in such a plan) to the Ministry of Environment, describing how they plan to recover the materials they put on the market. The implementation date was set for May 2014. To date, the only plan covering all PPP and granted approval by the province is from Recycle BC (formerly Multi-Material BC (MMBC)).

Performance Targets

The *Recycling Regulation* establishes a minimum recovery target (collection rate) of 75% for each sub-category of beverage containers listed in Schedule 1. However, there are no penalties for failing to achieve these targets, and there is no specific requirement for continuous improvement.

In addition to the provincial requirements, Encorp Pacific (Canada) has set its own recovery targets in its 2014-2018 Stewardship Plan. These are summarized in Table 5.²² Beyond recovery rate targets, Encorp has set targets for consumer access and awareness levels. A 97% consumer access level is the goal set within the approved stewardship plan. This target is based on drive times—30 minutes for urban areas and 45 minutes for rural areas—set out in the Stewardship Agencies of British Columbia (SABC) accessibility standard. Regarding public awareness of the types of beverages and containers registered under the system, the stewardship plan sets a target of 95%. It also sets a goal of 90% for awareness of locations to which containers can be returned.

Table 5 Encorp Pacific (Canada)'s Recovery Rate Targets (2014-2018)

| | Recovery Rate Targets (%) | | | | |
|---|---------------------------|--------------|--------------|--------------|--------------|
| | 2014 | 2015 | 2016 | 2017 | 2018 |
| Glass | 93.9% | 93.9% | 93.9% | 94.0% | 94.0% |
| Plastic | 76.2% | 76.6% | 76.9% | 77.3% | 78.0% |
| Aluminum | 84.1% | 84.3% | 84.5% | 84.6% | 85.0% |
| Polycoat | 59.1% | 60.3% | 61.5% | 62.6% | 65.0% |
| Other (other metals, bag-in-box and pouches) | 56.2% | 57.0% | 57.7% | 58.5% | 60.0% |
| Total Recovery Rate (weighted) | 80.1% | 80.6% | 81.0% | 81.5% | 82.0% |

For beer containers, the Brewers Recycled Container Collection Council (BRCCC) has set a recovery (collection) target of 87.5% for the years 2015-2019.²³ This target applies to both the overall rate and the rate for each container type. BRCCC has also set an accessibility target of 385 return locations by 2019 (or 80% of the population living within a 10 minute drive of a return location).

Who is Responsible?

There are two corporate entities that collect and recycle beverage containers in B.C. on behalf of producers (brand owners or first importers of beverages sold in the province): Encorp Pacific (Canada) and the BRCCC.

Originally formed in 1994 and then as a product stewardship agency in 1998, Encorp is a not-for-profit organization responsible for all non-alcohol beverage containers (e.g. soft drinks, water, etc.) and all alcohol beverage containers (including glass bottles used for wine, spirits, beer, and cider), except for aluminum beer cans and refillable beer bottles. Encorp operates the "Return-It" depots across B.C., where all types of beverage containers (other than milk and milk substitutes) can be returned for a refund of the deposit. The

corporation is governed by a Board of Directors consisting of representatives of the beverage and retail grocery industries as well as directors who have no connection with either industry.

BRCCC is the stewardship agency for all refillable glass beer and cider bottles, as well as all aluminum beverage alcohol cans. Established by brewers, the BRCCC is a not-for-profit society composed of members representing companies or organizations that together represent over 95% of the beer volume sold in B.C. BRCCC subcontracts Brewers Distributor Limited (BDL), a privately-owned distribution and logistics company, to act as its agent. BDL is responsible for collecting container fees from brand-owners, managing unredeemed deposits and material revenues, and coordinating recycling collection through alcohol retailers, and also through Encorp's "Return-It" depots.

As of May 2014, producers of packaging and printed paper (PPP) that enters B.C.'s residential waste stream also have obligations under the *Recycling Regulation*. Recycle BC (previously named Multi-Material BC) is the non-profit stewardship organization responsible for ensuring that PPP is collected and recycled on behalf of its members. Recycle BC provides PPP collection and recycling services either directly to communities or by working in partnership with municipalities, First Nations, private companies, and other non-profit organizations.

Program Financing

Deposit Return Program

As shown in Encorp's financial statements, the total cost of running the "Return-it" program in 2016 was \$91.6 million. Handling fee payments to depots represented the biggest expense (\$53.5 million, accounting for 58% of total costs), followed by operations expenses (\$28.7 million, accounting for 31% of total costs). This includes transportation and processing fees. Administration and consumer awareness costs accounted for about 10% of total costs.

In 2016, total revenues amounted to \$85.3 million. The three primary sources of revenue for the program are: 1) unredeemed deposits; 2) revenue from the sale of processed material; and 3) container recycling fees (CRFs). Encorp receives no government funding.

At \$17.5 million, unredeemed deposits represent about 20% of total funds received. This is the difference between the deposits collected (\$87.6 million) from consumers and the refunds issued (\$70.1 million). Deposits, which are charged on all beverage containers covered under the program, are laid out in the *Recycling Regulation* and vary by container type and size. Non-alcoholic beverages up to and including 1L carry a 5-cent deposit, while alcohol containers of the same size carry a 10-cent deposit. All containers (alcohol or non-alcohol) over 1L carry a 20-cents deposit.

Revenues from the sale of processed containers represented approximately 13% (\$11 million) of the total funds received by Encorp in 2016. Although prices for aluminum and plastic declined in 2016, the weak Canadian dollar helped to offset the negative effect of the low commodity prices denominated in US dollars.

When the revenues from unredeemed deposits and material sales are insufficient to cover the costs of collecting and recycling a specific container type, a non-refundable CRF is added to the container to make up for the deficit. Encorp collected a total of \$45.3 million in CRFs in 2016, representing the largest (53%) source of funding. Implemented by the beverage industry (excluding the domestic beer industry), CRFs are charged based on the net cost for recovering and recycling beverage containers and vary depending on the market value—which fluctuates with economic conditions—and the collection rate for a particular container. CRFs are

adjusted on an annual basis and are rounded up to the nearest penny. With the exception of glass bottles over 1L, CRFs for all container types have increased since the 2016 report. As of February 1, 2018, CRFs range from 1-cent/unit for aluminum cans to 16-cents/unit for large (>1L) glass containers. For some non-alcohol containers, including large (>1L) bi-metal cans and gable top containers up to 1L, a CRF is not necessary.

Since the implementation of the CRF, producers of non-alcohol beverages bear no direct costs for the operation of the system. Any surplus funds (after expenses are paid) are placed into reserves. A minimum level of reserves must be maintained in order to ensure the program's financial stability over the long-term and to avoid cross-subsidization of container types. To prevent reserves from accumulating beyond their targeted ranges, Encorp can adjust or even eliminate CRFs in any given year, or it can increase its expenses to improve the recovery rate for a specific container type. As of 2016, Encorp had \$26.2 million in reserves.

Unlike the costs of managing of non-alcohol containers, the collection and recycling of alcohol containers is fully funded by the producers. This cost is factored into the shelf price of the product (i.e. not added at the till) as any other business cost, such as labor, energy, or transportation. Because BDL does not disclose financial details in its annual reports, its expenditures have not been analyzed.

Curbside Program

Since May 2014, B.C.'s residential PPP recycling program has been financed 100% by businesses (i.e. retailers, manufacturers, and restaurants) that supply PPP to residents. Producers pay fees to Recycle BC quarterly based on the weight and type of material. For municipalities and/or private companies offering curbside recycling and/or multi-family recycling, Recycle BC provides a fixed fee per household as a financial incentive. Municipalities, non-profits, and private companies operating depots for residential drop-off receive a fixed fee per tonne. Under this model, municipal waste management costs are fully or partially offset, effectively shifting the cost of recycling from taxpayers to businesses.

Collection System & Facilities

As of 2016, Encorp's collection network provides access to recycling of beverage containers to 99.4% of B.C. residents. Empty containers can be returned to 172 privately owned depots (down from 173 in 2014) and hundreds of beverage retailers, including corner stores, supermarkets, and government liquor stores. Ninety-five percent of all redeemed containers are collected through Return-it Depots. The rest is collected by retailers.

Encorp uses 37 transporters to pick-up the material and transport it to 12 processing facilities throughout the province, where the containers are compacted and prepared for shipment to various recyclers. In 2016, baled aluminum cans were shipped to a re-melt facility in the United States where they were turned back into sheet stock for new cans. Plastic containers were sold to Merlin Plastics and shipped to two different facilities in Alberta and B.C. to be cleaned and pelletized to become secondary feedstock for manufacturers of various plastic products and fibres. Glass bottles were processed in B.C. and shipped to various end markets, including a facility in Alberta that makes fibreglass insulation; a facility in Seattle (US) that produces new bottles, and a facility in Quesnel, B.C. that produces sandblasting materials.²⁴ Some glass is also crushed and sent to municipal sites to be used as construction aggregate. In the case of polycoat containers, these were sold to ICF International and shipped to manufacturing plants in South Korea, Thailand, and India, where they are used in the production of tissue paper. There were no end markets for stand-up pouches in 2016, so these were stored in Delta, B.C. The plastic bladders inside bag-in-box containers were shipped to a facility in South Korea

where the recycled plastic was used to make reservoir tanks. The cardboard was recycled by local processors. Bi-metal containers were collected and sold to scrap dealers for metal recovery.

For containers covered under the BDL program (refillable beer and cider bottles and aluminum alcohol beverage cans), BDL provides for container returns at 1,140 locations²⁵, including 72 authorized depots, 649 licensee retail stores, 200 government liquor stores, and 219 rural agency locations. BDL also offers on-site collection services to several thousand restaurants and bars. In addition to collecting the containers designated under its stewardship plan, BDL also collects and recycles all secondary packaging associated with its containers. In 2016, 100% of aluminum cans collected by BDL were sent to recyclers and processed for metal recovery. Ninety-nine percent of refillable glass bottles were sent to brewers for reuse, with 1% sent directly to a glass recycler for recycling.

Until May 2014, containers containing milk and milk substitutes were collected as part of a voluntary (non-deposit) recovery system financed by the British Columbia Dairy Council and administered through Encorp Pacific under the name Return-It Milk™. The collection and recycling of these containers is now part of Recycle B.C.'s residential PPP recycling program, which uses three collection methods: curbside collection from households, multi-family collection from a central location in buildings with five or more residential units, and depot collection.

Program Performance

Encorp collected a total of 1 billion beverage containers in 2016 (210.6 units per capita) for an overall collection rate of 78.0%. The chart below shows rates that include deposit cans so the aluminum and total numbers number are higher than those shown by Encorp.

Recycling rates for containers recovered under BDL's deposit program were significantly higher. In 2016, BDL collected nearly 600 million containers for an overall return rate of 90.6%. Industry standard refillable beer bottles saw the highest return rate at 94.3%, while non-standard bottles were recycled at a rate of 81.7%. The return rate for aluminum beer cans was 90.5%.

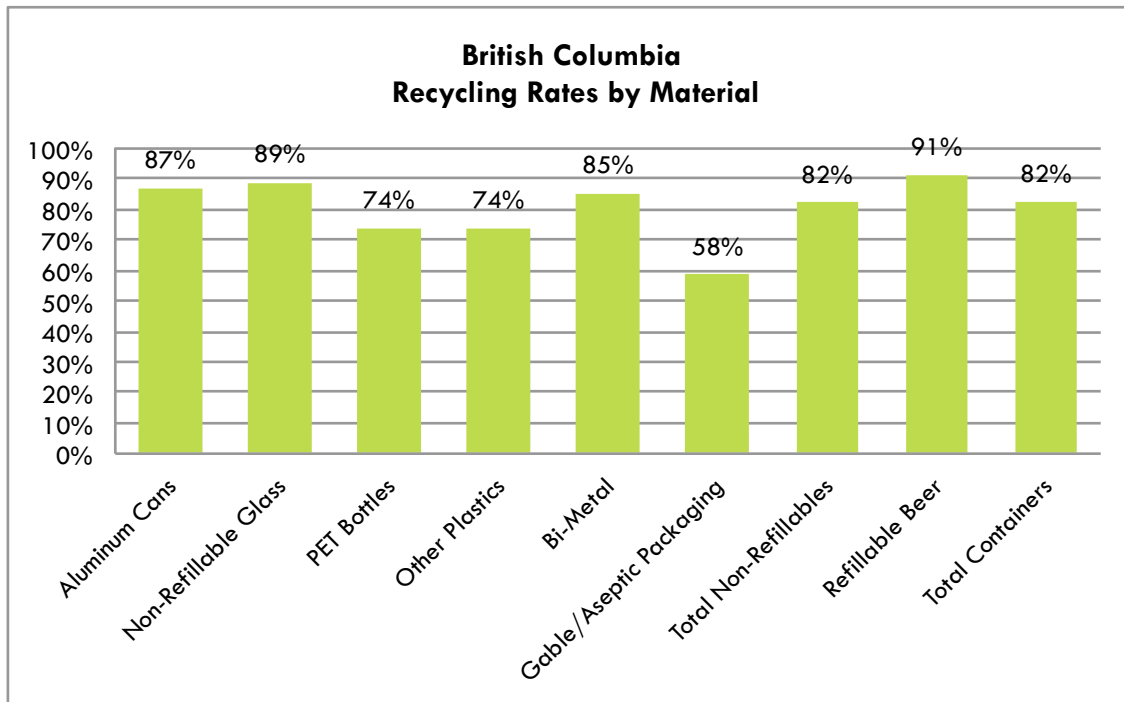


Figure 20 British Columbia Recycling Rates by Material (2016)

With respect to awareness of Encorp's Return-it program, research shows that a 99% net awareness level has been reached. Ninety-nine percent of those surveyed were aware that most beverage containers could be returned for a refund of the deposit, and 90% were aware of at least one location where they could return beverage containers for recycling.

BDL's program for beer containers is also well known. A 2013 survey by the Stewardship Agencies of BC showed that 96% of B.C. residents were aware of the program.

Alberta



Regulatory Framework

Alberta's DRS for beverage containers was established through the *Beverage Container Recycling Regulation*, which was enacted under the *Environmental Protection and Enhancement Act*.

First introduced in 1972, the Regulation has undergone several amendments over the years, including one in 1989 to include additional goods such as carbonated and/or flavored waters, fruit and vegetable juices, and prepared teas, and one in 1997 to include aseptic and gable top cartons. The Regulation's scope was further expanded in 2001 to

include all domestic beer containers. This meant that domestic beer producers would now be treated the same as other beverage producers in terms of program compliance, reporting requirements, and financial obligations (like handling fees paid to depots). Another big change came on November 1, 2008 when—for the first time in 20 years—Alberta increased the level of its deposits from 5-cents to 10-cents and 20-cents to 25-cents. The last major amendment to the Regulation was made in June 2009, when Alberta became the first jurisdiction in North America to include milk containers in a regulated deposit refund program. As a result of this expansion, every beverage container sold in Alberta is now part of the deposit system.

As of 1997, regulatory authority for the program is given to the Beverage Container Management Board (BCMB). Incorporated under the *Societies Act* as a management board under the *Beverage Container Recycling Regulation*, the BCMB operates in accordance with a number of general by-laws set by the Board of Directors, including, among others, the *Administrative By-Law*, the *Handling Commission Criteria By-Law*, and the *Collection System Agent By-Law*.

Performance Targets

In Alberta, there are no legislated targets for beverage container collection or recycling. However, the BCMB's 2016 annual report includes an overall return rate target of 84.1% for 2016. Overall return rate targets have also been set for 2017 (86.1%), 2018 (85.8%), and 2019 (86.4%).²⁶ In addition to setting overall targets, the BCMB has set material-specific return rate targets for aluminum (89.2% in 2016), bi-metal (89.1% in 2016), non-refillable glass (92.0% in 2016), refillable glass (96.5% in 2016), plastics 1L and less (78.1% in 2016), plastics over 1L (88.9% in 2016), aseptic containers and pouches (65.8% in 2016), and gable top containers (66.9% in 2016).²⁷

Who is Responsible?

Alberta's beverage container recycling system is administered by the BCMB. The BCMB is a not-for-profit, industry-led Board made up of representatives of Alberta beverage manufacturers, container depots, and the public. As a Delegated Administrative Organization (DAO), it operates at arm's length from government and has authority under the Ministry of Environment and Parks to impose requirements on recycling program stakeholders. The BCMB reports directly to Alberta Environment and Parks and submits annual reports on program performance. Its main responsibilities include registering brands, issuing permits, establishing handling fees, negotiating operating standards, and monitoring compliance with regulatory requirements.

To collect containers from return locations, the BCMB works in partnership with the Alberta Beverage Container Recycling Corporation (ABCRC), the Alberta Beer Container Corporation (ABCC), and the Alberta Bottle Depot Association (ABDA).

The ABCRC is the approved collection system agent (CSA) for Alberta's non-refillable beverage containers. It works on behalf of manufacturers of non-alcoholic beverages to collect and recycle non-refillables from depots, and process and ship them to recyclers. To facilitate this collection, it outsources 100% of transportation services to a third-party company, and contracts with a regional processor in Lethbridge for a small portion of processing capacity. The ABCRC also operates two of its own processing facilities: one in Edmonton and the other in Calgary.

The ABCC is the collection service provider (CSP) for beer manufacturers and is responsible for collecting and processing standard-sized, refillable beer bottles. Since 2009, the ABCC has outsourced the management of non-refillable beer containers to the ABCRC.

The ABDA represents bottle depot owners in Alberta. Depot operators are responsible for collecting, sorting, and counting containers for ABCRC.

Producers of alcohol containers are represented by a provincial government agency, the Alberta Gaming and Liquor Commission (AGLC). The AGLC uses ABCRC to manage its wine and spirit containers and the ABCC to manage its beer containers.

Program Financing

The total cost to run Alberta's beverage container recycling system in 2016 was \$126.4 million. The program's single largest expense was for handling commissions and BCMB fees (\$94.9 million, or 74.7% of total costs). Together, processing and transportation costs came up to \$22 million, representing 17.4% of total expenditures. Other costs to the system include those for administration (\$5.3 million, or 4.2%), marketing (\$2.4 million, or 1.9%), depreciation (\$1.4 million, or 1.1%) and financing charges (\$213,000, 0.2%).

Like many other provinces, Alberta's beverage container recycling program is self-funded and receives no money from any government source. Some of the money (\$28.9 million in 2016, or 24% of total revenues) comes from the proceeds ABCRC receives when it sells recycled beverage containers that have been baled to various recyclers. The rest comes from unredeemed deposits and container recycling fees.

In 2016, the program generated \$35.9 million in unredeemed deposits (30% of total revenues). This is the difference between the deposits collected (\$253,708,406) and the deposits refunded (\$217,787,354). The deposit amount for containers 1L or smaller is 10-cents and for containers larger than 1L it is 25-cents. Consumers are refunded the deposit when they return empty beverage containers to an Alberta bottle depot. For every one of their containers that is returned, beverage manufacturers (through the ABCRC or a CSP) pay the depot a handling fee as compensation for handling and collecting the containers.

Container recycling fees (CRFs) generated a total of \$54.7 million in 2016, accounting for nearly half (46%) of total funds received by the program. Administered by the ABCRC, the CRF is a fee that beverage manufacturers are required to pay to cover the net costs of recycling beverage containers that remain once the funds from unredeemed deposits and material sales are depleted. Although the decisions by manufacturers and retailers regarding cost internalization are made independently, this fee is typically passed down to the consumer, which means that the beverage industry bears no direct costs for the operation of the program.

Because some containers are more expensive to recycle than others, the CRF varies by container type and size. As of October 2016, CRFs ranged from 1-cent (aluminum cans) to 12-cents (large plastic containers). Some containers, like gable top cartons and bag-in-a-box (BIB), do not have a CRF because high material revenue and unredeemed deposits are sufficient to cover the collection costs. Depending on the retailer, the CRF may or may not be shown separately on sales receipts. Unlike deposits, these fees are non-refundable and are adjusted on an annual basis (usually on February 1).

Individual domestic brewers internalize their stewardship (collection, transportation, refilling, and recycling) costs. Precise costs are not publicly available.

Collection System & Facilities

Alberta's collection network for beverage container recycling is one of the largest in Canada. As of 2016, Albertans can return their empty beverage containers to 217 independently owned "universal" depots (accepting all beverage containers) and 17 Class D depots (accepting liquor containers only) across the province. Approximately 49% of the population lives within a 10-minute drive of a depot, and 35% live within an 11-20 minute drive.

After drop-off at the depot, containers are counted and sorted by depot operators. Wine and spirit containers are sorted by color, refillables are sorted by brand and size, and non-refillables are sorted by material type, size, and color, where applicable. Following sorting, the depots consolidate container loads in specified shipping containers (mega bags) for transport to processing facilities. Pick-up from depots is carried out by the ABCRC (for non-refillables) and the ABCC (for refillables). The majority of processing is carried out in ABCRC-operated facilities in Edmonton and Calgary, although a small amount of processing occurs in a Lethbridge facility.

Program Performance

In 2016, Albertans returned over 1.9 million beverage containers to Alberta depots, for an overall return rate of 85.7%.

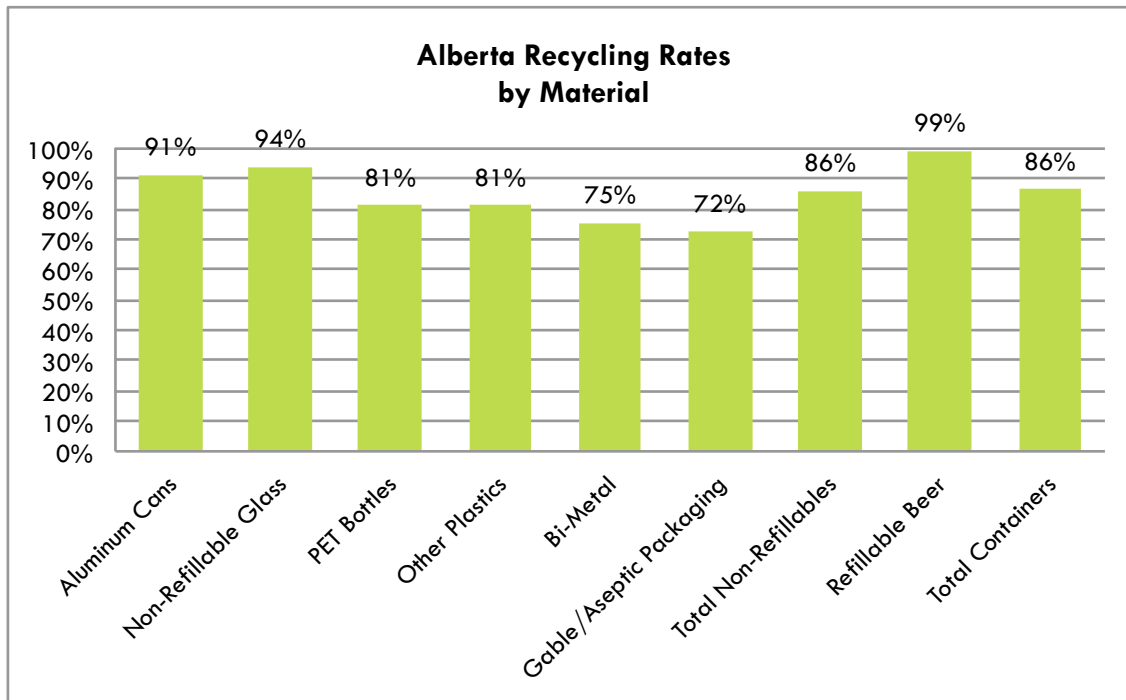


Figure 21 Alberta Recycling Rates by Material (2016)

What's New?

Improved Quality Control

In 2016, Alberta became the first province in Canada to implement TOMRA's automated counting machines in a processing facility. Installed for quality control purposes, this technology resulted in increased performance related to ABCRC's auditing of material shipped from Alberta depots. These machines have also resulted in increased system efficiencies because they require less space, less energy, and allow for quicker and more accurate counts than the previous counting technology.²⁸

Saskatchewan



Regulatory Framework

Established by the Ministry of Environment in 1988, Saskatchewan's beverage container collection and recycling program was originally legislated under the *Litter Control Act* (1978) and the *Designated Container Regulations* (1990). Today, the program is supported by the *Environmental Management and Protection Act* (2010).

Although the DRS initially covered only soft drinks and cans, several amendments to the regulations expanded the program's scope to eventually include all ready-to-serve beverages packed in metal cans,

plastic bottles, non-refillable glass bottles, multi-material shelf stable containers, and paper-based polycoat gable top containers. As of April 1, 2017, the program also includes milk containers.

In February 2013, the Government of Saskatchewan approved the *Household Packaging and Paper Stewardship Program Regulations*. These regulations require stewards of printed paper and packaging (PPP), including beverage-related consumer packaging, to develop and operate a product management program, or join a stewardship agency to do so on their behalf. The stewardship agency formed to discharge the obligations of its members is Multi-Material Stewardship Western (MMSW), which was established under the *Saskatchewan Non-Profit Corporations Act*. The regulations cover any container that is not under deposit, including those made of glass, metal, paper, boxboard, cardboard, paper fibre, or plastic (or any combination of these).

Performance Targets

There are no legislated targets set for Saskatchewan's DRS or the recently launched multi-material recycling program.

Who is Responsible?

The beverage container recycling program is administered by SARCAN Recycling, a division of the Saskatchewan Association of Rehabilitation Centres (SARC). SARCAN operates under contract to the Saskatchewan Ministry of Environment, with which it signed a new four-year agreement effective April 1, 2016. The ministry is responsible for designating containers to be included under the program and for establishing deposit levels and the environmental handling charges (EHC) that consumers pay when purchasing a beverage.

Multi-Material Stewardship Western Inc. (MMSW) is the stewardship organization established to operate Saskatchewan's Multi-Material Recycling Program (MMRP). Its members include brand owners, first importers, retailers, restaurants, manufacturers, distributors, wholesalers, and other organizations that supply PPP to Saskatchewan residents. Its main responsibilities include executing agreements with municipal partners and collecting fees from its members to finance residential PPP recycling programs.

Program Financing

Total costs for Saskatchewan's DRS for the year ended March 31, 2017 were \$32.1 million. These costs were offset by \$32.5 million in revenues. Although SARCAN's annual report does not provide a breakdown of revenue sources, Saskatchewan's program is similar to others in that the majority of funding comes from unredeemed deposits and environmental handling charges (EHCs).

As of April 1, 2018, deposits range from 5-cents to 40-cents per unit, and the EHC ranges from 5-cents to 9-cents per unit, depending on container type and size. Unlike the deposit, which is fully refundable, the EHC is kept by the provincial government and is used to offset SARCAN's contract cost and contribute to general revenues. Additional funding for the program comes from the proceeds generated from material sales and from a provincial grant (the current grant agreement with SARCAN expires March 31, 2020).

Saskatchewan's MMRP is a cost-sharing program between businesses and municipalities. Under the *Household Packaging and Paper Stewardship Program Regulations*, businesses that distribute or sell packaging and paper products in Saskatchewan—including beverage-related consumer packaging—are required to finance up to 75% of the costs associated with running recycling programs. Municipalities, First Nations, or Regional Waste Authorities that join the program are paid a fixed fee per household as long as MMSW standards are met. In 2016, this fee was set at \$11.75 per household served, and was paid out on a quarterly basis.²⁹ According to the 2017 Annual Report, since the launch of the program in January 2016, MMSW has executed funding agreements with 481 municipalities, First Nations communities, and Regional Waste Authorities.³⁰

Collection System & Facilities

SARCAN's collection network consists of 72 depots in 67 communities across Saskatchewan. All 72 depots now have Drop & Go service. Initially launched in 2014 as a pilot project, this service allows customers to drop off their deposit bearing containers at the depot without having to wait in long lines. To use this service, customers simply register online or through a touch screen at the drop-off location. After signing up, customers can login, attach identification tags to their bags, drop them off at a special receiving area, and leave. The deposit refunds are provided electronically through PayPal or by cheque.

After the containers have been counted and sorted by SARCAN staff, they are flattened and compacted into bales using multi-material flatteners. The bales are then picked up by SARCAN trucks and transported to one of the company's processing facilities where they are prepared for shipment to end-markets.

Refillable beer containers can be returned to Saskatchewan Liquor and Gaming Authority (SLGA) stores. All SARCAN depots and SLGA stores retain a 5-cent portion of the 10-cent refund as a handling fee. From there, they are sorted and sent back to the brewers for the full refund and for washing and refill.

Municipalities that provide residential recycling programs for waste packaging and paper can choose to participate in the new MMRP. Participating municipalities have options in terms of how recycling service is provided to their residents – through curbside pickup or a central depot – depending on the size of the community and the associated costs. Residents have the option to recycle their deposit containers through this program if they prefer, but will forfeit their deposit. Containers collected via the MMRP will find their way to SARCAN through municipal contractors.³¹

Program Performance

Over 405 million beverage containers were returned to SARCAN recycling depots in 2016-2017. This translates to an overall return rate for non-refillable containers of 81.9%, which is a decrease from 82.5% in the 2016

version of this report. Of all beverage container materials, refillable beer bottles were recovered at the highest rate (100%) (see Figure 21).

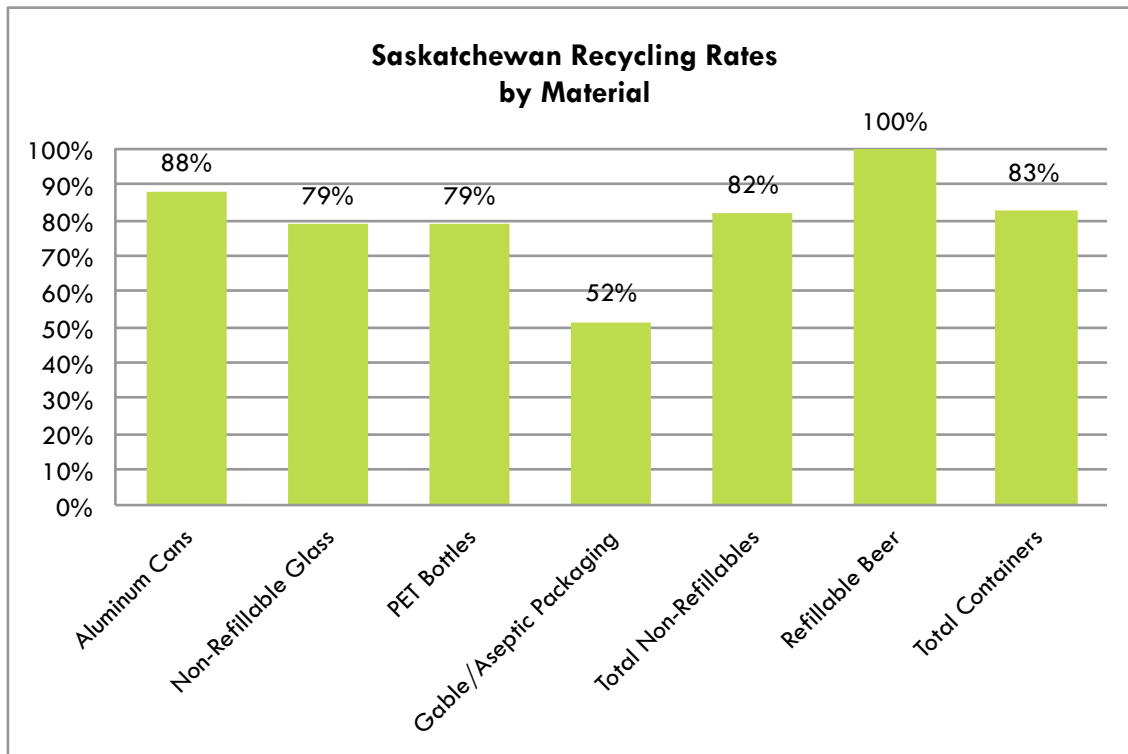


Figure 22 Saskatchewan Recycling Rates by Material (2016)

What's New?

Milk Containers Added to Deposit Program

As of April 1, 2017, “ready-to-serve” milk containers (including buttermilk, cream, fluid coffee creamers, lactose-free milk products, and drinkable yogurt) are included in the same DRS as other beverage containers accepted at SARCAN depots. Previously, the recycling of milk containers was covered under the province’s multi-material recycling program, which launched on January 1, 2016. Prior to that, beverage containers of milk products were collected voluntarily by SARCAN under the Unified Dairy Recycling System (UDRS). Launched in 1999, the UDRS was a program whereby the Saskatchewan dairy industry contracted with SARCAN to provide a collection and recycling option for plastic milk jugs and milk cartons.

The addition of milk containers to Saskatchewan’s deposit program means that in addition to a refundable deposit, milk containers are now subject to an environmental handling charge of 8-cents for plastic containers, 9-cents for glass containers, and 5-cents for aseptic and paper-based polycoat cartons.

Deposit Rate Increases

Another change affecting Saskatchewan’s deposit program in 2017 is the increase of some of the deposit refund amounts. As of April 1, 2017, the deposit/refund amount for larger (1L or greater) plastic and aluminum/tin/metal containers is 25-cents, up from 20-cents. Gabletop cartons and aseptic containers have

also seen their deposit levels increase from 5-cents (all sizes) to 10-cents for containers less than 1L and 25-cents for containers 1L or greater. The deposit amount for glass containers remains unchanged. This is the first time deposit refund amounts have increased in 25 years.

There have also been changes to the non-refundable EHC. Effective April 1, 2018, the EHC costs consumers 5-cents for tetra cartons (up from 3-cents), 7-cents for aluminum cans (up from 5-cents), 8-cents for plastic jugs/bottles (up from 6-cents), and 9-cents for glass containers (up from 7-cents).

Manitoba



Regulatory Framework

Manitoba's regulatory framework, under the *Waste Reduction and Prevention Act* (1990), enables the Minister of Conservation to designate products or materials for waste reduction responsibilities. The first regulation to be developed under the Act was the *Beverage Container and Packaging Regulation* (1992). This regulation was established to assess environmental levies on packaging materials, as well as to hold distributors of beverage containers responsible for developing a stewardship program. This regulation was later repealed and replaced by the *Multi-Material Stewardship (Interim Measures) Regulation*, which was

enacted in 1995. The primary purpose of this Regulation was to create the Manitoba Product Stewardship Corporation (MPSC). One of the key mandates of the MPSC was to establish and administer a waste reduction and prevention program for designated packaging and printed materials for Manitoba.³²

In December 2008, Manitoba introduced a *Packaging and Printed Paper Stewardship Regulation*. The Regulation requires any business that supplies, distributes, or sells packaged products or printed paper in Manitoba to register as stewards and to remit fees that are used to cover up to 80% of the cost of municipal recycling programs. The Packaging and Printed Paper Program Plan was developed in response to the Regulation and was approved by the Minister of Conservation in September 2009. The program launched on April 1, 2010, and is run by Multi-Material Stewardship Manitoba (MMSM).

Beverage producers have a separate program plan through the Canadian Beverage Container Recycling Association (CBCRA). The CBCRA plan works in conjunction with the MMSM plan (for the residential produced beverage containers) and targets beverage containers consumed both at home and away-from-home (AfH). All used, sealed ready-to-serve beverage containers are included under the program; this includes aluminum, PET, HDPE, aseptic packages, and gable top containers. Dairy containers are currently exempt.

Manitoba's Minister of Conservation approved CBCRA's first program plan in August 2011 (Until that time, the organization operated on a voluntary basis). The 2012-2016 program plan expired on December 15, 2017, and a new draft plan (for 2018 to 2022) was submitted to the government in November 2017³³. As of the time of writing, it is unknown if the minister has approved the updated plan.

Performance Targets

The Guidelines accompanying the *Packaging and Printed Paper Stewardship Regulation* include a requirement that stewards of obligated beverages are responsible for achieving a 75% recovery target. There is no timeline specified for when this target must be met.

Who is Responsible?

The PPP regulation targets producers of designated PPP material supplied into Manitoba. In order to fulfill their obligations under the Regulation, obligated stewards created MMSM to design, implement, and operate a residential PPP program on their behalf. MMSM is a not-for-profit organization that is governed by a board

of directors consisting of representatives from a number of sectors, including grocers, consumer producers, beverages, retailers, printed paper, newspaper, and restaurants. In accordance with the Regulation, MMSM is responsible for providing the Minister with an annual report on program performance. This information is obtained from stewards, who are required to report annually to MMSM the total quantity of designed PPP supplied for household use in the province. The reported quantity of PPP is used to determine a steward's total fees payable to MMSM.

The beverage container program, "Recycle Everywhere," is managed by the CBCRA, a not-for-profit, industry-funded organization created in 2010. As of the time of writing, the organization represented all of the obligated stewards of beverage containers supplied into Manitoba (excluding beer). While its members and stewards are also stewards of MMSM, the CBCRA is a separate and independent organization from MMSM, the latter of which also represents the interests of other PPP stewards. (The key elements of the relationship between CBCRA and MMSM are set out in a Memorandum of Understanding, last updated in 2016).

Whereas MMSM's focus is on the residential collection system, the CBCRA is tasked with enhancing both at home and away-from-home (AfH) collection. It does this by establishing partnerships with various public and private partners, including municipalities, schools, businesses, institutions, parks, festivals, and events that generate beverage container waste. CBCRA provides beverage container recycling bins for public spaces across the province free of charge, and partners take the recovered containers to a nearby recycler. To support their recycling programs, CBCRA also provides participating generators with the necessary signage, technical support, and promotion and educational materials. In addition to remitting a portion of its fees to MMSM, the CBCRA must report to MMSM all of its members' packaging (i.e. tonnes of aluminum cans; PET bottles; glass; Tetra Pak, etc.) sold into the province.

Provincial oversight responsibility has been delegated to Green Manitoba, a special operating agency that works closely with the Department of Sustainable Development (formerly Conservation and Water Stewardship) on regulation enforcement.

Program Financing

Under the Regulation, stewards of designated PPP material supplied into Manitoba are responsible for financing 80% of the total net cost of municipal recycling programs. Steward fees are established by MMSM on an annual basis and are calculated using a four-step methodology that takes into account material-specific recycling rates and commodity values.

Stewards who supply beverage containers into Manitoba are charged a 2-cent Container Recycling Fee (CRF) for every nonalcoholic, non-dairy beverage container they supply into the province. Producers report and remit these fees to the CBCRA on a monthly basis. In most cases, beverage producers pass the CRF to the retailer, who passes it on to the consumer. This fee is visible on most store receipts and is consistent across the province.

The CBCRA uses the revenue from the CRF to pay for the entire AfH recycling program, including infrastructure, signage, technical support, and P&E.³⁴ A portion of the CRF is also remitted to MMSM (on behalf of each member), which uses it to pay for up to 80% of the net cost to collect and process beverage containers recovered through the residential collection system. In other words, the CRF is designed to cover the costs of recycling beverage containers from all channels, including both residential and AfH. Alcohol distributors pay MMSM directly for their PPP obligation.

As in other provinces where they are charged, the CRF is adjusted annually by the CBCRA based on the overall cost of the program, as well as the differential cost of recycling various materials. The intention is that the costs of each material group should reflect the true cost of recycling that type of container, with no cross-subsidization.

In 2016, the CBCRA collected \$9 million in CRFs, \$1.1 million of which was remitted to MMSM.³⁵ CBCRA uses the remaining revenue to purchase and supply recycling bins to its partners, provide technical support, conduct waste audits, and to pay for awareness campaigns. Total costs in 2016 were \$8 million.

Collection System & Facilities

Beverage containers from the residential sector are collected via curbside recycling or depot drop-off centers. The program, operated by MMSM reached roughly 94% of the population of Manitoba in 2016. Generally, containers are collected, transported to MRFs, sorted, baled, and shipped to their respective end markets for recycling. With the exception of glass, all used beverage containers are sent out-of-province for final processing.

The CBCRA's program, which includes the AfH collection of containers, focuses its efforts on public spaces (e.g. parks and streets), IC&I locations (e.g. gas bars, restaurants, convenience stores, shopping malls), government buildings, educational institutions, and special events. In 2016, CBCRA distributed Recycle Everywhere bins to nearly 800 locations across the province, including 68 municipal sites, 498 IC&I sites, 6 park sites, 178 schools, 16 government buildings, and 8 First Nations. As of December 2016, the CBCRA has distributed a total of 52,000 Recycle Everywhere bins across the province.³⁶

Refillable and non-refillable beer cans are collected via retail beer vendors, the Manitoba Liquor Commission, and rural agency stores. Brewers Distributor Limited (BDL) collects empty domestic beer containers and back-hauls them to various distribution centres where recyclables are baled and shipped to market. Refillable bottles are sorted and sent back to the brewers for washing and refill.

Program Performance

Verifiable performance data for Manitoba's beverage container recovery program is not available.

Ontario



Regulatory Framework

Established in 1994, Ontario's Blue Box Program is one of the oldest and most comprehensive curbside recycling systems in North America. Initially developed under the *Waste Diversion Act (WDA)* of 2002, the program covers most food and beverage containers, including those made from glass, PET, aluminum, and steel. Other containers, such as Tetra Pak, gable top cartons, and HDPE bottles, may be added to the program voluntarily. Eligible waste materials are designated in the *Blue Box Waste Regulation* under the *WDA*.

In November 2016, the former *WDA* was repealed and replaced with the *Waste-Free Ontario Act (WFOA)*. The new legislation, which will have a major impact on the way municipal solid waste is managed in Ontario, is comprised of two schedules: 1) the *Waste Diversion Transition Act (WDTA)* and 2) the *Resource Recovery and Circular Economy Act (RRCEA)*. The first sets out the operation of existing waste diversion programs (including their wind up) and outlines the transformation of the current Waste Diversion Ontario (WDO) into the Resource Productivity and Recovery Authority (RPRA), a strong oversight body with new compliance and enforcement powers. The latter outlines the scope of the new producer responsibility framework, which will make producers individually responsible and accountable for their products and packaging at end of life. Currently, the cost to run the Blue Box Program is split roughly 50/50 between municipalities and producers. The new legislation has started the movement towards 100% producer responsibility for these programs, although much of the details on how the new system will work are still to be determined via the regulations.

Accompanying the *WFOA* is the *Strategy for a Waste-Free Ontario: Establishing the Circular Economy* (the Strategy). The Strategy includes 4 objectives and fifteen concrete actions to build up the province's circular economy and help reduce greenhouse gas emissions from landfills, such as banning certain materials (such as beverage containers) from landfill and requiring producers to register and report on their waste management activities. It also includes an implementation timeline that targets transition of the blue box program to full producer responsibility by 2022.

In July 2017, the Municipal 3Rs Collaborative and Stewardship Ontario sent a joint letter to the Minister of Environment and Climate Change asking that he request an amendment to the Blue Box Program Plan (BBPP). In response to this request, on August 14, 2017 the Minister issued a directions to the RPRA and Stewardship Ontario (SO) to develop a proposal for an amended BBPP, and if approved, to submit the proposal by February 15, 2018 for the Minister's consideration. The first phase of consultations on the engagement plan was completed between October and November 2017. On December 19, 2017, the second phase of consultations was launched with the posting of SO's draft amended BBPP. As of February 2018, SO and RPRA have agreed that more time is needed to address the comments received on the draft amended plan.³⁷

Unlike the Blue Box program, the Ontario Deposit Return Program (ODRP), which came into force in February 2007, is a voluntary program implemented by the provincial government. As such, there is no law mandating that wine and spirits sold under the Liquor Control Board of Ontario (LCBO) be placed on deposit. Also, although wine and spirit containers are on deposit, they may be added to municipal blue box programs voluntarily.

Refillable and non-refillable beer containers are collected through a separate program administered and operated by Brewers Retail Inc. (The Beer Store).

Performance Targets

The *Strategy for a Waste-Free Ontario: Building the Circular Economy* sets the following waste diversion targets: 30% overall waste diversion by 2020, 50% diversion by 2030, and 80% by 2050.³⁸ The province's ultimate goal is zero waste. The Strategy also indicates that the province will establish requirements that producers must meet, including reduction, reuse, and recycling targets. What these targets will be and how they will be set (material-specific or overall BB) will be set out in the regulations.

To encourage reuse, Regulation 340 of the Ontario *Environmental Protection Act* requires a minimum of 40% of soft drinks to be sold in refillable containers, dropping to 30% if a 60% collection rate for non-refillable bottles is achieved. While soft drinks companies are still legally required to meet this quota, in reality, the refillable market share is less than 1% because the requirements are not enforced.

Who is Responsible?

The new legislation transfers full (100%) responsibility – physical and financial – for the collection, transfer, and processing of Blue Box materials to individual producers. Obligated producers will be responsible for meeting any targets set through legislation and will report directly to the RPRA. They can join a collective organization to meet these obligations, or can choose to meet them on their own.

Unlike the previous waste diversion regime, there is no legislated role for municipalities in the *WFOA*. Rather, municipalities are considered a potential service provider to producers in the management of their materials. Other options for municipalities include: continuing to provide the service but letting producers pay for it; letting another provider take over using municipal infrastructure; or stepping back entirely. At this point, the municipal role in the system is still evolving. (Note: Changes to Regulation 101/94 to remove requirements for municipalities to collect materials at the curb will be part of the Blue Box transition consultation.)

As of November 30, 2016, the organization responsible for overseeing the Blue Box program is the RPRA (formerly the WDO), a non-Crown, not-for-profit organization. In addition to its oversight, compliance, and enforcement activities, the RPRA is responsible for operating a public-facing registry to receive and store data from producers and others who conduct resource recovery and waste reduction activities. The Authority is directly accountable to the Minister of Environment and Climate Change (MOECC) and is required to provide information to the Minister upon request.

With regards to the ODRP for alcohol beverage containers, the LCBO is the responsible entity, with oversight from the Ministry of Finance. When the provincial government decided to establish the program, The Beer Store (TBS) already had a successful DRS infrastructure in place for beer. Therefore, rather than establishing its own system, the LCBO has contracted collection (including return-to-retail collection for licensees), processing, and marketing responsibilities to TBS.

Program Financing

Each year, the RPRA conducts a Municipal Datacall, requiring municipalities to submit tonnage and financial information for residential Blue Box material collected in their recycling programs. Stewardship Ontario (SO)

uses this data, along with material generation estimates, to determine “fair” fees to charge stewards based on the type of material they sold into the Ontario marketplace. Each designated Blue Box material is associated with a fee rate, which is set annually. Stewards pay these fees to SO in quarterly increments.

Under the previous legislative framework, recycling costs were split roughly 50/50 between municipalities and the companies that place packaging and printed paper (PPP) products on the market. In 2016, stewards paid a total of \$122.9 million in fees to SO, of which \$110.8 million was transferred to municipalities³⁹. The new legislation is set to increase the obligation for PPP stewards from 50% to 100% (or full producer responsibility). This means that many companies in Ontario that currently pay blue box fees will potentially see their costs double. Although details of when the shift to full producer responsibility have not been announced, it is likely to occur beginning in 2019, after approval of the amended Blue Box plan by the Minister.

The funding for the ODRP comes from two primary sources: unredeemed deposits and government revenue. In 2016, the amount of the deposit ranges from 10- to 20-cents/unit, depending on container type and size. When eligible containers are returned to TBS for a refund, the LCBO pays the amount of the deposit to TBS, in addition to a per unit service fee. For the year ended March 31, 2016, expenditures related to service fees paid to TBS totaled \$41.0 million (including \$4.7 million of HST).⁴⁰ A contract with TBS, in effect since February 2012, sets the fee at 10.5-cents for 2016.

Collection System & Facilities

When it comes to beverage container collection there are two different streams. Beverage alcohol containers, as well as any associated packaging (including cardboard boxes, boxboard, bottle caps, tabs, and plastic wrap), are collected through a return-to-retail system. As of December 31, 2016, there were a total of 956 redemption locations across Ontario, including 446 Beer Store locations, 187 on-site brewery stores (beer containers only), 210 Beer Store retail partner stores and LCBO Northern Agency stores, 3 LCBO stores, and 110 Beer Store contracted empty bottle dealers.⁴¹ Refillable bottles are collected and separated to send to partner brewers for washing and refilling. Non-refillables are sorted by material type, separated into streams, and back-hauled to various distribution centers where they are sorted, baled, and shipped to recycling markets.

Non-deposit beverage containers are collected through curbside recycling programs (i.e. the Blue Box) together with non-beverage packaging. Since the inception of the Blue Box program, collection has been the responsibility of municipalities, but this is set to change under the new legislation. The new producer responsibility framework will provide municipalities will new options – to act as service providers to producers who are required to pay for these programs, to work with private companies that may use municipal infrastructure, or to opt out altogether.

Currently, Blue Box programs are only required to collect PET, glass, aluminum, and steel containers, while the inclusion of other types of containers such as aseptic cartons, gable top, and HDPE are voluntary. It is expected that the list of obligated materials subject to the program will be expanded under the amended Blue Box Program Plan beginning in 2020.⁴²

Program Performance

In 2016, the total recycling rate for deposit beverage containers (beer store system containers and ODRP containers combined) was 87%. The rate for refillable bottles sold through the Beer Store and LCBO was 95%,

and for non-refillables it was 80%. Of all alcoholic beverage containers, Tetra Pak/Bag-in-Box containers achieved the lowest recycling rate at 25%.⁴³ Many of the remaining containers end up in municipal Blue Boxes; about 37% of the glass in Blue Boxes is DRS material.⁴⁴

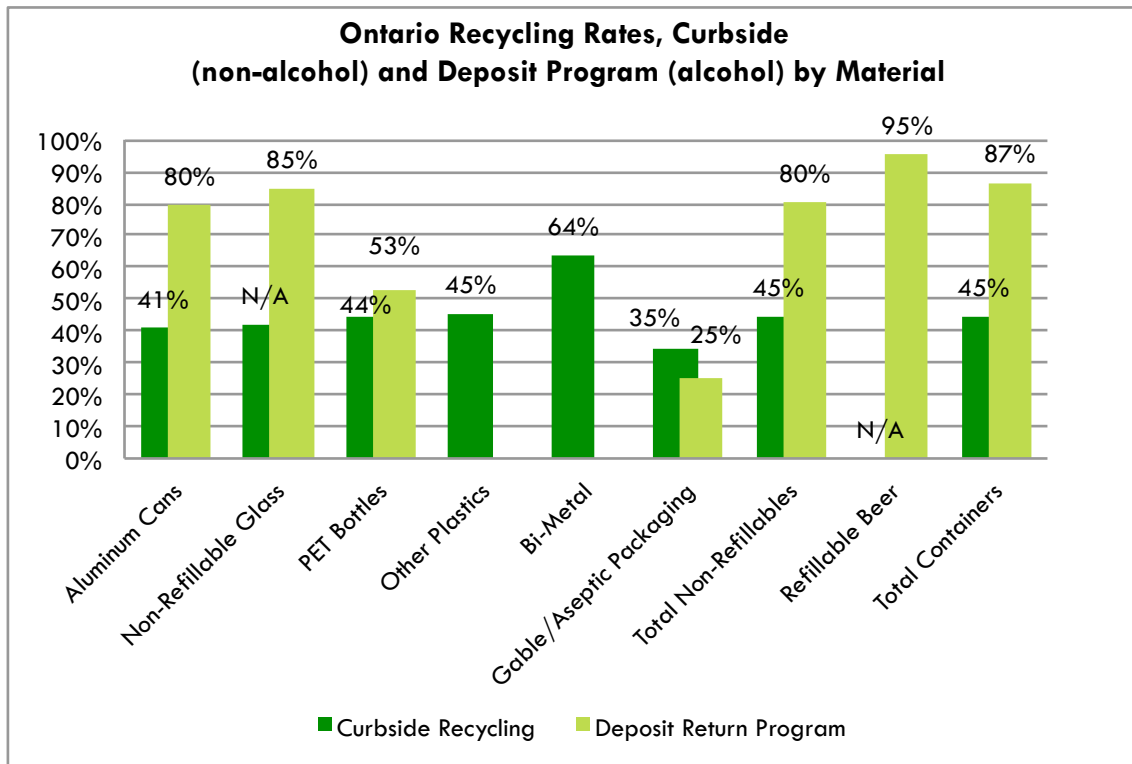


Figure 23 Ontario Recycling Rates by Material – Curbside (Non-Alcohol) and Deposit Program (Alcohol) by Material (2016)

The curbside recycling rates presented for Ontario are the only curbside beverage container recycling rates reported in *Who Pays What* 2018, as dependable data was not available for Manitoba and Quebec. The rates in the curbside programs are typically lower than rates in deposit programs. This is shown by comparing the rates by material from the two co-existing systems in Ontario. Non-alcoholic beverage containers collected through the Blue Box program show an overall recycling rate of approximately 45% while deposit containers are recycled at a rate of 87%. The rate for non-alcohol aluminum containers is 41%, half the rate of the same containers in the ODRP.

What's New?

Ontario to Transition to Full Producer Responsibility

In late 2016, Ontario proclaimed the *Waste-Free Ontario Act*, which repealed and replaced the *Waste Diversion Act* of 2002. Under the new waste diversion regime, producers will be 100% responsible – financially and physically – for the collection, transportation, and processing of their printed paper and packaging materials at end-of-life. Although many of the details on how the system will work have yet to be determined, it is expected that Blue Box recycling programs will undergo some of the biggest changes.

In December, 2017, Stewardship Ontario submitted a proposal for amending the current Blue Box Program Plan.⁴⁵ The amended Plan will transition the program from its current cost share model to full producer

responsibility, and will require a 75% recovery rate for PPP as well as a proposal for material-specific targets. The Government's *Strategy for a Waste-Free Ontario: Building the Circular Economy* identifies a schedule to start the transition of the Blue Box Program, to be completed by 2022-23. The Province has promised to ensure proper consultation, careful consideration, and cooperation among municipalities, producers, the RPRA, and Stewardship Ontario is maintained during the transition period.

According to the Strategy, considerations for consultation on the Blue Box program transition could include: roles and responsibilities for the operation of the Blue Box system; opportunities for municipal integrated waste management system to support producer responsibility; how to address municipal contracts and assets; opportunities to harmonize materials collected across Ontario and the type of collection activities that are undertaken; opportunities to lower overall costs; and the status of Regulation 101/94 which currently requires municipalities with a population of 5,000 or more to operate a Blue Box waste management system.⁴⁶ It is also worth noting that Ontario's new strategy includes a proposal to ban certain materials from landfill, including beverage containers.

Quebec



Regulatory Framework

Established in 1984, Québec's DRS for beverage containers is regulated under the provisions of the *Environment Quality Act* (1972). The program covers all non-refillable soft drink and beer containers, including plastic bottles, metal and bi-metal cans, and glass bottles.

The details of the deposit system for soft-drink containers are set out in the *Agreement Relating to the Consignment, Recovery, and Recycling of Non-Refillable Soft Drink Containers*, the most recent of which was signed

on January 1, 2016 and which is in effect until December 31, 2018 (Note: the initial agreement was made on December 1, 1999). This is an agreement between the Ministry of Sustainable Development, Environment, and Action against Climate Change (MDDELCC), the Société Québécoise de Récupération et de Recyclage (Recyc-Québec), the Association des Embouteilleurs de Boissons Gazeuses du Québec Inc., Boissons Gazeuses Environnement (BGE), and its registrants. A similar but separate agreement was reached with the beer industry called the *Agreement Relating to the Consignment, Recovery, and Recycling of Non-Refillable Beer Containers*.

In addition to the above agreements, beer and soft-drink producers are governed by the *Beer and Soft Drinks Distributors' Permits Regulation* under the *Act Respecting the Sale and Distribution of Beer and Soft Drinks in Non-Returnable Containers*. This Act requires anyone selling or distributing beer and soft drinks in Québec in non-refillable containers to obtain a permit from the MDDELCC. To receive a permit, the applicant must do one of two things: 1) enter into an agreement with Recyc-Québec and the Minister of MDDELCC for beer, and BGE and the Minister of MDDELCC for soft drinks, or 2) comply with beverage container regulations set out in Section 70 of the *Environment Quality Act*.

Other beverage containers, such as those used for water, sports drinks, and juice, are managed through curbside multi-material recycling programs ("collecte sélective"). Under the *Environment Quality Act* and the *Regulation respecting compensation for municipal services provided to recover and reclaim residual*

materials,” municipalities that operate these programs are entitled to compensation for their services in the order of a percentage of the net costs incurred (100%).

Performance Targets

The 2011-2015 Action Plan of the *Québec Residual Materials Management Policy* includes a target to recycle 70% of paper, cardboard, plastic, glass, and metal waste by 2015. No new targets have been set for the future.

The *Agreement Relating to the Consignment, Recovery, and Recycling of Non-Refillable Soft Drink Containers* includes a 75% collection target for soft-drinks containers for the twelve-month period ending December 31, 2018. The same 75% collection target is set for beer containers under the *Agreement Relating to the Consignment, Recovery, and Recycling of Non-Refillable Beer Containers*.

Who is Responsible?

The beer and soft drink container deposit program is managed by the MDDELCC through Recyc-Quebec. Founded in 1990, Recyc-Quebec is a crown agency responsible for the promotion and development of reduction, reuse, recovery, and recycling programs for containers and packaging in Quebec. Its main responsibility is program oversight. Recyc-Quebec reports to the Minister and is responsible for interpreting the applicable regulations and for monitoring program performance.

Boissons Gazeuses Environnement (BGE), a non-profit organization established by the Quebec soft-drink industry, is responsible for administering the deposit-refund system for non-refillable soft drink containers on behalf of its members. BGE took over this role from Recyc-Quebec on December 1, 1999.

The deposit system for beer containers is managed by the brewers themselves, but is overseen by Recyc-Quebec. Brewers and bottlers operate the recovery of containers at the retailers' facilities.

Financial responsibility for the collection of all beverage containers belongs to Éco-Entreprises Québec (ÉEQ), a private, non-profit organization created by companies that supply PPP material to Québec (As of 2016, ÉEQ represents over 3,300 companies selling paper and food and consumer packaging). Akin to Stewardship Ontario in Ontario, ÉEQ is certified by the Government of Québec to develop a fee structure and collect contributions from companies in order to finance municipal curbside recycling programs. ÉEQ is also responsible for managing the province's Away-from-Home Recovery program, which came to an end on December 31, 2016.

Program Financing

The DRS for beer and soft drinks containers is almost entirely funded from unredeemed deposits (\$35 million in 2016). Since the program began, the deposit on aluminum, glass, and plastic soft drink and beer cans has been 5-cents. Beer cans and bottles larger than 450ml are subject to a 20-cent deposit. Information on program costs is not available because it is proprietary.

Industry contributes a much larger share to the municipal curbside program. Since 2005, the compensation plan enacted by Quebec's *Environment Quality Act* and the *Regulation Respecting Compensation for Municipal Services provided to Recover and Reclaim Residual Materials* has meant that targeted businesses are required by law to provide compensation to municipalities for the net costs to collect, transport, and process materials in a curbside recycling system. The financing of these costs is achieved through contributions by obligated

stewards, calculated based on the materials and quantities generated. In 2011, significant changes were made to the compensation plan, which increased the rate of compensation payable to municipalities from 50% to 70% for the year 2010, 80% for 2011, 90% for 2012, and 100% for 2013 and following years. Municipalities also receive a flat amount equal to 8.55% of costs to cover management costs relating to recycling activities, including for example overhead, P&E, and the cost of recycling bins.⁴⁷ Including the 2017 Schedule of Contributions for reference year 2016, the total compensation paid out to municipalities (561 municipal agencies) since 2005 is over \$1 billion.⁴⁸ (Note: Although soft drinks and beer containers themselves are not subject to the compensation plan, any associated packaging is (e.g. boxboard cases, film plastic)).

The Away-from-Home (AfH) Recovery Program has a total budget of \$8 million that is jointly financed by a voluntary contribution by ÉEQ and the MDDELCC (through the Green Fund). This program reimburses municipalities for 70% of the costs of the recovery equipment they install in public spaces and municipal buildings, up to a maximum of \$840/unit.

Collection System & Facilities

Québec has a hybrid collection system in which beverage containers are recovered via two separate channels.

Carbonated beverage containers (including beer, soft-drinks, and carbonated energy drinks) are recovered through the province's DRS, which is based on a return-to-retail collection system. Empty beverage containers can be returned to approximately 10,000 licensed grocers, service stations, pharmacies, and other retail outlets located throughout Québec. By law, anyone that sells these containers must take them back.

As of 2016, approximately 70% of returned deposit-bearing containers are managed through reverse vending machines (RVMs). The rest is collected manually by retail staff. Following collection, the containers are sent to a processing centre where they are sorted and prepared for shipment to end-markets. Refillable beer bottles are sent back to brewers for washing and refill. (Note: the recovery of refillable and non-refillable containers are two distinct operations and are performed by different trucks).

All other beverage containers, including those for wine, spirits, water, non-carbonated flavoured drinks, juices, and milk are collected via curbside recycling programs. Municipal curbside recycling in Quebec serves 99% of the population—the highest coverage rate of all provincial curbside recycling systems in Canada.⁴⁹

Program Performance

In 2016, the recycling rate for containers recovered via the DRS was 77% (this includes data for refillable bottles). Precise recycling rates for containers recovered through the curbside system are unavailable.

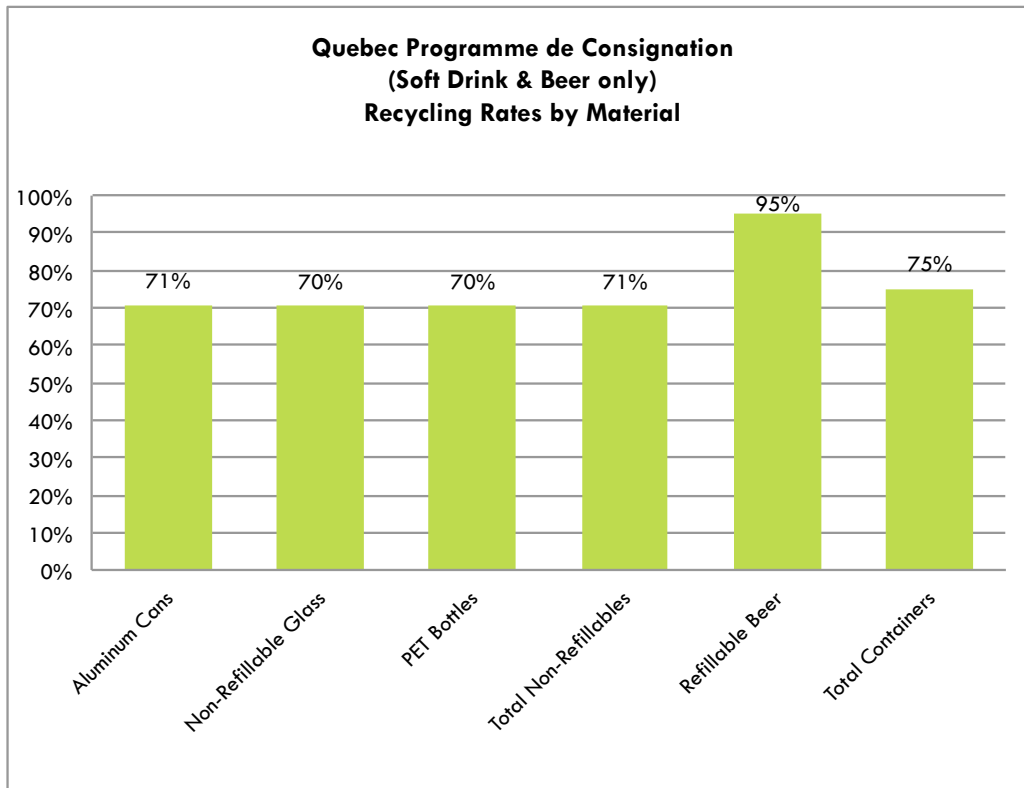


Figure 24 Quebec Recycling Rates for Deposit Program (Soft Drink & Beer Only) by Material (2016)

What's New?

Quebec Considers Program Expansion

The Québec government is seriously considering expanding its DRS to include beverages sold in plastic, metal, and other containers that currently don't have a deposit, like water and sports drinks (wine and liquor bottles are not included in the proposal). The government is also considering increasing the deposit value from 5-cents to 10-cents.

During 2017 and 2018, the Government, via Recyc-Québec, has been negotiating elements of system design with the industry. Further action has been delayed with the call of an election in Fall 2018.

New Brunswick



Regulatory Framework

Established in 1992, New Brunswick's beverage container recycling program was implemented to reduce the amount of waste going to landfills or being littered along the province's roadways and waterways. The program is regulated under the *General Regulation – Beverage Containers* (1992) made under the *Beverage Containers Act* (1991).

Section 1 of the Act defines a beverage container as any ready-to-drink container that holds 5L or less of a beverage. This includes soft drinks, beer, wine and spirits, flavored waters, fruit juices, vegetables juices, and low

alcohol drinks that are packaged in aluminum/metal, plastic, glass, Tetra Pak, gable top, bag-in-box or pouch containers. The regulation also covers refillable beer bottles. Milk and milk products, milk substitutes, infant formula, and meal replacements are exempt and therefore do not have a deposit.

Performance Targets

There are no targets established in the Act or Regulation. However, at the time of it's writing, the Department of Environment established an unofficial target recovery rate of 80% by year five (1997) of the program.

Who is Responsible?

Under the *Beverage Containers Act*, beverage container distributors (companies that sell deposit-bearing containers to retailers in New Brunswick) are required to package their beverages in containers that have a management plan approved by the Department of Environment. In this plan, distributors must indicate how their containers will be managed post-consumption, either through refilling or recycling. The Act also requires all distributors to be registered by the Department, which has responsibility for program oversight.

In order to fulfill these obligations, the soft drink industry created Encorp Atlantic Inc. in 1992 to act as its stewardship agent. Unlike many of the stewardship agencies in Canada, which are not-for-profit, Encorp Atlantic Inc. is a private company. As their agent, Encorp is responsible for managing the collection, transportation, and partial processing of its stewards' non-alcohol containers. It does this through its collection and transportation service provider, G.M. Rioux & Fils. Encorp is also required to manage the financial aspects of the program, which include collecting deposits from the distributors, paying handling fees, reimbursing redemption centers for the refunds paid out, and remitting a portion of the fees to the province.

As for alcohol containers (wine, beer, spirits, and coolers), New Brunswick Liquor (NB Liquor) is the responsible agent. NB Liquor collects the deposits from distributors and remits the provincial share of the environmental fee directly to the Environmental Trust Fund. To manage the operational aspects of the program (i.e. collection, transportation, and processing), the agency contracts with the Rayan Investments Ltd., a trucking company based on of Moncton.

Program Financing

New Brunswick's beverage container program operates as a "half-back" system, meaning that residents who purchase non-refillable containers are refunded only half (50%) of their deposit when they return them for recycling. To illustrate, a consumer that pays a 10-cent deposit on the purchase of a non-alcoholic beverage

will only receive a 5-cent refund upon redemption of this container. Likewise, a consumer that pays a 10-cent or 20-cent deposit on an alcoholic beverage container (depending on size) will only get back 5- or 10-cents. The exception is refillable beer bottles, where consumers are refunded the full 10-cents when returning these containers to a redemption center.

The portion of the deposit that is not refunded to the consumer is considered an “environmental fee.” This fee, along with all of the unredeemed deposits and revenues generated from material sales, is used to cover program costs, which include costs for sorting, transportation, processing, and administration. Costs also include the handling fees paid to redemption centers as compensation for collecting, sorting, and storing redeemed beverage containers. Effective April 1, 2017, the handling fee for empty refillable beer containers is \$0.03120/unit, and \$0.04368 for all other empty containers. Beverage distributors pay these fees directly to redemption centres without any government involvement.

Part of the revenue from the unrefunded portion of the deposit goes into New Brunswick’s Environmental Trust Fund, which provides financial assistance for projects aimed at protecting, preserving, and enhancing the province’s natural environment. During the 2016-17 fiscal year, a total of \$8 million of fund money was invested in environmental projects.⁵⁰ This fund is managed by the Department of Environment.

Collection System & Facilities

Seventy-two individually owned and operated redemption centers are located throughout the province. In order to operate, every redemption center must be registered with the Ministry of Environment. These centers collect, sort, and pay refunds to consumers for empty beverage containers and store them until they are picked up and transported to one of two processing facilities: Rayan Investments (for alcohol containers) or Encorp Atlantic (for non-alcohol containers). Refillable beer bottles are transported directly to the breweries to be washed and refilled.

From May 2015 to May 2017, three redemption centres implemented a trial run of “Express Bags,” which allowed customers to collect their containers in specially designed bags, and then drop them off at one of the participating redemption centres for a quick cash refund. Because of the pre-determined cash value (40 deposit-bearing containers for a fixed refund of \$2), customers with express bags were given priority service, as the containers did not need to be counted or sorted in front of them. The pilot project proved successful, with approximately 1000 participants and over 57,000 bags processed from June 1, 2015 to December 31, 2016 (average of 138 bags daily).⁵¹ Aside from reducing customer wait times, the fixed-count bags have allowed redemption centers to increase efficiencies which have resulted in lower labour costs.

Program Performance

In 2016, New Brunswick’s overall recycling rate for non-refillable beverage containers was 73%. This is unchanged from the rate reported in *Who Pays What 2016*.

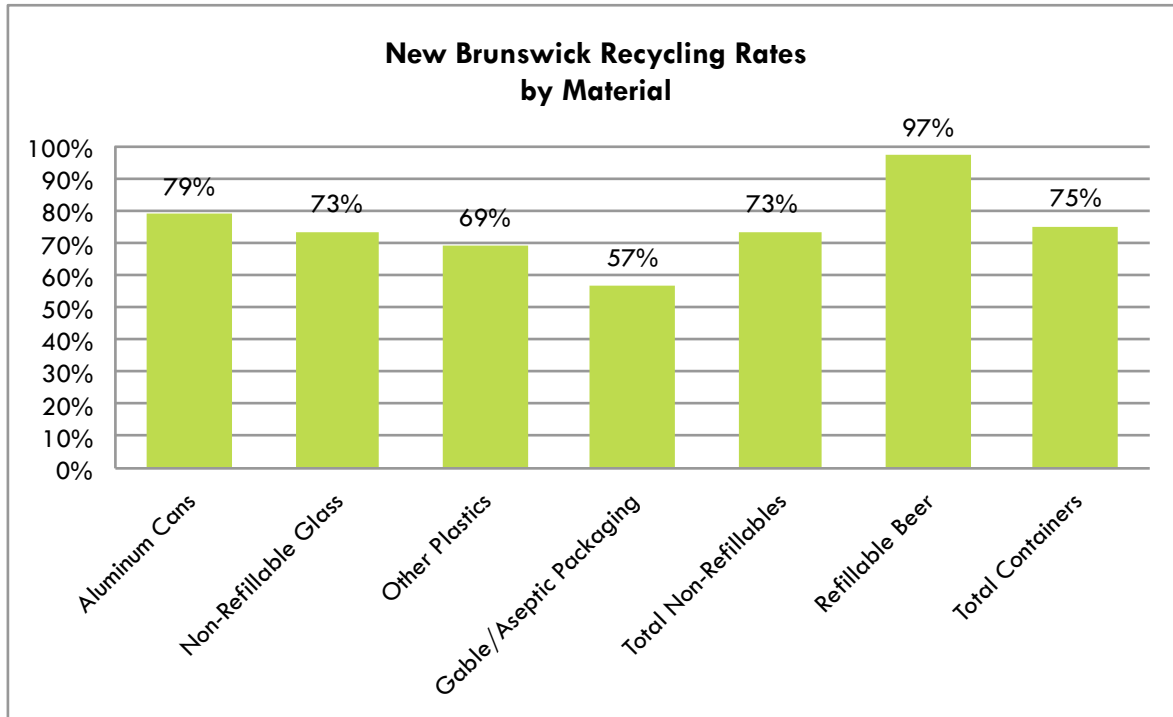


Figure 25 New Brunswick Recycling Rates by Material (2016)

In New Brunswick, PET and HDPE are reported together, so we have included these containers under “Other plastic.” It is likely that PET soft drink and water bottles make up the vast majority of this number.

What’s New?

Encorp Atlantic Launches New Pilot Project

As part of a series of pilot projects aimed at making the redemption process more convenient for its customers, Encorp Atlantic launched a new initiative in April 2017 called Re360. The Re360 recycling boxes, now being used at four redemption centers (one in Moncton, one in Dieppe, and two rural RCs), are a natural extension of the Express Bags, which were used in a pilot project from May 2015 to May 2017. The new boxes are made from recycled plastic and can hold up to 60 empty beverage containers. Customers who use the new green boxes are given priority service when they drop off their containers, and do not have to wait in line to receive a refund of their deposit. For each box filled with 60 containers, customers receive a \$3 cash payout on the spot. Those interested in signing up for the program can pick up a Re360 box at one of the participating redemption centres in exchange for a \$5 refundable deposit (limit of 2 boxes per household). As of July 2017, preliminary data showed that customers were satisfied with the convenience of the program while participating redemption centres stated that count accuracy levels were fine.⁵²

Re-Centre Pilot Project Extended and expanded

In April 2014, Encorp Atlantic launched Phase 1 of the Re-Centre pilot project at two redemption centres in the Greater Moncton region. A test group of 2,500 members of the public got to sign up for the automated bag-drop technology, collecting their empty beverage containers in bags and dropping them off whenever they pleased. At the Re-Centre depot, consumers print barcoded tags to attach to each of their bags to identify them, and then using their member card, unlock one of three drop doors to deposit their bags. Bags are picked

up and processed off-site by Re-Centre staff. Deposit refunds are handled through an online payment system, where customers can check their balances and request to receive a refund via cheque, direct deposit, PayPal or donation. Over the 36-month test period, the Re-Centre depots were able to serve customers with at least three bags (150 containers) in 30 seconds or less over 95% of the time. The pilot project also proved that customers preferred better hours of operation for redemption centres, as 50% of visits occurred when neighbouring redemption centres were closed.⁵³

Given the positive results achieved in Phase 1 of the project, the Re-Centre automated bag-drop technology will move to Phase 2 in the fall of 2017. Starting September 1st, existing Re-Centre depots will be managed by local redemption centre operators to allow for testing of the technology in a real-time environment. The rest of the program will remain unchanged: Encorp will continue to manage communications and all Re-Centre online accounts, and members will continue to see their balances via their online account. The service will also be made available to new members.

In 2018, Encorp decided to combine its unmanned bag drop-off recycling depot model with its fixed value bags concept, thus launching a new pilot project, Re-Express. Like for its Re-Centre counterpart, the goal of Re-Express is to make recycling empty beverage containers fast, easy and convenient. Customers register online to get a card linked to their account. They collect their used beverage containers, drop them off at their convenience at the automated Re-Express depot, and collect their refund via an online account. But with the addition of fixed value bags, participants are instructed to collect their containers in specially designed \$2/40 bags and fill these bags with 40 New Brunswick deposit-bearing beverage container for a \$2 refund per bag. Encorp will be closely monitoring the public's perception towards the \$2/40 bags and accuracy of container counts in this automated/unmanned drop-off recycling depot setting.

Nova Scotia



Regulatory Framework

Nova Scotia's DRS came into effect on April 1, 1996 and is regulated under the *Solid Waste-Resource Management Regulations* (1996) (promulgated under the *Environment Act*).

In addition to banning certain types of beverage containers from landfill, the regulations require distributors and retailers to charge a deposit on all designated beverage containers sold in the province. The regulations apply to all ready-to-drink beverages, excluding milk, milk products, soya milk, rice beverages, certain meal replacements, formulated liquid diets, baby

formulas, and beverage concentrates. Non-alcoholic beverage containers 5L or greater are also excluded.

The collection and recycling of milk containers is carried out under the *Nova Scotia Milk Packaging Stewardship Agreement*, a voluntary agreement signed in 2000 between Nova Scotia Environment, the Atlantic Dairy Council (ADC), and the province's seven solid waste-resource regions. Under the Agreement, the ADC voluntarily agreed to provide financial assistance to municipalities to manage milk packaging waste, effectively transferring the costs of recycling from taxpayers to producers. The agreement also states that in order to obtain a license in Nova Scotia, a milk distributor must either participate in this program or develop their own stewardship program and have it approved by the Department of Environment.⁵⁴

Performance Targets

Through the *Environment Act* and the *Environmental Goals and Sustainable Prosperity Act*, the provincial government is committed to achieving 50% waste diversion and to meet a per capita disposal target of 300kg per year by 2015. The per capita target has not been met.

No specific targets have been set for the beverage container DRS.

Who is Responsible?

Divert NS (previously known as the Resource Recovery Fund Board) is the not-for-profit organization responsible for operating Nova Scotia's non-refillable beverage container recycling program. The organization operates at arms-length from government and was established in 1996 under Section 4 of the *Solid Waste-Resource Management Regulations*. In addition to managing the beverage container program, Divert NS is also responsible for administering the province's used tire program, which diverts an average of 1 million tires a year from landfills.

Distributors of regulated beverages are required to register with Divert NS in order to sell their products on the Nova Scotia marketplace. The regulations also require distributors to submit sales and returns data as well as applicable deposits to Divert NS on a monthly basis. According to the Divert NS website, the deposit program includes approximately 99 registered beverage distributors and 34 liquor distributors, selling approximately 141,500 products in Nova Scotia.⁵⁵ The Regulations also place obligations on retailers. Retailers are required to charge a deposit on the purchase of designated beverage containers and to display the deposit amount on the sales receipt. They are also required to display a notice stating to customers that a deposit will be charged, and to identify the location of the nearest redemption location.

Depot owners and operators also have responsibilities under the Regulations. For example, in order to become a licensed Enviro-Depot, depot owners must register with Divert NS and sign a standard agreement, which lays out a number of rules and standards governing depot operation. Depots that fail to comply with these rules can have their licenses revoked.

Divert NS is not responsible for administering the beer bottle deposit program. This is managed by the Brewers Association.

Responsibility for the milk packaging recycling program is shared between the ADC, which provides the funding, and the province's solid waste-resource management regions, which operate the residential curbside programs and recycling facilities in which milk packaging is collected. Municipalities are required to submit data on volumes collected, processed, and recycled annually to Nova Scotia Environment.

Program Financing

Similar to the other Atlantic provinces, Nova Scotia's deposit program is based on a "halfback" model, where residents that purchase and return non-refillable beverage containers for recycling are refunded only half (50%) of the initial deposit paid. The deposits are currently set at 10-cents for non-alcohol containers less than 5L; 10-cents for alcohol containers 500ml or less; and 20-cents for alcohol containers greater than 500ml. All deposits received by beverage distributors are remitted to Divert NS. (*Note: The only exception to this halfback system is refillable domestic beer bottles. The deposits paid on these containers (\$1.20/dozen) are fully refundable, and are provided by the Brewers Association.*)

The non-refundable portion of the deposit (5- or 10-cents, depending on the container) is used as revenue by Divert NS. In fiscal 2016-17, revenue from deposits amounted to \$42.8 million. Revenues are also generated from the sale of recyclable materials (\$4.8 million in 2016-17). Combined, this revenue is used to cover program costs, which include, among other things, handling fees paid to Enviro-Depots™ and municipal waste management facilities, transportation, processing, and administration (*Note: A breakdown of costs is not available in Divert NS's annual report*). A portion of the unredeemed deposits is also distributed to municipalities to help offset the costs of their waste-diversion initiatives. In fiscal 2016-17, a total of more than \$8 million in funding was provided.⁵⁶

Unlike the deposit program, which is funded primarily by consumers, the milk packaging recycling program is 100% industry financed. Through the *Nova Scotia Milk Packaging Stewardship Agreement*, the ADC provides funding to Nova Scotia's solid waste-resource management regions based on the number of milk containers collected for recycling through municipal programs. Municipalities receive compensation based on the average cost to recycle (including collection, processing, education, enforcement, and administration costs) and quantities collected. In 2012, the ADC contributed \$434 per tonne to municipalities for a total of \$681,289. This amount equates to an industry cost of around 1-cent per milk container sold in Nova Scotia. Data for 2016 was not available.

Collection System & Facilities

Nova Scotia residents can return empty beverage containers to one of the 78 Enviro-Depot™ locations around the province for a refund. Residents also have the option of placing empty beverage containers in their blue bag for curbside collection, although doing so will mean they forgo the refund. In these cases, the containers are recovered by non-public buy backs, which are compensated for those containers by either Divert NS (for

non-refillable containers) or the brewers (for refillable bottles). Non-public buy-backs are waste management facilities operated either directly by municipalities or for municipalities under private contract.⁵⁷

At each Enviro-Depot™ and non-public buy back, empty beverage containers (except glass) are stored in large bags or large plastic tubs (for glass only).⁵⁸ Containers are sorted so that each bag or tub contains one material type only, for example, aluminum, plastic, glass, etc. For certain containers, materials undergo additional sorting by colour or size. In Spring 2015, RRFB Nova Scotia reduced the number of required beverage container sorts, and as a result, Enviro-Depots now combine HDPE and clear, colored, and blue PET into one sort.⁵⁹

Divert NS contracts two local carriers to collect and transport the containers to one of four local processing facilities. A compaction trailer is used for dedicated product types (either aluminum only or plastic only), and a dry van trailer is used for mixed loads, including glass. Three of the facilities (Kentville, Sydney, and Kemptown) process all beverage container types, while the other handles non-refillable plastics only. All containers undergo some form of processing, whether it is baling (all container types except for glass), flaking (for either baled or compaction trailer plastic), or crushing (glass only). After processing, Divert NS sells the material to end-markets.

As for refillable beer bottles, these containers can be returned to either the liquor store at which they were purchased or to Enviro-Depots™. Several bottle dealers operate Enviro-Depots and pick up beer bottles from other depot operators. In fact, just over half of the depots are licensed Brewers' bottle dealers. These licensees are paid a handling fee for each container received, but are required to have a truck-load of empties before the brewers will accept them for pick-up. Beer cans are sent directly to Encorp.⁶⁰

Milk packaging is collected separately via municipal curbside recycling programs.

Program Performance

Three hundred and fifty million non-refillable beverage containers were returned to depots in fiscal 2016-2017, for an overall recycling rate of 80.8%. This is a small decrease from the previous year, when the recycling rate was 83.6%. Aluminum beverage cans saw the highest recycling rate (89%), followed by non-refillable glass (86%) and PET/HDPE beverage containers (78%).

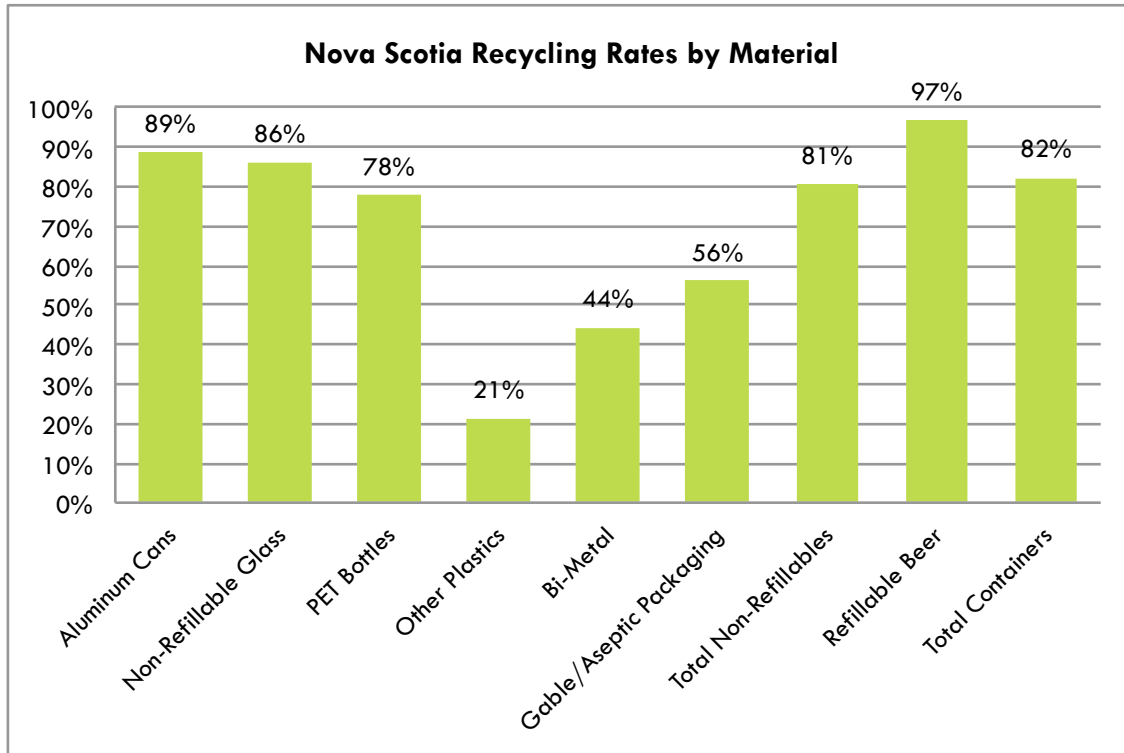


Figure 26 Nova Scotia Recycling Rates by Material (2016)

What's New?

In June 2016, Divert NS installed a quality control machine at the Kemptown processing facility that counts one bag of containers in 10 minutes (220 containers/minute) compared to 45 minutes per bag when counted manually. This piece of equipment has increased productivity significantly and has improved the efficiency and accuracy of Divert NS's quality control program, in which bags are statistically selected for audit prior to pick up and then audited.

Prince Edward Island



Regulatory Framework

In 1973, the government of Prince Edward Island passed the *Litter Control Regulations* (1973) under the *Environmental Protection Act* (1988), which banned the sale of beer in non-refillable containers. In 1984, the ban was extended to all non-refillable soft drink containers. As a result, all carbonated beer and soft drinks for sale in the province were to be packaged in refillable containers.

In late 2007, the law prohibiting the sale of non-refillable soft-drink containers was repealed and deposit-return legislation was enacted in its place. The beverage container program was launched in May 2008 under the provisions of the *General Regulations* and the *Recyclable Beverage Container Deposit Regulations*, and covers all ready-to-drink beverage containers 5L or less (except dairy products, milk substitutes, or nutritional supplements). In addition to defining producer obligations and establishing minimum deposit levels, the Regulations make it illegal to sell beverage containers that are connected by plastic rings or any other connecting device, unless it is biodegradable or photodegradable.

Performance Targets

The legislation does not specify any targets for the program.

Who is Responsible?

PEI's DRS is overseen and administered by the province's Department of Communities, Land, and Environment (previously known as the Department of Environment, Energy, and Forestry).

All beverage distributors are obliged to register each product sold or distributed into the province by completing a registration form. The form must indicate the return for refund message, the product name, and the type and size of container. Distributors must also indicate how they plan to recover empty beverage containers from beverage container depots, and to list the facilities used for refilling or recycling their empty containers.

Program Financing

PEI's beverage container program operates in a similar way to that of the other Atlantic provinces in that it is a "half-back" system. Under this system, a consumer that purchases a non-refillable beverage container and pays a deposit of 10-cents (for non-alcohol containers 5L or less or alcohol containers 500ml or less) or 20-cents (for alcohol containers larger than 500ml) will only receive half of that money back when they return the container for recycling. The only exception to this half-back system is the refillable domestic beer bottle. Consumers who return these containers for recycling are eligible for a full refund of their initial deposit (\$1.20 per dozen).

Together, 50% of the revenues generated from the non-refunded portion of the deposit, as well as from unredeemed deposits, is used to fund environmental projects carried out by the provincial government, such as watershed protection and pollution prevention. The other 50% is used to cover system costs.

In 2016-2017, the total cost to operate PEI's deposit program was \$5.6 million. In addition to expenses related to administration, transportation, and processing, this cost includes the handling fees paid to depot operators as compensation for handling returned beverage containers. As of 2017, the handling fee for empty beverage containers (except for refillable beer containers) was 4.13 cents per unit. In fiscal year 2016-2017, just under \$2.2 million in handling fees were paid out (38% of total program costs).

If there are funds that remain after all program costs are paid, the surplus goes towards solid waste management and/or environmental programs in PEI. The program's surplus in 2016-2017 was \$1.6 million.

The collection and recycling of milk packaging is part of the Island's Waste Watch program and is financed by the provincial government.

Collection System & Facilities

Residents can return their empty beverage containers to any one of 11 privately run depots located throughout the province. The collection, sorting, transportation, and processing of containers is contracted out to a local private supplier. A computerized inventory control system is used to track containers from the point of consumer refund, through processing and material sales.

Milk packaging and other containers that do not fall under the Regulations (i.e. food containers) are collected separately through the Island Waste Management Corporation (IWMC)'s Waste Watch Program, a mandatory curbside recycling program available to all residents. The program requires all residents, visitors, and businesses in PEI to separate the waste they produce into three streams: recyclables, compost, and waste.

Program Performance

In fiscal 2016-2017, PEI had a non-refillable container recycling rate of 80% and a total container recycling rate of 82%. This is effectively unchanged since 2010.

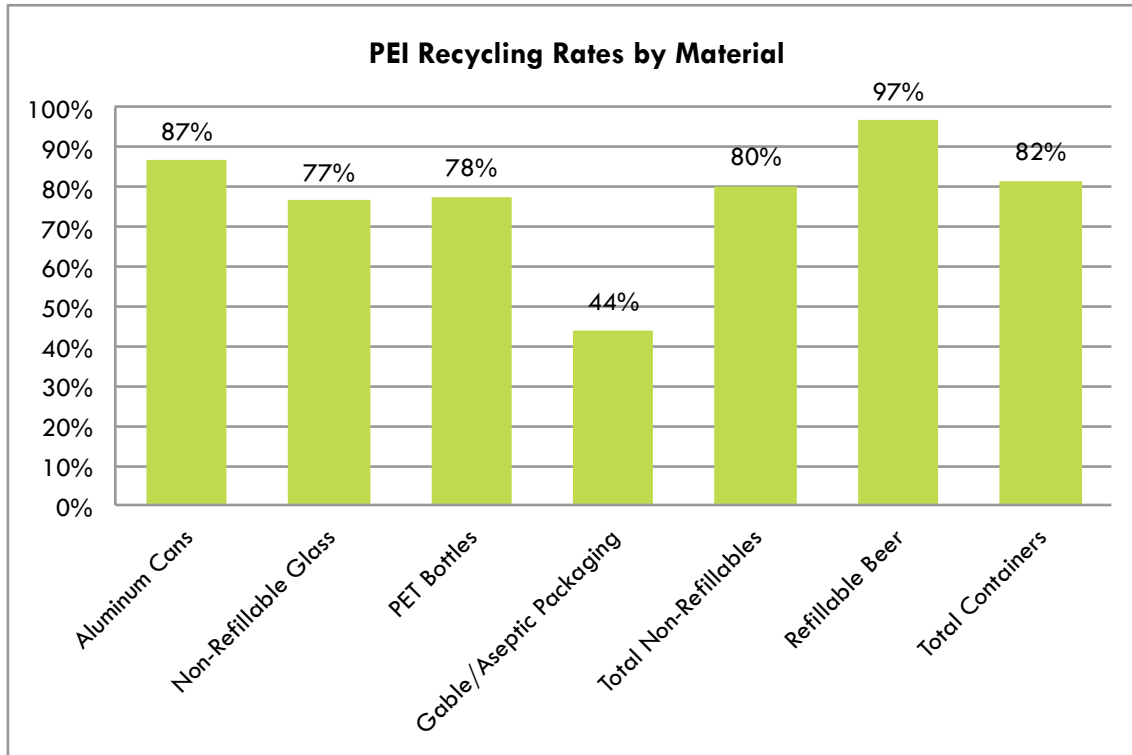


Figure 27 Prince Edward Island Recycling Rates by Material (2016)

Newfoundland and Labrador



Regulatory Framework

Newfoundland and Labrador's DRS was established in 1997 by the province's *Beverage Container Control Regulations* (1996), enacted under the *Packaging Material Act* (1996). These regulations established an Environmental Trust Fund and gave regulatory authority to the Multi Materials Stewardship Board (MMSB) to operate the program.

In 2003, in order to allow for the development of other stewardship programs beyond beverage containers, the province repealed and replaced these regulations with the *Waste Management Regulations* (2003), made under the *Environmental Protection Act* (2002). Part 1 of the Regulations sets out the composition and duties of the MMSB, and also continues the Waste Management Trust Fund established under section 4 of the *Beverage Container Regulations*. Part 2 defines the program's scope, the minimum deposit/refund amounts to be applied, and the responsibilities of beverage distributors. It also prohibits the sale of any beverage container that is not refillable or recyclable.

The *Waste Management Regulations* apply to all ready-to-drink beverage containers sold or distributed in Newfoundland and Labrador that are 5L or less, with the exception of milk and milk substitutes, infant formula, meal replacements, and concentrated products. Refillable beer bottles (including domestic beer) are also exempt.

Performance Targets

The government's Provincial Solid Waste Management Strategy (2002) establishes the goal to divert 50% of solid waste from disposal in landfills. The target date for meeting this goal is the year 2020.⁶¹ Although MMSB has stated that it will work towards this target, it has not set any specific goals for the beverage container program as there are no specific targets set out in the Act or regulations.

Who is Responsible?

Newfoundland and Labrador's beverage container program is administered by the MMSB. Established in 1996, the MMSB is a provincial Crown agency that reports to the Minister of Municipal Affairs and Environment. MMSB's mandate is threefold: 1) develop/manage province-wide waste reduction and recycling programs, 2) develop/implement public education and awareness programs, and 3) utilize the Waste Management Trust Fund to support the implementation of the province's waste strategy. To deliver its mandate, MMSB works in partnership with stakeholders such as regional waste management authorities, municipalities, and third-party service providers such as Green Depot operators. The organization is governed by a Board of Directors, which consists of members representing industry, consumer stakeholder organizations, and the provincial government.

Aside from the MMSB, the *Waste Management Regulations* impose obligations on beverage distributors, retailers, and Green Depots. For example, distributors and retailers are required to register with and remit deposits to MMSB on a regular basis. Green Depots are required to register with MMSB and to operate within

the terms and conditions of their permit. This includes accepting used beverage containers from consumers and paying out refunds.

Program Financing

The MMSB is a self-financed agency that does not receive any direct funding from the government. The program is financed nearly 100% through consumer-based deposits on beverage containers (collected through distributors).

Newfoundland's DRS is similar to that of other Atlantic provinces, but is not exactly a "half-back" model. Consumers pay an 8-cent deposit when purchasing a designated beverage container and receive a refund of 5-cents when they return it for recycling. The deposit/refund is the same for beer cans, imported beer bottles, and alcoholic miniatures. For all other alcoholic beverage containers, consumers pay a 20-cent deposit and get a 10-cent refund (half-back).

Part of the revenue generated from the non-refunded portion of the deposit (3-cents for non-alcohol containers and 10-cents for alcohol containers) is used to cover program costs. Other sources of revenue include unredeemed deposits (\$22.8 million in fiscal 2016-17) and the proceeds from the sale of recovered material (\$2.1 million in fiscal 2016-17). Funds that remain after program costs are paid are placed in the province's Waste Management Trust Fund, where they are used to support the implementation of the Provincial Solid Waste Management Strategy.

The total cost to operate the beverage container program in fiscal 2016-2017 was \$20.8 million (\$20.9 million in 2015-2016). Handling fees alone totaled over \$7 million (MMSB pays depot operators 4.25-cents⁶² per container as compensation for collecting, sorting, and handling used containers). A further breakdown of costs by cost category (i.e. administration, processing, etc.) is not available, as this information is not provided in MMSB's annual report.

Collection System & Facilities

Deposit-bearing containers are collected through a network of privately owned and operated Green Depots, all of which are licensed by the MMSB. In 2016-2017, there were a total of 56 Green Depots located throughout the province (40 main depots, 16 sub depots, and 20 mobile collection services). When dropping off containers, customers have the option of signing up for an Xpress account, which allows them to drop their bags and go. Within five business days of being dropped off, their bags are processed and the refund is deposited into their Xpress account. As of January 2018, 30% of all transactions and 20% of all redeemed containers go through the Xpress system.⁶³

After the containers are sorted at the depots, they are transported to a processing facility where they are prepared for shipment to end-markets. Plastic is sent to a recycling plant in Amherst, Nova Scotia, where they are ground into chips that are used to make packaging and new plastic containers. Glass is sent to a recycling plant in New Brunswick, where it is crushed into cullet and then sold to markets in Canada and the US for the production of new glass bottles. Tetra and gable top containers are sent to a recycling plant in Hantsport, Nova Scotia, where the material undergoes a pulping process. The paper fibre, which makes up the majority of these containers, is made into boxboard. Aluminum cans are transported to a facility in New York where they are used in the production of new aluminum cans. Steel cans are sent to a local facility in St-John's where the steel is loaded onto trucks with other reclaimed steel and sent to markets through North America to be used in new steel products.

Because local brewers operate their own DRS, consumers must return domestic beer bottles (such as Labatt, Molson and Quidi Vidi) to a beer retailer or to a Brewers Bottle Depot if they want a refund of their deposit. Wholesalers are paid a handling fee for the empties, which are picked up at the retailer (corner stores and BRI outlets). These containers are returned to the brewers for washing and refill.

While some Green Depots may also accept domestic beer bottles for recycling, this is considered an added-service. MMSB does not pay them a handling fee to collect these containers, and so the amount of the refund might be reduced in order to cover these costs.

Program Performance

In 2016-2017, 177 million non-refillable containers were collected and recycled through MMSB's used beverage container recycling program, for a recycling rate of 62% (the same rate as 2014-2015). Although these are generally very low rates for a deposit program, Newfoundland and Labrador's low population density make it challenging to offer citizens quality access to recycling.

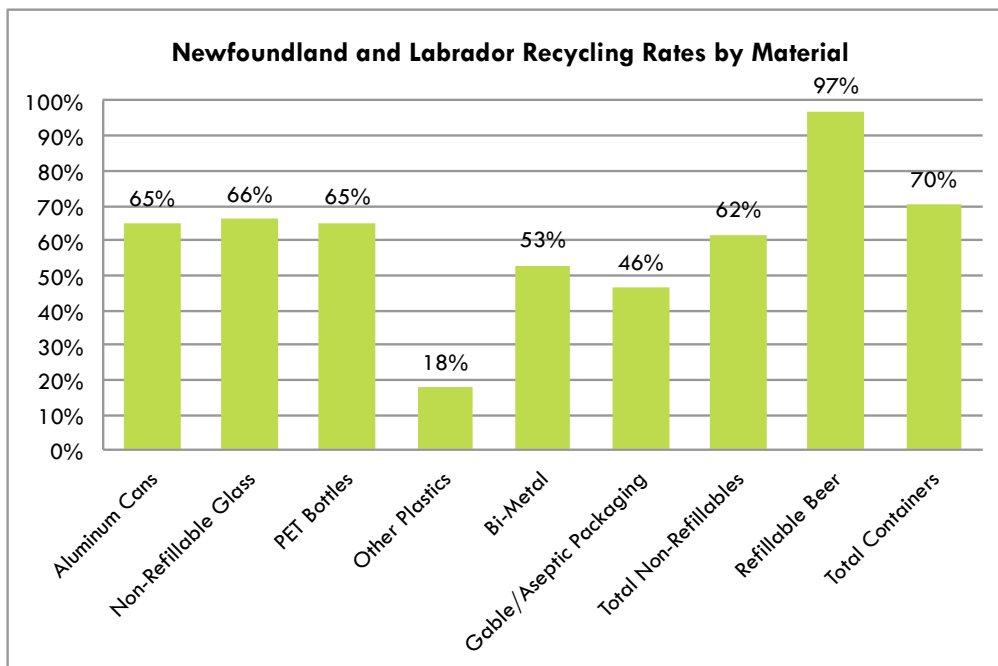


Figure 28 Newfoundland and Labrador Recycling Rates by Material (2016)

What's New?

Cups for Ca\$h

From May 1 to 27, 2017, the Newfoundland city of Corner Brook ran a *Cups for Ca\$h* campaign, aimed at encouraging people to pick up littered coffee cups around the city in exchange for 5-cents/cup. As an extra incentive, the city scattered four "surprise cups" around the city. Anyone who found and returned one of these specially marked cups could get an extra \$100. By May 27, members of the public cashed in a total of 45,000 paper cups in return for \$2,326.⁶⁴ The campaign was financed by corporate sponsors and not by the city.

Yukon



Regulatory Framework

Yukon's beverage container recycling program is regulated under the *Beverage Container Regulation* (1992) and *Recycling Fund Regulation* (1992) enacted under the *Environment Act* (1992).

When it was first passed in 1992, the *Beverage Container Regulation* applied only to aluminum cans and refillable beer bottles. Since then, it has undergone several amendments to expand the program's scope, including one in 1996 to include glass and plastic containers, and one in 1998 to

include tin and tetra pak containers. The last major amendment to the Regulation came into effect in August 2017 when containers for milk and milk substitutes were added to the program. As a result of this expansion, every beverage container sold or distributed in the Yukon is now part of the deposit system.

Performance Targets

There are no legislated targets for this program.

Who is Responsible?

Environment Yukon is responsible for enforcing the two regulations, while the Department of Community Services is responsible for managing the program. This is in contrast to most other beverage container programs, which are run and administered by non-profit organizations.

Distributors of designated beverages in Yukon must register with Environment Yukon and are required to submit sales and returns data to the Department of Community Services on a monthly basis.

Deposits/surcharges must also be remitted. There is also an obligation for depot operators to obtain a permit from the Department of Community Services in order to collect empty beverage containers from consumers.

Program Financing

The *Beverage Container Regulation* applies surcharges and refunds on beverage containers. There are two separate product categories that define the surcharge/refund that consumers pay and get back when returning an empty container for recycling. Beverage containers less than 750ml have a 10-cent surcharge with a 5-cent refund, and beverage containers of exactly 750ml or more come with a 35-cent surcharge and a 25-cent refund. As of August 1, 2017, containers for milk and milk substitutes also have the under 750ml surcharge added to them at checkout.

The money collected from the non-refundable portion of the surcharge is collected by the retailer and remitted to the territory's recycling fund. Unredeemed deposits also go into this fund. The recycling fund is administered by Yukon's Department of Community Services and is used entirely to support recycling activities. The fund is also used to promote container returns (e.g. the Yukon Recycling Club), make improvements to recycling facilities and depots, and pay staff wages.

In Yukon, the exact costs to run the program are unavailable. They include the cost of handling fees paid to recycling depots, as well as a monthly operating allowance that they receive. Processing and handling fees are

also paid to registered processors for each container received. Depending on the beverage container type, the non-refundable portion of the surcharge covers 40 to 96% of the cost of recycling.⁶⁵ The remainder is covered by territorial and municipal governments, which pay recyclers diversion credits to make up the difference.⁶⁶

Collection System & Facilities

Yukon residents can return their empty beverage containers to 22 recycling depots located throughout the territory. The depots are operated by individuals, private businesses, or non-profit organizations. At the depots, containers are sorted and placed in bags or boxes, and then transported to one of two processing facilities in the city of Whitehorse: Raven Recycling and P&M Recycling. From there, containers are processed and shipped south to various end-markets for recycling.

Program Performance

A breakdown of performance by container type is not available due to lack of data, but in 2016, the government of Yukon published that the program had an overall recycling rate of 82%.

What's New?

Changes to Beverage Container Regulation

As of August 1, 2017, the *Beverage Container Regulations* include containers for milk and milk substitutes, making Yukon one of the last jurisdictions in Canada to bring milk into its program. The new regulations also simplify beverage container refunds. There are only two main categories now, and it's based on size: less than 750ml and 750ml or more. In the old regulations, the higher surcharge was applied on containers of 1L or more. The old regulations also had different surcharge amounts for alcohol and non-alcohol containers; this designation has now been eliminated.

Northwest Territories



Regulatory Framework

Created in 2005, the Northwest Territories' (NT) beverage container program is regulated under the *Beverage Container Regulations* (2005) made under the *Waste Reduction and Recovery Act* (2003). These Regulations cover all ready-to-serve beverage containers sold or distributed in the NT, including soft drinks, energy drinks, water, juice, and alcohol containers, but not including power milk and infant formula. Milk containers (30ml or greater) were added to the program in February 2010.

Amended Regulations came into effect on February 1, 2016. These changes are intended to make the program simpler and more effective by simplifying container categories and increasing container handling fees. The amended regulations also include additional tools to enforce compliance. (Further detail is provided in the *What's New* section).

The Environment Fund, into which all surcharges from the beverage container program are paid, is a special purpose fund defined under the *Financial Administration Act*.

Performance Targets

There are no legislated targets for this program.

Who is Responsible?

The Department of Environment and Natural Resources (ENR) is responsible for administering the beverage container program. Its responsibilities include enforcing the Act and the accompanying regulations, coordinating and supporting local depots and regional processing centres, coordinating public information, ensuring continuous improvement of the program, producing an annual report on performance of the program, and undertaking audits of distributors, importers, stores, depots, and processing centres. The ENR also has the authority to create an advisory committee to provide advice and assistance relating to recycling programs established under the Act. This Committee was established in 2004 and consists of beverage distributors, retailers, community governments, the ENR, and the general public.

The *Beverage Container Regulations* also impose requirements on beverage distributors and manufacturers. Under the program, companies importing and distributing beverage containers in the territory are obligated to register with ENR and participate in the program. Distributors are also required to submit reports and remittances to the Environment Fund on a monthly basis, based on the number of containers that they distribute or sell. As of March 31, 2017, there were 24 beverage container distributors registered in the program.

Under the Regulations, retailers that purchase designated beverage containers from anyone that is not a registered distributor must register as a distributor with ENR. Retailers are encouraged to show the surcharge on the sales receipt when they sell ready-to-drink beverages, but are not required to.

Depot operators are responsible for collecting, sorting, and storing empty beverage containers. They pay out refunds to residents and send the containers to a processing centre or south for recycling. In order to operate, beverage container depots must have a licence, which they obtain from the ENR. Almost anyone can apply for a depot operator license, including individuals, businesses, schools, non-profit groups, community councils, and local development corporations. The licenses contain several terms and conditions that depot operators must follow, such as how to keep records and books, as well as minimum operating hours.

Processing centres must accept beverage containers from licensed depots and pay depot operators on a monthly basis for each beverage container received. The payment includes the refunds paid out to consumers as well as the depot's handling fee. Processing centres receive payment from the government, who reimburses them for the amount paid to depots plus their handling fee.

Program Financing

The program is financed through a surcharge applied to each beverage container sold in the territory. Effective February 1, 2016, the total surcharge per container ranges from 15-cents to 38-cents, depending on container type and size.⁶⁷ The surcharge consists of both a refundable deposit and a non-refundable container recycling fee. The surcharge is typically passed from the beverage distributor down to the retailer, who then passes it on to consumers.

Unlike the deposit which is refunded to the consumer when they return the empty beverage container for recycling, the container recycling fee—which makes up approximately 43% of the total surcharge—is placed into the Environment Fund where it is used to help cover program costs. The ENR provides an approximate breakdown of the non-refundable recycling fees as follows:

- 25% - depots and processing centres
- 6% - transportation and storage
- 6% - administration (advertising, P&E, equipment, maintenance, insurance, wages, etc.)
- 4% - contracts (satellite depots, audits, misc. contracts)
- 2% - grants and contribution (depot grants and contributions for operations and upgrades)

Deposits that are not redeemed by consumers also go into the Environment Fund. The Environment Fund is a special purpose fund set up under the *Waste Reduction and Recovery Act* that is separate from the general government account. All expenses incurred for the beverage container program are paid out of this fund. Surplus funds (if available) are used by the government to implement new waste reduction and recovery initiatives.

Collection System & Facilities

As of March 2016, there were 24 locally operated beverage container depots and five temporary satellite depots located throughout NT.⁶⁸ In an effort to reduce customer wait times and increase system efficiencies, Drop and Go service was introduced at two container depots (Yellowknife and Hay River) in August 2015. To use this service, customers register for an account, place their containers in a bag or box, attach a label, and drop them off. Refunds are automatically credited to the customers' accounts within 5 business days, at which time they may visit the depot to collect their cash.

Following collection and sorting, the territorial government pays for the containers to be picked up from the depots and sent to one of three processing centres (Yellowknife, Hay River, and Inuvik) where they are prepared for shipment to end-markets. Aluminum and paper-based containers are shipped to the US. Non-refillable glass and plastic are shipped to Alberta. Plastic jugs are baled and shipped to Alberta.

The collection of domestic refillable beer and cooler glass is not part of the deposit-system, but is carried out under an agreement with Brewers Distributor Ltd. in Edmonton. Under this agreement, refillable glass bottles are returned to breweries in Alberta, where they are washed and refilled an average of 15 times.⁶⁹

Program Performance

In fiscal 2016-2017, over 24 million beverage containers were returned for reuse or recycling, translating into an overall recycling rate of 83%. When broken down by material type, aluminum containers (alcohol and non-alcohol) showed rates of 84%, non-refillable glass 100% (likely explained by an error in categorization at some depots), and plastic containers 84%. Refillable beer also showed a return rate of over 100%.

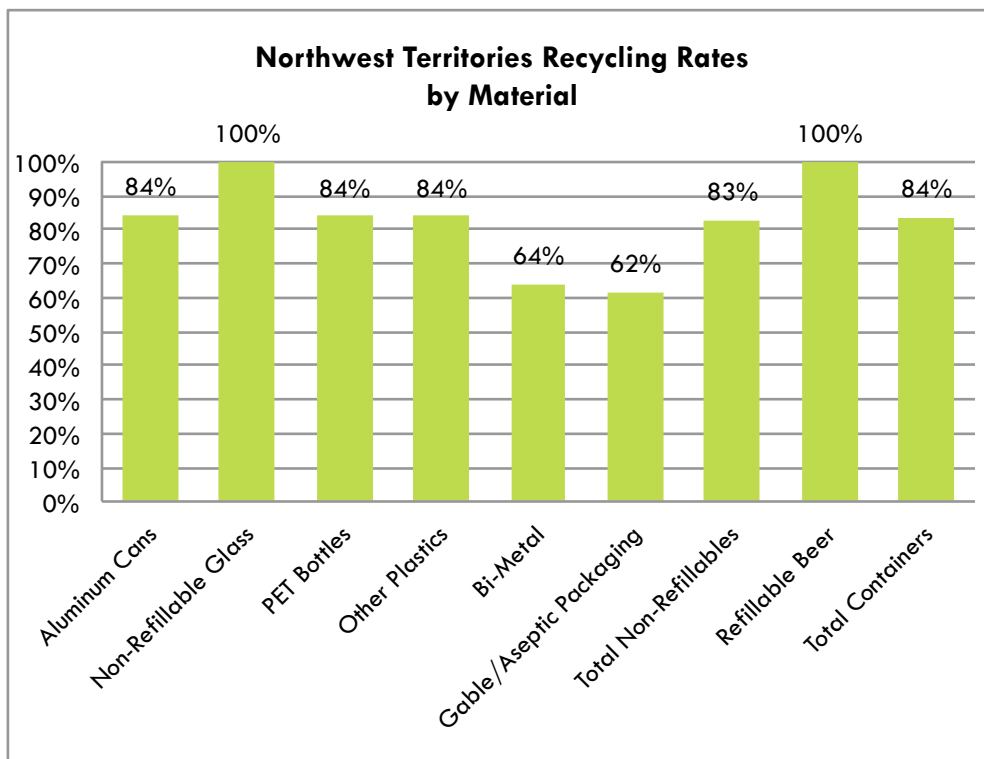


Figure 29 Northwest Territories Recycling Rates by Material (2016)

What's New?

Amended Beverage Container Regulations Come into Effect

On February 1, 2016, amended *Beverage Container Regulations* came into effect. One of the key changes to the program is a net increase to container handling fees. Changes to these fees were necessary in order to allow the program to be self-sustaining. The new Regulations also simplify container categories. In the past, surcharge amounts were based not only on the type and size of the container, but also on the contents, with

alcohol containers being a different category. There are only two main categories now, and it's based on size: up to 1L and more than 1L.

Nunavut



Nunavut's DRS is operated by the Southeast Nunavut Company, which collects and bales liquor bottles and beer cans returned through the Nunavut Liquor Commission.⁷⁰ The Commission charges a deposit on all liquor purchases made in the territory, whether bottle, can, or other, and accepts returned empty liquor containers at its one recycling center in Iqaluit. The Commission reported \$5.78 million in total sales in 2016-2017, the large majority (nearly 90%) of which is sold through Iqaluit.⁷¹ The deposit is 29-cents for spirit and wine containers (bottle or box) and 14-cents for beer and cooler containers (bottle or can).⁷² For each container returned, the recycler retains 4-cents of

the refund, which means that consumers returning spirit and wine containers receive 25-cents back (per container), while those returning beer and cooler containers receive 10-cents back. In 2016-2017, the Commission collected a total of \$213,009 in deposits and paid out \$180,697 in refunds. This translates to a deposit-value based return rate of 84.8% (Note: Because container returns are not tracked by material type or deposit level, it is impossible to calculate a recycling rate for this program). Although this is not an actual return rate, it does show that a substantial amount of the liquor containers sold in Nunavut are recovered.

In addition to the program described above, Nunavut has an unofficial recycling program for aluminum beverage cans. Arctic Co-operatives Limited (ACL). ACL is a service federation that is owned and operated by 31 independently owned and controlled Co-operatives located throughout Nunavut and the Northwest Territories.⁷³ ACL works with each Co-op to provide them with collection bags and boxes, as well as promotional materials. The ACL program is offered in 24 of Nunavut's 25 communities and allows residents to drop off their empty cans at individual co-op stores. There is no need to clean, crush, or count the cans, which makes the program manageable for local Co-ops and community groups to participate.⁷⁴

Although there is no official deposit/refund on these containers, ACL provides \$1,500 to any community-oriented non-profit group for each full shipping container collected (a typical container holds 40,000 cans). This equates to about 4-cents per container. What groups do with the money and how they collect the cans is up to them. Typically, schools and sports teams organize collection drives and use the money towards fundraisers.⁷⁵

Once collected, the containers are transported south for recycling via Nunavut Sealink and Supply, of which ACL is a majority owner. As of May 2013, the program had collected and shipped a total of 19 sealift containers full of aluminum cans out of Nunavut, for a total of approximately 750,000 soda, beer and other beverage cans. Updated data is not available. With regards to financing, some revenue is generated by the proceeds from the sale of the aluminum cans to recyclers. However, this revenue is nowhere near sufficient to cover program costs, and a levy charged on disposable plastic grocery bags is used to cover the rest.⁷⁶

The major challenges to introducing a territory-wide recycling program in Nunavut include infrastructure, transportation, depot management and operations, and the development of recycling legislation.

Part 4: System Financing

Consumer Fees

As with any diversion program, there are costs associated with implementing and operating a DRS for beverage containers. In many jurisdictions, the beverage industry—that is, the producers, manufacturers, and distributors of beverages—pays the bulk of these costs. In Canada, however, our programs have been designed in such a way to minimize or eliminate the industry’s financial obligation by passing on the costs to consumers in the form of a front or back-end fee. Table 6 shows the consumer fees charged in each province and territory, by container type, as of July 2018. Ontario and Quebec do not have consumer fees and are therefore they are excluded from the table.

Table 6 Consumer Fees by Province and Material

| Consumer Fees in Cents per Unit Sold (as of July, 2018) | | | | | | | | | | | | |
|---|-----|-----|-----|-----|----|----|-----------|-----------|-----------|-----------|------|------|
| Province | BC | AB | SK | MB | ON | QC | NS | NB | NL | PE | YT | NT |
| Type of Fee | CRF | CRF | EHC | CRF | - | - | Half-Back | Half-Back | Half-Back | Half-Back | RFF* | CHF* |
| Aluminum Cans | 1 | 1 | 7 | 2 | | | 5 | 5 | 3 | 5 | 5 | 8 |
| PET up to and including 1L | 3 | 2 | 8 | 2 | | | 5 | 5 | 3 | 5 | 5 | 8 |
| PET over 1L | 4 | 10 | 8 | 2 | | | 5 | 5 | 3 | 5 | 10 | 10 |
| PVC or HDPE up to and including 1L | 3 | 2 | 8 | 2 | | | 5 | 5 | 3 | 5 | 5 | 8 |
| PVC or HDPE over 1L | 4 | 10 | 6 | 2 | | | 5 | 5 | 3 | 5 | 10 | 10 |
| HDPE Milk up to and including 1L | | 2 | | | | | | | | | 5 | 8 |
| HDPE Milk over 1L | | 10 | | | | | | | | | 5 | 10 |
| Plastic up to and including 1L | | 2 | 8 | 2 | | | 5 | 5 | 3 | 5 | 5 | 8 |
| Plastic over 1L | | 10 | 8 | 2 | | | 5 | 5 | 3 | 5 | 10 | 10 |
| Polystyrene Cups (with sealed foil lid) | 3 | 2 | | 2 | | | 5 | 5 | 3 | 5 | | |
| Polypropylene up to and including 1L | 3 | 10 | 8 | 2 | | | 5 | 5 | 3 | 5 | 5 | 8 |
| Polypropylene over 1L | 4 | 10 | 8 | 2 | | | 5 | 5 | 3 | 5 | 10 | 10 |
| Pouch up to and including 1L | 0 | 0 | | 2 | | | 5 | 5 | 3 | 5 | | 5 |
| Glass up to and including 1L | 8 | 8 | 9 | 2 | | | 5 | 5 | 3 | 5 | 5 | 13 |
| Glass over 1L | 16 | 9 | 9 | 2 | | | 5 | 5 | 3 | 5 | 10 | 13 |
| Drink box up to and including 500ml | 1 | 4 | 5 | 2 | | | 5 | 5 | 3 | 5 | 5 | 5 |
| Drink box 501ml to 1L | 5 | 4 | 5 | 2 | | | 5 | 5 | 3 | 5 | 5 | 5 |
| Drink box over 1L | | 11 | 5 | 2 | | | 5 | 5 | 3 | 5 | 10 | 10 |
| Gabletop up to and including 500ml | 0 | 2 | 5 | 2 | | | 5 | 5 | 3 | 5 | | 5 |
| Gabletop 501ml to 1L | 0 | 2 | 5 | 2 | | | 5 | 5 | 3 | 5 | | 5 |
| Gabletop over 1L | 6 | 10 | 5 | 2 | | | 5 | 5 | 3 | 5 | | 10 |
| Gabletop Milk up to and including 1L | | 2 | | | | | | | | | | 5 |
| Gabletop Milk over 1L | | 10 | | | | | | | | | | 10 |
| Bi-metal up to and including 1L | 5 | 3 | 7 | 2 | | | 5 | 5 | 3 | 5 | 5 | 5 |
| Bi-metal over 1L | 0 | 0 | 7 | 2 | | | 5 | 5 | 3 | 5 | 10 | 10 |
| Bag-in-the-Box over 1L | 0 | 0 | | 2 | | | 5 | 5 | 3 | 5 | | 10 |
| Wine/Spirits under 500ml | | | | | | | 5 | 5 | 10 | 5 | | |
| Wine/Spirits equal to or greater than 500ml | | | | | | | 5 | 10 | 10 | 10 | | |



category not applicable

material covered under another category

* In NT, the 1 litre container for non-dairy product is included with the over 1 litre containers.

For dairy products, a one-litre container is included with the under 1 litre containers

*In Yukon, the size threshold is 750 ml. All containers of 750ml or more,

regardless of contents or material, are charged 10 cents RFF.

Container Recycling Fee (CRF) in a Deposit-Return System

A Container Recycling Fee (CRF) is non-refundable fee levied on the purchase of certain beverage containers in B.C. and Alberta. It is separate from the deposit and represents the net cost to collect and recycle beverage containers after other revenues (from unredeemed deposits and the sale of recyclable materials) are used. Unlike deposits, the CRF fluctuates annually and varies with the value of the material collected and the collection rate. Containers with high collection rates generate less unredeemed deposit revenue and therefore require a higher CRF. The opposite is true for containers with low collection rates.

As of February 1, 2018, the CRF in B.C. ranges from no charge to 16-cents per unit, depending on the type and size of container. With the exception of glass bottles over 1L, which saw their CRF decrease by 24-cents, the CRF for all other container types increased by 1-cent per unit between 2016 and 2017.⁷⁷

In Alberta, the recycling fee ranges from no charge to 11-cents per unit, with Aseptic containers over 1L having the highest fee. Some containers, including bag-in-a-box over 1L, pouches 0-1L, and bi-metal cans over 1L, do not require a CRF since the revenue they generate from unredeemed deposits is high enough to cover the costs of recycling.

Typically, the CRF is paid by beverage producers and passed down to retailers, who in turn pass it on to consumers. It should be noted, however, that the decisions by producers to pass on the CRF to retailers and by retailers to pass on the CRF to consumers are discretionary. Some retailers may choose not to pass on the CRF or to show it separately so that the consumer can see the charge on their receipt.

Environmental Handling Charge (EHC)

In addition to paying a refundable deposit, consumers who purchase non-refillable, ready-to-serve beverages in Saskatchewan must pay a non-refundable Environmental Handling Charge (EHC), which varies by container type and size. As of April 1, 2018, EHCs range from 5- to 9-cents per unit. These fees are collected by the retailer at the point of purchase and remitted to the Government of Saskatchewan to fund SARCAN Recycling. The province retains surplus EHCs within the General Revenue Fund.

Container Recycling Fee (CRF) as an Industry Imposed Levy

In Manitoba, consumers are charged a 2-cent CRF on non-alcoholic beverage containers. This fee, which is different from the CRF charged in B.C. and Alberta, is collected, monitored, and overseen by CBCRA, and is used to pay for up to 80% of the net costs of municipalities for operating residential recycling programs. It is also used to finance away-from-home recycling initiatives, including the recycling bins and associated signage and P&E material that Recycle Everywhere provides free of charge to municipal, IC&I, and other public space recycling partners across Manitoba. Like other consumer fees, it is common for this fee to be passed on from producers to retailers to consumers.

The Half-Back System

Nova Scotia, New Brunswick, and PEI employ a half-back system. In these systems, only half of the initial deposit paid on the purchase of a non-refillable beverage is refunded to the consumer when the empty container is returned for recycling. Fifty-percent of the non-refunded portion of the deposit—plus revenues generated from commodity sales—is used to pay for program costs, while the remaining 50% typically goes towards provincial waste reduction and recycling initiatives.

Newfoundland and Labrador's deposit system operates in a similar way. For alcohol containers, the refund on a 20-cent deposit is 10-cents. However, for non-alcohol containers (as well as beer cans, importer beer bottles, and alcoholic miniatures), the refund on an 8-cent deposit is only 5-cents. In a true half-back system, consumers would receive 4-cents back; this is not possible due to the elimination of the 1-cent coin in 2013.

Recycling Fund Fee (RFF) and Container Handling Fee (CHF)

The recycling fund fee (RFF) and container handling fee (CHF), which are charged in Yukon and the Northwest Territories, respectively, are modeled after the half-back system in that they refund only a portion of the initial

deposit paid on designated beverage containers. In Yukon, 5-cents is refunded on a 10-cent deposit (true half-back) and 25-cents on a 35-cent deposit. In the Northwest Territories, 10-cents is refunded on a 15-, 18-, 20-, or 23-cent deposit, and 25-cents is refunded on a 35- or 38-cent deposit.

Both the RFF and CHF are remitted to the provincial government who uses the funds to pay for program operation (handling, processing and transportation) and to develop and implement promotional and educational initiatives related to the program. In general, these schemes generate far more revenue than is needed to pay for the system. Surplus revenues are placed into a special fund that is kept separate from general revenues. These funds are used to subsidize municipal curbside recycling programs and other provincial environmental initiatives.

How Have Consumer Fees Changed Over Time?

Only in B.C., Alberta, and Saskatchewan has the fee charged to consumers changed in the last decade-plus that this report has been published. The 2-cent increase that took effect in April 2018 in Saskatchewan was the first increase in that province since we began creating WPW. Unlike in other provinces and territories, the fee in B.C. and Alberta changes because it is based on the net cost of collection and recycling and therefore varies with the rate of collection and value of collected material, among other things.

Table 7 Historic Consumer Fees (2003-2018)

| Historic Consumer Fees (2003-2018) | | | | | | | | | | |
|------------------------------------|----|----|----|----|----|----|----|----|-----|-----|
| Aluminum cans | BC | AB | SK | MB | NS | NB | NL | PE | YT | NT |
| 2003 | 0 | 0 | 5 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2006 | 0 | 0 | 5 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2008 | 0 | 0 | 5 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2010 | 2 | 0 | 5 | 2 | 5 | 5 | 3 | 5 | 5 | 5 |
| 2012 | 1 | 0 | 5 | 2 | 5 | 5 | 3 | 5 | 5 | 5 |
| 2014 | 1 | 0 | 5 | 2 | 5 | 5 | 3 | 5 | 5 | 5 |
| 2016 | 1 | 0 | 5 | 2 | 5 | 5 | 3 | 5 | 5 | 8 |
| 2018 | 1 | 1 | 7 | 2 | 5 | 5 | 3 | 5 | 5 | 8 |
| PET over 1 litre | BC | AB | SK | MB | NS | NB | NL | PE | YT* | NT |
| 2003 | 4 | 7 | 6 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2006 | 4 | 2 | 6 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2008 | 3 | 3 | 6 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2010 | 5 | 6 | 6 | 2 | 5 | 5 | 3 | 5 | 10 | 10 |
| 2012 | 6 | 5 | 6 | 2 | 5 | 5 | 3 | 5 | 10 | 10 |
| 2014 | 6 | 7 | 6 | 2 | 5 | 5 | 3 | 5 | 10 | 10 |
| 2016 | 4 | 10 | 6 | 2 | 5 | 5 | 3 | 5 | 10 | 10 |
| 2018 | 4 | 10 | 8 | 2 | 5 | 5 | 3 | 5 | 10 | 10 |
| PET under 1 litre | BC | AB | SK | MB | NS | NB | NL | PE | YT* | NT |
| 2003 | 1 | 3 | 6 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2006 | 1 | 1 | 6 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2008 | 3 | 2 | 6 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2010 | 4 | 2 | 6 | 2 | 5 | 5 | 3 | 5 | 5 | 5 |
| 2012 | 3 | 0 | 6 | 2 | 5 | 5 | 3 | 5 | 5 | 5 |
| 2014 | 3 | 3 | 6 | 2 | 5 | 5 | 3 | 5 | 5 | 5 |
| 2016 | 3 | 2 | 6 | 2 | 5 | 5 | 3 | 5 | 5 | 8 |
| 2018 | 3 | 2 | 8 | 2 | 5 | 5 | 3 | 5 | 5 | 8 |
| Glass 0-500 ml | BC | AB | SK | MB | NS | NB | NL | PE | YT* | NT |
| 2003 | 3 | 5 | 7 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2006 | 4 | 5 | 7 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2008 | 5 | 3 | 7 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2010 | 10 | 6 | 7 | 2 | 5 | 5 | 3 | 5 | 5 | 10 |
| 2012 | 12 | 6 | 7 | 2 | 5 | 5 | 3 | 5 | 5 | 10 |
| 2014 | 12 | 8 | 7 | 2 | 5 | 5 | 3 | 5 | 10 | 10 |
| 2016 | 9 | 9 | 7 | 2 | 5 | 5 | 3 | 5 | 5 | 13 |
| 2018 | 8 | 8 | 9 | 2 | 5 | 5 | 3 | 5 | 5 | 13 |
| Glass over 1 litre | BC | AB | SK | MB | NS | NB | NL | PE | YT* | NT |
| 2003 | 5 | 8 | 7 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2006 | 5 | 7 | 7 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2008 | 5 | 4 | 7 | 2 | 5 | 5 | 3 | - | n/a | n/a |
| 2010 | 10 | 9 | 7 | 2 | 5 | 5 | 3 | 5 | 10 | 10 |
| 2012 | 20 | 10 | 7 | 2 | 5 | 5 | 3 | 5 | 10 | 10 |
| 2014 | 25 | 11 | 7 | 2 | 5 | 5 | 3 | 5 | 10 | 10 |
| 2016 | 40 | 10 | 7 | 2 | 5 | 5 | 3 | 5 | 10 | 13 |
| 2018 | 16 | 9 | 9 | 2 | 5 | 5 | 3 | 5 | 10 | 13 |

*In Yukon in 2016, the size threshold changed to 750 ml. All containers of 750 or more, regardless of contents or material, are charged 10 cents RFF.

As shown in Figures 30 and 31, consumer fee fluctuations are not uniform across all container types, nor within groups of container types even if they were the same material type. Consider B.C., for example; for glass containers over 1-litre, fees increased from 5-cents to 40-cents per container from 2003 to 2016, but then fall back down to 16 cents in 2018. At the same time, per unit fees for glass containers 0-500ml in size increased from 3-cents to 12-cents per from 2003 to 2012, and back down to 9-cents in 2016, where it remains as of 2018.

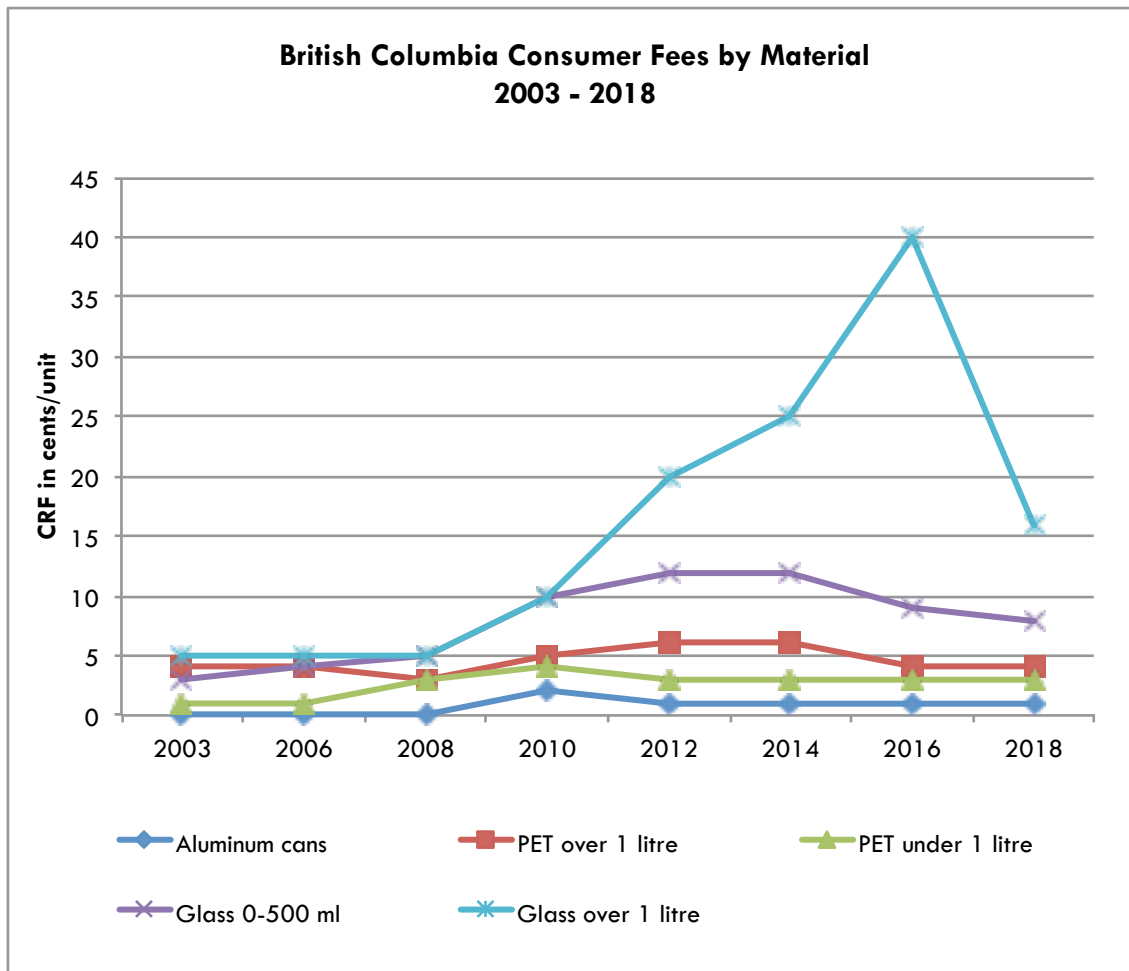


Figure 30 British Columbia Consumer Fees by Material (2003-2018)

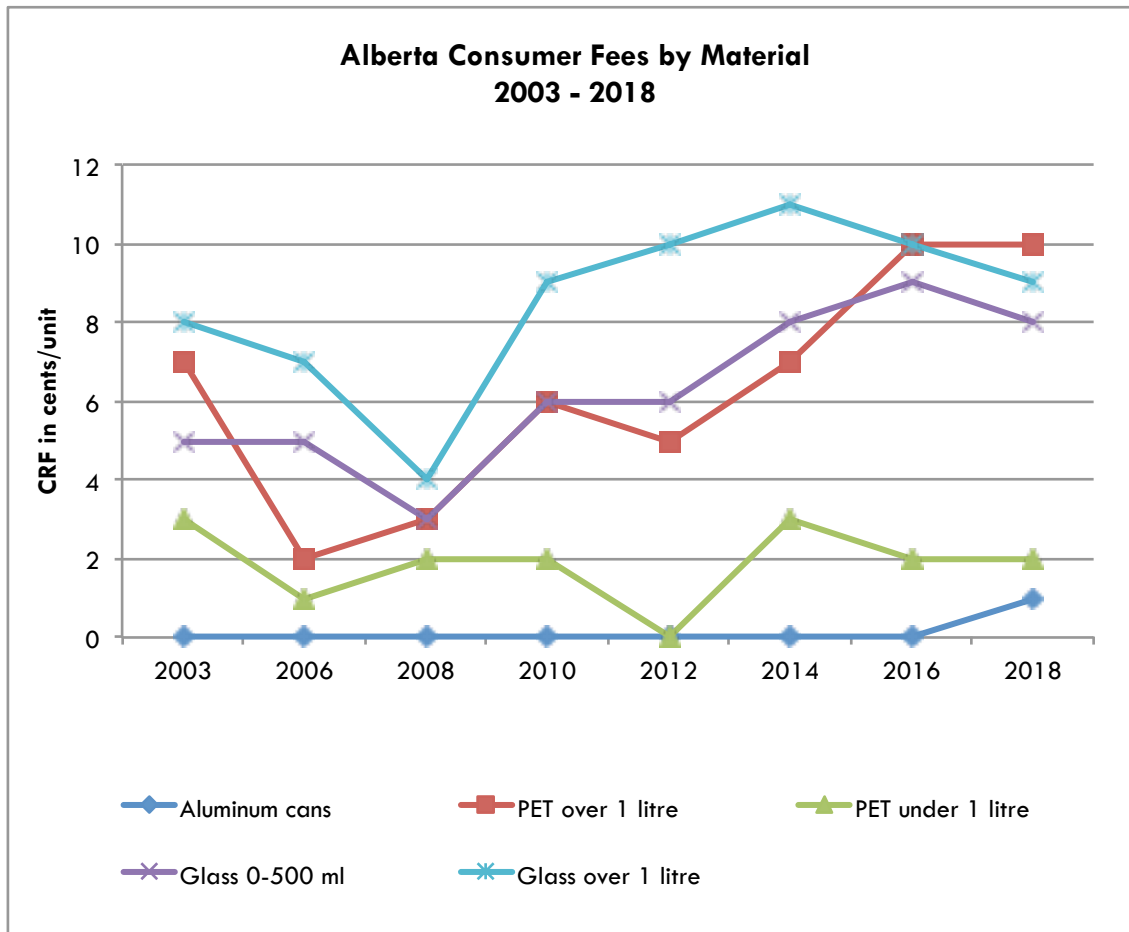


Figure 31 Alberta Consumer Fees by Material (2003-2018)

Deposits

In DRS provinces, retailers are required to collect and remit a deposit from consumers on all applicable beverage containers. Intended to act as an incentive to recycle, a deposit is a small fee that is added to the price of a beverage container at the point of purchase, which is refunded to the consumer when the empty container is returned to an authorized redemption centre or retailer. If the container is not returned, the system keeps the deposit.

In the North and in the Atlantic Provinces, only a portion of the deposit is refunded when a non-refillable container is returned (see section on 'The Half-Back System' above). The portion of the deposit not returned, in addition to any unredeemed deposits, is used to help fund the system and subsidize other provincial environmental initiatives. Typically, these deposits are indicated separately on the sales receipt. They are not a government tax and no funds from the fees are paid to government.

As of November 2017, deposits range from a low of 5-cents to a high of 40-cents per container. Table 8 shows the deposits charged on various types of beverage containers in each province, as well as the refund that is provided to consumers upon return of the container.

Table 8 Deposit and Refund Values by Province and Container Type (as of November 2017)

| Province | BC | AB | SK | MB | ON | QC | NS | NB | NL | PEI | YT | NT |
|-------------------------------------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| Containers ≤ 1L | 5/5 | 10/10 | | | | | | | | | | 10/10 |
| Containers > 1L | 20/20 | 25/25 | | | | | | | | | | 25/25 |
| Containers ≤ 750ml | | | | | | | | | | | 10/5 | |
| Containers > 750ml | | | | | | | | | | | 35/25 | |
| Carbonated beverage containers | | | | | | 5/5 | | | | | | |
| Non-alcohol container | | | | | | | 10/5 | 10/5 | 8/5 | 10/5 | | |
| Metal cans < 1L | | | 10/10 | | | | | | | | 10/5 | |
| Metal cans ≥ 1L | | | 20/20 | | | | | | | | 35/25 | |
| Milk ≤ 1L | | 10/10 | | | | | | | | | | |
| Milk > 1L | | 25/25 | | | | | | | | | | |
| Glass bottles ≤ 300ml | | | 10/10 | | | | | | | | 10/5 | |
| Glass bottles 301ml-999ml | | | 20/20 | | | | | | | | 10/5 | |
| Glass bottles ≥ 1L | | | 40/40 | | | | | | | | 35/25 | |
| Plastic bottles < 1L | | | 10/10 | | | | | | | | 10/5 | |
| Plastic bottles ≥ 1L | | | 20/20 | | | | | | | | 35/25 | |
| Juice box & gabletop | | | 5/5 | | | | | | | | | |
| Tetra Pak & Gabletop < 1L | | | | | | | | | | | 10/5 | |
| Tetra Pak & Gable Top ≥ 1L | | | | | | | | | | | 35/25 | |
| Wine & spirit containers ≤ 500ml | 10/10 | 10/10 | | | | | 10/5 | 10/5 | 20/10 | 10/5 | | |
| Wine & spirit containers 501ml-1L | 10/10 | 10/10 | | | | | 20/10 | 20/10 | 20/10 | 20/10 | | |
| Wine & spirit containers > 1L | 20/20 | 25/25 | | | | | 20/10 | 20/10 | 20/10 | 20/10 | | |
| Wine & spirit containers ≤ 630ml | | | | | 10/10 | | | | | | | |
| Wine & spirit containers > 630ml | | | | | 20/20 | | | | | | | |
| Non-refillable beer ≤ 1L | 10/10 | 10/10 | | 10/10 | 10/10 | | | 10/5 | 10/5 | 10/5 | | |
| Non-refillable beer > 1L | 20/20 | 25/25 | | 20/20* | 20/20 | | | 20/10 | 20/10 | 20/10 | | |
| Non-refillable beer ≤ 500ml (in NS) | | | | | | | 10/5 | | | | | |
| Non-refillable beer > 500ml (in NS) | | | | | | | 20/10 | | | | | |
| Non-refillable beer ≤ 450ml (QC) | | | | | | 5/5 | | | | | | |
| Non-refillable beer > 450ml (QC) | | | | | | 20/20 | | | | | | |
| Refillable beer bottles | 10/10 | 10/10 | 10/5* | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 | 10/5* | 10/10 | 10/10 | 10/10 |

* In SK and NL, 5-cents is retained by bottle depots in lieu of an official handling fee.

*In MB, the 20-cent deposit/refund only applies to containers 2L or larger. All containers less than 2L carry a 10-cent deposit/refund.

Effect of Inflation on Deposit Values

An important issue to consider when setting deposit and refund rates is the effect of inflation. In order to maintain the incentive to return containers, deposit amounts should be increased periodically, in line with inflation; otherwise, the value of the refund relative to the purchase price of a beverage will eventually decrease to a point where is little to no incentive to recycle. Adjusting for inflation is also important for program operators who rely on unredeemed deposits to finance some of the costs of managing, processing, and transporting recyclables, which have increased significantly over the years.

Despite this and strong evidence that the size of deposits affects the return rate of containers, deposit amounts have remained unchanged in most provinces. Consider British Columbia, for example. The nickel refund on carbonated soft drinks and beer containers that was introduced in 1970 would be equal to about 33-cents in buying power in 2018, according to the Bank of Canada's inflation calculator. This means that if adjusted for inflation, a \$1.98 deposit should be tacked on to a six-pack of beer instead of the 30-cents that is currently charged.

Some provinces, like Alberta, have recognized this problem and have sought to address it. In 2008, the province raised the deposits on all beverage containers, including milk, to 10-cents (from 5-cents) for containers 1L and under and 25-cents (up from 20-cents) for container greater than 1L. After just three years, the collection rate for the primary container types increased by approximately 13%. More recently, in April 2017, Saskatchewan increased the refundable deposit for certain sizes of metal, plastic, paper-based cartons and aseptic containers from 5- to 10-cents and 20- to 25-cents. This was the first change to deposit amounts since 1992.

Container Handling Fees

DRSs offer container handling fees (CHFs), an amount paid to retailers or redemption centers (depot or retail) by bottlers and distributors as compensation for collecting, sorting, and packaging empty beverage containers to be taken back to the bottler or distributor. On a long-term basis, CHFs also cover expenses related to investments in reverse vending machines (RVMs), electricity costs, space requirements, and additional personnel required to handle the containers.

Like deposits, CHFs can vary by container type. They can also vary based on the type of facility that receives the containers (i.e. a redemption center or retailer), whether containers are commingled or compacted, and whether collection is done manually or automatically using RVMs.

Table 9 presents CHFs by province and container type. Shaded areas of the table represent container categories that are not applicable to that particular province. It is important to note that in B.C., handling fees paid to grocers are privately negotiated and proprietary, and so are not publicly available. The fees shown for B.C. are from 2016 and are those awarded to depots only.

Table 9 Handling Fees by Province and Container Type (as of January 2018)

| Handling fees in cents per unit recovered (as of January 2018) | | | | | | | | | | | |
|---|----------|-------|------------|------|------|-------|------|-------|------|------|------|
| Province | BC | AB | SK[3] | MB | QC | NS | NB | NL | PEI | YT | NT |
| Aluminum Cans | 3.37 | 3.24 | | | 2.00 | 4.27 | 4.06 | 4.25 | 4.13 | 2.50 | 2.20 |
| PET up to 1L | 5.07 | 4.82 | | | 2.00 | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 2.20 |
| PET over 1L | 7.89 | 10.56 | | | 2.00 | 4.27 | 4.06 | 4.25 | 4.13 | 7.50 | 4.50 |
| PVC up to 1L | 5.07 | 5.76 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 2.20 |
| PVC over 1L | 7.89 | 11.81 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 7.50 | 4.50 |
| HDPE up to 1L | 5.07 | 5.76 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 2.20 |
| HDPE over 1L | 7.89 | 12.77 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 7.50 | 4.50 |
| Polypropylene up to 1 L | 5.07 | 5.76 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 2.20 |
| Polypropylene over 1 L | 7.89 | 11.81 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 7.50 | 4.50 |
| Sealed Polystyrene Cups | | | | | | | | | | | |
| Polystyrene up to 1L | 5.07 | 5.76 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 2.20 |
| Polystyrene over 1L | 7.89 | 11.81 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 7.50 | 4.50 |
| Pouch (Up to 1L in AL) | 4.49 | 4.93 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 2.20 |
| Plastic up to 500ml | 5.07 | | | | | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 2.20 |
| Plastic 501ml to 1L | 5.07 | | | | | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 2.20 |
| Plastic over 1L | 7.89 | | | | | 4.27 | 4.06 | 4.25 | 4.13 | 7.50 | 4.50 |
| Glass bottles up to 1L | 6.77 | 7.96 | | | 2.00 | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 3.50 |
| Glass bottles over 1L | 7.89 | 12.88 | | | 2.00 | 4.27 | 4.06 | 4.25 | 4.13 | 7.50 | 3.50 |
| Drink box up to 500ml | 5.08 | 5.32 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 2.20 |
| Drink box 501ml to 1L | 5.98 | 5.32 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 2.20 |
| Drink box over 1L | | 15.36 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 7.50 | 4.50 |
| Gabletop up to 1L | 6.77 | 6.38 | | | | 4.27 | 4.06 | 4.25 | 4.13 | | 2.20 |
| Gabletop over 1L | 11.03 | 12.88 | | | | 4.27 | 4.06 | 4.25 | 4.13 | | 4.50 |
| Bag in the Box over 1L | 11.27 | 23.85 | | | | 4.27 | 4.06 | 4.25 | 4.13 | | 3.50 |
| Bi-metal up to 1L | 5.08 | 7.56 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 2.20 |
| Bi-metal over 1L | 11.27 | 13.35 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 7.50 | 4.50 |
| Imported beer bottles | 5.08 | 7.96 | | | | 4.27 | 4.06 | 4.25 | 4.13 | 4.00 | 3.50 |
| Liquor and wine ceramic | | | | | | 4.27 | 4.06 | 4.25 | 4.13 | | |
| Sleeman bottles | | 7.10 | | | | 4.27 | 4.06 | 4.25 | 4.13 | | |
| Moosehead Green Bottle | | | | | | 2.57 | | | | | |
| Refillable Beer (ISB) | [1] | 4.83 | 2,6 [4] | 2.67 | 0.50 | 2.74 | 2.90 | 5 [4] | 2.81 | 2.50 | |
| Beer Cans | | 3.24 | | 2.04 | | | | | | | |
| Milk up to 1 litre | | | | | | | | | | | 2.00 |
| Milk over 1 litre | | | | | | | | | | | 3.50 |
| Milk jugs | [2]~2.7 | | \$420/t[5] | | | \$407 | | | | | |
| Milk cartons | [2]~4.09 | | \$150/t | | | tonne | | | | | |
| Container included in another category | | | | | | | | | | | |
| Category not applicable | | | | | | | | | | | |
| [1] In BC bottle depots independently negotiate handling fees directly with the beer industry. | | | | | | | | | | | |
| [2] About 166 Depots in BC are paid a handling fee for collecting milk jugs and carton. The fee shown in the table is based on 60 units per bag. | | | | | | | | | | | |
| [3] Saskatchewan does not charge handling fees. SARCAN depots are paid a contracted rate per year, which is generated through the Environmental Handling Charge (EHC). | | | | | | | | | | | |
| [4] In Saskatchewan and Newfoundland a handling fee charged on refillable beer is charged at the back-end from the refund. In SK it is 5 cents at Sarcen depots and 2 cents at SLGA stores who also receive an additional subsidy of 2.6 cents per ISB bottle from BDL. In NL it is 5 cents | | | | | | | | | | | |
| [5] In SK, a variable rate paid to recyclers for milk jugs is based on 80% of the salvage value for that month . | | | | | | | | | | | |

How Have Handling Fees Changed Over Time?

In the western provinces, where fees are pegged to the actual cost to recycle the material, fees have fluctuated up or down depending on the material and size of the container. The handling fee paid to depots for the most inexpensive to recycle container, the aluminum can, has increased very slightly from 2004 to 2016, from 3-cents to 3.37-cents in B.C., and from 2.8 cents to 3.24 cents in Alberta. Rates have also increased every year or every other year for each material and size in BC. In Alberta, the fee rates for PET and small glass containers dropped in 2008 but increased again after 2010.

In Québec, CHF's have remained constant at 2-cents for all legislated containers since the program began. The Yukon and Northwest Territories have also kept the same CHF's since the start of their programs.

In the Atlantic provinces, CHF's increased slightly every year or every other year. Specifically, in the years 2004-2016 fees in Nova Scotia increased from 3.1-cents to 4.3-cents, while New Brunswick's fees have gone from 3.3-cents to 4.06-cents. In Newfoundland and Labrador and Prince Edward Island, CHF's increased from 3-cents and 3.6-cents, to 4.25-cents and 4.05-cents, respectively over that 12-year period.

Figure 32 below shows fluctuations in the average handling fee paid per unit by province from 2004-2016.

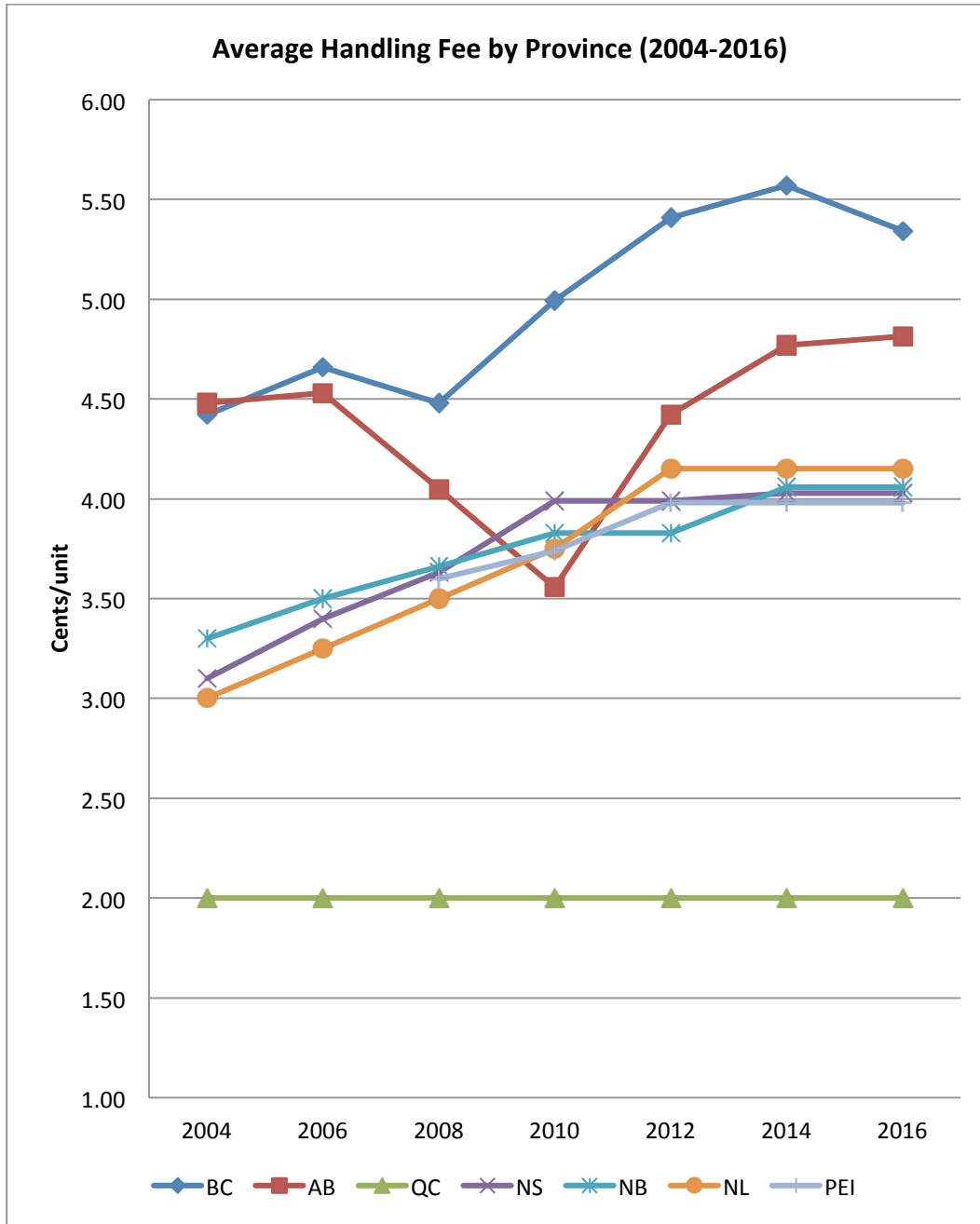


Figure 32 Average Handling Fee by Province (Per Unit) (2004-2016)

Beverage Container Packaging Fees

As of 2017, five Canadian provinces (B.C., Saskatchewan, Manitoba, Ontario, and Quebec) have passed mandatory EPR legislation that obligates the packaging industry to take back the packaging they place on the market. This legislation shifts the responsibility for financing packaging reuse, recycling, or recovery to the packaging industry and away from municipalities and taxpayers. Table 10 presents the percentage of funding of net costs that producers pay into each program. The legislation in B.C. and Saskatchewan does not cover beverage containers so the numbers for those provinces are not included here.

Table 10 Percentage of Net Costs Paid by Industry in Canada's PPP Programs

| | Manitoba | Ontario | Quebec |
|---|----------|---------|--------|
| Industry Share of Net Costs (%) | 80% | 50%* | 100% |
| *Note: On August 14, 2017, Ontario's Minister of Environment and Climate Change issued a letter directing Stewardship Ontario and the RRPA to prepare an amended Blue Box Program Plan (BBPP) by February 15, 2018. The amended plan will increase the obligation for brand owners and importers from 50% to 100%. Although details of when the shift to full producer responsibility for recycling costs have not been announced, it is likely to occur beginning in 2019. | | | |

In each province with a legislated EPR program, the responsible agency (i.e. MMSM, Stewardship Ontario, and ÉEQ) collects fees from “stewards” (first importers, manufacturers, or brand owners) based on the amount of packaging their products contribute to the province's waste and recycling stream. Specific packaging or stewardship fees vary from one provincial program to another, and also by material type. Lower performing materials tend to have a proportionally higher share of the costs. As Table 11 shows, the fees can vary widely even within the same material category.

Table 11 Packaging and Printed Paper Stewardship Fees (cents/kilogram) (2018)

| Package Type | Manitoba ⁷⁸ | Ontario ⁷⁹ | Quebec ⁸⁰ |
|-------------------------|------------------------|-----------------------|----------------------|
| Aluminum | -42.86 | 3.33 | 16.866 |
| PET | 36.05 | 15.97 | 27.441 |
| HDPE | 26.08 | 11.89 | 10.719 |
| Other Plastics | 49.89 | 33.01 | 27.757 |
| Glass (clear) | 6.10 | 3.77 | 16.832 |
| Glass (coloured) | 6.10 | 6.16 | 16.836 |
| Steel / Bi-metal | 14.87 | 6.50 | 16.891 |
| Aseptic cartons | 63.19 | 22.92 | 22.375 |
| Gable top | 63.19 | 22.92 | 18.744 |

The province of Québec requires 100% of eligible net costs to be paid by producers (although it is the municipalities that operate the system). This program began with 50% industry contributions in 2009, and increased to 80% in 2011, 90% in 2012, and finally 100% in 2013. Éco-Entreprises Québec's (ÉEQ) fee rates are developed using an Activity-Based Costing model and are based on the quantity and type of materials generated.⁸¹ The fee structure also takes into account environmental criteria. In 2017, 3,400 contributing companies provided nearly \$150 million annually to finance the program, including the optimization activities carried out by ÉEQ.⁸² (Note: There is another contribution for printed-paper, which is “in-kind” and therefore not reported as a financial contribution.).

In Ontario, the funding model to date, under the now repealed *Waste Diversion Act, 2002*, (WDA) resulted in a 50/50 split of the total municipal program net costs. Under the new legislative framework, the implementation of which is still a provincial work in progress as the Ministry of Environment and Climate Change (MOECC) develops the enabling regulations, a greater (up to 100%) allocation of costs will be borne by producers.

In Manitoba, the net cost of municipal recycling programs is funded 80% by industry. Manitoba's funding model is different to other PPP programs in that it collects a 2-cent CRF from most nonalcoholic beverage distributors, in addition to and separate from regular PPP fees. These fees, which are typically passed down

the recycling chain to consumers, are used to help finance 80% of MMSM's beverage related obligation, in addition to buying recycling bins and promoting the AfH recycling program.

In most Canadian PPP programs, packaging fees are levied on almost all types of containers. One exception is aluminum beverage cans in Québec, most of which are subject to deposits and therefore exempt from the municipal funding program. Only the aluminum used in non-beverage packaging such as tins of cat food, canned fish, foil, and pie plates, is subject to packaging fees. Consequently, aluminum in Québec carries a higher fee than it does in Ontario and Manitoba. Because steward fees depend on material type and weight, per container fees can be calculated when the weight of each unit is known. Table 12 shows 2018 fee rates for various types and sizes of containers that are more commonly found on store shelves.

Table 12 Expression of Fees by Beverage Container Type for Select Containers (cents/unit sold) (2018)

| Package Type | | Weight (g) | MB | ON | QC |
|---|-----------------------------------|--------------|--------------|-------------|--------------|
| <i>Gable top</i> | <i>2-L</i> | <i>63</i> | <i>3.98</i> | <i>1.44</i> | <i>1.18</i> |
| <i>Gable top</i> | <i>1-L</i> | <i>41</i> | <i>2.59</i> | <i>0.94</i> | <i>0.77</i> |
| <i>Gable top</i> | <i>Small</i> | <i>14</i> | <i>0.88</i> | <i>0.32</i> | <i>0.26</i> |
| <i>Aseptic cartons</i> | <i>Small</i> | <i>10.6</i> | <i>0.67</i> | <i>0.24</i> | <i>0.24</i> |
| <i>Bi-metal</i> | <i>Small</i> | <i>46.7</i> | <i>0.69</i> | <i>0.30</i> | <i>0.79</i> |
| <i>Glass</i> | <i>473ml clear bottle</i> | <i>228</i> | <i>1.39</i> | <i>0.86</i> | <i>3.84</i> |
| <i>Glass</i> | <i>>1-L clear liquor</i> | <i>737.2</i> | <i>4.50</i> | <i>2.78</i> | <i>12.41</i> |
| <i>Plastic</i> | <i>2-L PET bottle</i> | <i>58</i> | <i>2.09</i> | <i>0.93</i> | <i>1.59</i> |
| <i>Plastic</i> | <i>Outer milk bag – LDPE film</i> | <i>8</i> | <i>0.40</i> | <i>0.26</i> | <i>0.22</i> |
| <i>Aluminum</i> | <i>355ml can</i> | <i>14</i> | <i>-0.60</i> | <i>0.05</i> | <i>0.24</i> |
| <i>Italicized materials are based on Stewardship Ontario Blue Box Program Plan 2003.</i> | | | | | |
| <i>Non-italicized materials are based on Encorp data.</i> | | | | | |

Overview of System Costs and Revenues

To determine the costs of the various beverage container recycling programs in Canada, CM Consulting relies on data found in financial reports prepared by the agencies and organizations responsible for managing those systems. Typical program costs include collection, transportation, and processing costs, as well as expenses relating to administration and promotion and education. Revenues generally come from a combination of sources, including commodity sales, unredeemed container deposits, and consumer fees.

Factors Impacting Program Costs

Many factors can affect program costs, such as the collection rate, convenience level (i.e. collection frequency, number of depots, etc.), program scope, and population density. No program in Canada operates within the same parameters, which is why the costs of provincial programs should not be directly compared.

To illustrate this point, consider the provinces of Manitoba, Ontario, and Quebec. While each of these programs may be less expensive to operate than DRs, they are also less effective and collect fewer containers per capita. Ontario and Quebec are also two of the most populated provinces, which means they can benefit from economies of scale. What is unknown in all three of these provinces is the cost of the away-from-home (AfH) collection programs, which are likely significant. These costs need to be considered in any comparison of

financial performance, as well as the incremental costs that would be incurred to achieve higher collection and recycling rates.

Another factor that can impact the financial performance of a program is the amount of revenue generated from material sales. Material sales revenue, which plays an important role in helping to offset the gross costs of the program, will vary depending on the current market value of the materials collected, as well as on the types of containers collected and their respective collection rates. This, in turn, is influenced by the deposit level and the types of containers that are subject to deposit.

In Alberta, where the DRS covers all material container types (excluding those for domestic beer), sales revenues covered 24% of total program costs. In Ontario, where only wine, spirits, and beer containers are included under deposit-return, the amount of revenue generated from material sales as a percentage of total system costs is lower. This is attributable to the fact that over 95% of material collected is glass bottles, which are worth significantly less than the materials that typical DRSs manage. Conversely, Québec's DRS for non-refillable containers manages mostly PET and aluminum cans (which have a higher re-sale value), with only a minor amount of material coming from the non-refillable glass bottles used for beer or for non-carbonated juices.

The Role of Surplus

As discussed in the financing section of this report, some provincial programs (e.g. Saskatchewan, Nova Scotia, New Brunswick, Newfoundland and Labrador, Northwest Territories) charge consumer fees on beverage containers as a means of generating additional revenue. Although part of this revenue may be used to offset program costs, it is sometimes used to subsidize other provincial programs or contribute to a province's general revenues. Table 13 shows how excess funds are used in each provincial program where information is available.

Table 13 Where Do Surplus Funds Go in Each Program?

| Province / Territory | How Surplus Funds Are Used |
|----------------------|---|
| BC | Surplus revenues generated from the CRFs are used to offset the following year's recycling costs. Surplus funds do not subsidize other programs and are adjusted regularly to reflect actual program shortfalls. |
| AB | Surplus revenues generated from the CRFs are used to offset the following year's recycling costs. Surplus funds do not subsidize other programs and are adjusted regularly to reflect actual program shortfalls. |
| SK | Surplus is placed in provincial general revenues and helps fund extended recycling programs |
| NB | Some of the half-back revenue is placed in the Environmental Trust Fund, which is used to promote recycling activities and other initiatives aimed at improving the state of the environment |
| NS | Some of the half-back revenue is distributed to municipalities to help offset the cost of their waste diversion initiatives |
| PEI | All excess funds accrue to the provincial treasury |
| NL | Surplus funds are invested in the Waste Management Trust Fund, which is used to advance sustainable waste management in the province. |
| NT | Funds generated by the program are placed in the Environment Fund, a special purpose fund that can only be used for waste reduction and recovery purposes. Any surplus revenue in the fund is used to help create new waste reduction and recovery programs. This fund is separate from the government's general account. |
| YT | Funds generated by the recycling fund fee (RFF) are placed into the Recycling Fund, an account separate from general government revenues that is used to support all recycling activities in Yukon, including community recycling depots, the Recycling Club, transportation of recyclables, etc. |

Who Bears the Share?

In early editions of *Who Pays What*[™], we presented data on the costs associated with beverage container recycling in a way that enabled comparisons to be made on a program-to-program basis. However, as explained earlier, this approach is not the most suitable for comparing the efficiency and effectiveness of different programs since system costs (and revenues) can be affected by a myriad of program-specific factors, which makes meaningful comparison impossible.

In recognition of this issue, in 2010 CM Consulting developed a new approach called “Who Bears the Share,” that allows for a better understanding of how system costs are shared among the different players in each province. By identifying the share (percentage) of program costs that each stakeholder group is responsible for, this approach is intended to offer insight into the equity or fairness of the various funding models.

The “share” is calculated by taking the stakeholder’s contribution and dividing that by the total amount of program funding (excluding material revenues). The formula is as follows:

$$\text{Stakeholder Contribution (\$)} / \text{Total Program Funding (\$)} \text{ (excluding material revenues)}$$

Figure 33 shows the results of the *Who Bears the Share* analysis for 2016.

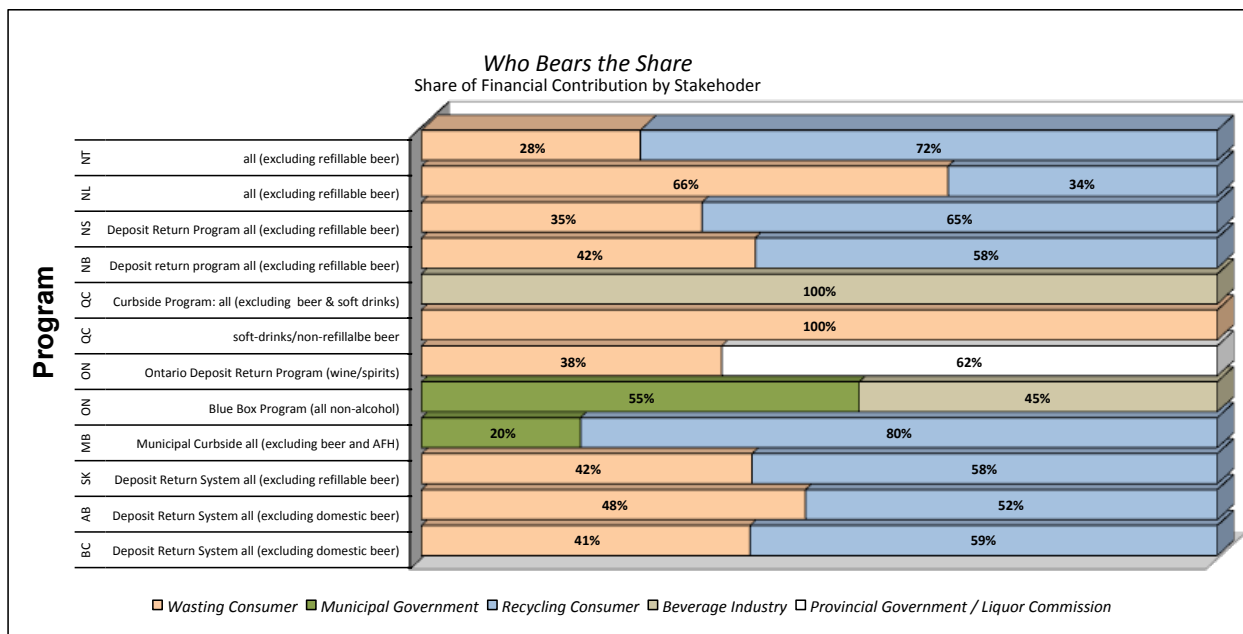


Figure 33 Share of Financial Contribution by Stakeholder by Province

Summary of Analysis

The *Who Bears the Share* analysis confirms that only in Québec and Ontario does industry pay for some portion of the costs of collecting and recycling beverage containers (note: these contributions are mandated

through provincial EPR laws). In most other provinces, it is the consumer that is stuck paying for some or all of the system costs.

The consumer can be divided into two groups: the “wasting consumer” and the “recycling consumer.” The wasting consumer is the person who chooses not to redeem the container; this group pays through unredeemed deposits. The recycling consumer is the person who returns the container for recycling; this group pays through non-refundable consumer fees and halfback deposits in provinces where they are charged (BC, Alberta, Saskatchewan, and the Atlantic provinces). The wasting consumer will also pay the up front consumer fee.

The analysis shows that only in two provinces (Quebec and Newfoundland) do wasting consumers pay more than recycling consumers. Since 2013, Québec consumers who choose not to return their empty beverage containers bear 100% of the costs of the DRS. In Alberta, wasting consumers bear approximately 48% of net program costs, leaving recycling consumers with the remaining 52% (see Figure 34). This is because of Alberta’s relatively high deposit levels, which translate into more revenue from unredeemed deposits. In B.C., with lower deposits, recycling consumers pay a larger share of program costs (see Figure 35). In Newfoundland and Labrador, the lower recovery rate combined with the relatively high refund (in relation to the non-refundable portion) means there is a greater pool of unredeemed funds.

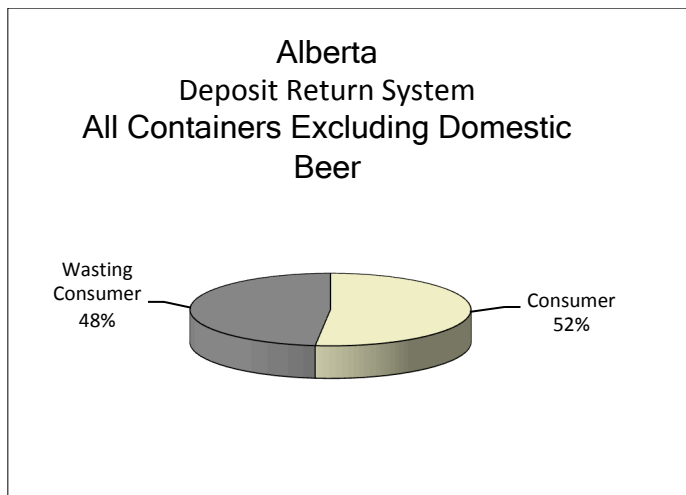


Figure 34 Percentage of Program Costs Paid by Wasting vs. Recycling Consumer, Alberta (2016)

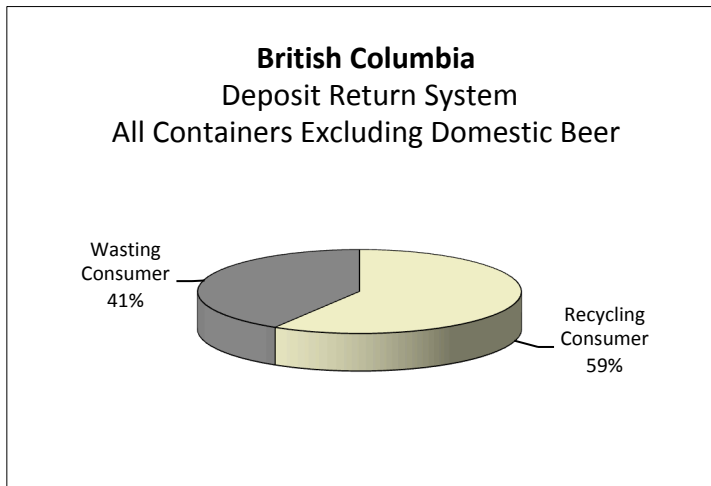


Figure 35 Percentage of Program Costs Paid by Wasting vs. Recycling Consumer, British Columbia (2016)

In Ontario's deposit system for alcohol beverage containers, the recycling consumer pays nothing because the deposit is 100% refundable. In contrast, the wasting consumer pays 36% of program costs. The Liquor Control Board of Ontario (LCBO) covers the rest.

In Manitoba, Ontario and Québec, the producers or first importers of all non-deposit beverages are required to pay levies on all of their packaging sold into the residential stream. In British Columbia and Saskatchewan, this requirement applies only to milk. In Manitoba, 80% of program costs are covered by industry through the 2-cent per unit levy applied to beverage purchases. In Ontario, the former *Waste Diversion Act* mandated that industry reimburse municipalities 50% of the costs of the curbside recycling program; this is likely to increase to 100% under the new legislation. In Québec, beverage producers (except those for non-refillable soft-drinks and beer) are legally obligated to finance 100% of the net costs to collect, transport, and process the materials, plus 8.55% of that amount to cover administrative costs (e.g. overhead, P&E, etc.).

Who Pays What?

Stakeholders

There are five major stakeholder groups that fund beverage container recycling in Canada. Understanding the role each one plays, from the point at which a container is distributed and sold to the point at which it is consumed and recycled, is critical to informing effective policy development. To this end, this section provides an analysis of the various stakeholders involved and what their roles and responsibilities are when it comes to program financing. Also discussed are some of the key factors that impact each group's relative contribution to total program costs, as well as observations on the fairness of the funding scheme.

The Recycling Consumer and the Wasting Consumer

As mentioned earlier, the recycling consumer is the consumer who returns empty containers to an authorized redemption center or places them in a designated recycling bin (at home or AfH). Regardless of whether containers are recycled via a DRS or curbside program, the recycling consumer has to pay a per unit

consumer fee (i.e. CRFs, EHCs, half-back deposit) on the purchase of all applicable beverage containers. These fees, which are passed down by the beverage industry, are non-refundable and are used to offset system costs.

Total Consumer Fees Paid Out (\$) / Total Number of Containers Sold

The wasting consumer is the consumer who chooses not to recycle their containers. By forfeiting their deposits, the wasting consumer bears the direct costs of his actions. The “cost of wasting” is determined by the following calculation:

$$\frac{\text{Total Unredeemed Deposits (\$)} + \text{Non-Returnable Fee on Unredeemed Units}}{\text{Total Number of Unredeemed Containers}}$$

The percentage of program costs borne by the wasting consumer varies by province and depends on a number of factors, including the deposit value and whether beverage containers are subject to any upfront, non-refundable container fees. The higher the deposit, the more expense it is for the wasting consumer, and therefore the higher share they will pay of total program costs. Wasting consumers will also pay more in provinces where there is an up-front fee, like in British Columbia, Alberta, and Saskatchewan.

Table 14 shows the average cost per container borne by the recycling and wasting consumer by province.

Table 14 Expression of Fees by Beverage Container Type for Select Containers (Cents/Unit Sold) (2016)

| Province / Territory | Program | Recycling Consumer (Cents/Unit Sold) | Wasting Consumer (Cents/Unit Sold) |
|----------------------|------------------------------------|--------------------------------------|------------------------------------|
| BC | wine /spirits / non-alcohol | 3.5 | 9.7 |
| AB | all (excluding domestic beer) | 2.4 | 13.5 |
| SK | all (excluding refillable beer) | 5.3 | 17.3 |
| MB | all (excluding beer) | 2 | 2.0 |
| ON | all non-alcohol | 0 | 0 |
| ON | wine/spirits (mostly glass) | 0 | 14.1 |
| QC | soft-drinks/non-refillable beer | 0 | 5.8 |
| QC | all (excluding beer & soft drinks) | 0 | 0 |
| NB | all (excluding refillable beer) | 5.9 | 10.7 |
| NS | all (excluding refillable beer) | 4.9 | 11.3 |
| NL | all (excluding refillable beer) | 3.0 | 8.0 |
| NT | all (excluding refillable beer) | 5.3 | 10.3 |

Municipal Government

In Canada, the responsibility for collecting, diverting, and disposing waste falls on municipal governments, as does the responsibility for litter collection. Unless the municipality adopts a user-pay system or an EPR program is in place, much of the costs of providing these services (including collecting beverage containers for recycling) are borne directly by municipal taxpayers. Besides removing a powerful incentive to reduce waste and increase recycling, this approach to paying for residential waste management gives consumers the impression that recycling/composting is free, which distorts costs and devalues the service. It is also unfair in that it forces households generating small amounts of waste or recyclables to subsidize higher-waste producing households.

In recognition of this problem, a number of provinces have passed EPR legislation to shift some (or all) of the costs for waste management away from municipalities and towards producers. In Saskatchewan, stewards are obligated to pay fees to cover payment for services for qualified municipalities for up to 75% of the net costs of municipal recycling programs, leaving municipalities to cover the remaining 25%. In Manitoba, the portion of costs borne by municipalities is 20%, and in Ontario it is 50% (to be increased to 100% under the new *Waste-Free Ontario Act*). British Columbia and Quebec are currently the only two provinces where municipalities are completely (100%) relieved of the financial burden of recycling and waste management.

Provincial Governments or Liquor Commissions

In most Canadian provinces, the provincial government bears no responsibility for the costs of beverage container recycling. Ontario is the exception. In Ontario, the costs of operating the Ontario Deposit Return Program (ODRP) for wine and spirit containers are split between the province's liquor commission (i.e. the LCBO) and the wasting consumer. Specifically, the LCBO pays 5.1-cents (net) on every unit sold. This amount represents the net cost of recycling after unredeemed deposits are used to offset gross costs.

The Beverage Industry

As previously mentioned, industry is slowly being forced to take on an increasing share of financial responsibility for the end-of-life management of its products and packaging, including beverage containers. The idea behind this is sensible: those who have the greatest ability to influence the lifecycle impacts of the product should have the greatest responsibility for recovering and recycling those same products at end-of-life. In the case of beverage containers, these are the beverage companies.

Currently, there are five provinces in Canada where industry is directly responsible for paying a certain percentage of PPP recycling costs: B.C. (100%), Saskatchewan (75%), Manitoba (80%), Ontario (50%, to be increased to 100%), and Québec (100%). In these provinces, beverage producers or first importers of all non-deposit beverages are required to pay material-specific levies on all their packaging sold into the residential stream (In B.C. and Saskatchewan, this requirement applies only to milk). In Québec, if the deposit system is running a deficit, soft drink producers are required to pay a fee for every container sold into the province.

When it comes to DRSs, the only jurisdiction that requires industry to bear a share (albeit a very small share) of beverage container recovery costs is Quebec. It should be noted, however, that in the last few years the percentage of costs borne by industry has been reduced to zero because revenues from material sales and unredeemed deposits have been sufficient. Unlike other deposit provinces where the bulk of system costs are paid by consumers through fees and unredeemed/non-refundable deposits, in Quebec there is no CRF or half-back deposit system which means that recycling consumers pay nothing.

The Domestic Beer Industry (Refillable Containers)

Canada's domestic beer industry is unique in North America. Set up as a voluntary initiative, its DRS for refillable beer containers is managed collectively by brewers and is based on a return-to-retail collection model. The program, which relies on the existence of industry standard bottles (ISBs), allows brewers to share standard bottles and self-finance their distribution and reverse distribution. Although the brewers receive some of the unredeemed deposits to offset system costs, this revenue is minimal because the return rates are so high.

Part 5: End-Use Recycling Methods & Recycled Content

End Markets for Selected Beverage Packaging

It's no secret that China is a leader in international world trade. For years, the country has been a major importer of many types of foreign goods, including timber, dairy products, and petrochemicals. China is also the world's largest importer of waste and recyclables. But as of January 1, 2018, China will no longer import much of the waste we have been shipping there for decades. In July 2017, China notified the World Trade Organization that it would ban imports of 24 categories of solid waste by the end of the year, as part of its campaign against *yang laji* or "foreign garbage." The ban applies to several plastic resins (including PET, PE, PVC, PS, and "other" plastics), textiles, unsorted mixed paper, and other materials.

In the wake of China's decision, recyclables (specifically, plastic and paper) have been piling up in developed countries as they try to figure out what to do with the material they used to send to China. Several municipalities, particularly in the U.S., have cut back on their list of accepted materials, which has had impact on recycling access. Because most beverage containers in Canada are collected via DRSs, China's ban has had little impact (relative to other countries) on Canada's end markets for beverage packaging, as the materials collected tend to stay within the North American marketplace and command a higher price to due excellent quality. The fact that the material is high quality also means that provinces are still able to meet the new quality standards and have it accepted by China, if need be.

Aluminum Cans



Aluminum cans continue to be the most valuable material in the recycling stream and are considered a very desirable commodity for recyclers. In 2017, the average yearly value for aluminum cans collected in Ontario's Blue Box program was \$1,772 per tonne, up from \$1,576 in 2016.⁸³ From January to August 2018, the yearly average value increased again to \$1863/tonne.⁸⁴

Aluminum cans have a higher market share than all competing non-refillable package types. This is true in all provinces. In 2016 alone, over 7 billion beverage cans were sold in Canada.

The recycling rate for aluminum cans varies sharply by province, but is usually higher in provinces where cans are covered by deposit.

Unlike other package types, aluminum cans are most often recycled in a "closed loop" cycle. Following collection, sorting, and cleaning, the used cans are crushed, compacted into biscuits, and transported to

aluminum markets (mostly in the United States) where they are melted down and reformed into rolled stock. New aluminum cans are punched out from these sheets at a can production plant and the off-cuts or in-house scraps are all recycled. The entire process could take as little as 60 days.⁸⁵

Glass Bottles



The market value of recycled glass depends on the method by which it was collected. In Canada, glass is collected in one of two ways: color-separated collection and multi-material collection.

As the name implies, the first method sorts the material at the point of collection by color type (flint, green, brown, or mixed color) and provides the recycler with a color-specific load that is free of contamination. Given the high quality of the material, it may or may not require further processing. The second method collects glass together with other material types, like paper and plastic. The additional handling and truck compaction that come along with this method results in a significant amount of breakage, which means lower quality and lower value recycled glass. About 20% to 40% of the glass collected in this way ends up in landfill as cover material. Another 20% is marketed as glass fines, which are used for low-end applications like road aggregate or as a sandblasting base. The remaining 40% to 60% is crushed into small pieces (known as cullet) and is used to manufacture new bottles or fibreglass. The average market value for a tonne of mixed glass in Ontario in 2017 was -\$42 per tonne, down from -\$37 per tonne in 2016 and -\$30 tonne in 2015.⁸⁶ As of August 2018, the yearly average value for mixed glass in Ontario had decreased to -\$43 tonne.⁸⁷

In Ontario, the majority of wine, spirit, and beer container glass that is collected via the DRS is sold to Owens-Illinois for bottle-to-bottle manufacturing at a plant in Brampton, Ontario. Most of the glass collected via the province's Blue Box program becomes a raw material for products like fibreglass insulation, glass bottles, high traction road surfaces and reflective signs, construction aggregate, sandblasting material, or as drainage material. Due to circumstances of geography and low population density, most glass collected in northern Ontario ends up in landfill.

Up until April 2013, about 70% of Quebec's glass was processed at a facility in Longueuil, Quebec. Since the plant shut its doors, much of the glass collected through curbside recycling programs has ended up in landfills as roadbed or is used as an aggregate. In an attempt to address this issue, Eco Entreprises Quebec (EEQ) announced its *Innovative Glass Works* plan in January 2016, with the objective of finding a solution to recycling 100% of the glass recovered in Quebec. As part of the implementation of its plan, EEQ selected five sorting centres (EBI Environment Inc. in St-Paul-de-Joliette; Tricentris, tri, transformation, sensibilisation in Terrebonne; La Régie intermunicipale de traitement des matières résiduelles de la Gaspésie in Grande Rivière; Récupération Frontenac in Thetford Mines, and Centre de tri de Québec in Québec) to take part in 15-month pilot projects to test cutting-edge cleaning and sorting equipment for glass collected through curbside recycling in Quebec. The sorting centres enrolled in the experimental projects now process close to 25% of all the glass that Quebecers place in their recycling bins.⁸⁸ The glass produced from these centres will facilitate the material's transformation into a range of products, including abrasives, mineral wool, cement and concrete additives, ornamental mulch, water filtration agents, fillers, green paving stone, and cellular glass for use in infrastructure and sports fields.⁸⁹

In Alberta, glass containers are crushed and the glass is formed into tiny glass beads. From there, the recycled glass is spun into thin strings (like cotton candy) and used to produce fibreglass insulation.⁹⁰

Glass containers collected in British Columbia are processed and sent to various end markets in Alberta and Washington State where the material is recycled into fibreglass insulation or new glass bottles. Some of the glass collected is also sent to a facility that manufacturers sandblasting material in BC, and municipal sites that use crushed glass as construction aggregates.⁹¹

Glass containers collected in Saskatchewan are shipped to different end-markets depending on color; clear glass is sent to a processing facility in Moose Jaw, Saskatchewan, while the colored glass is sent to a facility in Airdrie, Alberta where it is manufactured primarily into new glass bottles and jars. Some colored glass is also made into fibreglass insulation. Any recycled glass that does not meet the manufacturers' standards to be manufactured into new glass bottles or fibreglass insulation (due to contamination) can be used for various other applications, such as countertops and floors, landscaping, tile, etc.⁹²

In Manitoba, glass is usually crushed and used locally as fill in roadways and sidewalks.

Most of the glass collected in the Maritimes is shipped to OI in Montreal for bottle-to-bottle recycling.

In Northern Canada (Yukon and the Northwest Territories), glass is crushed and used as an alternative daily cover at landfills or as a gravel substitute. Some also ends up as sandblasting material.

Refillable Beer Bottles



With a national collection rate of approximately 95%, the refillable beer bottle is Canada's most recovered beverage container. No province has a collection rate lower than 91%.

Following collection and sorting, industry standard bottles (ISBs) are returned to the brewery for their labels to be scraped off. They are then washed, refilled, capped, and crated. On average, the ISB can be reused 15 times (the "trippage rate") before it is taken out of circulation.⁹³ Other than being recycled by a bottler, a bottle may be taken out of circulation because of breakage (e.g. by a consumer) or scuffing.

Scuff marks on a refillable bottle – rings that develop on the bottle as a result of contact with the guide rails of the washing, filling, and bottle-handling equipment – become more noticeable with each reuse and can have a significant effect on bottle aesthetics, which in turn, can render them less marketable over time.

PET (Polyethylene terephthalate) Plastic Bottles



Making up over 25% of the beverage market in 2016, PET plastic is the second most common non-refillable package type in Canada (on a unit-sold basis).

It is challenging to estimate sales and collection rates for PET in Canada because many provinces report it within the plastic category as a whole.

The average yearly value for mixed PET from Ontario's Blue Box program in 2017 was \$383 per tonne, up from \$265 per tonne in 2016. From January through August 2018, the average yearly market price increased to \$411 per tonne.⁹⁴ This is still well below the peak of \$652 per tonne in 2011.⁹⁵

Clear PET containers are baled, shredded, and flaked. Plastic flake may be turned into a fibre that can be used to make fleece clothing and carpet underlay or new bottles for detergent, motor oil, and other non-food

products. Increasing numbers of PET bottles from DRSs are melted down and made into new beverage containers. According to recent data, approximately 25% of recycled PET is turned into food and beverage containers, 38% into fibre, 7% into strapping, 24% into sheet and film, and 4% is used for non-food containers. A very small percentage (2%) becomes engineered resin or other materials.⁹⁶

In B.C., collected plastic is sold to Merlin Plastics, and shipped to their facilities in B.C. and Alberta. PET from Saskatchewan and Manitoba is shipped to U.S. and Canadian processors that flake the material. PET from Québec and Ontario is brokered into the market with multiple end destinations. In the Atlantic Provinces, most plastic goes to Novapet Inc., a facility located in Amherst, Nova Scotia. PET from the Northwest Territories and Yukon is sent to markets in B.C. and Alberta.

HDPE (High-density polyethylene) Plastic Bottles



For 2017, the average yearly price for mixed HDPE from Ontario's Blue Box program was reported to be \$497 per tonne, down from \$533 per tonne in 2016.⁹⁷ From January through August 2018, the average value was down to \$478 per tonne.

Like PET, HDPE is generally reported as part of the plastics category as a whole (which may or may not include non-beverage plastic). For this reason, it is difficult if not impossible to report specific recycling rates for HDPE.

HDPE markets are very similar to PET markets and follow similar geographical flow patterns (see paragraph on PET Plastic Bottles). HDPE milk jugs and juice containers are baled, chipped, and washed. The clean chipped plastic is melted at high temperatures and formed into pellets, which are used as resin feedstock for the manufacture of non-food containers, plastic formed products, furniture, and toys.

Steel and Bi-Metal Cans



Steel and bi-metal cans make up a very small share of Canada's beverage container market (approximately 2%). The national recycling rate for these containers in 2016 was 69%.

In 2017, steel cans collected in Ontario's Blue Box program were worth an average of \$262 per tonne. The market price for recycled steel cans peaked in 2011 at \$335 per tonne, decreasing every year until 2016, when it started rising again. As of August 2018, the yearly average is \$322 per tonne.⁹⁸

Steel cans are crushed, baled, and shipped to steel brokers in the U.S. and Canada where they are melted down with other scrap metal to be used as construction rebar or in the manufacture of other steel products.

Aseptic Containers



Aseptic cartons or drink boxes are made up of paper, an aluminum lining, and a plastic coating, and are often reported as part of a wider "polycoat" or "aseptic and gable top packaging" category. For this reason, it is impossible to quantify sales, returns, and collection rates for Aseptic containers alone. If considering the larger category as a whole, however, recycling rates are 45% or higher in each of the deposit provinces and 25% in Ontario.

In 2017, polycoat containers collected in Ontario’s Blue Box program were worth an average of \$64 per tonne, a significant decrease from \$114 per tonne in 2016. As of August 2018, the yearly average market price was \$59 per tonne. The value of recycled polycoat material peaked in 2011 at \$127 per tonne.⁹⁹

Aseptic containers are hydro-pulped and separated into different material types. The resulting paper pulp (about 65% of the recycled material) is sent to paper mills in the U.S., China, and Korea where it is made into tissue. The remaining aluminum and plastic mix (about 35% of the recycled material) can be used to manufacture durable products like pallets and paper core plugs, but most end markets currently do not use the aluminum and plastic mix for value-added products.

Gable Top Cartons



Gable top cartons (used for juice and milk) are made up of “polycoat”, a lightweight, high-grade paperboard sandwiched between two thin layers of polyethylene film (and sometimes a foil laminate). It is impossible to calculate a specific recycling rate for gable top containers as they are generally reported with Tetra Paks, as part of a larger category of collected material.

In 2017, polycoat containers collected in Ontario’s Blue Box program were worth an average of \$64 per tonne, a significant drop from the 2016 average price of \$114 per tonne. As of August 2018, the yearly average market price was \$59 per tonne. The value of recycled polycoat material peaked in 2011 at \$127 per tonne.¹⁰⁰

Polycoat is converted into new material by hydro-pulping, which uses a combination of heat, water, and agitation to break down the material to produce pulp or raw fiber. This pulp can be used as feedstock to make new paper products, such as corrugated medium (the inner layer of corrugated cardboard), linerboard, household tissue products, and fine paper. The small amount of residual polyethylene can be screened off for use in other plastic and composite materials. Most polycoated packaging is sent to facilities in the US, South Korea, Thailand, and Japan for tissue production.

Poly Pouch Containers



Although they represent only a small portion of the market today, more and more beverage manufacturers are choosing poly pouch drink containers over traditional glass, paper, and metal packaging. A form of flexible packaging, a typical poly pouch container is made up of several layers of plastic (different types), aluminum, and other materials.

Compared to other beverage packages, poly pouches are lighter, less bulky, and take up less volume. They also have a higher product-to-package ratio than other packaging types (35:1, compared to 1:1 for glass and metal containers, 10:1 for plastic PET bottles, and 21:1 for aluminum cans¹⁰¹), and require about half of the energy required to produce, reducing CO₂ emissions (by up to 93%¹⁰²) released during production and transport, and taking up less space in landfill.

Notwithstanding the environmental benefits, it is important to note that poly pouches are not recyclable through the current waste management infrastructure. When removed at the sorting facility, these containers typically end up in residuals that go to landfill or EfW facilities. Also, because of their flat shape and light

weight, this material acts like paper in an MRF, flowing through with the paper stream, and can therefore contaminate the paper stream.¹⁰³

Although none currently exists, several recycling agents – particularly in provinces that mandate the recycling of all beverage containers – are attempting to source a large-scale end market for recycling this material. Potential market opportunities in the specialty sector include engineered fuel, lumber core, fuel substitution in cement kilns, and other industrial uses.¹⁰⁴

Cups



Polystyrene or paper-based, plastic lined beverage cups—the kind you find in your local coffee shop—are consumed almost exclusively away-from-home. It is estimated that Canadians consume an estimated 1.5 billion of these coffee cups every year, enough to fill 4,000 full-size garbage trucks.¹⁰⁵ Unfortunately, most of these cups end up in landfill as none of Canada’s provinces or territories include them under deposit return legislation, and only a few municipal recycling programs accept these containers for recycling (some

municipalities accept them for composting). There is no way to determine a recycling rate for these containers since their sales and returns are not tracked.

Made from paper fiber and coated with an additional plastic layer for waterproofing, recycling these cups is complex and challenging, as each layer must be separated from each other. The plastic lids, designed to stay on tight, make it even more challenging, because if the lid isn’t removed by the user, it doesn’t always come off in the recycling process and can end up contaminating the paper stream. In addition, the associated cost of shipping, given their large volume to weight ratio, is very prohibitive.

Although it remains expensive to do so, new technologies have allowed paper pulp processors to be able to turn cups into valuable pulp. After being sorted as mixed paper at a recycling facility, the cups and other polycoated papers are sent to a processor where they are shredded. They then enter a 'hydropulper', which agitates the material in a water bath to separate and then filter the layers. The extracted paper fibres are then used to make new paper products such as cereal boxes, egg cartons and more.¹⁰⁶

The Use of Recycled Content in Beverage Containers



Although the focus of this report is on beverage container collection, *Who Pays What* would be incomplete without a discussion on recycled content. ISO 14021 defines recycled content as “the proportion, by mass, of recycled material in a product or packaging.”

Using recycled material in the production of new beverage containers results in significant savings in energy and greenhouse gas emissions

because it avoids all of the activities associated with extracting and processing virgin materials. While the material recovered from beverage containers can be used to produce a variety of new products, closed-loop

recycling (e.g. where beverage cans are turned into new beverage cans) has been acknowledged as the most beneficial end-of-life scenario for most types of packaging. DRSs are especially suitable for closed loop recycling because they collect containers separate from other materials, eliminating the potential for contamination and increasing quality.

Recycled Content by Material Type

Aluminum

Aluminum cans continue to have the highest recycled content rate of all packaging types. This is not surprising given their high recycling rate and the fact that the high value of the material itself means that, unlike glass or plastic bottles, the aluminum can is most often recycled back into a new aluminum can. Aluminum cans can also be recycled indefinitely without any loss in material or quality, and recycling the cans uses only 8% of the energy needed to tract the same amount of aluminum from virgin material.¹⁰⁷

According to the Aluminum Association, the average aluminum can contains 70% recycled content, by weight.¹⁰⁸ Forty-three percent of this is post-consumer scrap (used beverage can and other scrap from the consumer waste stream), while 27% is post-industrial scrap (scrap generated from the can manufacturing process and recycled back into the manufacturing process). This figure is based on a 2012 survey of the five main producers of aluminum can sheet in the United States – Alcoa, Logan, Novelis, Tri-Arrows, and Wise. Determining the exact amount of recycled content in aluminum cans is difficult because unlike glass and plastic, the percentage of recycled material in a can is not determined by the company, but by the aluminum supplier. Adding to this ambiguity is the fact that different manufacturers use different standards to define the amount of recycled content in their products (for example, what constitutes post- or pre-consumer material).

PET Plastic

Though the savings aren't as high as with aluminum, making PET bottles out of recycled resin uses roughly 2/3 less energy than creating virgin plastic bottles.¹⁰⁹ For every tonne of plastic produced, this is equivalent to the energy contained in about 11 barrels of oil.¹¹⁰

In the absence of recycled-content mandates, many companies have made voluntary commitments to use a certain percentage of recycled material within their products and packaging. Some brands are moving towards using significant recycled PET (rPET) content; for example, Arrowhead, a product of Nestle Waters North America, announced that it would ensure that most of its bottle sizes contain up to 50% rPET by the end of 2016.¹¹¹

However, for the most part, the large manufacturers are not meeting their own self-proclaimed goals on use of rPET. A recent report from Greenpeace found that combined, five of the six largest global soft drink companies (Coca Cola did not participate) use an average of 6.6% recycled plastic in their bottles.

The Coca Cola Company itself has several times stated a goal of increasing recycled content. In 2009 the Sustainability Report commits to “source 25% of our PET plastic from recycled material by 2015”. In the 2010-11 Sustainability Report the goal has been changed to “source 25% of our PET plastic from recycled or renewable material by 2015”. The progress shown towards that goal touts the growth of using plant bottle material and makes no mention at all of using recycled plastic materials.

Unfortunately, the key variable that determines the amount of secondary PET used in production—besides quality, of course—is price. When energy costs are moderate to high, recycled PET is attractive to producers since it allows them to benefit from a slightly lower price. However, when the price of energy or virgin PET is low, the attractiveness of rPET diminishes, and companies will undoubtedly choose virgin plastic over recycled when procuring their raw materials.

According to the National Association for PET Container Resources (NAPCOR), only 25% of rPET was used for food and beverage containers in 2016. Most rPET available to manufacturers is being used for open-loop applications, such as fiber (43%), sheet and film (19%), strapping (8%), and non-food bottles (4%).¹¹²

Glass

Aside from being 100% recyclable, glass is one of the very few materials that can operate forever in a closed-loop system with essentially no loss of quality or purity. Using recycled glass cullet in the production of new glass has been acknowledged as the most beneficial end-of-life scenario for glass packaging, and for good reason. According to the Glass Packaging Institute (GPI) – the trade association representing the North American glass container industry – for every 10% recycled cullet used in the manufacturing process, energy savings of 2% to 3% are achieved.¹¹³ The greenhouse gas savings are also significant: for every 6 tons of recycled container glass used in the manufacturing process, one ton of carbon dioxide is avoided.¹¹⁴

In 2008, the GPI set a goal to use a minimum of 50% recycled material in glass bottles by 2013 (to increase to 60% by 2017). This goal has not yet been met. Although different bottle manufacturers have varying recycled-content levels, the GPI estimates that the average recycled-content incorporation rate of glass containers sold in North America in 2014 (most recent year for which data is available) was 33.89%, up from 25% in 2008.¹¹⁵ This is significantly lower than the Canadian brewery industry's refillable industry-standard bottle (ISB), which is estimated to contain an average of 70% recycled content.¹¹⁶

At the global scale, the average percentage of recycled content is lower than it is in Canada, largely because there is a lack of high-quality cullet available to meet manufacturer demands for new glass containers.

Measures for Increasing Recycled Content in Beverage Packaging

One of the most effective ways to increase the demand for and use of secondary materials is through recycled content legislation.

Recycled content laws require that a minimum percentage of recycled material be included in certain new products and packaging. Perhaps the best-known example is California's Rigid Plastic Packaging Container Law. Passed in 1991, the law mandates that product manufacturers use 25% postconsumer recycled content in rigid plastic containers unless the containers are reused or refilled at least five times, or if they are light weighted by 10%. Penalties for non-compliance range up to \$50,000 per violation for a maximum of \$100,000 per product manufacturer.

The state of Oregon has a law that is very similar to California's; in effect since 1995, Oregon's Rigid Container Recycling Law requires use of 25% postconsumer recycled content in rigid plastic containers (for example, soda bottles, various tubs and pails, jars, etc.) unless the recycling rate for plastic containers in the state is at least 25% (certain food and medical packaging, source-reduced containers, and some others are exempt).

Other measures to promote markets for recycled-content material include:

- labeling laws that require products to be labeled with their recycled-content percentage;
- low-interest loan programs offered to businesses that produce recycled-content materials and products, to site new facilities or expand existing operations;
- individual producer responsibility, whereby producers are made 100% financially and physically responsible for the end-of-life management of their products;
- mandated minimum recycling rates;
- government procurement policies to purchase certain recycled-content products; and,
- in the case of glass, mandatory color-separation at source.

Part 6: Economic and Environmental Benefits

Socio-Economic Benefits

The socio-economic benefits of beverage container recycling are numerous and widespread. Although they are sometimes difficult to quantify, these benefits must be considered if we are to understand the “full picture” of beverage container recovery in Canada. This section provides a brief overview of some of the indirect social and economic impacts of DRSs for beverage containers.

Job Creation

In 2011, the Container Recycling Institute (CRI) released a report entitled *Returning to Work: Understanding the Domestic Jobs Impacts from Different Methods of Recycling Beverage Containers*. Among other things, the report showed that DRSs create significantly more (11 to 38 times more) jobs than curbside recycling.¹¹⁷

One of the main reasons for this is the relatively greater amount of material throughput; the recovery rate for beverage containers in provinces with a DRS is 83%, compared to the average 49% in provinces with curbside recycling only. Consequently, DRSs require more workers to collect, sort, and transport the containers to materials recycling facilities (MRF) or secondary processors. In fact, ton for ton, DRSs require 1.5 to 4.0 times as many employees to carry out these tasks than curbside systems (depending on whether the curbside system is manual or automated).¹¹⁸

According to a recent economic impact study, Nova Scotia’s DRS for beverage containers created approximately 700 jobs and \$24.8 million in salaries and wages in 2016.¹¹⁹ In Alberta, the Alberta Beverage Container Recycling Corporation (ABCRC) reports that its two processing facilities in Edmonton and Calgary employ 165 Albertans amounting to 138 full-time equivalent hours.¹²⁰ Jobs have also been created in Prince Edward Island, which reports that its DRS employs approximately 56 full and part-time people through the depot network.¹²¹

DRSs also create ‘indirect’ jobs – jobs created from businesses in the region that supply goods and services to the recycling business. For example, in addition to the 500 jobs directly attributable to recovering beverage containers, TBS’s deposit-system and the ODRP created more than 300 jobs at external companies, such as Owens-Illinois. In Montreal, Owen Illinois’ glass bottle factory employs over 320 people in highly skilled jobs.¹²² Collectively, these employees are paid \$31 million in wages and benefits annually.¹²³

There are induced jobs that are created as a result of introducing a DRS. These jobs come from the purchases made by employees from the collection or processing business (the direct jobs), who spend their income on goods and services in the region.¹²⁴

Contribution to GDP

The economic impact of beverage container deposit programs extends beyond job creation; these programs also play a key role in contributing to the wider economy. Gross Domestic Product (GDP) is the most common indicator used to measure economic activity.

An economic impact study of Nova Scotia's beverage container recycling program found that the program contributed over \$32.7 million to the provincial economy in 2016, and over \$496 million since the program began. It also generated \$7.2 million in provincial revenue (in 2016).¹²⁵

A similar study, released in June 2017, was undertaken in the U.S. to estimate the broader economic impact associated with Massachusetts Bottle Bill. The study found that Massachusetts deposit system contributes anywhere from USD\$85 million to USD\$151 million to the state's economy, including direct, indirect, and induced effects.¹²⁶

Cost Savings for Municipalities

One of the main arguments used by opponents of DRS is that these systems harm municipalities by taking high-value recyclables like aluminum away from the municipal recycling streams. To support their argument, evidence is provided to show loss of material revenues as well as reduced industry contributions from EPR schemes for packaging where they exist. What opponents often fail to show are the cost savings that accrue to municipalities as a result of DRS, which can be significant. This includes savings resulting from the reduced or avoided costs of collection, treatment, and disposal by the municipal waste management system.

The primary driver of municipal waste management costs is the volume of collected waste and recyclables. This is due to the fact that the most expensive component of the municipal waste management system has to do with collection frequency, which is determined by the time it takes for garbage/recycling bins to fill up. Given their high volume to weight ratio, beverage containers cause bins to fill up quickly, and therefore demand more frequent collection. When beverage containers are collected via a deposit system, there is less material entering the municipal system, which means collection trucks fill up less quickly and do not need to leave collection rounds as frequently to go and unload their contents. The result is that collection trucks can serve more households in the same amount of time, which can translate into a reduction in the amount of vehicle and staff resources required to undertake collection work.

In addition to the impacts on collection costs, a DRS leads to savings on the costs of treatment/disposal of residual waste. Fewer beverage containers in residual waste means less material is sent to landfill, incineration, or other treatment. Less collected recyclables can also lead to a reduction in costs associated with sorting of collected materials, especially if municipalities collect recyclables in a mixed stream. Sorting material at a material recovery facility (MRF) is often a cost to municipalities (or their contractors), and if a DRS reduces the amount of recyclables collected, this reduces the tonnage on which such costs are incurred.

Cost savings from reduced litter clean-up are another benefit to municipalities that is often overlooked. It is important to note that estimating savings from litter reduction requires knowledge of the contribution of beverage packaging to total litter. This, in turn, depends on which metric is used. By piece count, beverage containers are only a small proportion of the entire litter stream, but when measured by volume, they are a significant contributor. Other factors to consider when estimating the cost savings on litter-clean up services are: estimated return rates (influenced by deposit level), ease of return (convenience), and whether litter is picked up by local authority contractors or is being left as uncollected litter.¹²⁷ There are also non-quantifiable benefits associated with litter reduction that should be monetized and included in the overall analysis of cost savings. This includes, for example, the value that people place on a litter-free environment, which can be measured by the amount people are “willing to pay” for reductions in litter.

Table 15 presents a compilation of 27 studies that examined the quantifiable costs and benefits to municipalities of implementing (or expanding) a DRS for beverage containers. It is noteworthy that although different in scope, location, author, and year, each study reports significant net savings to municipalities, even after lost material revenues are taken into account.

Table 15 Summary of Studies on Impact of Deposit Return Programs on Municipal Budgets

| | Study Title, Author and Year | Summary of Findings |
|---|---|---|
| 1 | Container Deposit Scheme – Consultation Regulation Impact Statement ACT Government, Transport Canberra and City Services Directorate, 2017 ¹²⁸ | <ul style="list-style-type: none"> The benefits transferred from the ACT Government in its capacity as a provider of municipal services to customers of those services are estimated to be \$9.7M over the 20-year period. |
| 2 | Consultation Regulation Impact Statement – New South Wales Container Deposit Scheme (NSW CDS) NSW Environment Protection Authority, 2017 ¹²⁹ | <ul style="list-style-type: none"> Avoided waste collection and transport costs: The benefits transferred from local government to customers are estimated to be \$272M over a 20-year period. |
| 3 | Costs and Impacts of a Deposit on Cans and Small Bottles in the Netherlands – Extended Summary CE Delft, 2017 ¹³⁰ | <ul style="list-style-type: none"> Cost savings on current collection systems: €5.5 to €8.0 million Maximum reduction in costs of litter clean-up: Approx. €80 million (up to 3 eurocent per packaging) Cost savings on emptying public litter bins: €3 to €10 million (0.10 to 0.37 eurocent per packaging) |
| 4 | Deposit Return Evidence Summary Zero Waste Scotland, 2017 ¹³¹ | <ul style="list-style-type: none"> Residual disposal savings: £2.6M to £6.2M Recyclate savings costs: £2.8M to £3M (assuming no change in gate fees or material revenue) Aggregated treatment and management costs savings: £5.3M to £9.2M |

| | Study Title, Author and Year | Summary of Findings |
|----|--|---|
| 5 | Cost-Benefit Analysis of a Container Deposit Scheme Sapere Research Group (prepared for the Auckland Council), 2017 ¹³² | <ul style="list-style-type: none"> Councils could expect to save \$12.5M-\$20.9M/year in collection costs (\$2,645 to \$4,424 per 1,000 pop.)¹³³ Reduced litter collection and public space maintenance costs: \$2.9M-\$4.4M (\$614 to \$931 per 1,000 pop.) Reduced landfill disposal costs: \$1.3M-\$3.7M (\$275 to \$866 per 1,000 pop.) |
| 6 | Impacts of a Deposit Refund System for One-way Beverage Packaging on Local Authority Waste Services Eunomia Research and Consulting Ltd. (Report Commissioned by Keep Britain Tidy, Campaign to Protect Rural England, Marine Conservation Society, Surfers Against Sewage, ReLoop Platform, Melissa and Stephen Murdoch), 2017 ¹³⁴ | <ul style="list-style-type: none"> Estimated net annual savings: £35M/year (£1.47/household) Impact on collection costs: 'no change' to savings of £152,000/year (£1.65/household) Impact on sorting costs: £800 to £220,000/year (£0.01 to £3.14/household) Lost materials revenue: £58,000 to £160,000/year (£0.67 to £1.63/household) Impact on residual waste treatment/disposal costs: estimated savings of £31,000 to £555,000/year (£0.54 to £4.55/household) Savings on street cleaning costs: for more urban authorities, £25,000 to £50,000/year (£0.22 to £0.45/household). Rural authorities may see smaller savings. |
| 7 | Massachusetts Container Deposit Return System – 2016 Employment and Economic Impacts in the Commonwealth Container Recycling Institute, 2016 ¹³⁵ | <ul style="list-style-type: none"> Absent the current bottle bill, cities and towns across the state would face an additional cost on the order of \$20 million in collection, sorting, and disposal of containers currently managed under the system. |
| 8 | Summary Review of the Impacts of Container Deposit Schemes on Kerbside Recycling and Local Government in Australia ¹³⁶ MRA Consulting Group (prepared for Container Deposit System Operators (CDSO)), 2016 | <ul style="list-style-type: none"> Reduced landfill gate fees: \$10.1M/year (\$5,465 per 1,000 pop.)¹³⁷ Increased material value: \$23M/year to \$62M/year (NSW only) Reduced collection costs: undetermined Reduced litter collection costs: \$59M/year (\$31,922 per 1,000 pop.) |
| 9 | The Incentive to Recycle: The Case for a Container Deposit System in New Zealand ¹³⁸ Envision New Zealand Ltd., 2015 | <ul style="list-style-type: none"> Refuse transport/ disposal savings: significant but undetermined Refuse collection savings: \$26.7M/year to \$40.1M/year (\$5,918 to \$8,887 per 1,000 pop.)¹³⁹ Reduced litter control costs: undetermined Reduced kerbside collection costs: up to \$19.26/household/year |
| 10 | A Scottish Deposit Refund System ¹⁴⁰ Eunomia Research & Consulting (prepared for Zero Waste Scotland), 2015 | Net annual savings (from reduced collection and disposal costs) of: <ul style="list-style-type: none"> £5M for local authority kerbside services (£931 per 1,000 pop.)¹⁴¹ £7M for reduced litter (£1,303 per 1,000 pop.) |
| 11 | Cost Benefit Study of a Tasmanian Container Deposit System ¹⁴² | <ul style="list-style-type: none"> From 2014/15 to 2034/35, a CDS would benefit local government by \$28M NPV (Net Present |

| | Study Title, Author and Year | Summary of Findings |
|----|---|--|
| | Marsden Jacob Associates (prepared for the Department of Primary Industries, Parks, Water and the Environment (DPIPWE)), 2014 | Value) (\$54,139 per 1,000 pop.) ¹⁴³ through the receipt of refunds on collected material & avoidance of some costs associated with existing kerbside recycling (undetermined). |
| 12 | Cost-Benefit Analysis of a Recycling Refund System in Minnesota ¹⁴⁴ Reclay StewardEdge (prepared for Minnesota Pollution Control Agency (MPCA)), 2014 | Estimated net annual savings for local governments: <ul style="list-style-type: none"> \$5.6M (\$0.27/household/month) (\$1,027 per 1,000 pop.)¹⁴⁵ Undermined savings from reduced litter clean-up costs |
| 13 | Executive Summary: Implementing a Deposit and Return Scheme in Catalonia – Economic Opportunities for Municipalities ¹⁴⁶ Retorna, 2014 | <ul style="list-style-type: none"> Reduced treatment costs: final treatment (€6,029,686, or €803 per 1,000 pop.)¹⁴⁷; Waste Disposal Tax (€607,170, or €81 per 1,000 pop.); OFMSW (€565,042, €75 per 1,000 pop.) Return of the waste disposal tax/collection fee: €1,105,523 (€147 per 1,000 pop.) Reduced street cleaning costs: €13,175,737/year (€1,755 per 1,000 pop.) Reduced beach cleaning costs: €580,481/year (€77 per 1,000 pop.) |
| 14 | An Assessment of the Potential Financial Impacts of a Container Deposit System on Local Government in Tasmania ¹⁴⁸ Equilibrium (prepared for the Local Government Association of Tasmania), 2013 | <ul style="list-style-type: none"> Reduced collection costs: \$257,000/year (\$1.31/service/year) (\$497 per 1,000 pop.)¹⁴⁹ Reduced processing costs: \$340,000/year (\$1.73/service/year or \$8.70/tonne) (\$657 per 1,000 pop.), Improved material value: \$750,000/year (\$1,450 per 1,000 pop.) Net savings: \$1.3M/year (\$2,514 per 1,000 pop.), up to \$26.8M (\$51,819 per 1,000 pop.) over 20 years Reduced litter management costs: \$160,000/year |
| 15 | Executive Summary: Report on the Temporary Implementation of a Deposit and Refund Scheme in Cadaques ¹⁵⁰ Retorna, 2013 | <ul style="list-style-type: none"> Reduced collection costs: €24,242/year (€8,536 per 1,000 pop.)¹⁵¹ to €35,372/year (€12,455 per 1,000 pop.) Reduction in compensation by Ecoembes: €1,240/year (€437 per 1,000 pop.) to €1,766/year (€622 per 1,000 pop.) (This would be offset by the reduction in collection costs). Reduced maintenance costs: €1,742/year (€613 per 1,000 pop.) to €2,420/year (€852 per 1,000 pop.) Net savings: €23,000/year to €33,605/year (€8,099 to €11,833 per 1,000 pop.) |
| 16 | Comparison of System Costs and Materials Recovery Rates: Implementation of Universal Single Stream Recycling With and Without | <ul style="list-style-type: none"> Estimated value of litter reduction: \$815,000 to \$1.2M (\$1,301 to \$1,917 per 1,000 pop.)¹⁵³ Avoided disposal savings: \$11.1M to \$11.3M |

| | Study Title, Author and Year | Summary of Findings |
|----|--|---|
| | Beverage Container Deposits – Draft Report ¹⁵² DSM Environmental (prepared for Vermont Agency of Natural Resources), 2013 | (\$17,730 to \$18,050 per 1,000 pop.) |
| 17 | The Impacts (Cost/Benefits) of the Introduction of a Container Deposit/Refund System (CDS) on recycling and councils ¹⁵⁴ Mike Ritchie & Associates (prepared for Local Government Association of NSW), 2012 | <ul style="list-style-type: none"> Recycling savings: \$9 to \$24/household Potential savings for local governments: \$23M/year to \$62M/year (\$3,010 to \$8,115 per 1,000 pop.)¹⁵⁵ |
| 18 | Understanding the Impacts of Expanding Vermont's Beverage Container Program ¹⁵⁶ CM Consulting (prepared for Vermont Public Research Interest Group (VPIRG)), 2012 | <ul style="list-style-type: none"> Increased material revenues: \$2.3M (\$3,674 per 1,000 pop.¹⁵⁷) Reduced garbage, recycling, and litter management costs: beyond the scope of this study, however, materials management in Vermont is estimated to cost \$90/ton to \$108/ton for disposal and \$1,200/ton to \$2,300/ton for litter collection. |
| 19 | Examining the Cost of Introducing a Deposit Refund System in Spain ¹⁵⁸ Eunomia Research & Consulting (prepared for Retorna), 2012 | <ul style="list-style-type: none"> Total savings to municipality: €57M/year to €93M/year (€1,237 to €2,019 per 1,000 pop.¹⁵⁹). 76% to 81% of these savings are derived from the reduction in costs associated with residual waste collection; ~20% come from reduced litter collection costs; and <1% come from reduced puntos limpios. |
| 20 | Packaging Impacts Consultation Regulation Impact Statement ¹⁶⁰ Standing Council on Environment and Water 2011 | <p>Over 20 years, a CDS is estimated to result in:</p> <ul style="list-style-type: none"> Avoided collection, transport and recycling costs: \$2.72 billion (\$112,933 per 1,000 pop.¹⁶¹) Other avoided costs (landfill and litter clean up): \$247M (\$10,255 per 1,000 pop.) |
| 21 | Turning Rubbish into Community Money: The Benefits of a 10 cent Deposit on Drink Containers in Victoria ¹⁶² Office of Colleen Hartland MLC, 2011 | <ul style="list-style-type: none"> Reduced recycling/MRF processing costs: \$6,577,919 (\$1,102 per 1,000 pop.¹⁶³) Reduced waste costs (landfill gate fee and levy): \$5,070,851 (\$850 per 1,000 pop.) Reduced litter collection costs: \$8.8M (\$1,475 per 1,000 pop.) Net savings: \$32,625,183/year ((\$5,468 per 1,000 pop)) |
| 22 | Have We Got the Bottle? Implementing a Deposit Refund Scheme in the UK ¹⁶⁴ Eunomia Research & Consulting (prepared for the Campaign to Protect Rural England), 2010 | <p>'Complementary' DRS scenario:</p> <ul style="list-style-type: none"> Reduced recycling collection costs: £129M/year (£1,982 per 1,000 pop.¹⁶⁵) Reduced bringsite costs: £3M/year (£46 per 1,000 pop.) Reduced Household Waste Recycling Centers (HWRC) costs: £1M/year (£15 per 1,000 pop.) Reduced litter collection costs: £27M/year (£415 per 1,000 pop.) Net savings: £159M/year (£2,443 per 1,000 pop.) (£7/household/year) |

| | Study Title, Author and Year | Summary of Findings |
|----|---|--|
| | | <p>'Parallel' DRS scenario:</p> <ul style="list-style-type: none"> Reduced collection, treatment and disposal costs: £143M/year (£2,198 per 1,000 pop.) |
| 23 | <p>Analysis of the Impact of an Expanded Bottle Bill on Municipal Refuse and Recycling Costs and Revenues¹⁶⁶</p> <p>DSM Environmental (prepared for Massachusetts Department of Environmental Protection (MassDEP)), 2009</p> | <ul style="list-style-type: none"> Avoided collection costs: \$4,214,071/year to \$5,033,112/year (\$620 to \$741 per 1,000 pop.¹⁶⁷) Avoided disposal costs: \$482,372/year to \$2,334,863/year (\$71 to \$344 per 1,000 pop.) Reduced litter clean-up costs: \$536,772 (\$79 per 1,000 pop.) (distributed between state and local litter collection efforts; no data available on what this distribution is) Net savings: \$3,797,011/year to \$6,468,544/year (\$559 to \$952 per 1,000 pop.) |
| 24 | <p>Analysis of Beverage Container Redemption System Options to Increase Municipal Recycling in Rhode Island¹⁶⁸</p> <p>DSM Environmental (prepared for Rhode Island Resource Recovery Corporation), 2009</p> | <ul style="list-style-type: none"> Reduction in municipal material revenues: \$1.4M/year (\$1,325 per 1,000 pop.¹⁶⁹) statewide Reduced litter collection costs: \$267,500/year (\$253 per 1,000 pop.) Reduced disposal costs: \$870,000/year (\$824 per 1,000 pop.) Reduced collection costs: \$1.3M/year (\$1,231 per 1,000 pop.) Net savings: \$1,037,500/year (\$982 per 1,000 pop.) |
| 25 | <p>Beverage Container Investigation¹⁷⁰</p> <p>BDA Group (prepared for the EPHC Beverage Container Working Group), 2009</p> | <ul style="list-style-type: none"> Deposits collected by local government: \$78M/year to \$147M/year (\$3,239 to \$6,103 per 1,000 pop.¹⁷¹) Kerbside savings: \$24M/year to \$25M/year (\$996 to \$1038 per 1,000 pop.) Landfill cost savings: \$13M/year to \$17M/year (\$540 to \$706 per 1,000 pop.) Landfill levy savings: \$7M/year to \$9M/year (\$291 to \$374 per 1,000 pop.) Material values lost by local government: \$47M/year to \$48M/year (\$1,951 to \$1,993 per 1,000 pop.) Net savings: \$75M/year (\$3,114 per 1,000 pop.) to \$150M/year (\$6,228 per 1,000 pop.), depending on level of deposit (\$0.10 or \$0.20/container) |
| 26 | <p>City of Toronto Staff Report: Amendments to Processing Fees Due to LCBO Deposit Return Program¹⁷²</p> <p>City of Toronto General Manager, Solid Waste Management Services (prepared for Public Works and Infrastructure Committee), 2008</p> | <p>The implementation of a DRS resulted in:</p> <ul style="list-style-type: none"> Reduced processing costs: \$657,700 (\$236 per 1,000 pop.¹⁷³) in 2007 and \$869,975 (\$312 per 1,000 pop.) in 2008 Reduced glass disposal costs: \$490,000 (\$176 per 1,000 pop.) in 2007 and \$393,250 (\$141 per 1,000 pop.) in 2008 |

| | Study Title, Author and Year | Summary of Findings |
|----|---|---|
| | | <ul style="list-style-type: none"> pop.) in 2008 Net savings: \$447,989 (\$161 per 1,000 pop.) in 2007 and \$381,126 (\$137 per 1,000 pop.) in 2008 |
| 27 | Economic & Environmental Benefits of a Deposit System for Beverage Containers in the State of Washington ¹⁷⁴ Jeffrey Morris (Sound Resource Management Group), Bill Smith (City of Tacoma), and Rick Hlavka (Green Solutions) (prepared for City of Tacoma Solid Waste Management), 2005 | <ul style="list-style-type: none"> Reduced garbage collection costs: \$78,150 (\$381 per 1,000 pop.¹⁷⁵) Reduced disposal costs: \$150,500 (\$734 per 1,000 pop.) Reduced recycling collection costs: \$69,400 (\$338 per 1,000 pop.) Reduced litter costs: \$34,300 (\$167 per 1,000 pop.) Loss of market revenues for recycling programs: \$68,300 (333 per 1,000 pop.) Net savings: \$264,050 (\$1,287 per 1,000 pop.) |

Charities and Community Organizations

Beverage container deposit programs play an important role in the fundraising efforts of many not-for-profit organizations (e.g. schools, community groups, youth groups) and charities.

In Ontario, for example, the *Returns for Leukemia* bottle drive has raised over \$11 million dollars since the fundraiser began more than 10 years ago.¹⁷⁶ The fundraiser, which is a combined effort of The Beer Store and United Food and Commercial Workers Local 12R24, invites customers to donate all or a portion of their empty bottles (or cash), with 100% of the refunds going directly to the Leukemia and Lymphoma Society of Canada. The annual 'Returns for Roger Nielson House' bottle drive is another fundraiser organized by The Beer Store at its Eastern Ontario locations. In 2016, the program raised over \$82,000 for Roger's House, a special palliative care facility for children.¹⁷⁷

In Alberta, the 'Alberta Cans for Kids' program was established by the Alberta Bottle Depot Association (ABDA) as a way of raising money and awareness for foundations dedicated to providing medical needs for children (i.e. Ronald McDonald House, Stollery Children's Hospital Foundation, and Alberta Children's Hospital Foundation). Since November 2009, more than 200 bottle depots and their customers have been donating the proceeds from their returned recyclables to the program, for a total of over \$500,000. The goal for this year's campaign is \$150,000.¹⁷⁸

In British Columbia, Encorp Pacific developed the Return-It School program, which encourages students, teachers, and parents to recycle and collect beverage containers. Participating schools keep all the deposit refunds earned from the Encorp containers they collect, which can be used for various school fundraising opportunities. In 2013, some schools collected more than \$10,000.¹⁷⁹

Supplemental Income for Low/No Income Individuals

In provinces that have them, many people rely on beverage container deposits as a means to earn or supplement their income. Most of these people are economically disadvantaged and, in many cases,

disengaged from the workforce. Without revenue from the deposits, many would have difficulty meeting their basic needs.

Environmental Benefits

Traditionally, the performance of beverage container recycling programs has been measured using operational and financial indicators, such as the number of containers collected for recycling. Today, more and more system operators are beginning to measure and report on the environmental impacts of their programs. This includes, for example, the amount of energy saved through the recycling of beverage containers or the amount of GHG emissions avoided. These indicators provide a more comprehensive picture of the overall impacts of beverage container recovery in Canada.

A recent study that assessed the benefits associated with Nova Scotia's DRS found that the landfill space saved by recycling beverage containers in 2016 was 7,660m³. The 20-year cumulative total was estimated at 129,632m³, which is equivalent to 52 Olympic-sized swimming pools. With landfill space at a premium these days, this is a particularly relevant indicator for measuring the environmental benefits of deposit programs. The study also found that recycling beverage containers in Nova Scotia saves 38,709 tonnes of GHG emissions each year, which is equivalent to removing more than 3,800 cars from the road. The amount of electricity saved by not having to produce new containers was estimated at 208 million kW in 2016, enough electricity to power 18,842 Nova Scotia homes.¹⁸⁰

In British Columbia, Encorp reported that its activities in 2016 contributed to the reduction of about 101,900 tonnes of CO₂ equivalent being released into the atmosphere. Not surprisingly, half of these reductions (50,645 tonnes of CO₂) were achieved through the recovery and recycling of aluminum beverage containers, which were turned back into sheet stock for new cans. The recycling of glass containers resulted in 25,977 tonnes of CO₂ reduced (25% of total reductions), while the recycling of plastic containers reduced CO₂ emissions by 12,441 tonnes (12% of total reductions). In terms of energy savings, the recycling of aluminum cans offered the greatest savings at 93%, followed by plastic (86%) and bi-metal (82%).¹⁸¹

The environmental benefits of Ontario's Beer Store and ODRP programs are also well documented. In 2016, a total of 203,555 metric tonnes of CO₂e was avoided through the reuse and recycling of wine, spirit, and beer containers. It is worth noting that about 56% of these emission reductions are attributable to the recycling of aluminum cans. The two programs also resulted in 2.6 million GJ of avoided energy consumption. Almost half (47%) of these savings are the result of glass reuse.¹⁸²

In addition to the above, Environment Canada and the U.S. Environmental Protection Agency (EPA) have undertaken extensive life-cycle analyses to measure the inputs and outputs, from cradle to grave, of recycling various materials. The results of these studies can be applied to beverage container diversion to quantify the environmental benefits associated with container recycling in each province. Results are summarized in Table 16. Note that in Quebec, the tonnes recycled are based on real 2016 numbers from Quebec's deposit program, and estimated numbers based on previous results for the curbside collection program.

Table 16 Environmental Benefits Realized from Recycling Beverage Containers in Canada (2016)

| Province / Territory | Avoided emissions (MTCO ₂ e) | Equivalent number of cars taken off the road | Total GJs saved | Avoided crude oil extraction (# of barrels) | Value of crude oil saved (based on \$98.97/barrel) (avg price in 2014, US EIA) |
|----------------------|---|--|-------------------|---|--|
| BC | 169,346 | 36,263 | 2,506,636 | 427,754 | 18,709,941 |
| AB | 181,313 | 38,825 | 2,936,477 | 501,105 | 21,918,346 |
| SK | 39,620 | 8,484 | 659,506 | 112,544 | 4,922,664 |
| MB | 14,801 | 3,169 | 409,606 | 69,899 | 3,057,369 |
| ON | 376,222 | 80,561 | 5,772,401 | 985,051 | 43,086,143 |
| QC | 272,751 | 58,405 | 4,162,659 | 710,351 | 31,070,768 |
| NB | 34,018 | 7,284 | 488,352 | 83,336 | 3,645,137 |
| NS | 35,940 | 7,696 | 631,451 | 107,756 | 4,713,254 |
| NL | 19,966 | 4,275 | 365,148 | 62,312 | 2,725,527 |
| PEI | 4,405 | 943 | 109,365 | 18,663 | 816,319 |
| YT | 136 | 29 | 3,005 | 513 | 22,433 |
| NT | 2,076 | 445 | 33,951 | 5,794 | 253,416 |
| TOTAL | 1,150,593 | 246,380 | 18,078,558 | 3,085,078 | 134,941,317 |

CM Consulting calculated the total avoided emissions (and equivalent cars off the road) by multiplying the tonnage recovered by container type with an emissions reduction factor for each material type. CM Consulting also calculated the total avoided energy used (and equivalent barrels of oil avoided) by multiplying the tonnage recovered by container type with an energy savings factor for each material type. See Table 17 for the results.

Table 17 Provincial and National Avoided Energy Used, by Material, 2016

| Province | Aluminum | Steel | PET | HDPE | Glass Recycling | Glass Reuse | Total GJs saved |
|-----------------------|-------------------|---------------|------------------|---------------|------------------|------------------|-------------------|
| Energy Factor | 152.76 | 19.97 | 31.87 | 50.20 | 2.13 | 6.90 | |
| British Columbia | 1,887,426 | 6,932 | 335,735 | - | 159,133 | 117,410 | 2,506,636 |
| Alberta | 1,985,116 | 7,998 | 640,334 | - | 131,591 | 171,438 | 2,936,477 |
| Saskatchewan | 475,308 | 379 | 112,125 | - | 21,083 | 50,611 | 659,506 |
| Manitoba | 225,627 | - | 121,361 | - | 1,358 | 61,261 | 409,606 |
| Ontario | 3,243,663 | 5,032 | 762,130 | 69,045 | 411,359 | 1,281,171 | 5,772,401 |
| Quebec | 2,503,712 | - | 594,305 | - | 285,003 | 779,638 | 4,162,659 |
| New Brunswick | 317,256 | 323 | 82,138 | - | 41,229 | 47,405 | 488,352 |
| Nova Scotia | 363,916 | 1,772 | 165,131 | 4,248 | 20,593 | 75,791 | 631,451 |
| Newfoundland | 133,889 | 91 | 69,272 | - | 14,259 | 147,638 | 365,148 |
| Prince Edward Island | 78,567 | - | 15,416 | - | 3,628 | 11,754 | 109,365 |
| Yukon | - | - | - | - | 65 | 2,940 | 3,005 |
| Northwest Territories | 26,275 | 240 | 4,207 | - | 1,001 | 2,229 | 33,951 |
| TOTAL | 11,240,755 | 22,768 | 2,902,153 | 73,293 | 1,090,303 | 2,749,286 | 18,078,558 |

Notes:

- All tonnage data are based on reported tonnes by program and container types.
- Refillable bottles tonnage is calculated as follows: average container weight of 263 grams multiplied by the number of units recovered. This number is then multiplied by 14/15, which represents an average of 15 individual trips per refillable bottle. For the remaining 15th trip (the last trip), it is assumed that the glass is being recycled.
- Energy saving factors were taken from the following report: Determination of the Impact of Waste Management Activities on Greenhouse Gas Emissions: 2005 Update—Final Report, Environment Canada & Natural Resources Canada, October 2005.
- Emissions reduction factors from <https://www.epa.gov/warm/versions-waste-reductionmodel-warm#WARM%20Tool%20V14> accessed July 6, 2016.
- A typical passenger vehicle emits about 4.67 metric tons of CO₂e per year <Source: www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references (accessed October 12, 2017).>
- One barrel of crude oil is equal to about 6.1 GJ of energy (1 barrel of crude = 5.848 Mbtu = 6.17 GJ). <Source: www.oregon.gov/energy/cons/pages/industry/ecf.aspx>
- The price of Brent crude oil averaged USD\$43.75/barrel in 2016.
<https://www.eia.gov/outlooks/steo/report/prices.php>https://www.eia.gov/dnav/pet/pet_pri_spt_s1_a.htm

The calculations used to produce Table 16 and Table 17 are available in Appendix B of this report. To receive a copy of Appendix B and of all the associated supporting data for this section, please contact us at jason@cmconsultinginc.com.

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Appendix A

Methodology for Calculating Recycling Rates in Ontario

The beverage container recycling rates are derived from Stewardship Ontario tonnage and collection rates. Then, a loss rate from contamination is applied. The loss rate for aluminum is assumed to be 2%, for PET plastic 22%, and for glass 40% (note that this only applies to curbside collected non-alcohol beverage glass).

The collection rate for aseptic and gable top non-alcoholic beverage containers is based on the rate reported by Stewardship Ontario for 2016. The away-from-home sales and recovery rates are not included in this summary.

Endnotes

- ¹ CSA Group. 15 September 2015. "CSA Group Publishes New Guideline for Accountable Management of End-of-Life Materials." <https://www.csagroup.org/news_or_press/new-guideline-accountable-management-of-end-of-life-materials/>
- ² Strategic Materials as cited by the Container Recycling Institute. <www.bottlebill.org/about/benefits/quality.htm>
- ³ Canadian Beverage Container Recycling Association. Annual Report 2016.
- ⁴ Container Recycling Institute. August 2015. The Environmental and Economic Performance of Beverage Container Reuse and Recycling in British Columbia, Canada. <[www.container-recycling.org/images/stories/PDF/BC study MJD 8-26-15 press quality.pdf](http://www.container-recycling.org/images/stories/PDF/BC%20study%20MJD%208-26-15%20press%20quality.pdf)>
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