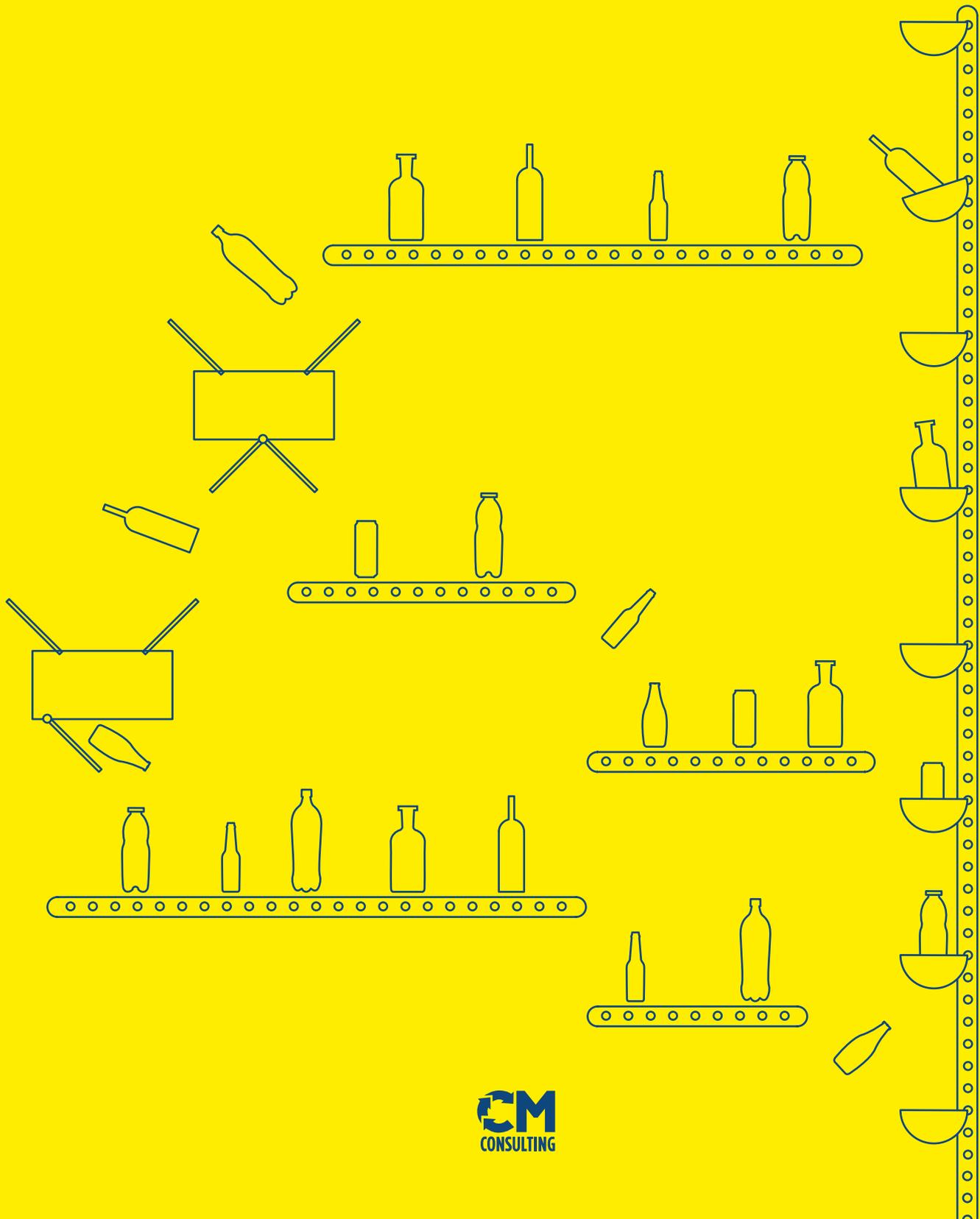


WHO PAYS WHAT

AN ANALYSIS OF BEVERAGE CONTAINER COLLECTION AND COSTS IN CANADA

2016



AUTHOR'S NOTE

CM Consulting provides the information contained in this report in good faith, and every attempt has been made to ensure that all facts and analyses presented are as accurate as possible. Sales and collection data, as well as information on recycling costs and fees, used in this report are taken directly from publicly accessible annual reports released by program operators, stewardship agencies, or other involved entities. Other information was obtained through interviews and e-mail correspondence. Users should be aware that CM Consulting is not liable for the use or application of this research. There is no guarantee provided in respect of the information presented, and any mention of trade names or commercial products does not constitute endorsement or recommendation for use.

CM Consulting Inc.

Working with industry, government, and not-for-profits, CM Consulting is recognized worldwide for the comprehensive information and analysis it provides – information that is relied upon to make informed policy and programming decisions. Established in 1998 by Clarissa Morawski, CM Consulting was founded on the principle that industry and consumers must assume greater responsibility for ensuring that the manufacture, use, reuse and recycling of their products and packaging has a minimum impact on the environment. CM Consulting specializes in waste minimization and Canadian stewardship policy with a specific focus on extended producer responsibility programs, cost and performance.

The CM Consulting team consists of Clarissa Morawski (Principal), Jason Wilcox (Projects Manager), and Samantha Millette (Research Analyst).

ACKNOWLEDGEMENTS & SPECIAL THANKS

A project like this is never a solitary enterprise. The gathering of accurate and detailed information, analysis, and peer-review required the help, support and co-operation of many people. This project would not have been possible without the generous assistance of the following individuals whose work is dedicated to beverage container recovery in Canada:

Bill Chan, Encorp Pacific Canada (British Columbia)
Brian Zeller-Kligman, Canada's National Brewers
Colette Boucher, Encorp Atlantic (New Brunswick)
Darrin Fredrickson, Department of Community Services (Yukon)
Diep Duong, Department of Environment & Natural Resources (Northwest Territories)
Frédéric St-Onge, Boissons Gazeuses Environnement (Québec)
Gilles Doucette, Divert NS (Nova Scotia)
Jeff Linton, Beverage Container Management Board (Alberta)
John Hughes, Ministry of Environment, Energy and Forestry (Prince Edward Island)
Ken Friesen, Canadian Beverage Container Recycling Association (Manitoba)
Mark Miller, Department of Environment and Local Government (New Brunswick)
Normand Bisson, Boissons Gazeuses Environnement (Québec)
Paul Russell, Multi-Materials Stewardship Board (Newfoundland & Labrador)
Pierre Landry, Encorp Atlantic (New Brunswick)
Roxanne Peters, Sarc/Sarcan Recycling (Saskatchewan)

In addition to these named individuals, we would like to give a special note of thanks to the financial supporters of this report:



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LIST OF ABBREVIATIONS

ABCRC	Alberta Beverage Container Recycling Corporation
ABCC	Alberta Beer Container Corporation
ABDA	Alberta Bottle Depot Association
ADC	Alberta Dairy Council and Atlantic Dairy Council
AfH	Away-from-home
AGLC	Alberta Gaming and Liquor Commission
BCMB	Beverage Container Management Board
BDL	Brewers Distributor Limited
BGE	Boissons Gazeuses Environnement
BIB	Bag-In-Box
CBCRA	Canadian Beverage Container Recycling Association
CHF	Container Handling Fee
CRF	Container Recycling Fee
CSA	Collection System Agent
CSP	Collection Service Provider
DRS	Deposit-return system
ÉEQ	Éco Entreprises Québec
EfW	Energy-from-waste
EHC	Environmental Handling Charge
EPR	Extended Producer Responsibility
GHG	Greenhouse Gas
GJ	Gigajoule
HDPE	High-density polyethylene
IC&I	Industrial, Commercial, and Institutional

IFO	Industry Funding Organization
ISB	Industry Standard Bottle
ISO	International Organization for Standardization
ISP	Industry Stewardship Plan
IWMC	Island Waste Management Corporation
LCBO	Liquor Control Board of Ontario
LDPE	Low-density polyethylene
MEBCalc™	Measuring the Environmental Benefits Calculator
MMBC	Multi-Material British Columbia
MMRP	Multi-Material Recycling Program
MMSB	Multi-Materials Stewardship Board
MMSM	Multi-Material Stewardship of Manitoba
MMSW	Multi-Material Stewardship Western
MRF	Material Recovery Facility
MtCO_{2e}	Metric tonnes of carbon dioxide equivalent
PER	Processing Efficiency Rate
PET	Polyethylene terephthalate
PPP	Printed paper and packaging
PVC	Polyvinyl chloride
R2R	Return to Retail
RF	Recycling Fund Fee
RPRA	Resource Productivity and Recovery Authority
RRFB	Resource Recovery Fund Board Inc.
RVM	Reverse Vending Machine
SO	Stewardship Ontario
TBS	The Beer Store (aka Brewers Retail, Inc.)
UDRS	Unified Dairy Recycling System
WDA	Waste Diversion Act (Ontario)
WDO	Waste Diversion Ontario

PROVINCE SHORT CODES

AB	Alberta
BC	British Columbia
MN	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 2016

AN ANALYSIS OF BEVERAGE CONTAINER COLLECTION & COSTS IN CANADA

A PRIMER

In 1970, British Columbia became the first jurisdiction in Canada to adopt a mandatory deposit-return system for soft drinks and beer containers. Established as a litter control initiative, the system was based on a return-to-retail model, with deposits and refunds being managed by retailers and brandowners. Fast-forward to today, nearly all provinces in Canada have followed suit, introducing programs aimed at increasing the collection of used beverage containers for reuse or recycling. In 2014, approximately 67% of all non-refillable beverage containers sold in Canada were collected for recycling. (All data in this report is based on calendar 2014 or fiscal year 2014-2015)

With the goal of documenting these collective efforts and offering valuable insight into the field of beverage container recycling, CM Consulting developed *Who Pays What*™ in 2002, a first-of-its-kind comprehensive review and analysis of beverage container reuse and recycling initiatives across Canada. Intended to be a living document, the report is updated and published bi-annually and has proven to be an invaluable tool for government as well as professionals in the beverage industry and recycling field.

In this seventh edition of the report, we have included an expanded analysis of the economic benefits of deposit-return to municipalities. Notwithstanding these new additions, the overall intent of the report remains unchanged: to serve as an essential reference guide for government and industry professionals by providing an in-depth examination of beverage container reuse and recycling programs across Canada. *Who Pays What*™ continues to feature a detailed description of container recovery programs in each province, including information on costs, performance, and who is responsible for their oversight and operation. Furthermore, the report continues to provide an analysis of the environmental benefits of container reuse and recycling, along with a discussion on commodity markets for different materials.

As the landscape of beverage container collection in Canada continues to evolve, CM Consulting looks forward to continuing to provide the most updated and comprehensive information on these initiatives.

I trust you will find this report informative in your efforts. Please do not hesitate to contact me 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,



Clarissa Morawski, Principal

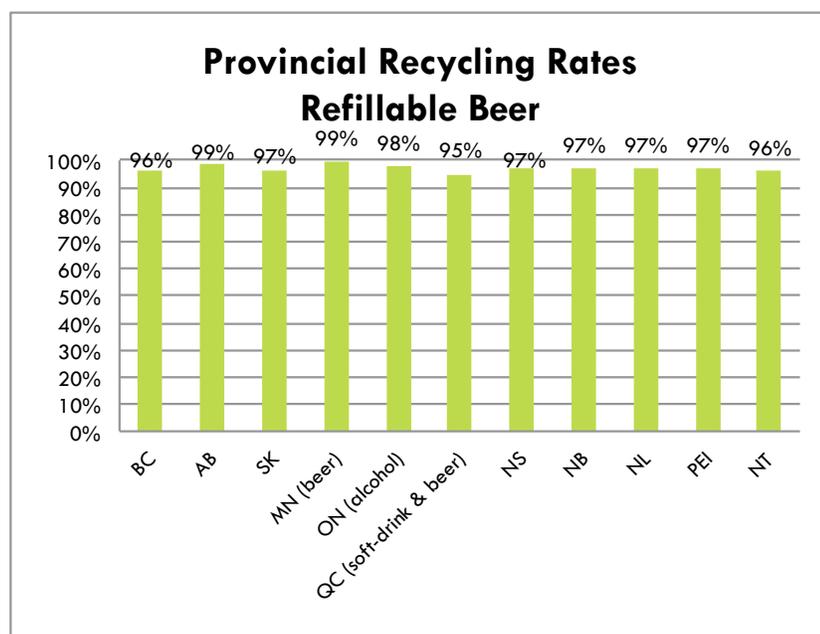
Executive Summary

Beverage Container Recycling Rates for 2014

Refillable Beer Bottles

Canada's recycling rate for these containers has been consistently high. In 2014, the rate was 97%. Figure 1 summarizes the recycling rates for refillable beer bottles collected through brewer-run provincial programs in fiscal year 2014. These rates will likely decline over the next few years as more and more brewers switch to non-refillable, one-way containers for beer, such as aluminum and plastic.

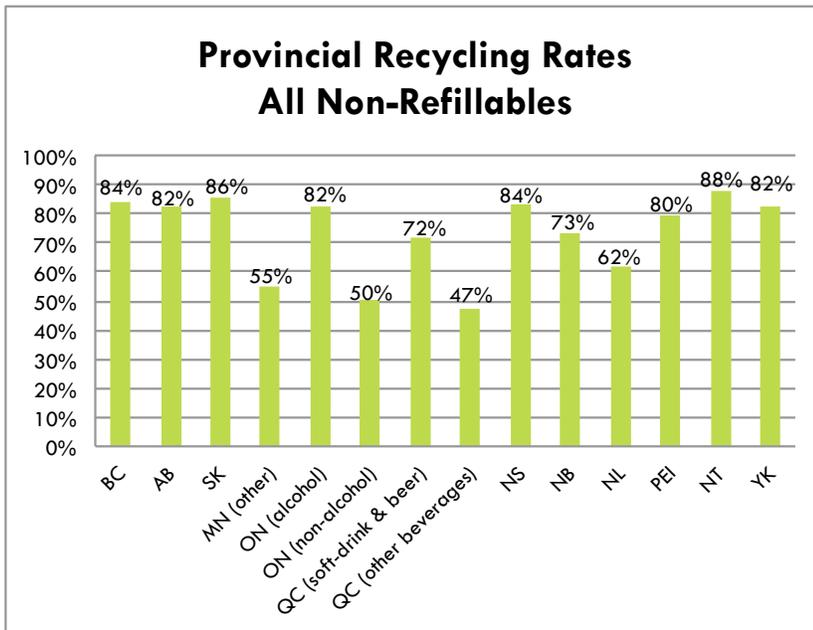
FIGURE 1 PROVINCIAL RECYCLING RATES, REFILLABLE BEER (2014)



Non-Refillable Containers

Non-refillable containers include all aluminum or steel cans, PET bottles, glass bottles, and gabletop/Tetra Pak containers. These are recycled at higher rates in jurisdictions that have deposit-return. For example, Saskatchewan and the Northwest Territories show non-refillable recycling rates of 86% and 88%, respectively, in 2014. In contrast, Ontario's non-refillable recycling rate (non-alcohol containers) was only 50%.

FIGURE 2 PROVINCIAL RECYCLING RATES, ALL NON-REFILLABLES (2014)



Environmental Benefits

In 2014, Canadians recycled and/or reused approximately 12 billion beverage containers. This level of diversion saved 18.5 million GJ of energy and eliminated over 1 million metric tonnes of CO₂ equivalent emissions, equal to taking more than 240,000 cars off the road. Other environmental benefits include avoided landfill space and litter reduction.

Economic Benefits of Deposit-Return Systems

Deposit-return creates significantly more (11 to 38 times more!) jobs than curbside recycling. According to a recent study, Nova Scotia's deposit-return system (DRS) creates approximately 600 jobs and \$20.1 million in salaries and wages. DRSs also result in big cost savings for municipalities. These savings come from the reduced or avoided costs of collection, treatment, disposal, and litter abatement. In this report, we present a compilation of 20 studies that examined the costs and benefits to municipalities of implementing (or expanding) DRS for beverage containers. The results are compelling; each study found that DRSs have only net-positive effects on municipal budgets.

Part 1: Program Performance

PERFORMANCE MEASUREMENT

Sports teams track scores and performance statistics to make the changes they need to improve. People who invest in stocks watch how the market is performing and adjust their investments accordingly. Companies monitor their expenses, revenues, and levels of customer satisfaction in order to remain a profitable business. It is the same for recycling programs. Without performance measurement, it is difficult – if not impossible – to design effective programs and to ensure that they are meeting their objectives.



Program performance is typically measured using the collection rate, which represents the number of containers collected for recycling in a given jurisdiction versus the number of containers sold in a given jurisdiction. Measuring the performance of a deposit-return system (DRS) is simple, since the refund provides an opportunity to track sales and collection to the last unit. Measuring the performance of multi-material collection systems, such as those in Manitoba, Ontario, and Québec (for non-carbonated beverages) on the other hand, is more complex. The complexity here lies in that beverage containers are collected commingled with other types of containers, for example PET from non-bottle sources, like ketchup bottles, and PET thermoform containers used to package fruits and baked goods.

Adding to this complexity is the fact that the weight of contaminants (leftover fluid, non-recyclables, glue and caps) is also included in the weight of collected containers. This renders the collection rate unable to reflect actual recycling of beverage containers. Before we can know what is truly recycled in these programs, the weight of non-beverage container material must be subtracted from the total collected tonnage. For this reason, CM Consulting chose to use recycling rates for this report.

In order to estimate recycling rates for beverage containers collected via multi-material recycling programs, CM Consulting applied reasonable and important assumptions to all available data (see Appendix).

Getting the Numbers Right: Accounting for Contamination in Commingled Recycling Systems

While the growing trend towards single-stream (also known as commingled) curbside recycling systems has led to increased public participation rates and volumes of recyclables collected, it has also produced unintended negative consequences, including higher contamination rates. Contamination in recycling can happen when non-recyclable items are mixed in with

recyclables (e.g. leftover liquids, dirt, or rocks in a beverage container) or when recyclable items are sorted improperly before they are shipped for recycling.

Contaminated materials create problems for recyclers such as higher costs, lower yield rates, more material to dispose of, and increased equipment downtime and maintenance. Contamination is also a problem when it comes to measuring program performance, because if recycling rates are reported without first removing contaminants, the rates will be inflated.

Compared to deposit-return, single-stream collection produces materials of a lower quality, with more residuals and out-throws. As evidence of this, recyclers in the U.S. have reported contamination rates (materials including caps, labels, and glue) of 33% for PET bottles recovered via single-stream collection methods; this is significantly higher than 27% for deposit bottles.¹

PROCESS LOSS

All bales of beverage containers shipped for recycling will experience some degree of yield loss due to the caps, labels, and glue that remain on the bottles after sorting, and it is important that both the numerator (i.e. amount of beverage container material collected) and the denominator (i.e. sales) include or exclude the weight of this material in a consistent manner.

Even in deposit-return programs, a certain level of yield loss will occur simply as a result of the recycling process. 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. In the case of recycling Tetra Pak 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 new ways to increase the recovery of beverage containers, it is important that they start reporting what is actually recycled (i.e. the recycling rate), not just what is collected for recycling (i.e. the collection rate). This requires applying the processing efficiency rate (PER) to the collection rate (see Table 1 for rate definitions).

It should be noted that this procedure is required only for collection rates that are measured and reported in weight, as is the case in Manitoba, Ontario, and Québec (for non-carbonated beverage containers). The collection rates reported for deposit-return programs are not affected by processing efficiency because these rates are based on unit counts, not on weight. On the other hand, recycling rates reported for non-deposit, multi-material collection programs decrease as the level of contamination increases.

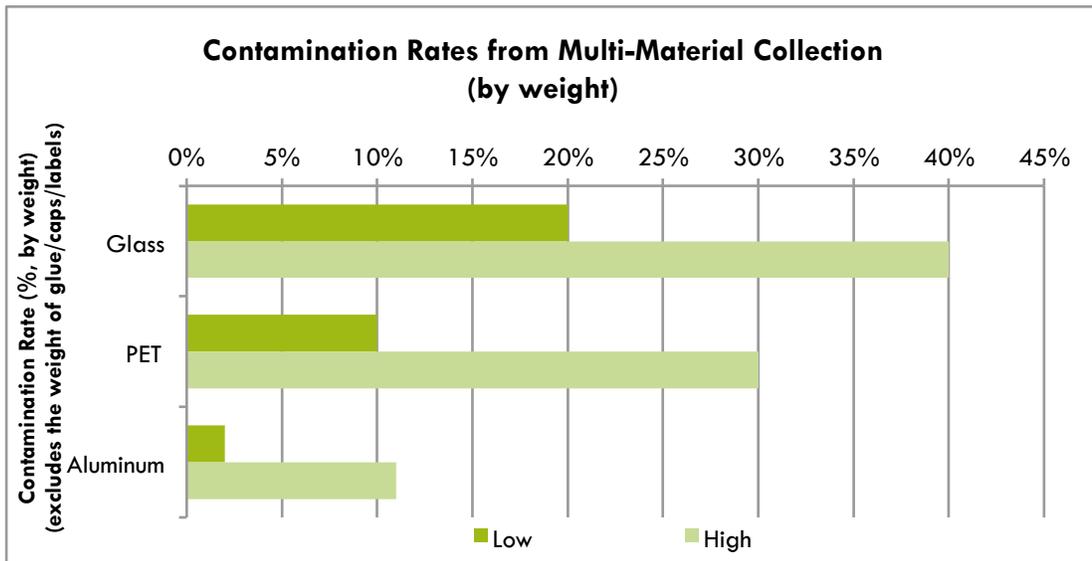
TABLE 1 RATE DEFINITIONS

<p>Collection Rate (CR)</p>	<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 in a given jurisdiction, excluding exports. There are instances where programs use "recovery rete" in place of collection rate in definitions.</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>
<p>Processing Efficiency Rate (PER)</p>	<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>
<p>Recycling Rate (RR)</p>	<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 in a given jurisdiction, excluding exports. The RR takes into account materials rejected due to contamination.</p> <p>Note: In deposit return systems, the collection rate and the recycling rate are the same.</p>

Knowing the PER (i.e. the contamination level) is critical for accurate performance measurement because it provides information on what was actually recycled – not on the material that was sent to disposal after secondary processing. To determine reasonable estimates of PERs, CM Consulting considered rates published by industry and conducted interviews with recyclers that process beverage container material in Canada.

Figure 3 presents typical contaminant rates (low and high) that are common in today's loads shipped from primary processors (i.e. material recycling facilities).

FIGURE 3 TYPICAL CONTAMINATION RATES (% BY WEIGHT) OF MATERIAL COLLECTED IN MULTI-MATERIAL COLLECTION SYSTEMS (EXCLUDES THE WEIGHT OF GLUE, GAPS, AND LABELS)



MATERIAL-SPECIFIC RECYCLING RATES

Collection or recycling rates for beverage containers are reported annually on a province-by-province basis. The method for measuring collection in deposit-return jurisdictions is straightforward: the collection/recycling rate is determined by dividing the number of units returned by the number of units sold in that year. Determining a recycling rate for provinces that operate multi-material recycling programs (in which beverage containers are collected mixed with other materials, such as paper and non-beverage containers) is more complex (see discussion above under 'Process Loss').

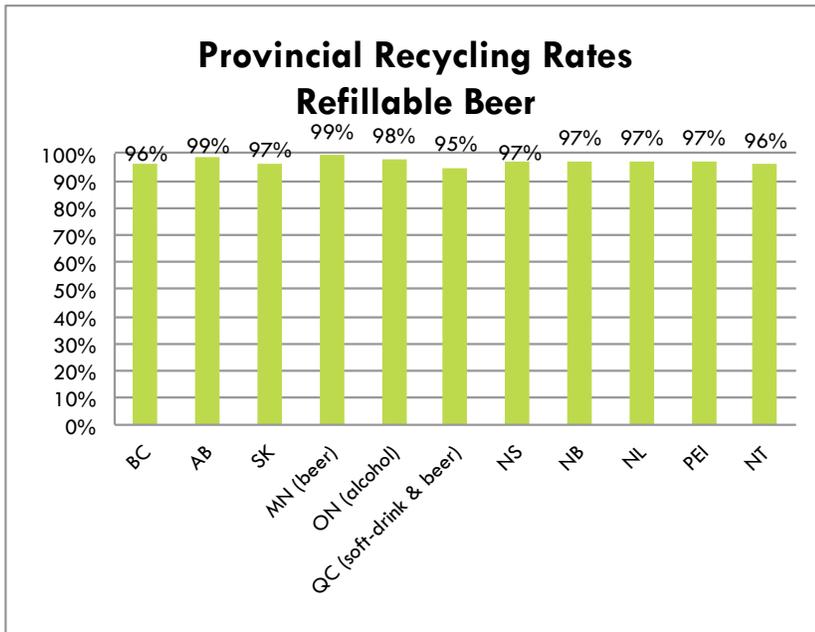
Refillable Beer Bottles

Provincial operating agencies and the Brewers Association of Canada are responsible for monitoring the collection/recycling rates for refillable beer bottles. The rate for these bottles has a considerable influence on the trippage rate, which, in turn, determines the environmental benefit to be gained from refillables. "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.

Canada's recycling rate for these containers has been consistently high. Figure 4 summarizes the recycling rates for refillable beer bottles collected through brewer-run provincial programs in fiscal year 2014. These rates will likely decline over the next few years as more and more brewers switch to non-refillable, one-way containers for beer, such as aluminum and plastic.

(Note: While the majority of refillable bottles are beer bottles, other forms of refillable bottles exist; these include refillable water bottles and bottles for other alcoholic and non-alcoholic beverages like milk and soft drinks. However, collection/recycling rates for these containers are not reported and so are not available to the public.)

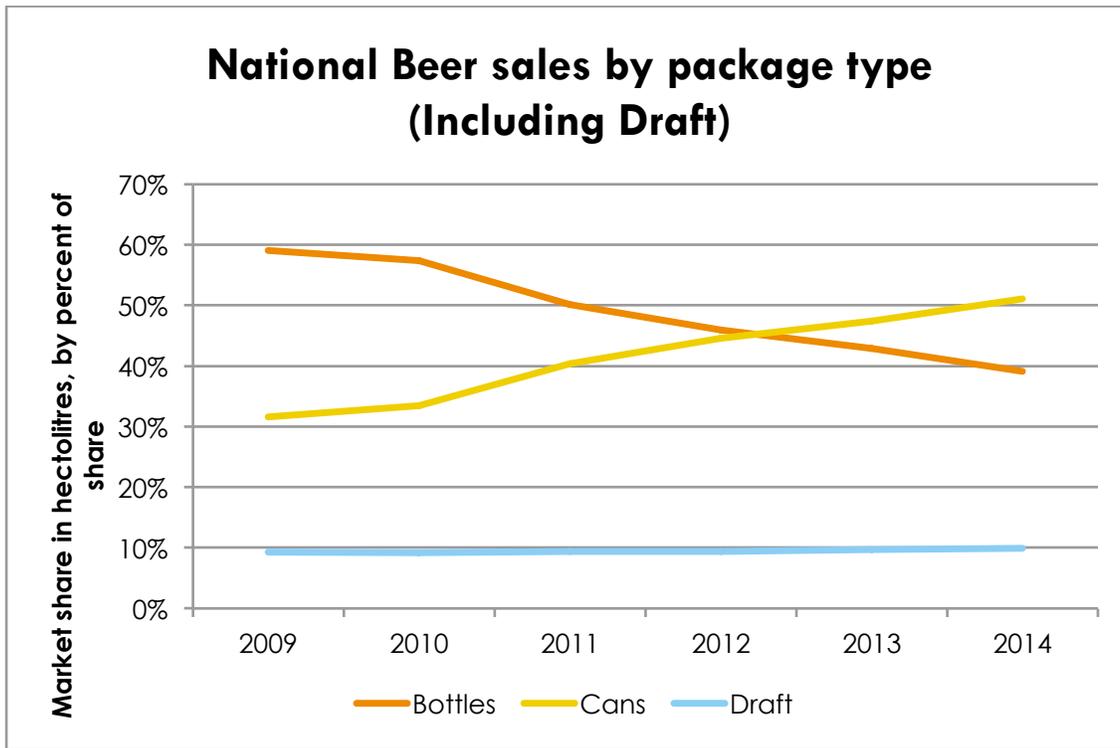
FIGURE 4 RECYCLING RATES FOR REFILLABLE BEER BOTTLES (2014)



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 Brewers Association of Canada (BAC) show that from 2009 to 2014, nationwide market share for the ISB dropped from 60% to 40% of overall hectoliters sold.

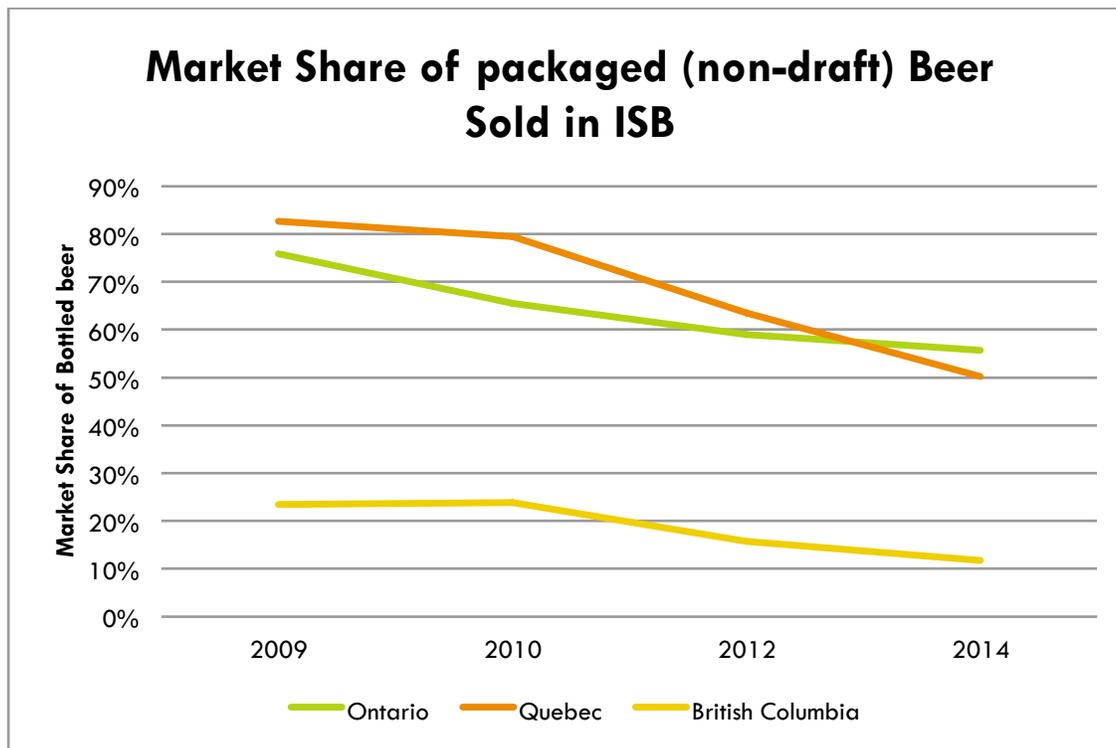
FIGURE 5 NATIONAL BEER SALES BY PACKAGE TYPE (INCLUDING DRAFT) (2009-2014)



Over 75% of refillable beer bottles sold in Canada are sold in Québec and Ontario, and it is in these two provinces where the greatest decline has occurred. In Québec, in 2009, 83% of packaged (cans and bottles) beer sold was in refillable bottles; by 2014, that share had dropped to 50%. During the same time period in Ontario, the percentage of beer sold in ISBs dropped from 76% to 56%. Many of these containers are being replaced by aluminum cans, which saw their market share in Ontario increase from 32% to 40% from 2012 to 2014. The province of B.C. has experienced a similar decline in refillable beer containers.

Figure 6 shows how the market share of the ISB has declined in Québec, Ontario and B.C. (2009-2014).

FIGURE 6 MARKET SHARE OF PACKAGED (NON-DRAFT) BEER SOLD IN ISB IN ONTARIO, QUEBEC, AND BRITISH COLUMBIA (2009-2014)



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 (increasing home consumption of beer, where traditionally the majority of beer was consumed in pubs, clubs, restaurants and hotels, etc., where empty bottles were retained by the establishments and returned to the distributors).

Non-Refillable Containers

Non-refillable containers, also called “one-way containers,” “single-use containers” or “disposable containers”, include cans (aluminum and steel), bottles (glass and plastic), and gabletop/Tetra Pak cartons. These containers are recycled at higher rates in jurisdictions that

have deposit-return. For example, Saskatchewan and the Northwest Territories show non-refillable recycling rates of 86% and 88%, respectively, in 2014. In contrast, Ontario's non-refillable recycling rate (non-alcohol containers) was only 50%.

Table 2 shows recycling rates for the different types of non-refillable containers collected through the provincial programs in 2014. Entries of "-" indicate that data for that category is either not available or not applicable for that province.

TABLE 2 PROVINCIAL RECYCLING RATES – NON-REFILLABLE CONTAINERS (2014)

Container Type	BC	AB	SK	MN (beer)	MN (other)	ON (alcohol)	ON (non-alcohol)	QC (soft-drink & beer)	NS	NB	NL	PEI	NT	YT
Aluminum Cans	90%	88%	92%	79%	50%	82%	48%	70%	92%	80%	64%	85%	97%	-
Non-Refillable Glass	92%	92%	94%	-	55%	87%	-	72%	83%	72%	62%	71%	82%	-
PET Bottles	75%	78%	82%	-	54%	53%	49%	78%	81%	71%	65%	81%	81%	-
Other Plastics	75%	78%	-	-	-	-	53%	-	53%	57%	37%	-	81%	-
Bi-Metal	66%	89%	-	-	50%	-	64%	-	93%	-	53%	-	59%	-
Gable/Tetra Pak/BIB	56%	65%	49%	-	19%	26%	29%	-	57%	124%	45%	50%	61%	-
Total Non-Refillables	84%	82%	86%	79%	55%	82%	50%	72%	84%	73%	62%	80%	88%	82%
Refillable Beer	96%	99%	97%	99%	-	98%	-	95%	97%	97%	97%	97%	96%	-
Total Containers	84%	83%	87%	83%	49%	89%	51%	78%	85%	76%	71%	82%	89%	-

Figure 7 presents recycling rates, by province, for non-refillables as a category in 2014. This figure clearly shows the difference in performance between deposit jurisdictions, with relatively high rates of recycling, and non-deposit jurisdictions (Manitoba, Ontario, and Québec), with relatively low rates of recycling.

FIGURE 7 PROVINCIAL RECYCLING RATES FOR NON-REFILLABLE CONTAINERS, DEPOSIT VS. CURBSIDE PROGRAMS (2014)

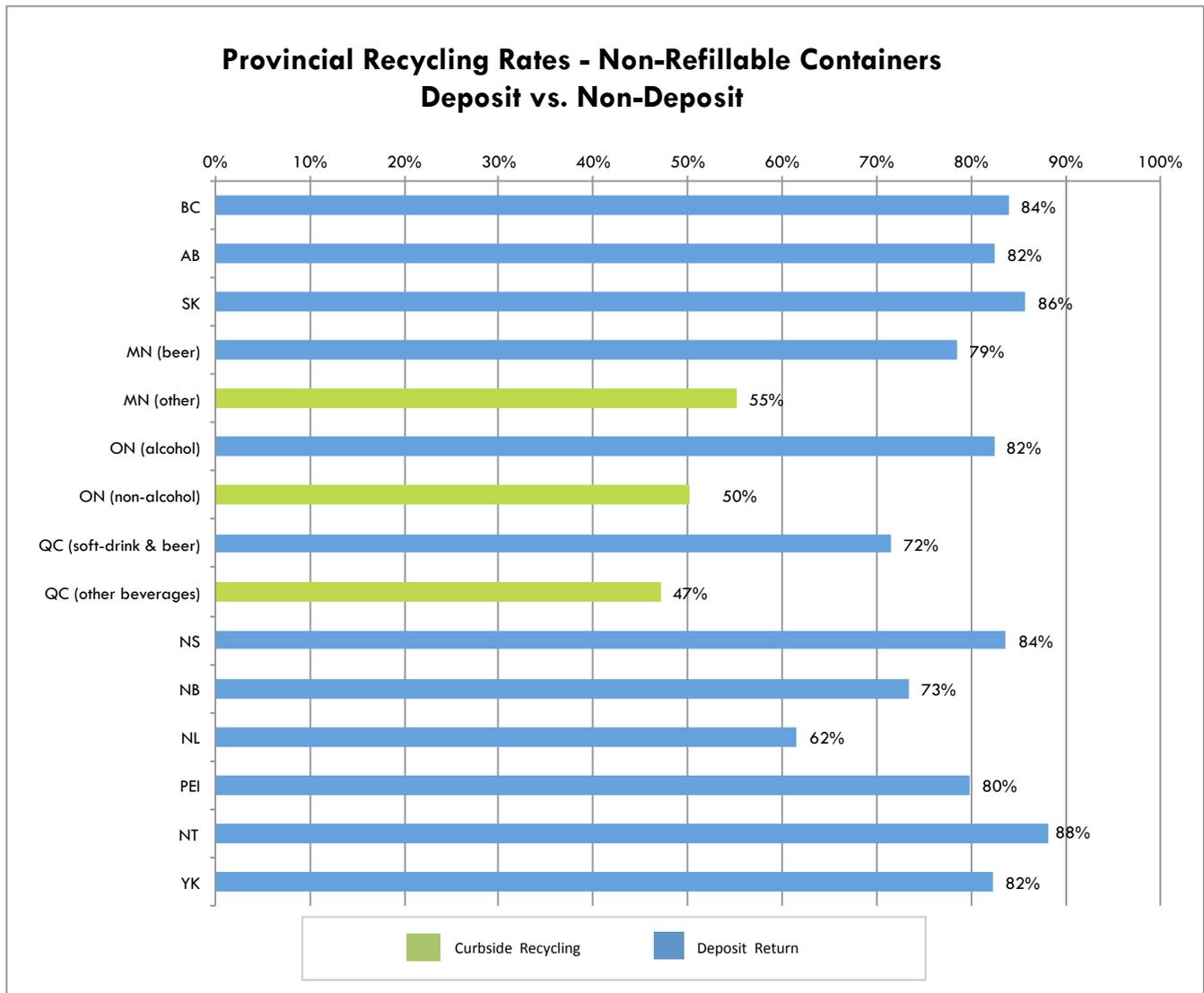
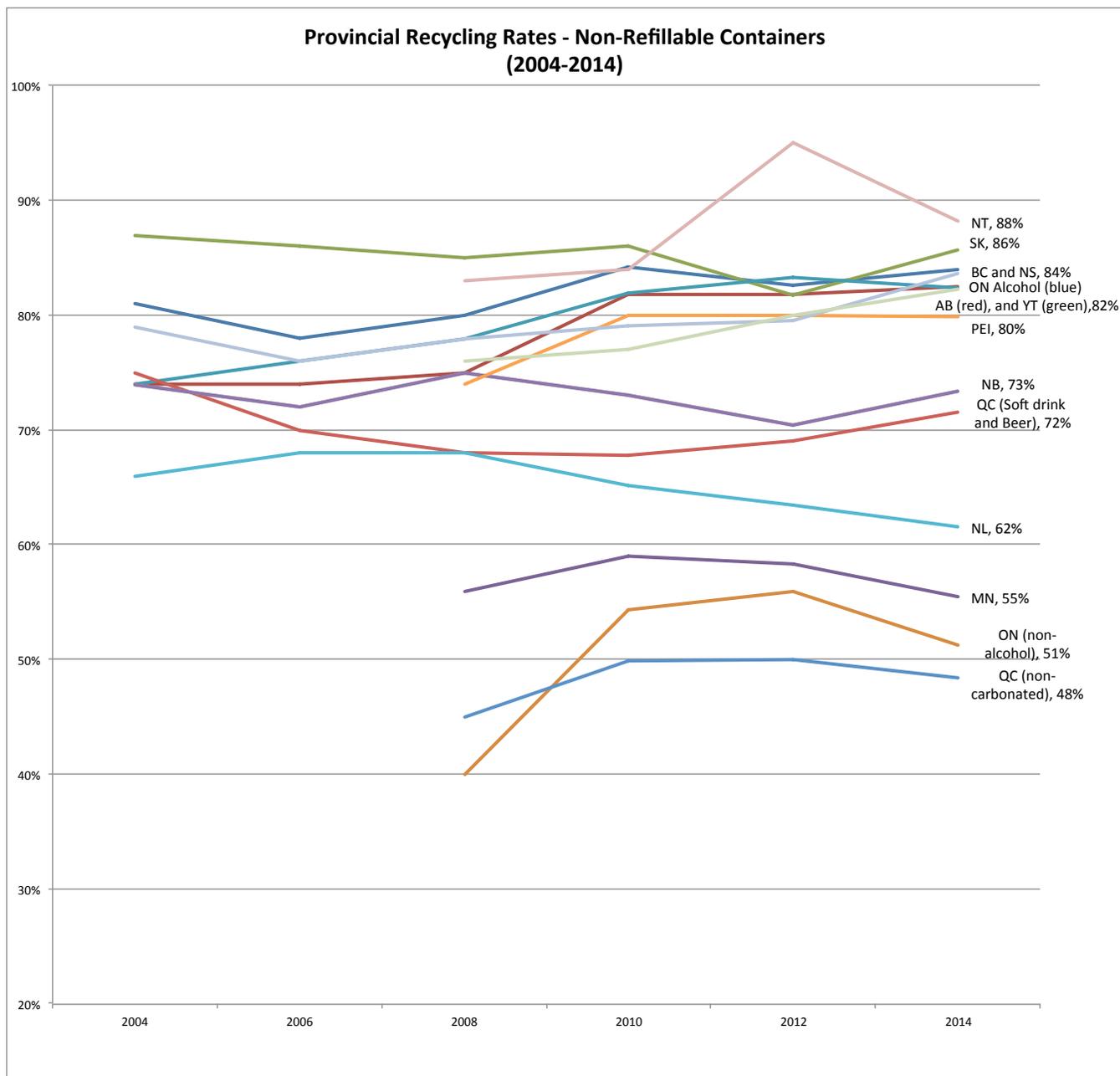


Figure 8 provides historical data on non-refillable recycling rates for the last decade. From 2004 to 2014, we can see that many programs have seen increases in recycling rates. One of the greatest increases can be seen in Alberta, where the recycling rate rose from 75% in 2008 to 82% in 2014. This is likely attributable to the deposit hike in 2009.

FIGURE 8 PROVINCIAL RECYCLING RATES, NON-REFILLABLE CONTAINERS (2004-2014)



Aluminum Cans

Figure 9 presents 2014 aluminum can recycling rates by province. It is clear from the chart that provinces with DRS in place perform considerably better than those without. For example, the Northwest Territories and Nova Scotia—both of which have deposits on aluminum cans—show can recycling rates of 97% and 92%, respectively.

It is worth pointing out that Québec's recycling rate for aluminum cans (beer and soft drinks) is 70%. Compared to other deposit jurisdictions, which generally have collection rates of between 80% and 95%, this is relatively low. The most likely cause for Québec's poorer performance is the level of the deposit it places on beer cans (5-cents), which is half the value of the deposit in most other provinces, and the fact that not all cans are covered. In Québec, only carbonated beverages carry a deposit. This creates confusion for consumers, which lowers overall performance.

FIGURE 9 PROVINCIAL RECYCLING RATES, ALUMINUM CANS (2014)

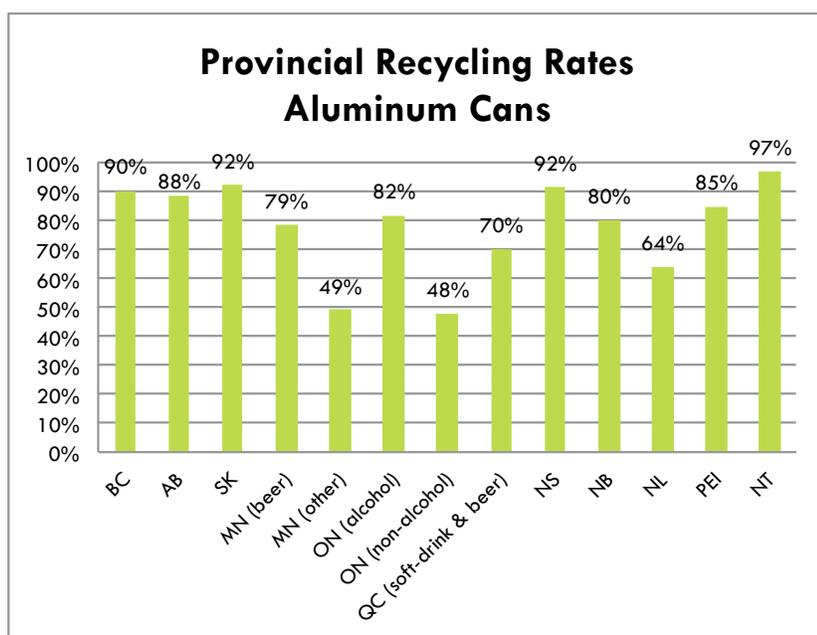


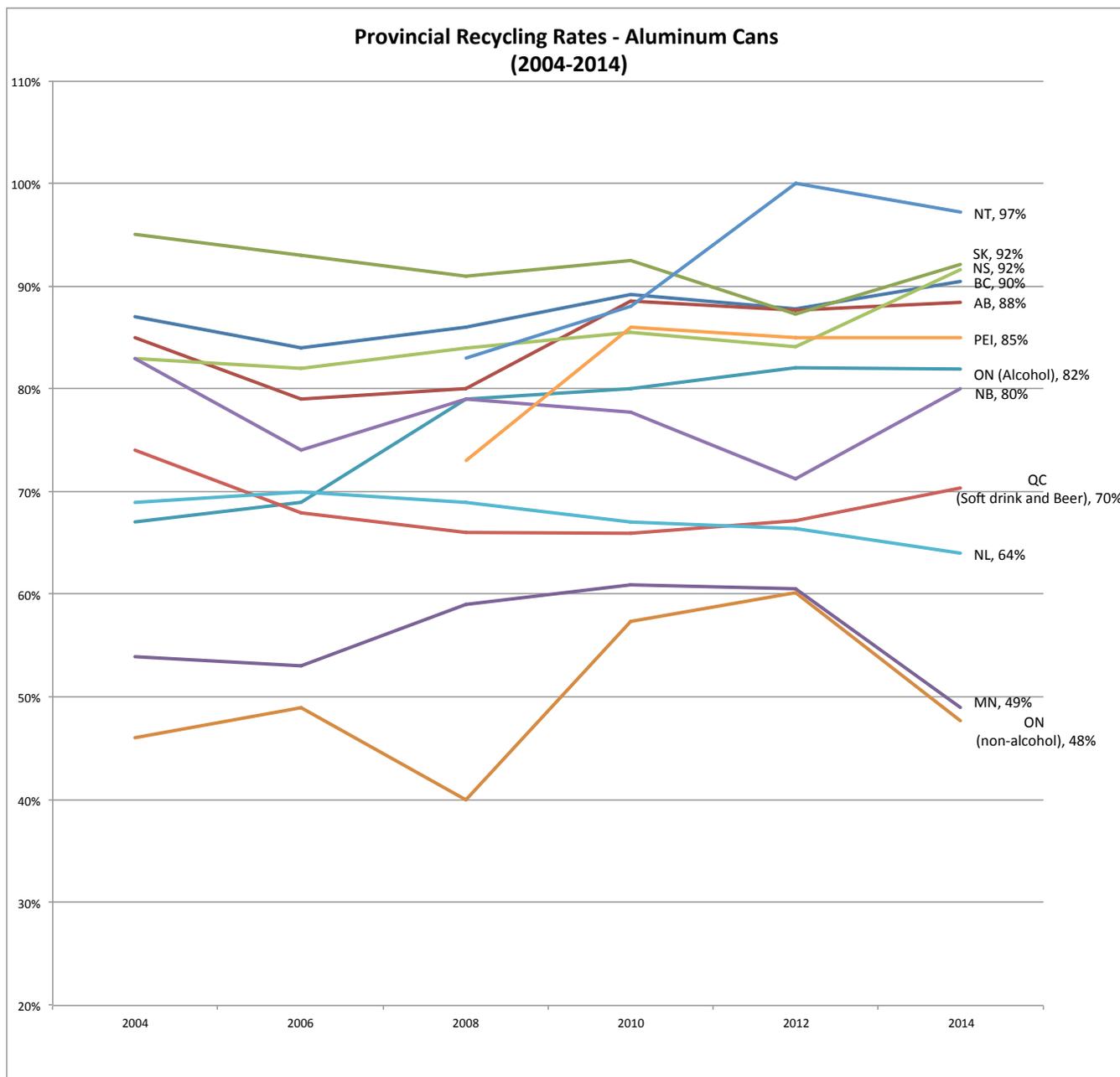
Table 3 shows 2014 recycling rates for aluminum beer cans and non-alcoholic beverage cans. When comparing these rates, it is important to consider the different deposit values placed on beer cans versus non-alcoholic beverage cans in each province. In B.C., for example, beer cans carry a 10-cent deposit, while non-alcoholic beverage containers have a deposit of only 5-cents. This difference may help explain why the recycling rate for beer cans is 95%, eleven percentage points higher than the 84% rate for non-alcohol cans in that province. The chart also clearly shows the difference in recycling rates for beer and soft drink cans in Ontario and Manitoba, where beer cans are on deposit and soft drink cans are collected through curbside programs.

TABLE 3 PROVINCIAL COLLECTION RATES, ALUMINUM BEER CANS VS. SOFT DRINK CANS (2014)

	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario	Quebec	Nova Scotia	New Brunswick	Newfoundland	Prince Edward Island
Beer Cans	95%	88%	92%	79%	82%	70%	92%	80%	64%	85%
Soft Drink Cans	84%	88%	92%	49%	48%	70%	92%	80%	64%	85%

Figure 10 shows how collection rates for aluminum beverage cans have changed over time in each province. From 2004 to 2014, some jurisdictions, like BC, Alberta, Nova Scotia, PEI, and Ontario (alcohol), have seen their collection rates increase, while others, like Newfoundland and Saskatchewan, have seen theirs decrease.

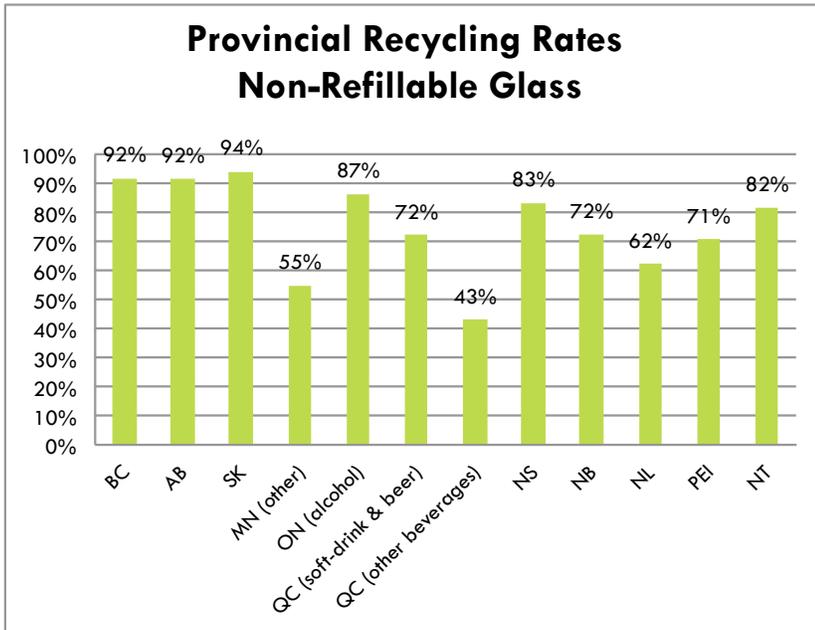
FIGURE 10 PROVINCIAL RECYCLING RATES, ALUMINUM CANS (2004-2014)



Non-Refillable Glass

Figure 11 presents provincial recycling rates for non-refillable glass bottles in 2014. As with other types of beverage containers, provinces with deposit-return perform considerably better. The province with the highest recycling rate for this material is Saskatchewan at 94%, followed by BC and Alberta at 92% each.

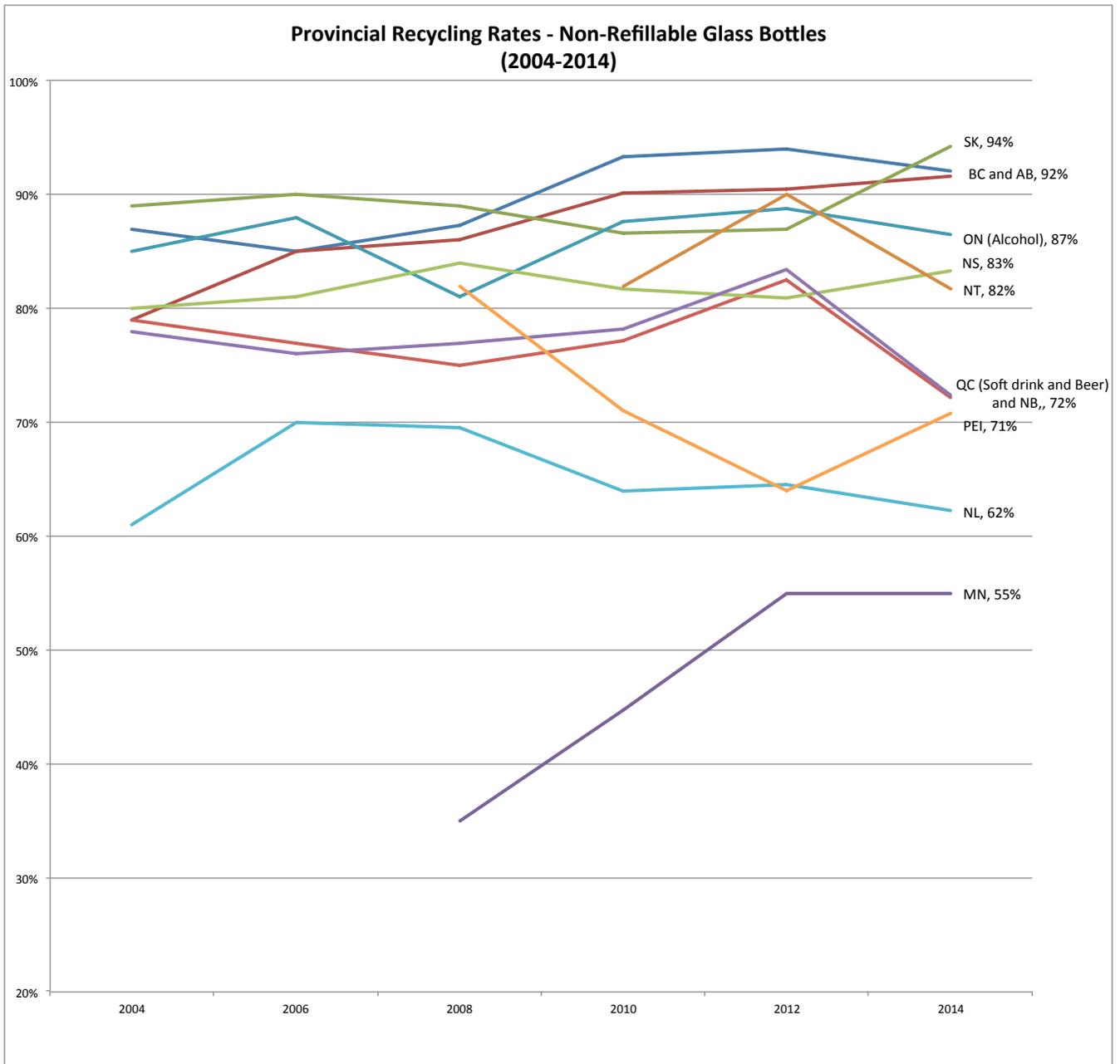
FIGURE 11 PROVINCIAL RECYCLING RATES, NON-REFILLABLE GLASS (2014)



As shown in Figure 12, some provinces have seen recycling rates for non-refillable glass bottles change significantly over the last 10 years. Consider Alberta, for example, which had a recycling rate of less than 80% in 2004, but today collects over 90% (an increase of over 10 percentage points). The province of Manitoba has also seen a significant increase in the amount of non-refillable glass containers collected and recycled, from less than 40% in 2004 to 55% in 2012. Other provinces, like PEI, have seen their rates drop dramatically only to pick back up in the last two years.

Various factors can help explain changes in return rates over time. For example, the drop in Ontario from 2006 to 2008 can be attributed to the launch of the Ontario Deposit Return Program. While the 2006 recycling rate included only non-refillable glass from beer bottles (which were under deposit), the 2008 rate included glass from wine, spirit, and cooler bottles, which were collected at a lower rate in the early years of the program (2007 and 2008). As shown in the figure, the recycling rate for non-refillable glass has since recovered.

FIGURE 12 PROVINCIAL RECYCLING RATES NON-REFILLABLE GLASS (2004-2014)



PET Bottles

Figure 13 shows provincial recycling rates for PET bottles in 2014. Like other beverage packaging, PET containers are collected at higher rates in deposit provinces. In 2014, Saskatchewan was the leader with a recycling rate of 82%. At the other end of the spectrum is Québec (other beverages), with a rate of 51%.

FIGURE 13 PET BOTTLE RECYCLING RATES BY PROVINCE (2014)

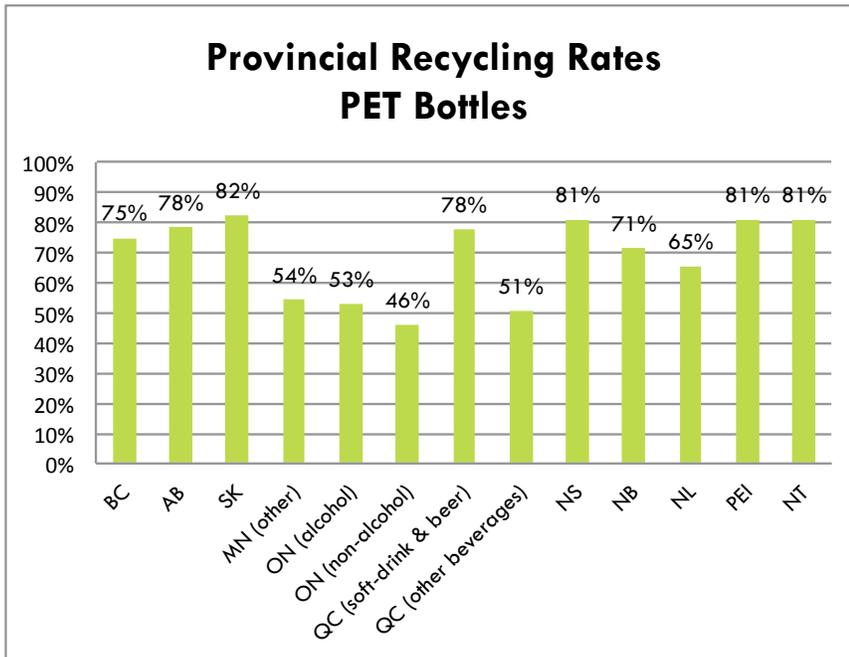
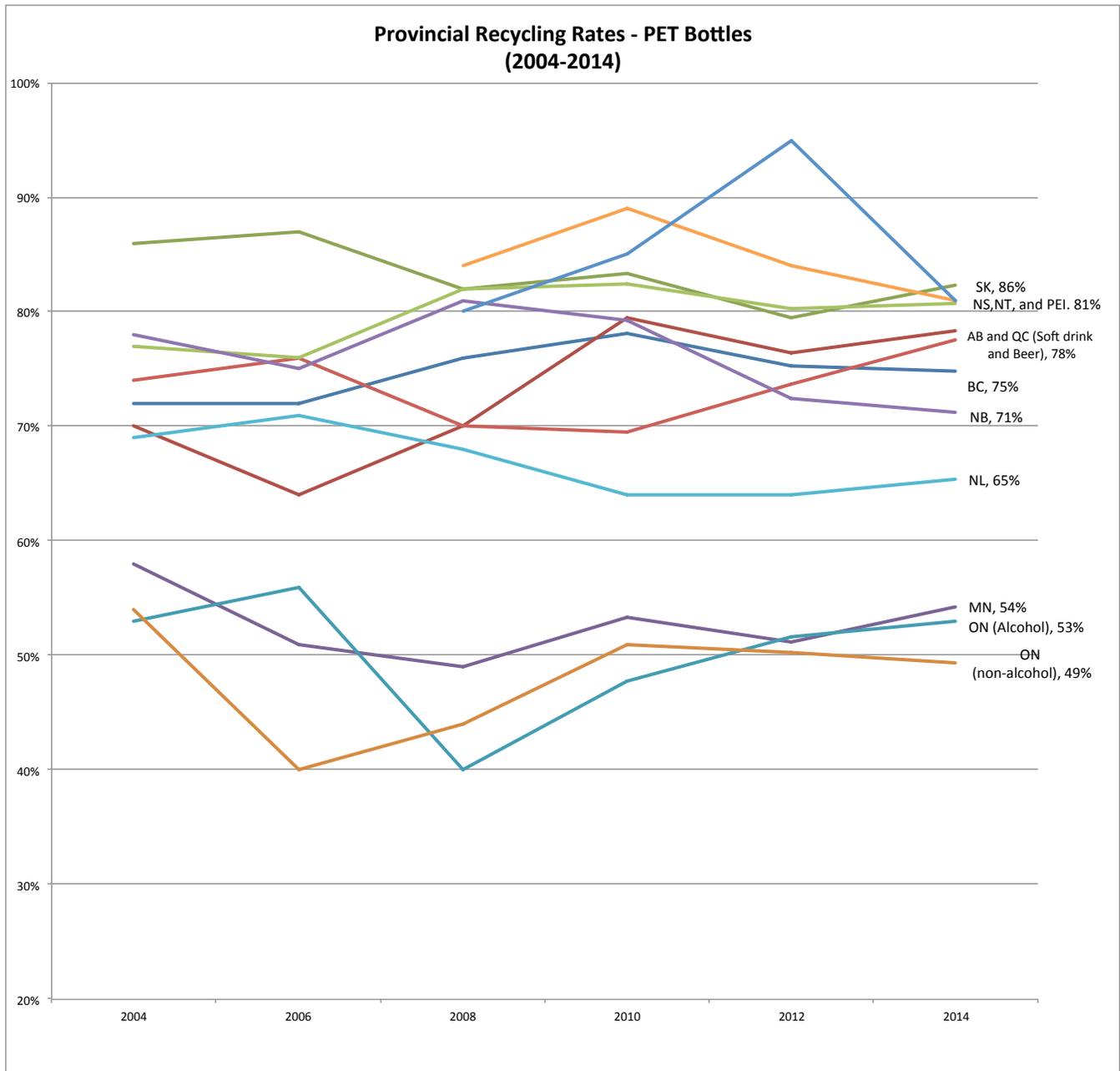


Figure 14 provides a historical perspective on the changes in PET recycling rates since 2004. As shown by the chart, most provinces have experienced a decrease in recycling rates since 2010. The exceptions are Ontario (alcohol containers) and Québec (soft drink and beer).

FIGURE 14 PROVINCIAL RECYCLING RATES, PET BOTTLES (2004-2014)



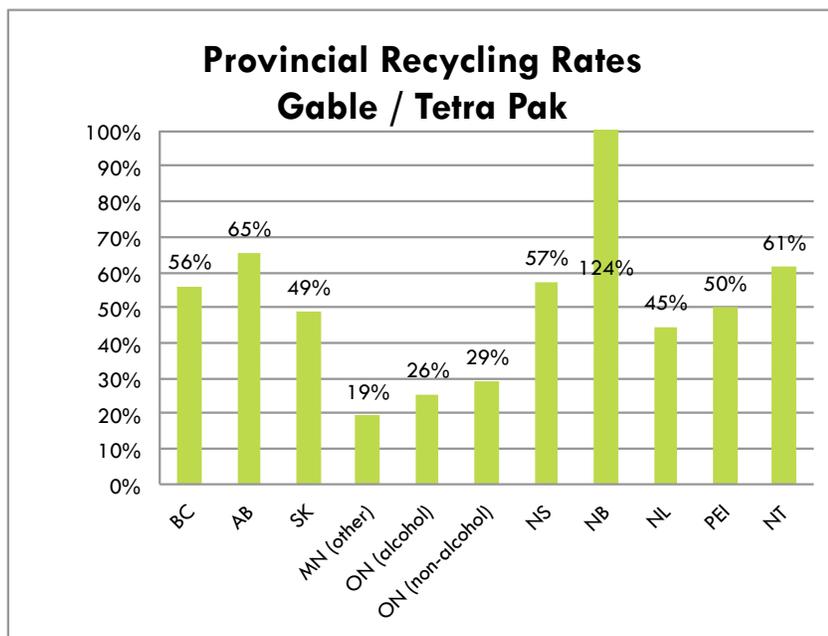
Gable Top and Tetra Pak Cartons, Bi-Metal Cans, and Other Plastics

Overall, the recycling rates for gable top and Tetra Pak cartons, bi-metal cans, and other plastics are on the rise. Figures 15, 16, and 17 show 2014 recycling rates for these materials in provinces that report them.

The highest recycling rate for gable top and Tetra Pak cartons was reported in New Brunswick (124%). This is clearly not possible, and reflects the fact that some cartons are being reported as sold under other categories by distributors, leading to a situation where the denominator for gable/Tetra Pak containers sold is lower than it should be, while the denominator for other categories may be falsely reported as too high (see Figure 26, page 82).

With the exceptions of Alberta and the Northwest Territories, all other provinces have recycling rates below 60%.

FIGURE 15 PROVINCIAL RECYCLING RATES, GABLE/TETRA PAK CONTAINERS (2014)



With respect to bi-metal cans, Nova Scotia had the highest recycling rate at 93% (see Figure 16). For the 'other plastics' category, which includes bottles made from resins other than PET, or in some provinces PET or HDPE, recycling rates were between 37% and 81% (see Figure 17). (Note: Because the bi-metal cans and 'other plastics' categories of containers are so small (in terms of units sold each year) relative to other container types, there tends to be a greater degree of fluctuation in recycling rates year over year.)

FIGURE 16 PROVINCIAL RECYCLING RATES, BI-METAL/STEEL CANS (2014)

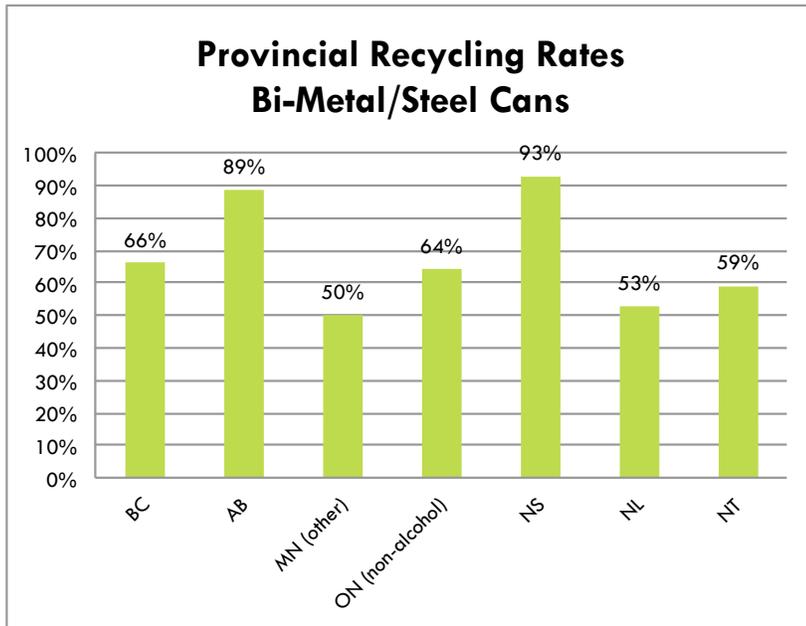
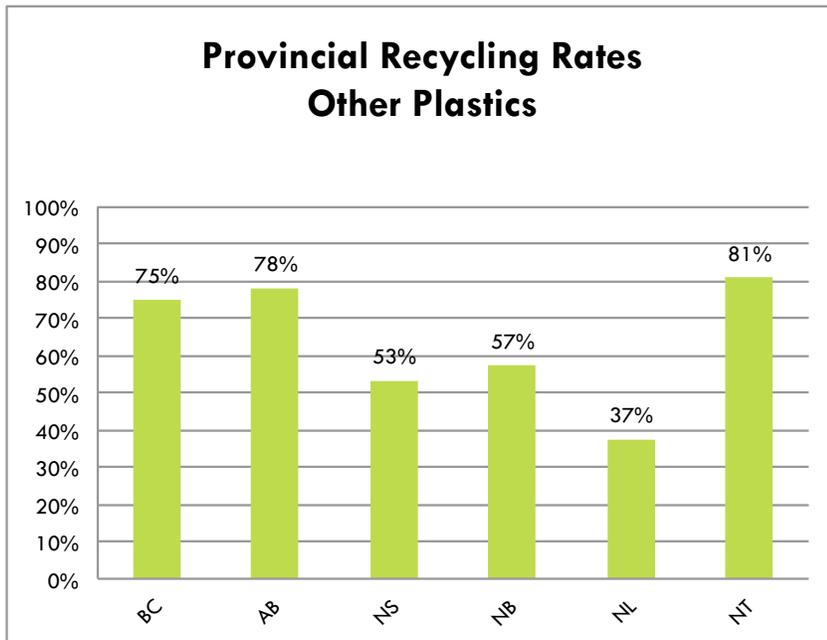


FIGURE 17 PROVINCIAL RECYCLING RATES, OTHER PLASTICS (2014)



Milk Containers

Most plastic milk containers are made from high-density polyethylene (HDPE). Overall, milk jugs have a much higher recycling rate than cartons. This difference may be attributable to several factors, including a strong secondary market for HDPE jug material.

Depending on the province, recycling rates for milk container packaging are measured in different ways. In some provinces the calculation is based on data from waste audits, while in others it is based on actual unit sales and collection data. In some cases, recycling rates for milk containers are estimated by extrapolating from the collection rates of a more wide-ranging material category, such as "aseptic" packaging, which includes Tetra Pak and gable top containers. In provinces where multi-material collection takes place, 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 BC, Manitoba, Ontario, and Québec, the majority of (if not all) milk containers are collected through residential curbside recycling programs (e.g. the Blue Box Program). Because they are collected with other materials, like paper, other plastics, and food containers, 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 recycling, specific collection rates have in the past been available from the Atlantic Dairy Council (ADC). According to the ADC, in 2005 the collection rate for milk packaging was 47.3%, an increase of nearly 25 percentage points over 2000, when the program began. In 2012-2013, the ADC stated that the collection rate for gable top cartons and HDPE milk jugs was 70.5%. Data for 2014 was not available.

Part 2: Away-from-Home Recycling

Today's beverage market is packed with convenience items, grab-and-go packages, and single-use containers that weren't around when curbside recycling programs were first conceived in the late 1980s. Single-use containers have grown in popularity with consumers, mostly because they're both easy-to-use and disposable. As more of these items enter the marketplace, the number of containers consumed "away-from-home" (AfH) – at places like sports stadiums, concerts, universities, and gas stations – is on the rise (see Table 4).

TABLE 4 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

HOW MUCH IS GENERATED AWAY-FROM-HOME?

While the majority of beverages continue to be consumed in households, it is estimated that anywhere between 30-40%² of beverages are consumed away-from-home (AfH), in areas where recycling services may not be available. Knowing the number of beverage containers that are consumed and discarded AfH is critical to determining accurate recycling rates and designing effective recovery programs. Despite this importance, there is very little data on this subject. There are several reasons for this.

For one, there is little information available on the total number of industrial, commercial, and institutional (IC&I) establishments in each province that participate in beverage container recycling programs. Secondly, waste and recycling collection and management services for IC&I buildings, events, hospitals, schools, and other AfH locations are typically contracted to private sector service providers. While this may not be a problem in itself, there are no regulatory requirements for these companies to track and report volumes collected at each location to the government or oversight authority. It is standard practice to weigh loads at the end of a route, making it difficult to obtain information about a specific location unless volumes are estimated at the point of collection by the hauler.

Moreover, there is no single provincial or municipal authority that oversees diversion performance from the IC&I sector.³ In Ontario, while Regulation 102/94 has required selected

IC&I facilities to conduct waste audits and waste reduction work plans for several years now, there are no published results or performance measures in relation to their effectiveness.

Due to the lack of data available, we rely on findings from a series of studies to estimate a recycling rate for containers recovered from AfH locations. Table 5 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.

TABLE 5 ESTIMATED AWAY-FROM-HOME (AFH) 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</i> , prepared by Container Recycling Institute, August 2015	Not available to the public	All beverage containers: 30-40%
IPSOS Study conducted in Ontario for CBCRA in 2012 ⁴	Not available to the public	By container type Glass: 28% Aluminum cans: 28% PET: 28% HDPE: 20% Gable top cartons: 10% All beverage containers: 26%(estimated range is between 15 and 30%)
<i>Australian Beverage Packaging Consumption, Recovery and Recycling Quantification Study</i> , prepared by Clare Davey, 2008	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.	By container type Glass: 25% Aluminum: 25% Plastic: 45%
Beverage Packaging Environmental Council (BPEC) study, 2006 ⁵	Not available to the public	By container type Glass: 33% Aluminum: 24% Plastic: 42%
<i>Understanding Beverage Container Recycling: A Value Chain Assessment</i> , prepared by R.W. Beck, in collaboration with Franklin Associates, Tellus Institute, Boisson & Associates, and Sound Resource Management, 2002	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.	All beverage containers: 37% By container type Glass: 34% Aluminum cans: 13% PET: 63%
American Beverage Association (ABA) report	Not available to the public	All beverage containers: 30-34%
<i>Mise en Marché et Récupération des Contenants de Boisson au Québec</i> prepared by Francois Lafortune	Based on methodology used for 2002 report by R.W. Beck (see above)	By beverage type Milk containers: 5% Soft-drink containers: 17% Juice containers: 22% Wine/spirits containers: 22% Water bottles: 50%

EXISTING INITIATIVES TO ENHANCE AWAY-FROM-HOME COLLECTION

For jurisdictions without deposit-return, establishing a comprehensive AfH program in conjunction with a residential curbside collection program (single-family and multi-family dwelling) can mean the difference between a successful recycling program and one that is less successful. In an effort to encourage the recycling of beverage containers consumed AfH – especially those served in non-refillable containers – several Canadian cities/provinces have implemented pilots and long-term programs. Many of these initiatives are based on a partnership model in which an industry partner or non-governmental organization sponsors a program in partnership with a community.⁶ This cost-sharing model is key to the successful launch of such programs, which increase costs for municipalities with the need to purchase bins and provide promotion and education materials to their residents.⁷

Manitoba

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 was Canada's first province-wide AfH beverage container recycling program. Recycle Everywhere provides recycling bins free of charge to communities, schools, businesses, provincial parks, community centres, and events around the province to allow Manitobans to conveniently recycle their beverage containers rather than throwing them in the garbage. (For information on how the program is funded, see Manitoba's provincial program summary on page 64).

In 2014, over 13,000 Recycle Everywhere bins were placed with partners at 739 sites.⁸ In late 2013, Recycle Everywhere officially launched Recycle Everywhere 101, a brand-new province-wide initiative designed to increase the recycling of beverage containers at schools and among students. Currently, 487 schools (primary and secondary only) across Manitoba have Recycle Everywhere bins.

Since the program began, the collection rate for beverage containers has increased from 42% in 2010, to 64% in 2014 (by weight)—an increase of 22 percentage points.⁹ The government-mandated collection target for 2016 was 75%, which CBCRA has yet to achieve. (Note: It is important to remind the reader that in provinces like Manitoba, the collection rate is reported by weight and thus does not reflect actual recycling of materials (for a more detailed explanation, see section on “Process Loss” in Part 1: Performance Measurement).

Québec

Québec's away-from-home recycling program is managed by Éco Entreprises Québec, a private non-profit organization that represents more than 3,000 contributing companies who put containers, packaging, and printed matter on Québec's market. Launched in 2008, the program provides funding to municipalities to install recycling equipment in indoor and

outdoor public spaces, such as along streets and bike trails, in bus shelters, and arenas. It reimburses 70% of the cost of the equipment, up to \$840 per unit. To date, companies represented by ÉEQ and Québec's Ministry of Sustainable Development, Environment, and Action against Climate Change (MDDELCC) have contributed a total of \$6 million to municipal organizations for the installation of over 12,000 bins in the province (equivalent to around 1,300 bins per year).¹⁰

British Columbia

BC'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 new bins, and specially designed instructional and promotional signage.¹¹ To measure the effectiveness of this program, industry 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%.¹² 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.

Other Provinces

Public space recycling programs or pilots have also been successfully implemented in Ontario (Sarnia, Markham, Niagara Region), Nova Scotia (Halifax) and Alberta (Calgary).

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 three Sarnia arenas and eight 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.

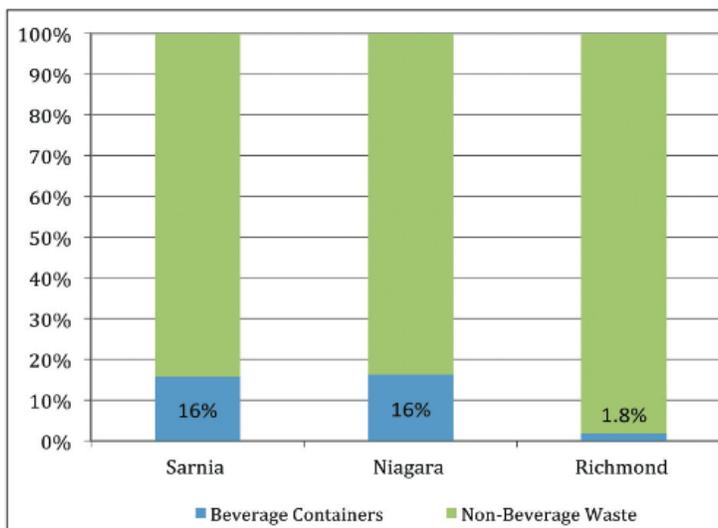
A pilot project conducted on the Halifax Waterfront generated even more promising results. After just three months of placing bins and signage along the Halifax Harbourwalk, the pilot project collected approximately 95% of all containers discarded in the area. Another highly successful public spaces pilot project took place in the city of Calgary in 2012. The program, which saw a total of 48 recycling bins installed in three 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%.¹³

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, BC a city where all beverage containers bear a deposit, and Sarnia and Niagara, ON where most beverage containers are collected at curbside.

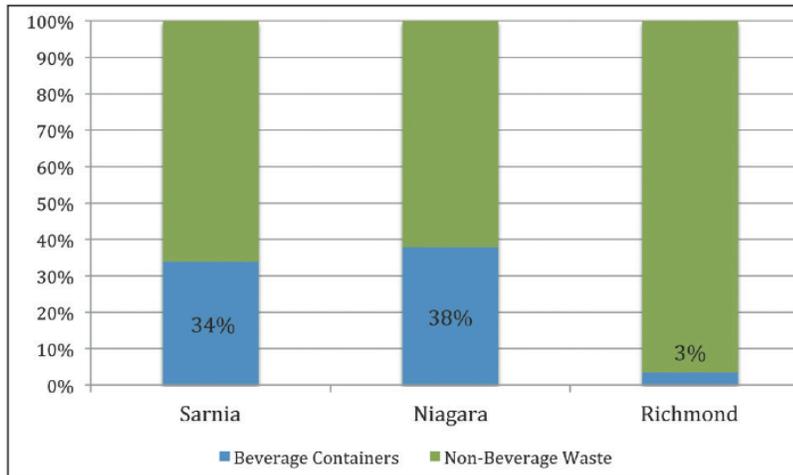
In Sarnia and Niagara, audits revealed that recyclable beverage containers made up over 15.7% and 16.2% (by weight), respectively, of the materials deposited in the waste bins. (PET beverage containers alone represented over 8% of the waste stream in each of the pilots). These numbers are significantly 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 is going 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.¹⁴ 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 Club¹⁵, 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 program is different when it comes to which materials are covered by the regulations, what agents are responsible for managing the program, the collection method used, and the funding model. Programs also differ in the methods used to calculate collection and recycling rates. All of these factors can make it difficult to collect and analyze data and to compare the effectiveness of recycling programs from one province to another.

The following section provides a summary of each provincial program, including: a description of the supporting regulatory framework and which containers are covered; a listing of key performance targets; a description of the entities responsible for managing and operating the program; a description of the program funding model; and a description of the collection methods used and recycling rates achieved. Some provinces also include a “What’s New” section to highlight some important updates since the last version of *Who Pays What*TM.

British Columbia

Beverage Container Recycling Program

SUPPORTING REGULATORY FRAMEWORK



POPULATION: 4,683,100

POPULATION DENSITY: 4.8 PERSONS/KM²

Adopted in 1970 under the province's *Litter Act*, British Columbia (BC)'s beverage container recovery program is the oldest in North America. In 1997, to address changes in beverage container packaging, the province replaced the

outdated *Litter Act* with the *Beverage Container Stewardship Program Regulation*. While the original legislation covered only carbonated soft drinks and beer, this regulation expanded the deposit-refund system to include any ready-to-serve beverage sold in container that is sealed by its manufacturer (e.g. bottled water, juice, new age drinks, and alcohol), excluding milk and milk substitutes.

This regulation was repealed and replaced in 2004 with the *Recycling Regulation*, which consolidated all BC stewardship regulations (including the *Beverage Container Stewardship Program Regulation*) into one. The *Recycling Regulation* contains key requirements that apply to all producers and stewardship programs with specific product category provisions listed in schedules. With the enactment of this regulation, stewardship agencies were required to submit revised stewardship plans consistent with the regulation by October 2008, which describe the development and operation of the beverage container program, including how the program provides customers with an efficient and convenient system.

In 2011, the *Recycling Regulation* was amended to make businesses supplying printed paper and packaging (PPP) into the province responsible for the costs of collecting, sorting, recycling their products. The amendments to the Regulation required every producer of PPP in BC to operate, or become a member of, an approved stewardship plan for the end-of-life management of their products by November 2012.

PERFORMANCE TARGETS

The *Recycling Regulation* establishes a minimum recovery target (collection rate) of 75% and requires that redeemed containers be either refilled or recycled.

In its latest Stewardship Plan, Encorp sets recovery rate targets for 2014-2018 as follows: 80.1% for 2014; 80.6% for 2015; 81.0% for 2016; 81.5% for 2017; and 82.0% by 2018.¹⁶

WHO IS RESPONSIBLE?

There are currently two stewardship agencies in BC that carry out deposit-refund obligations on behalf of producers (brand owners or first importers of all non-refillable beverages sold in the province): Encorp Pacific (Canada) and Brewers Distributor Ltd. (BDL). BDL represents brand owners of domestic coolers, beers, and ciders, while Encorp represents brand owners of all other beverage types, including non-alcoholic beverages, wine, spirits, some ciders, coolers, as well as some import beer. Province-wide, about 77% of containers are recovered by Encorp (77%) and 23% by BDL.¹⁷

As of May 2014, the *Recycling Regulation* also targets producers of PPP that supply material into the BC residential marketplace. Multi-Material British Columbia (MMBC) is the stewardship organization responsible for delivering an efficient and effective PPP stewardship program on behalf of the producers that have opted to become members.

PROGRAM FINANCING

The total cost of running the deposit-return program in 2014 was \$91 million. Of this, \$53.9 million (59%) was spent on container handling fees (both Encorp Pacific and BDL pay per-unit fees to authorized depots and contracted retailers for handling the containers and preparing them for shipment¹⁸); \$28.5 million (31%) on operating expenses (e.g. transportation and processing); \$4.7 million (5%) on administration; and \$3.9 million (4%) on consumer education and awareness initiatives.

The funds to pay for the costs of the program come from three sources: 1) unredeemed deposits (representing about 19% of the funds Encorp receives); 2) revenues generated from the sale of material (about 17%); and 3) container recycling fees (CRF) paid at the point of sale by consumers (about 64%).¹⁹

All beverage containers covered by the program carry a deposit. These deposits, which vary based on container type and size, are set through government legislation. Non-alcohol beverage containers up to and including 1L carry a deposit of 5-cents, while those over 1L have a 20-cents deposit. Deposits for alcohol containers are higher; alcohol containers up to and including 1L carry a 10-cents deposit, while those over 1L have a 20-cents deposit. Customers can redeem these deposits by returning empty containers to depots.

Any unredeemed deposits are kept by Encorp to cover collection and recycling costs; in 2014, there was a total of \$15.9 million in unredeemed deposits (\$84,483,769 in total deposits - \$68,524,319 refunds issued). In addition to unredeemed deposits, a portion of program costs are offset by the sale of processed containers, particularly aluminum and plastic. Thanks to strong commodity prices in 2014, a total of \$14.3 million revenue was generated from material sales.

When the revenues from unredeemed deposits and from sales of collected material are depleted, a non-refundable CRF is added to the container to make up for the deficit. In 2014, revenue from CRFs totaled \$50.4 million. Implemented by the beverage industry (excluding the domestic beer industry), CRFs are charged based on the net cost of collection and recycling specific container types (gross costs minus the unredeemed deposit and any material revenue) and vary depending on the value of the material and the collection rate for a particular container. These fees are adjusted on an annual basis and are rounded up to the nearest penny. To illustrate, if the net system cost to recover an aluminum can is 0.95-cents, the CRF will be 1-cent per can.

As of July 2016, per unit CRFs range from 1-cent for aluminum cans to 40-cents for large (<1L) glass containers. For some containers (e.g. bi-metal cans > 1L, gable top containers < 1L, bag-in-box), collection/recycling rates are so low that the unredeemed deposits are sufficient to cover program costs, and thus a CRF is not necessary.

Since the implementation of the CRF, the beverage industry bears no direct costs for the operation of the Beverage Container Recovery Program. Any funds that remain after all expenses are paid are placed into reserves. A minimum level of reserves must be maintained in order to ensure the long-term financial viability of the system. If these reserves accumulate beyond targeted levels, Encorp can do one of two things; it can reduce or eliminate CRFs until the reserve is reduced to an appropriate level, or it can reduce the reserve by spending more money on activities designed to increase collection of a specific container type. As of 2014, Encorp's total reserve was \$33.8 million.

On the other hand, individual brewers internalize their stewardship (collection, transporting, refilling, and recycling) costs.

As of May 2014, municipal residential PPP recycling programs are financed 100% by industry stewards. MMBC, a non-profit organization funded by the businesses that are responsible for

the PPP they put on the BC market, provides municipalities a fixed fee per household to collect blue box materials curbside and/or to operate depots for residential drop-off.

COLLECTION SYSTEM

Encorp's collection network includes 173 independent depots (up from 171 in 2012) and over 500 retail outlets, providing access to recycling of beverage containers to 99.4% of the population. This exceeds the target set in the approved stewardship plan, which is 97%.²⁰ Ninety-two percent of containers collected are returned to depots, with the remaining 8% going to retailers.

As of June 2015, BDL provides for container returns at 1,135²¹ locations, including 648 private liquor stores, 195 government-run liquor stores, 221 rural agency stores, and 71 contracted bottle depots. In addition to managing the containers designated under its stewardship plan, BDL also collects and recycles all secondary packaging associated with its containers. This includes, for example, cardboard cases, bottle caps, plastic can rings, and plastic shrink-wrap. Seventy-five percent of BC's population lives within a 10-minute drive of an authorized BDL return depot, while 92% (over 4 million residents) are within a 15-minute drive.²²

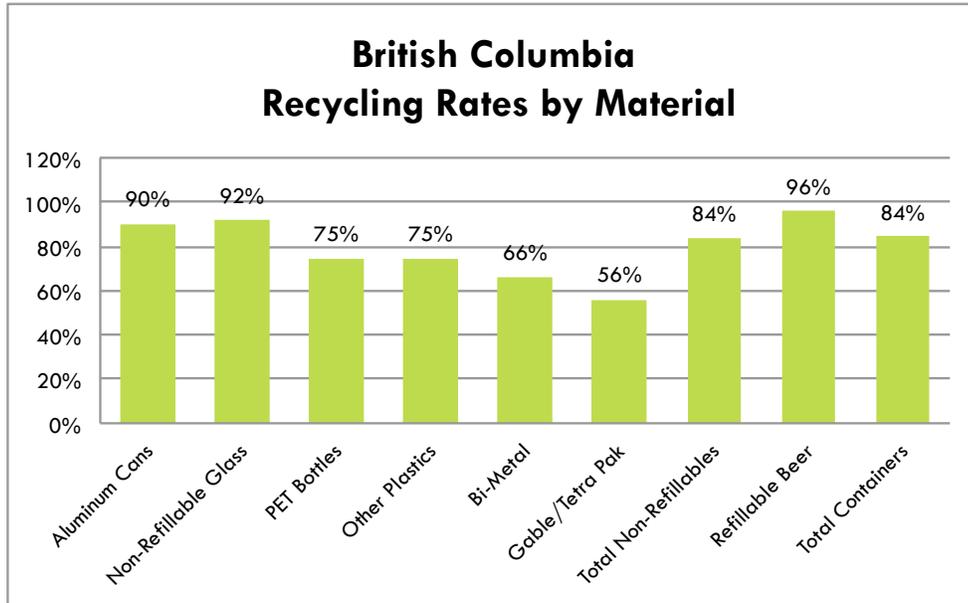
Over 30 contracted transport companies collect containers from depots and retailers and transport them to more than 17 central processing sites across BC, where they are compacted for shipment. Processors receive bags of mixed containers and prepare them for the appropriate recycling market by sorting, crushing, and baling the glass, aluminum, plastic, and other materials. Baled aluminum cans are shipped to a re-melt facility in the United States (US) where they are turned back into sheet stock for new cans. Plastics (i.e. PET and HDPE) are sent to different facilities in Calgary (AB) and Vancouver to be cleaned and pelletized to become secondary feedstock for manufacturers of various plastic products including new containers, strapping material, and fibres. Glass is shipped to various end markets, including a recycling plant in Alberta that makes fibreglass insulation; a facility in Seattle, Washington (US) that produces wine bottles; and a facility in BC that produces sandblasting material.²³ Some glass is also sent to municipal sites and used as construction aggregate. In the case of domestic beer containers, refillable bottles are sorted and sent back to the brewers for washing and refill. Polycoat containers are sent to paper recycling mills in South Korea and the US, where they are ultimately used in the production of new cardboard boxes and tissue paper.

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 the MMBC residential recycling program, meaning that consumers can recycle them at the curb.²⁴

PROGRAM PERFORMANCE

In 2014, 968.5 million beverage containers were recycled through the beverage container program (209.1 units per capita), for an overall recycling rate of 84%. This represents a slight increase from 2013 (83%). Gable/Tetra Pak containers showed the lowest performance with a recycling rate of only 56%. Non-refillable glass, on the other hand, had a high overall rate of 92%.

FIGURE 20 BRITISH COLUMBIA RECYCLING RATES BY MATERIAL (2014)



Recycling rates for containers recovered under BDL's deposit program were much higher. In 2014, BDL collected close to 580.5 million containers, for an overall recycling rate of 93.1%.²⁵ Refillable beer bottles saw the highest return rate at 96%, while aluminum beverage cans were recycled at a rate of 93%.²⁶

With respect to program awareness, 99% of BC residents surveyed were aware that most beverage containers could be returned for a refund of the deposit. Ninety-two percent were aware of at least one location where they could return beverage containers for recycling.²⁷

WHAT'S NEW?



Encorp Develops New "Mini Depot" Concept

In order to offer consumers a faster and more efficient "in depot" experience, Encorp developed the Return-It™ EXPRESS 'drop-and-go' service, with online refunding of deposit returns. Following a successful launch of the program in September 2013, Encorp expanded its drop-and-go service to nine other depots, where it continues to pilot the program.²⁸

In 2014, Encorp opened a new concept drop-and-go-only Express outlet in Yaletown.²⁹ Unlike the other Return-It depots, this 'mini-depot' location is cashless and containers are counted off-site. Encorp sees this as an important step towards increasing the return rate of beverage containers in BC, especially in urban areas, such as high-density residential neighbourhoods lacking appropriate zoning, or where lease rates are unaffordable.³⁰

Multi-Material British Columbia (MMBC) Program Launched

After more than two years of planning and consultation, Multi-Material British Columbia (MMBC) submitted its Packaging and Printed Paper Stewardship Plan to the BC Ministry of Environment. The plan was approved in April 2013, and on May 19, 2014, MMBC's recycling program was officially launched. Because containers regulated under the *Recycling Regulation* are not considered packaging for the purposes of MMBC's Stewardship Plan, the MMBC program does not replace the existing DRS for beverage containers in BC. However, if consumers choose to place deposit-bearing containers in MMBC's blue boxes, MMBC will return them to Encorp Pacific and receive the deposit value for those containers. The revenue from these deposits will be applied against the appropriate materials.³¹

Alberta

Beverage Container Recycling Program

SUPPORTING REGULATORY FRAMEWORK

Alberta's Beverage Container Recycling Program is regulated under the provisions of the *Beverage Container Recycling Regulation of the Environmental Protection and Enhancement Act*.

First introduced in 1972, the Regulation was expanded in 1989 and again in 1997 to cover other beverages, including Tetra Pak and gable top containers. A further expansion in 2001 included all domestic beer containers; domestic beer producers were now subject to the same obligations as other beverage producers. Further amendments to the Regulation came into force in November 2008, increasing deposit levels to 10- and 25-cents. Another change came on June 1, 2009, when Alberta became the first jurisdiction in North America to accept and charge a deposit on containers for milk and milk products. As a result of this amendment, every beverage container sold in Alberta is now part of the deposit-refund system.

In 1997, regulatory authority for the program was given to the Beverage Container Management Board (BCMB). Incorporated under the *Societies Act*, the BCMB operates in accordance with the following by-laws set by the Board of Directors: the *Beverage Container Management Board Administrative By-Law*, the *Beverage Container Management Board Fee*



POPULATION: 4,196,500
POPULATION DENSITY: 5.7 PERSONS/KM²

By-Law, and the Beverage Container Management Board Administrative Compliance By-Law. The BCMB is required to report to and operate within the policy parameters established by the Minister of Alberta Environment and Water.

PERFORMANCE TARGETS

No targets are specified in the legislation; however, the BCMB's 2015-2017 Business Plan includes an overall collection target of 83.7% for 2014. The BCMB has also set targets by container type; for example, 90.6% for non-refillable glass and 87.2% for aluminum. Overall collection targets have also been set for 2015 (83.4%), 2016 (84.2%), and 2017 (85.0%).

WHO IS RESPONSIBLE?

The province requires beverage producers and brand owners to operate a common collection system to recover containers from the bottle depots and retail locations for beer.

The BCMB administers the *Beverage Container Recycling Regulation*. The BCMB is a not-for-profit association consisting of representatives of Alberta beverage manufacturers, container depots and the public (environmental organizations, municipalities and concerned citizens) that reports directly to Alberta Environment and Minister of Environment, and reports on program performance in its annual report. Alberta Environment is ultimately responsible for monitoring program performance and compliance with the regulation.

As the system regulator, the BCMB is responsible for ensuring the collection and recycling of beverage containers throughout Alberta. To fulfill this obligation, the BCMB works in partnership with its collection system agent (CSA) – the Alberta Beverage Container Recycling Corporation (ABCRC) – or a collection service provider (CSP) to collect containers from depots. The Board's main responsibilities include registering containers and manufacturers; permitting and monitoring deposits; setting handling fees; and overseeing aspects of the relations between manufacturers, depots, the ABCRC, and CSPs.

The Alberta Beer Container Corporation (ABCC) acts as a CSP for beer manufacturers and is responsible for ensuring that beer containers are collected, transported, processed, and recycled as per the requirements of the regulation. ABCC directly manages the collection of refillable beer containers, and subcontracts the management of non-refillable beer containers to the ABCRC. The ABCRC outsources 100% of its transportation services to facilitate container collection.

A provincial government agency – the Alberta Gaming and Liquor Commission (AGLC) – represents the producers of alcoholic beverages. The AGLC uses ABCRC to manage its wine and spirit containers and the ABCC to manage its beer containers.

PROGRAM FINANCING

The Alberta Beverage Container Recycling Program is funded through revenues from three sources: unredeemed deposits (36%), container recycling fees (CRFs) (34%), and the sale of collected material (30%). The provincial government does not supply or obtain any funding for or from the operation of the program.

In 2014, the program generated \$45 million in unredeemed deposits. Deposits of 10-cents (for containers 1L or smaller) and 25-cents (for container larger than 1L) are charged on each non-refillable container sold. Customers can obtain a refund of their deposit by returning used beverage containers to a recycling depot. Beverage manufacturers (through the ABCRC or a CSP) pay a handling fee to the depots for each of their containers returned and for which a refund was paid out.

In addition to the fully refundable deposit, some beverage containers are subject to a non-refundable container recycling fee (CRF). The CRF is a fee beverage manufacturers are required to pay the ABCRC in order to cover the net costs of recycling that remain after the funds from the unredeemed deposits and from the sale of recyclable materials are depleted.

More often than not, the CRF is passed down to the consumer; however, the decisions by manufacturers to pass on the CRF to retailers and by retailers to pass it on to consumers are made independently. While the CRF is often shown (visible) on the sales receipt so that customers are aware of the direct net costs of recycling each type of container, some retailers may show it separately. Since the CRF's implementation, the beverage industry bears no direct costs for the operation of the program.

Administered by the ABCRC, the CRF varies depending on the value of the material and the collection rate for a particular container. Materials with higher collection rates generate less revenue from unredeemed deposits and therefore carry a higher CRF. In contrast, materials with lower collection rates generate greater unredeemed deposit revenue and therefore carry a lower CRF. Some containers, like aluminum cans, do not have a CRF because high material revenue and unredeemed deposits cover the collection costs. Similarly, drink pouches and bag-in-box containers over 1L do not have a fee.

In 2014, the CRF ranged from no charge to 10-cents, depending on the size and material used for the container. These fees are adjusted every year (usually on February 1st) to reflect the actual cost of recycling a specific beverage container.³² In 2014, nearly \$43 million in revenue was generated from CRFs. For a complete list of refundable deposits and CRF values, see Table 8 in the Financing section of this report.

All revenues generated go towards the cost of running the program: handling commissions, BCMB fees, transport, and processing (91%); administration (3.7%); marketing (2.7%); and other (e.g. financing charges, depreciation, etc.), (2.4%).

Individual domestic brewers internalize their stewardship (collection, transportation, refilling, and recycling) costs.

COLLECTION SYSTEM

Alberta's collection network for beverage container recycling is one of the largest in Canada. As of 2014, there are 216³³ independently owned "universal" (accepting all beverage containers) depots and 21 Class D depots (accepting beer containers only) across the province at which consumers can return their registered containers for a full refund of the deposit. Approximately 51% of the province's population lives within a 10-minute drive of a depot, and 34% within a 11-20 minute drive.³⁴

The Alberta Bottle Depot Association (ABDA) represents all depots across Alberta. Depot operators are responsible for collecting, sorting, and counting containers for the Alberta Beverage Container Recycling Corporation (ABCRC). Wine and spirit containers are sorted by color; refillables are sorted by size and manufacturer; and non-refillables are sorted by material type (aluminum, glass, plastic, composite, etc.), size, and color where applicable.³⁵ Once sorted, containers are placed into mega bags for pick-up.

Pick-up from depots is carried out by the ABCRC (non-refillable containers) and the ABCC (refillable containers) on behalf of beverage manufacturers. Empty containers are transported to processing facilities where the materials are prepared for shipment to end markets or to brewers for reuse (in the case of refillable beer bottles). In 2014, over 11,000 containers were processed per hour (a slight decrease from the previous year).³⁶ One facility in Lethbridge is responsible for 9.6% of total annual processing capacity. All other processing is completed in ABCRC-operated facilities in Edmonton and Calgary.³⁷

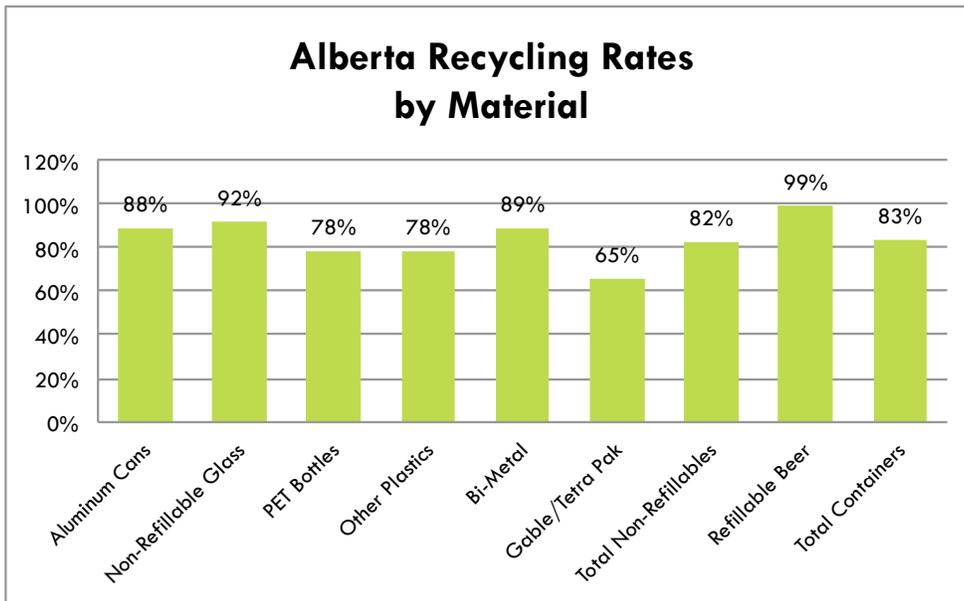
PROGRAM PERFORMANCE

In total, over 2 billion beverage containers were returned to Alberta depots in 2014, resulting in an overall return rate of 83%.

In 2014, Alberta's non-refillable containers recycling rate was 82% (a slight increase over 2013). Non-refillable glass containers showed the highest rates at 92%, followed by aluminum cans at 88%. At the other end of the spectrum, only 65% of gable/Tetra Pak containers were collected for recycling.

Refillable beer bottles were recycled at a rate of 99%.

FIGURE 21 ALBERTA RECYCLING RATES BY MATERIAL (2014)



In 2014, 97% of Albertans reported being aware that they could return beverage containers for a refund. Despite this, the participation rate was estimated at 91%.³⁸

WHAT'S NEW?



Update on the Designated Materials Recycling Regulation

In late 2013, Alberta Environment and Sustainable Resource Development (AESRD) consulted with industry stakeholders regarding its proposal to consolidate all eight of Alberta's existing recycling regulations (for beverage containers, used oil, tires, electronics, and paint) into one regulation – the “Designated Materials Recycling Regulation.” The proposed regulatory amendments are intended to reduce waste, streamline the regulatory framework, and shift the costs of waste management from taxpayers to producers and consumers. In addition to consolidating existing regulations for recycling designated materials, the new regulation would remove environmental fees from regulation and introduce extended producer responsibility (EPR) for PPP and household hazardous waste. A regulatory package for decision makers' review was expected to be complete by Winter 2015, but it appears that this may be delayed.

10-Cent Deposit on Non-Dairy Liquid Coffee Creamers

Effective November 1, 2015, non-dairy liquid coffee creamers (all sizes) are subject to a 10-cent deposit and can be returned to Alberta bottle depots for a refund. Containers with an expiry date before October 31, 2015 are not eligible for a refund and can only be recycled through municipal recycling programs.³⁹

Point-of-Return Software

Starting January 1, 2016, all depots handling more than 10 million containers are required to have in place an industry-approved point-of-return system, which provides to the customer an automated count of containers at each refund rate, and the total refund payable. In addition to raising consumer confidence in the system, the software helps to streamline financial processes.⁴⁰

Saskatchewan

Beverage Container Collection and Recycling Program

SUPPORTING REGULATORY FRAMEWORK

Established in 1988, Saskatchewan's beverage container recycling program was originally supported by the *Litter Control Act* (1978) and the *Designated Container Regulations* (1990). In 2010, matters formerly covered by the *Litter Control Act* and the *Environmental Management and Protection Act* (2002)—whose “Litter Control” section, amended in 2009, was also relevant to the collection of beverage containers—were repealed and became regulated under Part VI, Division 1 of the *Environmental Management and Protection Act* (2010). Refillable beer bottles are governed by the *Saskatchewan Litter Act* and the *Liquor and Gaming Act*.



POPULATION: 1,133,600
POPULATION DENSITY: 1.8 PERSONS/KM²

Initially, only soft drink and beer cans were recovered under the program, but due to a 1999 amendment to the *Litter Control Act*, the program was expanded to include all ready-to-serve beverage containers – except those for milk, milk substitutes, flavored milk, infant formulas, meal replacements or dietary supplements.

In February 2013, the Government of Saskatchewan approved the *Household Packaging and Paper Stewardship Program Regulations*. These new regulations require brand owners and first importers of printed paper and packaging (PPP) to develop a product management program, or join a stewardship agency to submit one on their behalf. These regulations cover any container (including beverage containers) made of glass, metal, paper, boxboard, cardboard, paper fibre, or plastic (or any combination of those materials), but do not include containers that are regulated under the *Litter Control Act* and that are under deposit.

PERFORMANCE TARGETS

No targets have been set with regards to SARCAN's beverage container recycling program or the recently launched Multi-Material Recycling Program (MMRP).

WHO IS RESPONSIBLE?

SARCAN Recycling, a division of the Saskatchewan Association of Rehabilitation Centres (SARC), is responsible for administering the deposit-return program and operates under contract to the Saskatchewan Ministry of Environment. The Ministry is responsible for designating containers that can be collected for recycling, and for establishing the value of the deposit and environmental handling charge (EHC) that consumers pay when purchasing a beverage.

Multi-Material Stewardship Western Inc. (MMSW) is the stewardship organization established to design and operate the Multi-Material Recycling Program (MMRP), which provides Saskatchewan residents with increased access to beverage container recycling on a province-wide basis. Acting on behalf of industry stewards, MMSW is a not-for-profit agency similar to those developed for packaging in other jurisdictions, like Stewardship Ontario and Éco-Entreprises Québec.

PROGRAM FINANCING

The total cost to operate Saskatchewan's DRS in 2014-2015 was \$29 million, while total revenues amounted to \$33.4 million.⁴¹

In Saskatchewan, the majority of program revenue comes from environmental handling charges (EHCs) and unredeemed deposits. As of August 2016, the EHC ranges from 3-cents to 7-cents per unit sold. Unlike the deposit, EHCs are not refundable but are used by the provincial government to offset SARCAN's contract cost and to contribute to general revenues (excess funds generated by the provincial government are put into general revenues.). In 2013-2014, SARCAN's recycling contract for beverage containers was worth \$22.7 million.⁴² Additional funding comes from the revenue generated from material sales (\$6.8 million in fiscal 2013-2014) and from a provincial grant awarded (\$1.7 million in fiscal 2013-2014).

Up until July 2016, SARCAN was also paid a handling fee for all milk containers collected through its depots or through municipalities on a per tonne basis. Although they were never part of the deposit program, SARCAN would accept the containers in lieu of other recycling solutions being available. The dairy industry financed these costs (plus management and advertising) through a levy on milk containers. In 2014-15, handling fees paid to SARCAN for milk container collection totaled \$571,000.⁴³ Now that these containers are considered part of Saskatchewan's MMRP, SARCAN no longer receives these payments.

The new MMRP, which started on January 1, 2016, is modeled after the industry-funding programs currently operating in Ontario, Québec, and BC. Under this program, stewards (brand owners or first importers) of packaging, including all beverage-related consumer packaging, are obliged to finance 75% of the costs associated with the residential recycling program. Municipalities that join MMSW receive compensation in the form of a set fee per household served, as long as MMSW standards are met.⁴⁴

COLLECTION SYSTEM

Saskatchewan residents can take their empty containers back to any one of 71 SARCAN depots in 66 communities across the province. After the containers have been sorted, the depots flatten and compact the material using multi-material flatteners, a technology pioneered by SARCAN employees. Once baled, the containers are picked up by SARCAN trucks, transported to one of the company's processing facilities, and sent to recycling end markets.

Clear glass is shipped to a facility in Moose Jaw, Saskatchewan, while colored glass is sent to a facility in Airdrie, Alberta where it is primarily recycled into new glass bottles and jars or fibreglass insulation. Depending on the resin type, plastics are sent to either Calgary (PET) or Vancouver (HDPE and other). Aseptic containers are shipped off to Cheboygan, Michigan (US), where they are hydropulped and used in the production of various products such as napkins, facial tissue, fences, and decks. Steel/tin containers are shipped to Regina (SK), where they are melted down and recycled into other steel products, such as rebar and pipe, while aluminum cans are sent to the Coca-Cola recycling facility in Kentucky (US), where they are recycled into new aluminum cans.⁴⁵

Refillable beer containers can be returned to Saskatchewan Liquor and Gaming Authority (SLGA) stores, hotels, and four depots. (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 then sent back to Brewers Distributor Ltd. (BDL) for the full refund and for washing and refill.

Municipalities that operate residential collection programs for waste packaging and paper can choose to participate in the new Multi-Material Recycling Program (MMRP). Municipalities enrolled in the program will have the choice of what type of collection system they will use – curbside pickup or a central depot – depending on the size of their community and the associated costs. If customers choose to put their beverage containers in their curbside bins, the containers will still come to SARCAN, although the customer will forgo deposit.

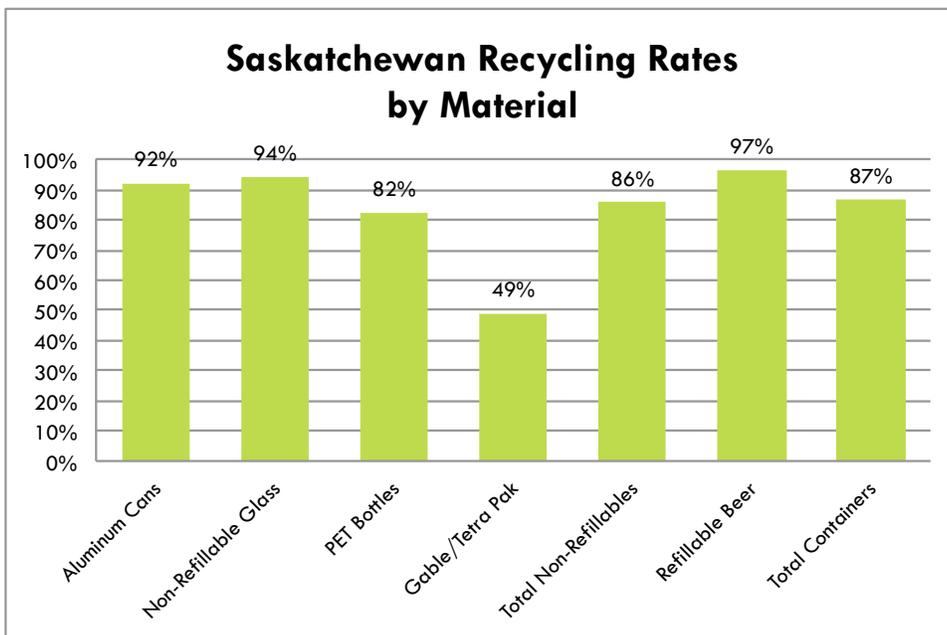
Up until this year, beverage containers of dairy products were collected voluntarily under the Unified Dairy Recycling System (UDRS). Launched in 1999, the UDRS was a program whereby the Saskatchewan dairy industry contracted with SARCAN Recycling to provide a collection and recycling option for non-deposit plastic milk jugs and paper milk cartons in beverage

container depots. Starting January 1, 2016, the recycling of milk containers is covered under the new MMRP.

PROGRAM PERFORMANCE

In fiscal 2014-2015, a total of 405.6 million beverage containers were returned to SARCAN recycling depots, for an overall container recycling rate of 87% (up 4-percentage points from the previous report). Non-refillable glass and metal containers showed the highest return rates at 94% and 92% (up from 87% and 87% in 2013-2014, respectively), followed by PET bottles at 82%. Juice boxes (i.e. Tetra Paks) were returned at a much lower rate at 49%.

FIGURE 22 SASKATCHEWAN RECYCLING RATES BY MATERIAL (2014)



WHAT'S NEW?



Multi-Material Recycling Program (MMRP) Launched

In February 2013, the provincial government approved the *Household Packaging and Paper Stewardship Program Regulations*, requiring industry to finance up to 75% of the net cost of municipal recycling programs for residential waste packaging and paper (PPP) in Saskatchewan. In addition to requiring brand owners and first importers of PPP to share the cost of recycling their material with municipalities, the new regulations require them to develop a product management plan, or be part of a plan submitted on their behalf.

In response to the regulation, Multi-Material Stewardship Western (MMSW) was established to represent industry stewards and fulfill their stewardship obligations. MMSW submitted a

stewardship plan to the Ministry of Environment in August 2013, which was approved in December of the same year.

While implementation of the Multi-Material Recycling Program (MMRP) was initially set to commence by January 1, 2015, last minute Ministerial changes to MMSW's approved operational/financial plan necessitated revisions to the plan, resulting in significant delays.

In July 2015, MMSW submitted a revised program plan which reflected several key differences for stewards, including government exemptions for certain stewards (e.g. stewards that generate less than \$2 million in gross revenue per year, less than 1 tonne/year of paper, or operate as a single point of retail are permanently exempt from participating in the MMRP). Another key change to the plan focuses on a new method for calculating municipal funding. The revised plan was approved in October and launched on January 1, 2016.⁴⁶

It is important to note that the MMRP does not replace the collection program operated under SARCAN because containers regulated under the *Litter Control Act* and that are under deposit are not considered packaging for the purposes of the WPP Stewardship Plan. If consumers choose to place their deposit-bearing beverage containers in their curbside bins, the containers will still go to SARCAN (they will be sorted by the recyclers), but they will lose their deposit refund.⁴⁷

SARCAN Phases Out Milk Container Collection

Starting January 1, 2016, the collection and recycling of milk containers will be covered by the new provincial program for household packaging and printed paper operated by MMSW. As a result of this new program, SARCAN has begun a 6-month phase-out of its milk recycling program, and will only continue to recycle milk containers that are received between January 1, 2016 and July 1, 2016.⁴⁸

Drop N Go

As part of a pilot project to improve efficiencies, SARCAN Recycling launched a new service in 2014 called Drop N Go, which allows customers to drop off their deposit beverage containers at the depot, and have the refunds sent to them via PayPal. Customers simply create an account, either online or with the touch pad service at the depot; note the number of identification tags they need; attach the tags to their bags; place the bags of containers in a special receiving area; and leave. The Drop N Go option is currently offered at two depots (Martensville and Saskatoon Sutherland depots), but will be expanded to the other 16 Extra Large depots in Saskatchewan in 2015-2016⁴⁹.

Manitoba

MMSM's Packaging and Printed Paper Program Plan and CBCRA's RecycleEverywhere Program

SUPPORTING REGULATORY FRAMEWORK

Manitoba's *Waste Reduction and Prevention Act (WRAP)* (1990) provides the legislative framework for introducing beverage container collection and recycling programs. The first initiative was the *Beverage Container and Packaging Regulation* (1992). This regulation was repealed and replaced by the *Multi-Material Stewardship (Interim Measures) Regulation* in 1995, which created the Manitoba Product Stewardship Corporation (MPSC). One of the main mandates of the MPSC was to establish and administer a waste reduction and prevention program for designated packaging and printed materials for Manitoba.⁵⁰



POPULATION: 1,293,400
POPULATION DENSITY: 2.2 PERSONS/KM²

In December 2008, the province introduced a new *Packaging and Paper Stewardship Regulation*. In response to this regulation, in September 2009 Manitoba's Minister for Conservation approved a program plan for PPP collection in the province. Packaging in the regulation is defined as "any package or container, or any part of a package or container, that is comprised of glass, metal, paper or plastic, or any combination of any of those materials and includes, but is not limited to, service packaging." This initiative began on April 1, 2010, and is run by Multi-Material Stewardship Manitoba (MMSM).

At the same time, the beverage industry created the Canadian Beverage Container Recycling Association (CBCRA), which takes responsibility for the collection of all beverage containers consumed both at home and away-from-home (AfH). The CBCRA's first program plan was approved August 31, 2011, and a second plan was approved in 2013 (until 2016). All used, sealed ready-to-serve beverage containers are included under the program; this includes aluminum, PET, HDPE, aseptic packages, and gable-top containers. The CBCRA has agreed that containers containing dairy products will be phased in at a later date.

PERFORMANCE TARGETS

Included in the Guideline accompanying the *Packaging and Printed Paper Stewardship Regulation* is a requirement that obligated beverage producers achieve a 75% recovery

(collection) rate for all used, ready-to-serve beverage containers supplied into Manitoba by 2016. Once that target is achieved, Government will work with industry to set targets for future years.⁵¹

WHO IS RESPONSIBLE?

Manitoba's *Packaging and Printed Paper Stewardship Regulation* targets stewards (brand-owners and first importers) of designated printed paper and packaging (PPP) that are resident in Manitoba. Under the regulation, stewards are required to contribute funds to municipalities to help cover up to 80% of the net cost of PPP recycling programs. In 2006, representatives of obligated companies established Multi-Material Stewardship Manitoba (MMSM) – a not-for-profit, industry-funded organization – to design, implement, and operate the province-wide residential recycling program on their behalf. To do this, it receives funding from the CBCRA.

Founded in 2010, the CBCRA is a non-profit, industry-funded organization comprised of beverage producers and distributors (excluding beer). While its members and stewards are also stewards of MMSM and are obligated to remit fees to MMSM on all their packaging, it 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 which was signed in 2010.). According to its website, the CBCRA represents approximately 90% of the beverage containers sold into Manitoba.

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. CBCRA buys the bins, provides technical support and best practices information, and finances the province-wide promotion and educational campaign called "Recycle Everywhere." Participating generators get new recycling bins and free educational materials from Recycle Everywhere to support their recycling programs. In return, they must pay for their recycling program and use a registered program processor for this service. These generators or their processors receive all the revenue from the PET and aluminum collected.

In addition to remitting fees to MMSM, the CBCRA reports to MMSM all its members' packaging (i.e. tonnes of aluminum cans; PET bottles; glass; Tetra Pak, etc.) sold into the province and pays the total fees for that year.

The AfH program targets municipalities and businesses that generate beverage containers. These could include libraries, community centers, golf courses, arenas, events venues, and other establishments.

PROGRAM FINANCING

All stewards of PPP in Manitoba are responsible for financing 80% of the total net cost of municipal recycling programs across the province. Steward fees are set by MMSM and are based on a number of factors including program costs, recovery rates, and a penalization factor for materials with poor collection rates.

Producers of beverages are charged a 2-cent Container Recycling Fee (CRF) for every non-alcoholic, non-dairy beverage container they supply into Manitoba. Producers remit these fees to the CBCRA on a monthly basis, who then pays MMSM (on behalf of each member) on a quarterly basis. Alcohol distributors pay MMSM directly for their Blue Box obligation. In most cases, beverage producers pass the CRF to the retailer, who then passes it on directly to the consumer. This fee is visible on most store receipts and is consistent across the province.

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.

This fee is used to pay for the entire AfH recycling program, including infrastructure, signage, technical support, and P&E.⁵² The CRF is also used 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 charged to beverage producers covers the cost of recycling beverage containers from all collection streams.

In 2014, CRF revenue totaled \$8.8 million, \$1.2 million of which was used to pay MMSM for residential collection. CBCRA uses the remaining revenue to purchase and distribute recycling bins (free of charge) to its partners across Manitoba (e.g. municipalities, IC&I buildings, government buildings and other provincially-run locations such as parks and schools); provide technical support; conduct waste audits; and to pay for its promotion and educational campaign ("Recycle Everywhere").

COLLECTION SYSTEM

Beverage containers from the residential sector are collected via curbside recycling or depot drop-off centers. PET, glass, aluminum, and steel containers are collected in most programs, whereas aseptic, gable top, HDPE, and other less common containers are collected in approximately 90% of the programs. Municipalities either perform the collections themselves or contract these services out to private companies. 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. As of December 2015, over 20,000 Recycle Everywhere bins have been placed with partners in more than 736 communities across the province. Bins have also been installed in more than 586 IC&I buildings, and 487 schools.

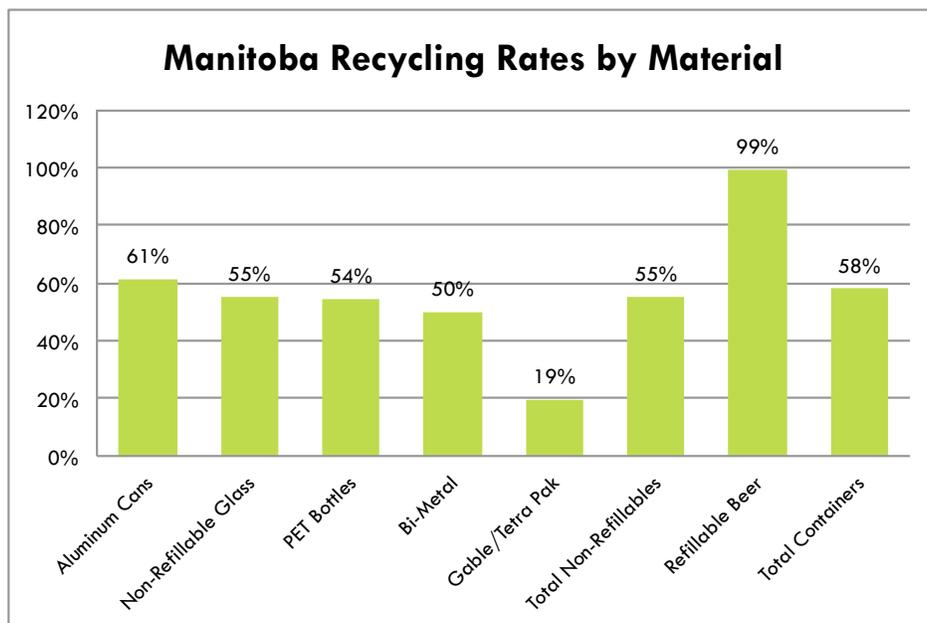
Refillable and non-refillable beer cans are collected via retail beer vendors, the Manitoba Liquor Commission, and rural agency stores. Brewers Distributor Limited (BDL) collects empty domestic beer containers and back-hauls them to various distribution centres where recyclables are baled and shipped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

PROGRAM PERFORMANCE

In 2014, the CBCRA reported an overall collection rate of 64% based on tonnes collected. To determine the recycling rate, CM Consulting applied assumed process loss rates (see Appendix for assumptions used). With these losses factored in, the recycling rate is 55% of all non-refillable beverage containers (excluding beer) sold in Manitoba.

It should be noted that the recycling rate for aluminum cans includes beer cans (recycled at a rate of 79%) and soft drink cans (recycled at a rate of 49%).

FIGURE 23 MANITOBA RECYCLING RATES, BY MATERIAL (2014)



WHAT'S NEW?



In December 2014, the Government of Manitoba released a Recycling and Waste Reduction discussion paper, which proposes to reduce the amount of waste going to landfills by 50% by 2020. Among the options for action are establishing a new target for recovering beverage containers (up from the current 75% target) and phasing in disposal bans of products and materials currently managed under the province's EPR programs. If implemented, both of these proposals – as well as several others in the discussion document – could have an impact on stewards.

Ontario

Blue Box Program and the Ontario Deposit Return Program (ODRP)

SUPPORTING REGULATORY FRAMEWORK

Established in 1994, Ontario's Blue Box Program is one of the oldest and most comprehensive curbside recycling systems in North America. 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.



POPULATION: 13,792,100
POPULATION DENSITY: 14.1 PERSONS/KM²

Ontario's Blue Box Program was developed under the *Waste Diversion Act* (WDA) (2002) in response to a 2003 request by the Ontario Minister of the Environment for such a program. The WDA obligates companies that introduce printed paper and packaging (PPP), managed through the municipal waste system, to contribute 50% of the share of the net cost of operating municipal curbside recycling programs. The Act establishes Waste Diversion Ontario (WDO) as the non-crown corporation responsible for developing, implementing, and operating waste diversion programs in the province, including one for designated Blue Box wastes (see O. Reg 273/02). Eligible waste materials and the Industry Funding Organization (IFO) are designated in the *Blue Box Waste Regulation* under the WDA.

In addition to the WDA, municipal recycling programs are legislated under the *Environmental Protection Act* (EPA) (1990). Specific regulations of relevance to recycling are the 3Rs Regulations, namely *Regulation 101/94 (Recycling and Composting of Municipal Waste)*. *Regulation 101/94*, in place since 1994, requires every municipality with a population of at least 5,000 to operate a Blue Box program that collects at least five mandatory materials (newspapers, PET bottles, aluminum and steel cans, glass containers), as well as a minimum of two other materials made from metal, plastic, or glass. Also relevant is *Regulation 103/94 (Industrial, Commercial and Institutional Source Separation Programs)*, which mandates IC&I

recycling for most commercial sectors and for some basic recyclables (excluding multi-laminate containers).

The EPA also includes a number of beverage-specific regulations such as: *Refillable Containers for Carbonated Soft Drink Containers* (O. Reg 357), *Disposable Paper Containers for Milk* (O. Reg 345), and *Disposable Containers for Milk* (O. Reg 344). All of these regulations have been consolidated into the *Revised Regulations of Ontario (1990)* (R.R.O. 1990).

On June 1, 2016, the Ontario Government passed Bill 151 – the *Waste Free Ontario Act* (WFOA), comprised of two schedules: 1) the *Waste Diversion Transition Act* (WDTA) and 2) the *Resource Recovery and Circular Economy Act* (RRCEA). Together, these Acts will replace the current WDA—which utilizes industry funding organizations, like Stewardship Ontario, and industry stewardship plans—and transition to the new producer responsibility framework. At this point, the Act is high level, enabling legislation that will see much of the details on how the new system will work determined later through regulations⁵³.

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 2004 Blue Box Program Plan set an overall diversion target of 60% for Blue Box waste by 2008, which was reached ahead of schedule. No targets have been set for waste diversion from the IC&I sector.

Regulations also call for 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. The ministry is looking at several alternatives to the 30% refillable quota, and is considering repealing it altogether.

WHO IS RESPONSIBLE?

Under the new *Waste-Free Ontario Act* (2016), which is scheduled to take effect in January 2017, individual producers (not an agent) will be held legally responsible for achieving resource recovery and waste reduction requirements.⁵⁴ Although they will not be able to

transfer their liability, producers will have flexibility to determine how to best meet their obligations, subject to the regulations and the restrictions of the *Competitions Act*.

Obligated producers will report directly to the Resource Productivity and Recovery Authority (RPRA). The RPRA will replace Waste Diversion Ontario (WDO) and will be directly accountable to the Ontario Ministry of Environment and Climate Change. The Authority is responsible for providing independent oversight of producer requirements, operating as a data clearinghouse for producer responsibility programs, and undertaking compliance and enforcement activities related to waste diversion and recycling programs. Compliance and enforcement tools could include inspections, compliance orders, administrative penalties, and offence provisions.

Under the old waste diversion regime, municipalities with a population of 5,000 or more were responsible for operating multi-material curbside recycling programs for beverage containers and other PPP materials. Under the new legislation, there is no legislated role for municipalities. Rather, municipalities are considered a potential service provider to producers.⁵⁵ 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.⁵⁶

With regards to the ODRP for wine, spirits, and imported beer containers, the LCBO is the responsible entity. When the provincial government decided to establish the program, The Beer Store (TBS) already had a successful deposit-return 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, WDO conducts a Municipal Datacall, requiring municipalities to submit tonnage and financial information for residential Blue Box material collected in their recycling programs. Along with material generation estimates, Stewardship Ontario (SO) uses this data 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.

Prior to Bill 151, PPP stewards (represented by SO) were responsible for paying 50% of the annual share of the net costs of the Blue Box program, as per the agreement under the *Waste Diversion Act (WDA)* (2002). Under Ontario's new waste diversion regime, producers' responsibility for blue box costs could increase from 50% to 100% (full producer responsibility). A decision on whether to raise the current funding cap beyond 50% will be made during the Blue Box transition period, which is expected to take anywhere from three to five years.⁵⁷

In 2014, over 1,000 stewards reported into the Blue Box program and paid a total of \$106.2 million in fees to SO. About 135 stewards account for 80% of the fees.⁵⁸ Of the total stewardship fees, \$104.4 million was transferred to municipalities for operation of the Blue Box program. This amount includes program delivery, administration, and HST. Some of these funds were also used to support continuous improvement (\$3.3 million), R&D (\$914,000), and promotion and education (\$5,500).

The ODRP is financed through unredeemed deposits and government revenue. Refundable deposits currently range 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, 2015, expenditures related to service fees paid to TBS totaled \$38.0 million (including \$4.4 million of HST).⁵⁹ It is worth noting that the service fee – 80% of which is collected for handling large glass bottles – has decreased since the beginning of the program. A contract with TBS, in effect since February 2012, sets the fee at 10.5-cents for 2016.

COLLECTION SYSTEM

Ontario has a hybrid collection system in which beverage containers are recovered via two streams.

Alcoholic beverage containers, as well as any associated packaging, can be returned to 443 beer store locations, 113 breweries (beer containers only), 141 retail partner stores, 63 LCBO northern agency stores, 4 additional LCBO stores, and 115 empty bottle dealers (small independent depots contracted in more remote locations where beer retailers are not available), for a total of 879 redemption locations. TBS trucks collect these empty containers and back-haul them to various distribution centres where recyclables are sent to a processing facility for sorting, baling, and shipping to market. Refillable bottles are sent back to the brewers for washing and refill.

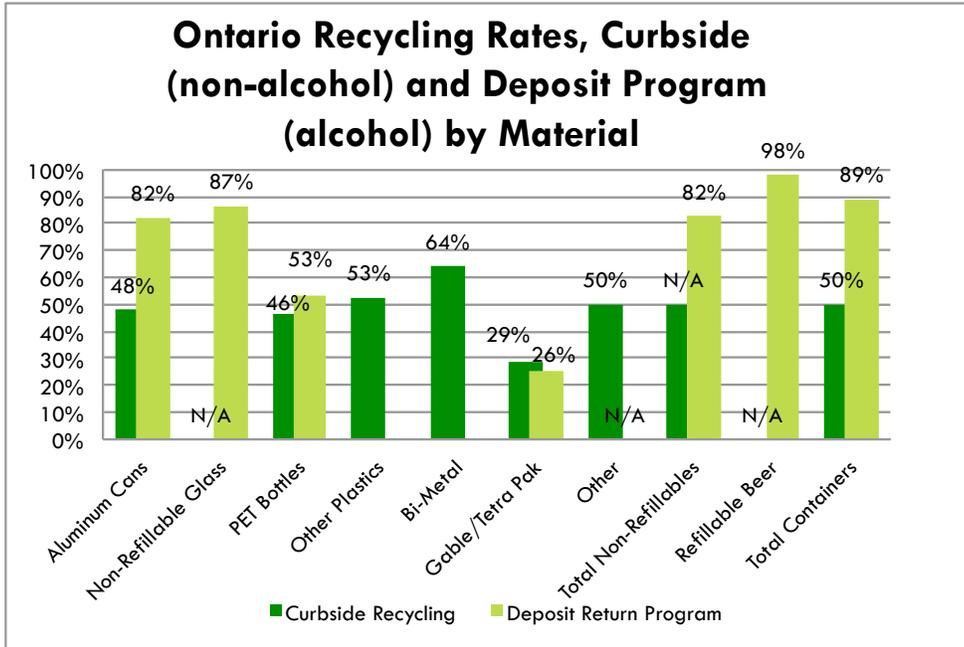
Beverage containers from the residential sector are collected via curbside recycling or drop-off depots. Municipalities are required by law to collect PET, glass, aluminum, and steel containers, whereas the collection of Tetra Pak, gable top, HDPE and other less common containers is voluntary. Municipalities may perform collection themselves or may contract it out to private companies. Generally, after collection, containers are transported to MRFs where they are sorted, baled, and shipped to their respective end markets for recycling.

PROGRAM PERFORMANCE

Containers returned through Ontario's deposit-return system show a total recycling rate of 89% for 2014-2015. This rate is higher than that in other deposit programs in Canada because of a combination of the high rate for the refillable beer bottle (98%) and a high market share for that bottle in the province (56% of all beer containers sold). The rate for non-refillable alcoholic

beverage and beer containers is also high at 82%. Of all alcoholic beverage containers, gable/Tetra Pak cartons achieved the lowest collection rate at 26%.

FIGURE 24 ONTARIO RECYCLING RATES BY MATERIAL – CURBSIDE (NON-ALCOHOL) AND DEPOSIT PROGRAM (ALCOHOL) (2014)



Non-alcoholic beverage containers collected via the Blue Box program show an overall recycling rate of approximately 50% (down from 56% in 2012-2013).

WHAT'S NEW?



Ontario Introduces New Waste Legislation and Strategy

On June 1, 2016, the Ontario government passed the *Resource Recovery and Circular Economy Act (2016)* and the *Waste Diversion Transition Act (2016)*, otherwise known as the *Waste-Free Ontario Act (Bill 151)*. This new legislation replaces the *Waste Diversion Act* under which producers are required to split the costs (50/50) of recycling PPP with municipalities. The Act also replaces WDO with the Resource Productivity and Recovery Authority (RPRA), with additional oversight and enforcement powers. Bill 151 also allows the government, through regulation, to increase producers' funding of the Blue Box program beyond the current 50% funding cap during the transition process.⁶⁰ The Blue Box program is proposed to transition to full EPR in 2016-2017.

Under Ontario's new waste diversion regime, individual producers' obligations will extend beyond the current requirement to remit fees, giving producers the flexibility to achieve

resource recovery and waste reduction requirements individually or in collectives.⁶¹ Another core feature of Bill 151 related to the collection and recycling of beverage containers is that unlike the previous legislation, there are no provisions to require 'reasonable compensation' for municipalities - instead this will be dictated by the market.⁶² Part of the Blue Box transition will also include consultation on changes to Regulation 101/94 to remove requirements for municipalities to collect materials at the curb.⁶³ By placing a heavier burden on producers, it is the province's intention to encourage the production of more reusable and recyclable products.

Along with the proposed legislation, the Ontario government released its draft *Strategy for a Waste-Free Ontario: Building the Circular Economy*. This strategy document identifies the province's key objectives with respect to waste recovery, which include increasing resource productivity to reduce waste, promoting a more efficient and effective recycling system, and creating conditions to support sustainable end-markets.⁶⁴ To achieve these objectives, the draft Strategy prioritizes a number of actions, including for example, implementing disposal bans and recycling standards, designating new products and packaging, and enhancing requirements for waste generators and service providers. A key aspect of the draft strategy is the government's focus on *outcomes* and *requirements* for designated products and packaging. These could include, for example, minimum collection rates.⁶⁵

Québec

Collecte sélective Québec, programme pour la récupération hors foyer, programme de consignation

SUPPORTING REGULATORY FRAMEWORK

Québec's DRS was established in 1984 under the *Environment Quality Act*. The program covers all non-refillable soft-drink and beer containers. Other beverage containers, such as those containing 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%).



POPULATION: 8,263,600
POPULATION DENSITY: 5.8 PERSONS/KM²

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, 2014, and which was in effect until December 31, 2015. This agreement was first reached on December 1, 1999 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*. New agreements are currently being negotiated for both industries (separately).

In addition to the above agreements, the beer and soft-drink industries are governed under the *Beer and Soft Drinks Distributors' Permits Regulation under An Act Respecting the Sale and Distribution of Beer and Soft Drinks in Non-Returnable Containers*. This Act requires that anyone selling or distributing beer and soft drinks in Québec in non-refillable containers must obtain a permit to do so 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*.

PERFORMANCE TARGETS

The government's *Québec Residual Materials Management Policy and 2011-2015 Action Plan* includes a target to recycle 70% of paper, cardboard, plastic, glass, and metal waste by 2015.

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, 2015.⁶⁶ 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 program is overseen by the *Société québécoise de récupération et de Recyclage* (also known as "Recyc-Québec"), a crown agency founded in 1990 responsible for promoting, developing, and encouraging the reduction, reuse, recuperation, and recycling of containers, products, and packaging in Québec. The Ministry responsible for carrying out the provisions of the *Act respecting the Société québécoise de récupération et de Recyclage* – which lays out the mission and mandates of Recyc-Québec – is the Ministry of Sustainable Development, Environment, and Action against Climate Change (MDDELCC) (Ministère de Développement durable, de l'Environnement et de la Lutte contre les changements climatiques).

BGE – a non-profit organization established by the Québec soft-drink industry – administers the deposit-return program for non-refillable soft drink containers on behalf of the industry. BGE took over this role from Recyc-Québec on December 1, 1999.

Recyc-Québec oversees the beer container collection program. 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 put PPP on Québec's market. 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 in Québec. In 2014, ÉEQ represented over 3,000 companies selling paper and food and consumer packaging.

PROGRAM FINANCING

The two programs in Québec are funded via different streams.

The DRS for beer and soft drinks containers is almost entirely funded by the wasting consumer through unredeemed deposits. In 2014, nearly 30% of deposits paid by consumers were not redeemed.⁶⁷ Because the cost data for the transport and recovery operations are proprietary, the actual share of costs is unavailable. Depending on program expenses and material revenues for a given year, the percentage of the cost borne by the beverage industry versus the consumer can change, but the wasting consumer typically bears the lion's share.

Industry contributes a much larger share to the municipal curbside program. Since November 2004, municipalities with multi-material recycling programs are entitled to receive compensation for their services under the *Environment Quality Act* and the *Regulation Respecting Compensation for Municipal Services provided to Recover and Reclaim Residual Materials*. As of 2013, beverage producers (except those for non-refillable soft-drinks and beer which are on deposit) 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.) and the cost of collection equipment (e.g. recycling bins).⁶⁸ The total compensation paid to municipalities (561 municipal agencies) in 2014 was \$156.5 million.⁶⁹ (Note: While soft-drinks and beer containers themselves are not subject to the regulation, any associated packaging is (e.g. boxboard cases, film plastic)).

COLLECTION SYSTEM

Similar to Ontario, Québec has a hybrid collection system in which beverage containers are recovered via two streams.

Containers of carbonated beverages (including beer, soft-drinks, and carbonated energy drinks) are collected via the deposit-return program, which is based on a return-to-retail collection system. Consumers can return their empty containers for a refund of their deposit to approximately 10,000⁷⁰ licensed grocers, service stations, pharmacies, and other retail outlets located throughout Québec. By law, anyone that sells these containers must take them back.

Approximately 70% of returned deposit-bearing containers are managed through reverse vending machines (RVMs) using dedicated transport by distributors and bottlers. A significant portion of the remaining 30% is collected using the same side-load trucks that deliver full goods (reverse logistics). These 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 used for wine, spirits, water, non-carbonated flavoured drinks, juices, and milk are collected via municipal curbside recycling programs, available in over 1,100 municipalities (representing 99% of the population)⁷¹ throughout Québec.

In addition to the above, Québec residents can recycle empty beverage containers through the Away-From-Home Recovery Program managed by ÉEQ. Between its creation in 2008 and December 31, 2014, this program has resulted in the installation of 10,100 pieces of materials recovery equipment in indoor and outdoor municipal public spaces across Québec.⁷²

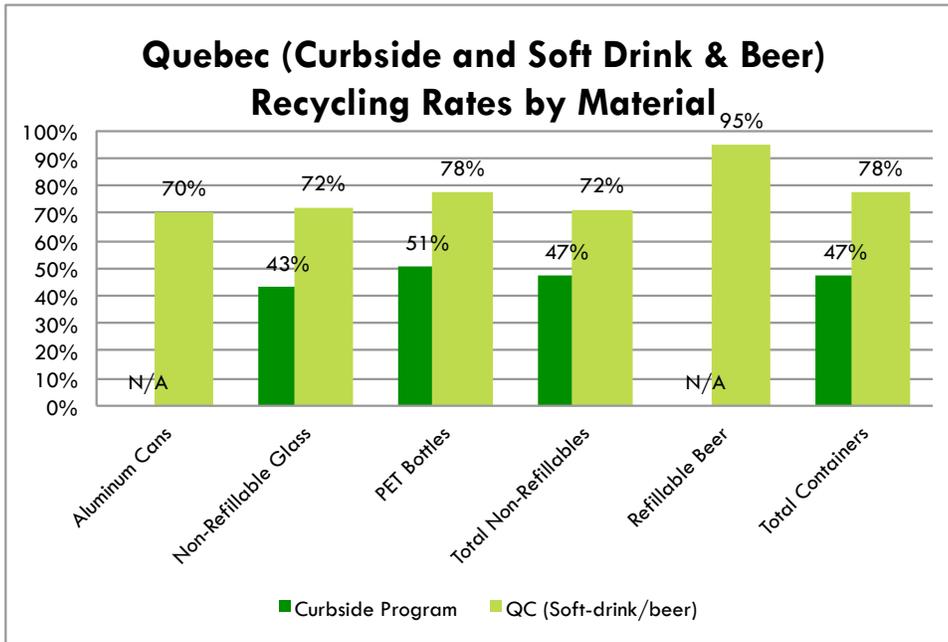
Other AfH recycling initiatives are pursued by those outside government or the beverage industry, including *La Table pour la récupération hors foyer* (Issue table for out-of-home recycling). Formed in 2007 by stakeholders in the public, private, and voluntary sectors, the non-for-profit organization's mission is to initiate, develop, and implement large-scale programs to increase AfH recycling. To date, the organization has distributed \$4.7 million to municipal organizations for the installation of 10,300⁷³ multi-material recycling bins, and \$1.2 million to over 3000 restaurants, bars and hotels that now recover all their recyclable materials.

The program is now being operated by ÉEQ to supplement curbside collection. Funding for the program (\$8 million) is provided in equal parts through voluntary contributions from the ÉEQ, the MDDELCC, and through the Green Fund.

PROGRAM PERFORMANCE

In 2014, the recycling rate for containers recovered via the deposit-return system was 78% (this rate includes data for refillable bottles). During the same period, the rate for containers collected through the municipal curbside recycling program was 47%.

FIGURE 25 QUEBEC RECYCLING RATES FOR DEPOSIT PROGRAM (SOFT DRINK & BEER) AND CURBSIDE PROGRAM (ALL NON-CARBONATED BEVERAGES) BY MATERIAL (2014)



WHAT'S NEW?



Québec Considers Program Expansion

The Québec government is seriously considering expanding its deposit-return program to include beverages sold in plastic, metal, and other containers that currently don't currently 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 5-cents refund to 10-cents, as well as increasing the handling fee offered to retailers for their collection efforts to 2.5-cents (up from 2-cents). The announcement is expected in the last quarter of 2016.

New Brunswick

Beverage Container Recovery Program

SUPPORTING REGULATORY FRAMEWORK

Established in 1992 under the *Beverage Containers Act* (1991) and the *General Regulation – Beverage Containers Act* (1992), this province-wide program covers all ready-to-drink, non-refillable beverage containers 5L and under. This includes soft-drinks; beer, wine and spirits; flavoured waters; fruit juices; vegetable juices; and low alcohol drinks. The regulation also covers refillable beer bottles. Containers for milk and milk products (and substitutes) as well as processed apple cider are exempt from the program at this time.



POPULATION: 753,900
POPULATION DENSITY: 10.5 PERSONS/KM²

PERFORMANCE TARGETS

There is no collection target established in the Act or the regulation. However, the Department of Environment has established an unofficial target of 80%.

WHO IS RESPONSIBLE?

Encorp Atlantic Inc. – a stewardship agency originally created by the soft-drinks industry – is responsible for managing the collection, transportation, and partial processing of non-alcoholic beverage containers on behalf of obligated brand owners. It does this through a contract with Gilbert M. Rioux & Fils Ltd.⁷⁴ In addition to managing the operational aspects of the program, Encorp is responsible for collecting all deposits from the distributors, reimbursing redemption centres for the refunds paid out, remitting a portion of the fees to the Environmental Trust Fund, and paying redemption centres a handling fee.

New Brunswick Liquor (NB Liquor) is responsible for the collection of alcoholic beverage containers (wine, beer, spirits, and coolers), and contracts the transportation and processing of these containers to Neighborhood Recycling (Rayan Investments Ltd.). NB Liquor collects the deposits and remits the provincial share of the environmental fee directly to the Environmental Trust Fund.

Program oversight is the responsibility of the Department of Environment. Distributors of containers sold in the province must register with the Department and submit a plan describing how the container will be managed after the beverage has been consumed.

PROGRAM FINANCING

New Brunswick's beverage container program operates under a "half-back" model. Under this system, residents who purchase non-refillable beverage containers are refunded only half (50%) of their deposit when they return the containers for recycling. To illustrate, a consumer who paid a 10-cent deposit on a non-alcoholic (ready-to-drink) beverage, of any size, would only receive a 5-cent refund upon redemption of this container. Likewise, a consumer who paid a 10-cent or 20-cent deposit (depending on size) on an alcoholic beverage container would only receive back half that amount. The exception to this half-back system is refillable beer bottles. When returning these bottles to a redemption center, consumers are refunded the full 10-cent deposit.

The unrefunded portion of each deposit (2.5- or 5-cents depending on the container), plus the revenue generated from unredeemed deposits and from the sale of material, is used to cover the costs of administering the program. These costs include sorting, transporting, and processing the containers. They also include a handling fee paid to redemption centres; handling fees are currently set at \$0.04059 per empty beverage container (except for empty refillable beer containers).⁷⁵ Handling fees are paid to redemption centres as compensation for receiving, paying out refunds for, sorting, and storing redeemed beverage containers. These fees are paid directly to redemption centres without government involvement.

In addition to covering program expenses, some of the revenue from the unrefunded portion of the deposit goes into New Brunswick's Environmental Trust Fund, which is used for environmental conservation, education, protection, and other provincial environmental initiatives aimed at reducing waste. In fiscal year 2015, a total of \$6.7 million was paid to the fund. This fund is managed by the Department of Environment.

COLLECTION SYSTEM

As of February 2016, New Brunswick residents can return their empty beverage containers for a refund to any one of the 72⁷⁶ individually owned and operated redemption centres throughout the province. All redemption centres must be registered with the New Brunswick Department of Environment.

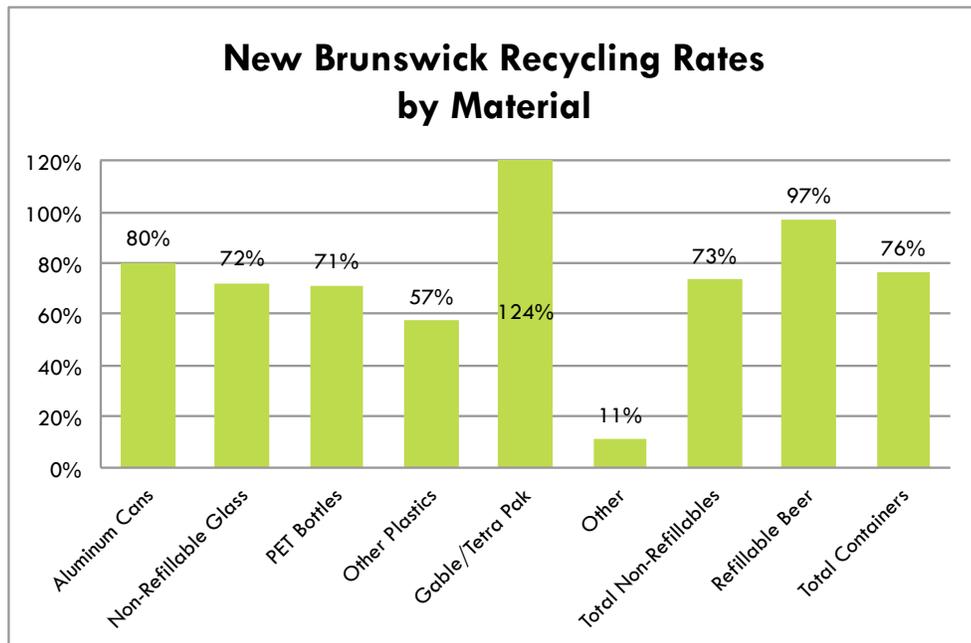
At the redemption center, containers are sorted by material type (and for certain plastic and glass containers, by colour also), placed into bulk bags, and then transported to one of two processing facilities: Neighborhood Recycling or Encorp Atlantic. The former processes all alcoholic beverage containers (on contract to the N.B. Liquor Corporation), while the latter processes all non-alcoholic containers. Refillable beer bottles are returned directly to the breweries where they are washed and refilled.

PROGRAM PERFORMANCE

In 2014, New Brunswick's recycling rate for non-refillable containers was 73%, an increase of three-percentage points over 2012. Since 2012, aluminum cans have seen their rate increase

from 71% to 80%, while non-refillable glass has seen its rate decrease from 83% to 72%. There has been little change in PET bottle recycling rates.

FIGURE 26 NEW BRUNSWICK RECYCLING RATES BY MATERIAL (2014)



In New Brunswick, some cartons sold are being categorized as ‘other’ sold by distributors, leading to a situation where the denominator for gable/Tetra Pak containers sold is lower than it should be, while the denominator for ‘other’ sold is higher. (This is possible because New Brunswick law does not require the distributor to provide a detailed breakdown of container types sold, and only the total number of containers sold). This helps to explain why the collection rate for gable/Tetra Pak cartons is so high while ‘other’ is so low.

WHAT'S NEW?

Encorp Atlantic Launches Series of Pilot Projects to Modernize Recycling System

As part of a series of pilot projects aimed at increasing recycling rates and implementing best practices and technology to make recycling more convenient, Encorp Atlantic launched **(re)** in April 2014, a new self-serve drop-off service offered exclusively in the Greater Moncton region. Similar to other drop-and-go programs, consumers register online and get a card linked to their account.⁷⁷ After signing up, consumers collect empty beverage containers, drop them off at one of two unmanned sold-powered/off-the-grid re-centres, and receive their deposit refund via an online payment system.⁷⁸ As of September 2015, 2058 households were enrolled in the pilot project.⁷⁹ After the 36-month trial run, Encorp will evaluate the success of the model to see how it can eventually be expanded to the rest of the province. Data for the 12-month

period ending September 2015 shows that most containers returned are PET clear bottles (25.6%) and aluminum non-alcohol containers (21.4%).⁸⁰

The new Express Service Bag concept is another pilot project launched by Encorp with the aim of modernizing beverage container recycling in New Brunswick. The two-year pilot project, which started in June 2015, is being implemented at four redemption centres in the Fredericton and Shediac regions.⁸¹ Customers who sign up for the free service collect their deposit-bearing containers in the specially designed Express Service Bags and are given first priority when dropping them off at the redemption centre, as the containers don't need to be counted or sorted in front of them. The initial express bag being tested is a medium size bag designed to hold 40 containers that will entitle the consumer to a \$2 cash refund. Later in the trial period, Encorp plans to test a larger bag with a capacity of 60 containers for a \$3 payout. Based on data and feedback received from participants (only 2500-3000 households will be accepted in this trial run), Encorp hopes to improve the service and eventually expand it to other redemption centres in the province. So far, results are positive: from June 1 to September 12, 2015, a total of 7521 express bags were processed (average of 100 bags daily).⁸²

New Trucks and Technology Increase System Efficiency

In Fall 2015, Encorp Atlantic and its new collection and transportation contractor unveiled a new fleet of trucks and compaction trailers, which have had a number of positive effects on the efficiency of the beverage container program. In addition to reduced greenhouse gas emissions, this new generation of trucks has enabled Encorp Atlantic to increase the number of beverage containers it can ship in each load (up to 650 bulk bags) and ship its plastics directly to market. The new technology has also allowed Encorp to reduce the number of sorts, from 13 to 8. This means faster service for customers at redemption centres as well as lower operating costs and increased fuel economy for the program.⁸³

Nova Scotia

Nova Scotia Deposit Refund Program

SUPPORTING REGULATORY FRAMEWORK

Launched on April 1, 1996, Nova Scotia's deposit-return program for beverage containers is regulated under the *Solid Waste-Resource Management Regulations* made under Section 102 of the *Environment Act* (1994-1995).

In addition to banning certain beverage containers from disposal in provincial landfills, these regulations require beverage distributors or retailers to charge consumers a deposit on all regulated beverage containers sold in Nova Scotia. The regulations apply to all ready-to-drink beverage containers, excluding milk, milk



POPULATION: 943,000
POPULATION DENSITY: 17.4 PERSONS/KM²

products, soya milk, and rice beverages. Other containers exempt from the DRS are certain meal replacements, formulated liquid diets, foods for very low energy diets, thickened juices, baby formulas, concentrates, and non-alcoholic beverages in containers of 5L or more.

The *Solid Waste-Resource Management Regulations* also established the Resource Recovery Fund Board Inc. (RRFB) as the independent agency responsible for managing the province's deposit-return program, including the operation of a collection network for the recycling of regulated containers.

The collection of milk containers is carried out under a voluntary agreement between Nova Scotia Environment, the Nova Scotia Solid Waste Management Regions (there are 7), and the Atlantic Dairy Council (ADC). Signed in February 2000, the *Nova Scotia Milk Packaging Stewardship Agreement* transfers the costs of recycling milk packaging from taxpayers to producers.

PERFORMANCE TARGETS

There are no specific targets relating to beverage container collection and recycling under either program. However, since 1996, the provincial government has been committed to achieving 50% overall waste diversion. Through an amendment to the *Environment Act* in 2006, the province also set a disposal target of no more than 300 kg of waste per person per year by 2015. No new targets have been set for 2016 onwards.

WHO IS RESPONSIBLE?

Since its inception, the organization responsible for managing the province's DRS has been Resource Recovery Fund Board (RRFB) (now Divert NS). Created by legislation in 1996, RRFB Nova Scotia is a not-for-profit organization, operating at "arms length" from government. In addition to the beverage container program, it is also responsible for administering the province's tire and paint recycling programs.

Under the *Solid Waste-Resource Management Regulations*, all distributors of designated beverage containers must register with RRFB in order to sell these products legally within the province. Other distributor obligations include reporting sales data and remitting applicable deposits directly to RRFB on a monthly basis. According to RRFB's 2015 Annual Report, there are currently 105 beverage distributors and 27 liquor distributors selling approximately 142,500 products in Nova Scotia.⁸⁴

The Regulations also impose requirements upon retailers. By law, retailers are required to charge a deposit on designated beverage containers and display the deposit amount on the sales receipt. Retailers are also required to display a notice stating that a deposit will be charged on beverage containers and to identify the location of the nearest depot where beverage containers can be returned for a refund.⁸⁵

Depot owners and operators are also subject to obligations under the Regulations. For example, in order to become a licensed Enviro-Depot™, operators must sign a standard form agreement with RRFB. If the depot fails to comply with the standards established by the Board, their license can be revoked.

Responsibility for the milk container recycling program is shared between the ADC, who provides the funding, and Nova Scotia's Solid Waste Management Regions, who operates residential curbside programs and municipal recycling facilities, in which milk packaging is collected. Municipalities are required to submit volumes of milk packaging collected, processed and recycled annually to Nova Scotia Environment.

PROGRAM FINANCING

The two programs in Nova Scotia receive their funding from different streams.

The DRS is based on a "halfback" model. Under this system, a deposit is paid on all non-refillable containers, but only half of that deposit (50%) is refunded to the consumer. The deposits are currently set at 10-cents for non-alcoholic containers less than 5L; 10-cents for alcoholic containers 500ml or less; and 20-cents for alcoholic containers 500ml or larger. The exception to Nova Scotia's halfback system is refillable domestic beer bottles. Unlike non-refillables, the deposits paid on these containers are 100% refundable (\$1.20/dozen). All deposits received by beverage distributors (105 in fiscal 2015) are remitted to RRFB Nova Scotia.

The non-refundable portion of the deposit (5-cents or 10-cents, depending on container type and size) is used as revenue by the RRFB. In fiscal 2015, revenue from deposits amounted to \$40 million. Revenues are also generated from the sale of recyclable materials. Combined, this revenue is used to help pay for program costs. These costs include, among other things, the handling fees to Enviro-Depots™ and municipal waste management facilities, transportation, processing, program awareness, compliance audits, and administration.⁸⁶ As of January 2014, the handling fee for empty beverage containers (except for empty refillable beer containers) was 4.03-cents per container. A portion of the unredeemed deposits is also distributed to municipalities to help offset the costs of their waste-diversion initiatives. In fiscal 2015, RRFB Nova Scotia provided \$7.4 million in funding to Nova Scotia's 54 municipalities.⁸⁷

Unlike the DRS, which is funded mostly by consumers, the voluntary collection and recycling of milk containers is financed entirely by industry. Through the *Nova Scotia Milk Packaging Stewardship Agreement*, the Atlantic Dairy Council (ADC) provides funding to Nova Scotia's Solid Waste Management Regions, based on the number of milk containers collected for recycling through municipal recycling programs. Municipalities receive compensation based on the average cost to recycle (including collection, processing, education, enforcement,

and administration costs) and quantities collected.⁸⁸ 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 2014 was not available.

COLLECTION SYSTEM

Nova Scotians can return empty beverage containers for a refund of the deposit to any one of the province's 78 privately owned and operated Enviro-Depot™ locations. Consumers also have the option of forgoing the refund and recycling used beverage containers through their municipal curbside "blue bag" programs. In these cases, non-public buy backs (waste management facilities operated either directly by municipalities or for municipalities via private contract) recover the containers from the blue bags and are compensated for them (As of November 2015, there were 10 of these facilities strategically located around the province⁸⁹).⁹⁰

At each Enviro-Depot™ and non-public buy back, empty beverage containers are stored in large bags (for all container types except glass), or large plastic tubs (for glass only).⁹¹ Containers are sorted so that each bag or tub contains only a specific material type, for example, aluminum, plastic, glass, etc. For certain product types, 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.⁹²

After sorting, RRFB Nova Scotia's contracted local carrier collects and transports the containers to the nearest of four processing facilities in the province. Three of these facilities handle all beverage container types, and each is designated as a Regional Processing Centre (RPC) (The other facility handles beverage container plastics only). At the RPCs, aluminum and plastic beverage containers are separated and then compressed in a baler. Once baled, the RRFB sells the material on the commodity market. (Compaction trailer aluminum and plastics is transported directly to market.). Glass is crushed at a facility that has an arrangement with RRFB Nova Scotia to directly pick up and process all beverage container glass received, and is temporarily stored at the RPCs.⁹³

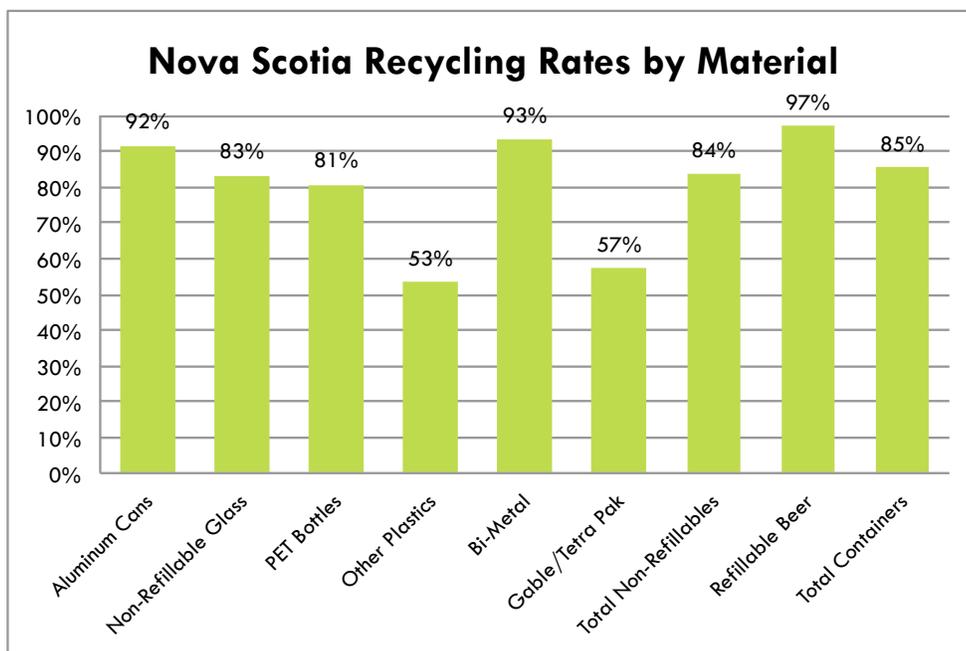
With regards to beer, containers are returned either to the liquor stores at which they were purchased, or to Enviro-Depots™. There are several bottle dealers who operate Enviro-Depots and pick up beer bottles from other depot operators. In fact, just over half of the Enviro-Depots are licensed Brewers' bottle dealers. These licensees are paid a handling fee for each container received, but are required to have a trailer load of empties before the Brewers will accept them for pick-up, where they will be washed and refilled. Beer cans are sent directly to Encorp.⁹⁴

Milk packaging is collected separately via municipal curbside recycling programs. According to the Nova Scotia government, milk packaging is approximately 3% of the current municipal recycling stream.⁹⁵

PROGRAM PERFORMANCE

In 2014, 334 million non-refillable beverage containers were returned to depots for recycling, for a recycling rate of 84%. Bi-metal and aluminum cans saw the highest rates, at 93% and 92%, respectively. With the exceptions of “other plastics” and gable/Tetra Paks, all other materials had rates over 80%.

FIGURE 27 NOVA SCOTIA RECYCLING RATES BY MATERIAL (2014)



In 2012, the milk container recycling program achieved a total collection rate of 70%. Updated figures are not available.

WHAT'S NEW?



Compaction Trailer Project Expanded

In July 2012, RRFB Nova Scotia introduced a new compaction trailer for beverage container collection and launched a pilot project at 18 high-volume Enviro-Depots in Halifax. The trailer, which combines a compaction auger on a 53-foot tractor-trailer, allows Depots to compact beverage containers and transport them directly to market; previously, these containers were transported to one of four processing centres before going to market.

With the capacity to hold up to 30,000 lbs of PET or aluminum,⁹⁶ and loading bags at a rate of approximately four bags per minute, the 53' trailer is able to transport more than 5x as many beverage containers in one load than was possible using the former, regular trailers (78 then vs. 500 today). During the 2-year pilot project alone, this translates into a 62% reduction in the number of kilometers driven, and 548 tonnes of GHG emissions avoided.⁹⁷

After the pilot ended on August 31, 2014—and after receiving positive feedback from participating depots and end market processors—RRFB Nova Scotia purchased three new compaction trailers, and in September 2014 began servicing the majority of Enviro-Depots along main highway routes throughout the province.⁹⁸

As of summer 2015, the compaction trailers have transported 191 loads of PET and 158 loads of aluminum direct to market, which would have been 1,019 loads and 465 loads, respectively, using the former system.⁹⁹ In addition to reducing GHG emissions by over 230 tonnes, the trailers are expected to reduce costs by \$500,000 to \$1 million annually.¹⁰⁰

Proposed Changes to Beverage Container Program

With the aim of providing a high level of environmental protection and ensuring that diversion programs are efficient and sustainable, Nova Scotia Environment (NSE) has been examining revisions to the solid waste regulations. As outlined in its discussion document, *“Revising Our Path Forward: A Public Discussion Paper About Solid Waste Regulation in Nova Scotia,”* the department is proposing amendments in seven key areas, one of which is the beverage container refund program.¹⁰¹

In order to allow more flexibility to respond to future changes (increases) in recycling costs, NSE is proposing to make changes to the regulations that would result in 1) a container recycling fee (CRF) of 5-cents, and 2) a separate deposit refund of 5-cents.¹⁰² It is important to note that this change will not impact consumers in the short-term, but rather is an internal administrative change to ensure that the program remains sustainable.

Under the existing regulations, consumers pay a 10-cent deposit when purchasing a beverage container; half of that, or 5-cents, is refunded to the consumer when the container is returned to an Enviro-Depot, while the other half is used to cover program costs (i.e. collection, transportation, processing, marketing, promotion and education, R&D, etc.). If this change is approved, residents of Nova Scotia would still pay a 10-cent deposit on each beverage container purchased and receive a 5-cent refund. The difference is that in this new system—which would not necessarily be a half-back system—the other 5-cents would be called a “container recycling fee” that is designated to pay for program costs. By making this change, the CRF could be increased/decreased in the future based on changing market conditions and could harmonize with other provinces.¹⁰³

Prince Edward Island

Beverage Container Management System

SUPPORTING REGULATORY FRAMEWORK

As part of its efforts to reduce litter, in 1973, the province passed regulations banning the sale of beer in non-refillable containers. This was followed, in 1984, by a ban on the sale of *all* non-refillable soft-drink containers. Both these bans were authorized under the *Environmental Protection Act*

(1988) and the *Litter Control Regulations* (1973), and effectively required that all carbonated beer and soft drinks were to be packaged in refillable containers.



POPULATION: 146,400
POPULATION DENSITY: 24.7 PERSONS/KM²

In late 2007, the government repealed the law prohibiting the sale of non-refillable soft drink containers, and in its place, launched a DRS on May 3, 2008. Regulated under the provisions of the *General Regulations* and the *Recyclable Beverage Container Deposit Regulations* made under the *Beverage Containers Act* (2008), this program covers all ready-to-drink beverage containers up to 5L, except those used for dairy products, milk substitutes, or nutritional supplements.

In addition to establishing minimum deposits and minimum refund levels for different sizes of containers and requiring retailers to take-back any product that they sell, PEI's regulations prohibit the sale of beverage containers that are connected by plastic rings, or any other connecting device that is not biodegradable or photodegradable.

PERFORMANCE TARGETS

The legislation does not include any official targets.

WHO IS RESPONSIBLE?

The deposit-return program is overseen and administered by the Department of Environment, Energy, and Forestry.

PROGRAM FINANCING

Similar to those in the other Atlantic Provinces, PEI's deposit-return program is based on a "half-back" model. Under this system, the consumer pays a deposit on all designated beverage containers (10-cents for non-alcoholic containers 5L or less; 10-cents for alcoholic containers 500ml or less; and 20-cents for alcoholic containers larger than 500ml), and receives a refund of that deposit when he/she returns the empty container to a depot. If the container being

returned is a refillable domestic beer bottle, the consumer will receive a full refund of their deposit (\$1.20 per dozen). In contrast, if the container being returned is non-refillable, the consumer will only receive a portion (50%) of the deposit back.

Fifty-percent of this "half-back" revenue—that is, the unrefunded portion of the deposit— plus revenue generated from unredeemed deposits, is used to fund environmental projects carried out by the provincial government, like watershed protection and pollution prevention. The other half is used to pay for system costs.

In 2014-2015, total costs for the program amounted to \$5.2 million.¹⁰⁴ In addition to things like system administration, these costs include the handling fee paid per container to depot operators as compensation for receiving, paying out refunds for, sorting, and storing returned beverage containers. As of January 2016, the handling fee for empty beverage containers (except for empty refillable beer containers) was \$0.04047 per unit.¹⁰⁵ In fiscal year 2014-2015, a total of \$1.76 million in handling fees was paid to depot operators (representing 33% of total program costs).¹⁰⁶

Any surplus arising from the deposit program supports solid waste management and/or environmental programs in PEI. The program's surplus was \$1.8 million in 2014-2015 (total revenues of \$7 million minus total expenses of \$5.2 million).¹⁰⁷

The recycling of milk containers, which is part of the Island's Waste Watch program, is financed by the provincial government.

COLLECTION SYSTEM

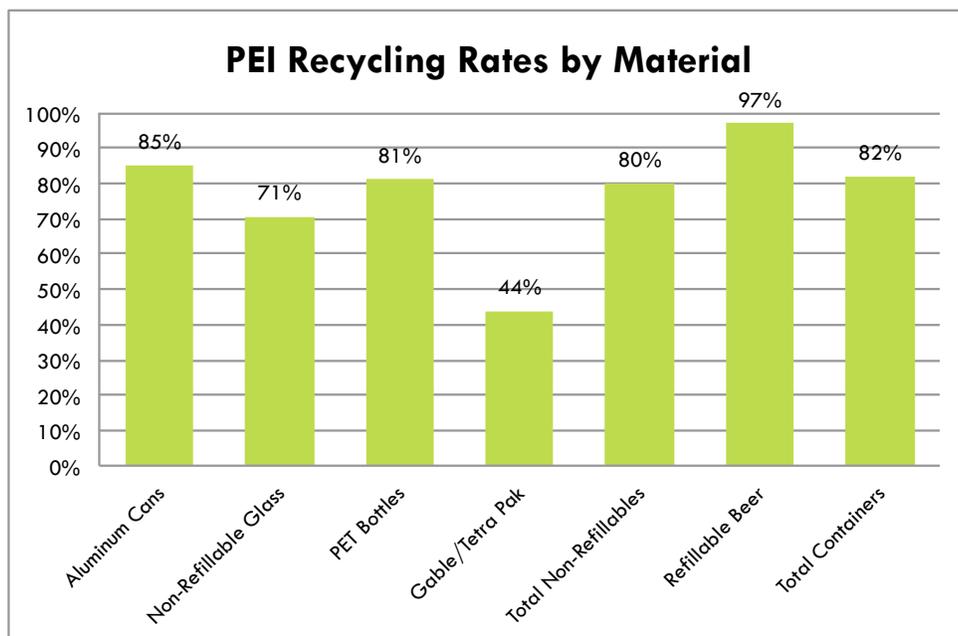
Residents of PEI can return designated empty beverage containers to 10 privately run depots throughout the province. The collection, sorting, transportation and processing of containers is contracted out to a local private supplier. A computerized inventory control system is used to track containers from the point of consumer refund, through processing, and material sales.

Milk packaging and other containers exempt from regulations made under the *Beverage Containers Act* (i.e. food containers) are collected separately through the Island Waste Management Corporations (IWMC)'s Waste Watch program, a mandatory curbside recycling program available to all Island residents. The Waste Watch program requires residents, visitors, and businesses to separate the waste they produce into 3 streams: recyclables, compost, and waste.

PROGRAM PERFORMANCE

In fiscal 2014-2015, PEI had a non-refillable container recycling rate of 80%¹⁰⁸ and a total container recycling rate of 82%. In the non-refillable categories, aluminum containers saw the highest rate at 85%, followed by plastic PET bottles at 81%.¹⁰⁹

FIGURE 28 PEI RECYCLING RATES BY MATERIAL (2014)



Newfoundland and Labrador

Used Beverage Container Recycling Program

SUPPORTING REGULATORY FRAMEWORK

Established in 1997, Newfoundland and Labrador's Used Beverage Container Recycling Program is administered as a deposit-refund system in accordance with specific provisions as prescribed in the province's *Waste Management Regulations (2003)*, made under the *Environmental Protection Act (2002)*. The regulations apply to all ready-to-drink beverage containers 5L or smaller, with the exception of milk¹¹⁰ and milk substitutes (soy milk, rice milk, and almond milk), infant formula, concentrated liquids (including syrup and frozen juice), and medicinal/nutritional supplements. Refillable bottles (including domestic beer bottles) are also exempt from the regulations.



POPULATION: 527,800
POPULATION DENSITY: 1.4 PERSONS/KM²

PERFORMANCE TARGETS

There are no official collection targets for beverage containers in the Act or regulations. However, the Provincial Solid Waste Management Strategy of 2002 and its associated implementation plan of 2007 includes a goal to reduce the amount of material going to provincial landfills by 50% by 2020.¹¹¹

WHO IS RESPONSIBLE?

The program is administered by the Multi-Materials Stewardship Board (MMSB), a Crown agency established in 1996 to develop, implement, and manage waste diversion and recycling programs across the province for waste streams designated by the government. MMSB operates at arms-length from government and is governed by an independent Board of Directors appointed by the Minister of Environment and Conservation. The delivery of its mandate, which is derived from the *Environmental Protection Act* and pursuant *Waste Management Regulations*, is achieved in partnership with stakeholders such as regional waste management authorities, municipalities, and third-party contracted service providers such as Green Depot operators.

By law, beverage distributors and retailers are obligated to register with and remit deposits charged on the sale of all beverage containers to MMSB. Green Depots must also register with MMSB.

PROGRAM FINANCING

Newfoundland's beverage container program is a derivative of the "half-back" model common to Atlantic Provinces. On the purchase of a non-alcoholic beverage, consumers pay an 8-cent deposit and receive a 5-cent refund when they return the container to a Green Depot. 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.

Part of the revenue generated from the non-refunded portion of the deposit (3-cents for non-alcoholic containers and 10-cents for alcoholic containers) is used to pay for the cost of the recycling program, including administration, handling, transportation, and processing costs. Unredeemed beverage container deposits, as well as revenue generated from the sale of material, are used to supplement the cost of running the program. After all expenses are paid, any excess revenue is placed in the province's Waste Management Trust Fund to support the implementation of the Provincial Solid Waste Management Strategy. The MMSB does not receive any direct funding from the provincial government.

COLLECTION SYSTEM

Beverage containers that are part of the DRS are collected through a network of privately owned and operated Green Depots. As of February 2016, there are 40 main depots, 16 sub depots, and 20 mobile collection services located throughout the province.¹¹²

Green Depots, which are licensed by the MMSB to help carry out the program, receive a per-unit handling fee of 4.25-cents¹¹³ from MMSB as compensation for receiving, sorting, and paying out refunds for empty beverage containers that are returned. (In 2013-2014, a total of

\$6.75 million in handling fees were paid to redemption centers)¹¹⁴. After the containers are sorted, they are transported to a processing centre on the east coast where they are prepared for shipment to markets in Canada and the US.

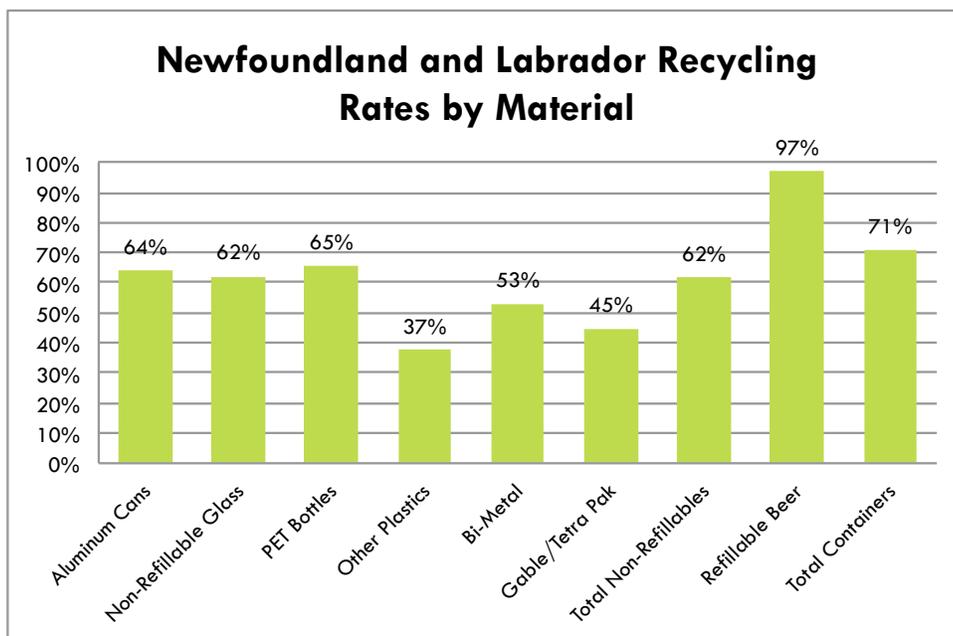
Because local brewers operate their own DRS, domestic beer bottles (such as Labatt, Molson and Quidi Vidi) must be returned to a beer retailer or to a Brewers Bottle Depot to receive a refund (Note: Containers are fully refunded at these locations). Even though they are not part of MMSB's beverage container recycling program, some Green Depots – as an added service to their customers – will also accept domestic beer bottles for recycling (possibly at a reduced refund to cover their cost of handling the material).

In 2014, refillable beer bottles are sold through corner stores and two Brewers Retail Inc. (BRI) stores in St. Johns. Beer is sent to 27 wholesalers who then deliver to the corner stores and the BRI outlets. The wholesalers are paid a handling fee for the empties, which are picked up at the retailer.

PROGRAM PERFORMANCE

In 2014-2015, more than 165 million used non-refillable beverage containers were collected and recycled through Newfoundland's network of collection depots, for a recycling rate of 62%. Aluminum, non-refillable glass, and PET bottles each had rates over 60%.

FIGURE 29 NEWFOUNDLAND AND LABRADOR RECYCLING RATES BY MATERIAL (2014)



Northwest Territories

Beverage Container Program

SUPPORTING REGULATORY FRAMEWORK

Launched on November 1, 2005 to help reduce the number of beverage containers being littered or ending up in provincial landfills, NT's beverage container program is regulated under the *Beverage Container Regulations* of the *Waste Reduction and Recovery Act* (2003). These regulations cover all ready-to-serve beverage containers made of glass, plastics, aluminum, bi-metal, and mixed materials, including juice, milk and liquid milk products (added February 2010), pop, water, beer, wine, liquor and other alcoholic beverages. Excluded from the deposit-return program are containers for infant formula; containers for milk and liquid milk products smaller than 30 ml; and powder milk.



POPULATION: 44,100
POPULATION DENSITY: 0.0 PERSONS/KM²

On February 1, 2016, the *Beverage Container Regulations* were amended and include changes to CHFs, as well as additional tools to enforce compliance. Additionally, to create a simpler system, the new Regulations include only two categories of beverage containers: containers 1L or less, and container more than 1L in size.

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.¹¹⁵ The ENR also has the authority to create an advisory committee to provide advice and assistance relating to recycling programs established under the Act.¹¹⁶ This Committee was established in 2004 and currently consists of beverage distributors, retailers, municipalities, recyclers, environmental organizations, transportation industry, and the general public.

The *Beverage Container Regulations* also impose requirements on beverage distributors and retailers. Under the program, companies importing and distributing beverage containers in the territory are obligated to register with ENR and submit regular reports and payments. As of March 31, 2014, there were 38 beverage container distributors registered in the program.¹¹⁷

Depots must obtain a license to operate from ENR. These licenses contain several terms and conditions that depot operators must follow, such as: the manner in which containers must be received, collected, stored, and disposed; and how to keep records and books.

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 Northwest Territories. Effective February 1, 2016, the total surcharge per container ranges from 15-cents to 38-cents, depending on container size and material type.¹¹⁸ The surcharge consists of both a refundable deposit and a non-refundable handling fee.

More often than not, the surcharge is passed from beverage distributors down to the retailer, who then passes it on to consumers. Retailers are encouraged to display the surcharge on the consumers' receipt, but it is not mandatory.

Whereas the refundable deposit is returned to the consumer when they return the beverage container to a depot (\$2.9 million in 2014¹¹⁹), the non-refundable handling fees, which makes up approximately 43% of the total surcharge, are put into the Environment Fund and are used to help cover program costs.¹²⁰ This includes paying depots and processing centres, paying for the transportation of containers from depots to processing centres (or to breweries for refillable glass), storage, advertising, general program operations and maintenance, and program improvements.¹²¹ The ENR provides an approximate breakdown of the non-refundable handling 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)

All unredeemed deposits also go into the Environment Fund. Combined, unredeemed deposits and container handling fees generated a total of \$5 million in program revenue in 2014.¹²²

The Environment Fund is a special fund set up under the *Waste Reduction and Recovery Act* and, as such, is separate from the general government account. All revenue received and all

expenses incurred for the beverage container program are paid out of this fund. Any surplus is used by the government to implement new waste reduction and recovery initiatives.

COLLECTION SYSTEM

As of March 2014, there were 23 locally operated beverage container depots and 6 temporary satellite depots at which residents could return their empty beverage containers for a refund of the deposit. Depot operators could be individuals, local businesses, schools, non-profit organizations, and municipal governments/local bands.

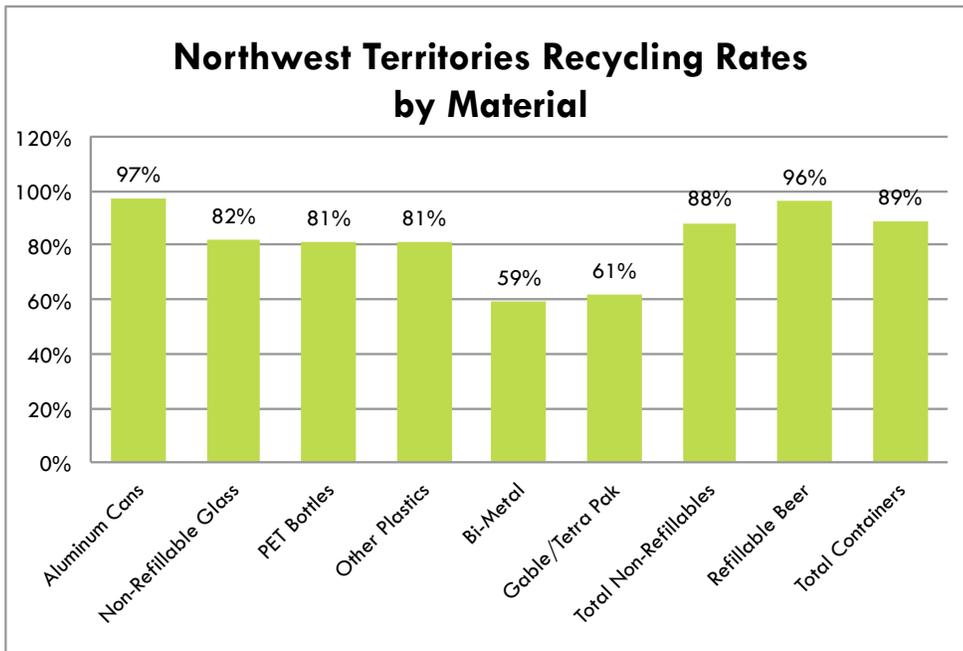
Local depots collect, sort, and bag or box the redeemed containers, then ship them to one of three regional processing centres in Inuvik, Yellowknife, and Hay River. From there, aluminum and plastic containers are compacted and sent to recycling markets in Alberta and the US. Multi-material containers, such as gable tops, are baled and shipped to southern markets, then onto the US along with multi-material containers collected in Alberta's program. Non-refillable glass is converted to cullet, some of which is used as construction aggregate, with the remainder going to Alberta where it is processed into fibreglass.

The collection of domestic refillable beer and cooler glass bottles is carried out under an agreement with Brewers Distributor Ltd. in Edmonton. Under this agreement, refillable glass bottles are returned to breweries, where they are cleaned and refilled an average of 15 times.¹²³

PROGRAM PERFORMANCE

In fiscal 2014, approximately 26 million beverage containers were returned for reuse or recycling, translating into an overall recycling rate of 89%. When broken down by material type, aluminum containers (alcohol and non-alcohol) showed the highest rates at 97%, followed by non-refillable glass (82%) and plastic containers (81%). Refillable glass also showed a very high rate of 96%.

FIGURE 30 NORTHWEST TERRITORIES RECYCLING RATES BY MATERIAL (2014)



WHAT'S NEW?

Drop N Go Collection Service

Following the trend of some other provinces, the NT government launched a Drop and Go service in August 2015 to reduce customer wait times and increase efficiencies. The service is currently offered at the Yellowknife and Hay River depots. Customers simply create 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.¹²⁴

Amendments to the Beverage Container Regulations

On February 1, 2016, the Government of the Northwest Territories amended the *Beverage Container Regulations* in an effort to make the program simpler and more effective. One of the key changes to the program that will affect consumers 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, container categories were based not only on the type of material and size of container, but also on the contents of the container, with alcohol containers being a different category. The new *Regulations* make it easier for the public, depot staff, and distributors to sort containers by including only two categories: containers up to 1L and containers greater than 1L in size.¹²⁵

Yukon

Beverage Container Recycling Program

SUPPORTING REGULATORY FRAMEWORK

Yukon's deposit-return program for beverage containers was introduced in 1992 and is regulated under the *Environment Act* and the pursuant *Beverage Container Regulation (1992)* and *Recycling Fund Regulation (1992)*. Originally, the regulations covered only aluminum cans and refillable beer bottles, but have since been amended (in 1996 and 1998) to cover all ready-to-drink beverage containers (glass, plastic, steel, aluminum, and Tetra Pak), excluding those containing milk and milk substitutes (e.g. soy and rice milk).



POPULATION: 37,400
POPULATION DENSITY: 0.1 PERSONS/KM²

In May 2016, the Yukon government announced changes to the *Beverage Container Regulation*. These changes, which are expected to be implemented next year (August 1, 2017), will affect the surcharges and refunds applicable to beverage containers including milk and milk substitutes, and will simplify the regulation. Once the territory's new regulations kick in, all beverage containers will fall into two categories: (1) 750ml and less, including all milk & milk substitutes (surcharge 10-cents, refund 5-cents), and (2) 750ml and more (surcharge 35-cents, refund 25-cents).¹²⁶

PERFORMANCE TARGETS

There are no official 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.

PROGRAM FINANCING

Consumers pay a surcharge on the purchase of certain beverage containers, which includes a refundable deposit and a non-refundable recycling fund fee (RFF). Currently, the surcharge on designated beverage containers sold in Yukon ranges from 10-cents to 35-cents, depending on the size and material of the container.

Upon return of the empty container to a depot or processor, a portion of the surcharge (the refundable deposit) is refunded to the consumer. The remainder of the surcharge – the non-

refundable RFF – is collected by the retailer and remitted to the territorial Recycling Fund on a monthly basis. Unredeemed deposits also go into this fund.

The Recycling Fund is a revolving fund that is administered by the government but is kept separate from general government revenue. It is used entirely to support recycling activities, such as collection, processing, and shipping costs. Recycling depots receive handling fees per container and also receive a monthly operating allowance. Processing fees and handling fees are also paid to registered processors for each container received. The fund is also used to promote container returns (e.g. the Yukon Recycling Club, a program aimed at encouraging recycling habits in youth aged 4-16), improve recycling facilities and community depots, and pay part-time wages for depot staff.

COLLECTION SYSTEM

Consumers return empty beverage containers to one of 22¹²⁷ community recycling depots to receive a partial refund of their deposit. Depots are run 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 dealers and markets for recycling.

PROGRAM PERFORMANCE

In 2014, Yukon had a non-refillable recycling rate of 82%. No breakdown of recycling rates by material is available due to lack of data.

WHAT'S NEW?

Proposed Amendments to the Beverage Container Regulation

As part of its plan to fall in line with other jurisdictions across Canada, the Yukon government has recently announced changes to the territory's *Beverage Container Regulation*. In addition to expanding the list of materials subject to the recycling surcharge to dairy products and dairy substitutes, the government has proposed to simplify the regulation by having beverage containers fall into two categories: (1) containers 750ml and less (including dairy and dairy substitutes regardless of size), and (2) containers 750ml and more.¹²⁸ These changes were supposed to take effect in August 2016; however, the government is postponing implementation of the amended recycling regulations until August 1, 2017, in order to allow additional consultation with stakeholders.¹²⁹

Nunavut

In 2007, Nunavut's Department of Environment established three Pilot Recycling Projects in the communities of Iqaluit, Kugluktuk, and Rankin Inlet.¹³⁰ The purpose of these projects was to examine the feasibility of implementing a beverage container recycling program across the territory.

During the pilot program, residents in these communities could drop off their beverage containers at depots that would sort and prepare the recyclables for shipment to processing facilities in southern Canada. The three-year pilot ended in December 2010 after an independent evaluation found that the costs of operating the programs were very high, while the amount of waste they diverted was minimal (2-3%).¹³¹



POPULATION: 36,900
POPULATION DENSITY: 0.0
 PERSONS/KM²

The major challenges in Nunavut include infrastructure, transportation, depot management and operations, and the development of recycling legislation. While there is no formal territory-wide recycling program, the Department of Environment and the Department of Community and Government Services are working together to evaluate the territory's solid waste management practices as a whole. The Department of Community and Government Services is also working on establishing a Nunavut-wide solid waste management strategy.

Part 4: System Financing

CONSUMER FEES

In many deposit-return jurisdictions, the bulk of system costs are paid for by the beverage industry. In Canada, however, programs have been designed in such a way to minimize or eliminate the industry's financial obligation by passing it on to customers in the form of a front-end or back-end fee. There are several examples of different fees being charged to consumers to finance the collection and recycling of beverage containers. Table 6 presents a summary of consumer fees charged in each province, by container type, as of July 2016.

TABLE 6 CONSUMER FEES BY PROVINCE & CONTAINER TYPE, AS OF JULY 2016 (CENTS/UNIT SOLD)

Consumer Fees in Cents per Unit Sold (as of July, 2016)												
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	0	5	2			5	5	3	5	5	8
PET up to and including 1L	3	2	6	2			5	5	3	5	5	8
PET over 1L	4	10	6	2			5	5	3	5	10	10
PVC or HDPE up to and including 1L	3	2	6	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										8
HDPE Milk over 1L		10										10
Plastic up to and including 1L		2	6	2			5	5	3	5	5	8
Plastic over 1L		10	6	2			5	5	3	5	10	10
Polystyrene Cups (with sealed foil lid)	3	2		2			5	5	3	5		8
Polypropylene up to and including 1L	3	2	6	2			5	5	3	5	5	8
Polypropylene over 1L	4	10	6	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	9	9	7	2			5	5	3	5	5	13
Glass over 1L	40	10	7	2			5	5	3	5	10	13
Drink box up to and including 500ml	1	2	3	2			5	5	3	5	5	5
Drink box 501ml to 1L	5	2	3	2			5	5	3	5	5	5
Drink box over 1L	0	8	3	2			5	5	3	5	10	10
Gabletop up to and including 500ml	0	0	3	2			5	5	3	5		5
Gabletop 501ml to 1L	0	0	3	2			5	5	3	5		5
Gabletop over 1L	6	8	3	2			5	5	3	5		10
Gabletop Milk up to and including 1L		0										5
Gabletop Milk over 1L		8										10
Bi-metal up to and including 1L	3	7	5	2			5	5	3	5	5	5
Bi-metal over 1L	0	0	5	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 levied on the purchase of certain beverage containers in British Columbia and Alberta. It represents the net cost to collect and recycle beverage containers (after other revenue from unredeemed deposits and the sale of recyclable materials are used), and fluctuates annually based on actual system costs. CRFs are charged in addition to the deposit and are non-refundable.

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.

Unlike deposits, the CRF varies with the value of the material collected and the container's collection rate. Higher collection rates generate less unredeemed deposit revenue and therefore require a higher CRF. In contrast, lower collection rates generate greater unredeemed deposit revenue and therefore allow for lower CRFs.

As of July 2016, CRFs range from 0 to 40-cents per unit in BC, depending on container size and type. The fees in Alberta are lower, ranging from 0 to 10-cents per unit. In both provinces, glass containers carry the highest CRF. Some containers (e.g. gable top cartons, bag-in-box, bi-metal cans over 1L, etc.) do not carry a CRF because the revenue they generate from unredeemed deposits is high enough to cover the costs of recycling.

Environmental Handling Charge (EHC)

Used in the province of Saskatchewan, the Environmental Handling Charge (EHC) is a fee collected from the consumer on every non-refillable, ready-to-serve beverage container sold. The retailer remits the EHC to the provincial government who uses the fees to pay for the operation of the program. The EHC usually generates far more revenue than is needed to fund the system. Any surplus funds are placed directly into provincial government coffers.

As of July 2016, EHCs range from 3- to 7-cents per unit, depending on the size of the container and the material type. Unlike the deposit, this fee is non-refundable.

Container Recycling Fee (CRF) as an Industry Imposed Levy

The Manitoba CRF is different from the one in BC and Alberta in that it is imposed by Industry to collect the monies required by the stewardship law to pay 80% of net costs of municipalities. The levy is collected, monitored, and overseen by the beverage industry. It is pooled and is used to finance municipal and away-from-home recycling initiatives across the province, including

the recycling bins that Recycle Everywhere provides free of charge to municipal, IC&I, and other public space recycling partners across Manitoba.

The Half-Back System

The provinces of Nova Scotia, New Brunswick, and PEI employ a half-back system, whereby only half of the deposit paid on the purchase of non-refillable beverage is refunded to the consumer. In these systems, 50% of the non-refunded portion of the deposit— plus the revenue generated from the sale of empty containers—goes towards covering program costs, while the remaining 50% is typically used to support provincial waste reduction and recycling initiatives.

The system in Newfoundland and Labrador is similar. For alcohol containers, consumers receive a 10-cent refund based on a 20-cent deposit. However, for non-alcohol containers (as well as beer cans, importer beer bottles, and alcoholic miniatures), the deposit is 8-cents, and the refund is 5-cents; a true half-back system would provide a 4-cent refund (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 the municipal curbside recycling program and other provincial environmental initiatives.

How Have Consumer Fees Changed Over Time?

For the most part, the consumer fees charged on beverage containers in Canadian programs have remained relatively constant from 2003 to 2016. The two exceptions are British Columbia (Figure 31) and Alberta (Figure 32). The reason why rates have fluctuated so much in only these provinces is that BC and Alberta set their consumer fees according to how much is needed to finance the deposit program that year. Any surplus revenues generated by one

container type cannot be used to make up the shortfall for another container type, but are used instead to lower any future CRF on that container type.¹³² Elsewhere in Canada, CRFs are fixed and support a wider range of provincial recycling initiatives.

Consumer fees may increase for a variety of reasons; for example, decreased revenues from the sale of materials (due to decreased market value for the material, or less material available to sell), or increased costs of collection, which can be affected by, for example, higher transportation costs. However, they can also go down if collection costs drop or if the revenue from unredeemed deposits increases as a result of a lower collection rate.

TABLE 7 HISTORIC CONSUMER FEES (2003-2016)

Historic Consumer Fees (2003-2016)										
Aluminum cans	BC	AB	SK	MN	NS	NB	NL	PEI	YT	NT
2003	0	0	5	2	5	5	3	n/a	n/a	n/a
2006	0	0	5	2	5	5	3	n/a	n/a	n/a
2008	0	0	5	2	5	5	3	n/a	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
PET over 1 litre	BC	AB	SK	MN	NS	NB	NL	PEI	YT	NT
2003	4	7	6	2	5	5	3	n/a	n/a	n/a
2006	4	2	6	2	5	5	3	n/a	n/a	n/a
2008	3	3	6	2	5	5	3	n/a	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
PET under 1 litre	BC	AB	SK	MN	NS	NB	NL	PEI	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
Glass 0-500 ml	BC	AB	SK	MN	NS	NB	NL	PEI	YT	NT
2003	3	5	7	2	5	5	3	n/a	n/a	n/a
2006	4	5	7	2	5	5	3	n/a	n/a	n/a
2008	5	3	7	2	5	5	3	n/a	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
Glass over 1 litre	BC	AB	SK	MN	NS	NB	NL	PEI	YT	NT
2003	5	8	7	2	5	5	3	n/a	n/a	n/a
2006	5	7	7	2	5	5	3	n/a	n/a	n/a
2008	5	4	7	2	5	5	3	n/a	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

As shown in the charts below, 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 BC for example. For glass containers over 1-litre, fees increased from 5-cents to 40-cents per container from 2003 to 2016, which is an increase of 700% over the 13-year period. In contrast, per-container fees for glass containers 0-500ml in size increased from 3-cents to 12-cents per container from 2003 to 2012, and back down to 9-cents in 2016, which is an increase of 200% over the same period.

FIGURE 31 BRITISH COLUMBIA CONSUMER FEES BY MATERIAL (2003-2016)

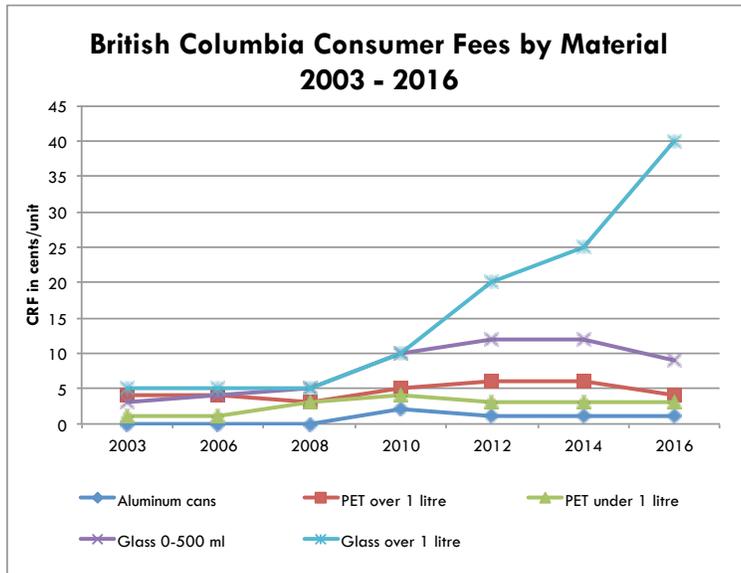
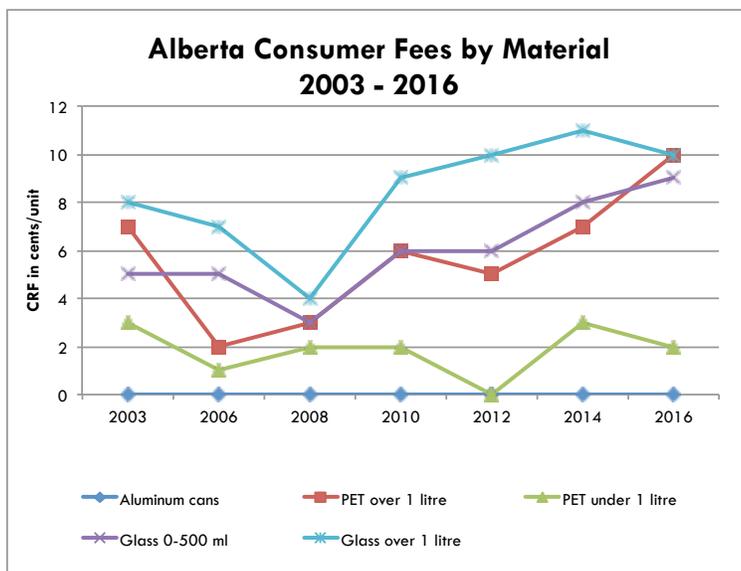


FIGURE 32 ALBERTA CONSUMER FEES BY MATERIAL (2003-2016)



DEPOSITS

In provinces with deposit-return programs, retailers are required to collect and remit a deposit from consumers on all applicable beverage containers. Intended to act as an incentive to recycle, deposits are charged on containers when they are purchased and refunded when the consumer returns the container 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 August 2016, 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 AUGUST 2016 (CENTS/UNIT)

Container Type	BC	AB	SK	MN	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	
Soft-drinks						5/5						
Non-alcohol							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 ≤ 300ml			10/10								10/5	
Glass 301ml-999ml			20/20								10/5	
Glass ≥ 1L			40/40								35/25	
Plastic < 1L			10/10								10/5	
Plastic ≥ 1L			20/20								35/25	
Juice box and gabletop			5/5									
Tetra Pak & gabletop <1L											10/5	
Tetra Pak & gabletop ≥ 1L											35/25	
Wine & spirit ≤ 500ml	10/10	10/10					10/5	10/5	20/10	10/5		
Wine & spirit 501ml-1L	10/10	10/10					20/10	20/10	20/10	20/10		
Wine & spirit > 1L	20/20	25/25					20/10	20/10	20/10	20/10		
Wine & spirit ≤ 630ml					10/10							
Wine & spirit > 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 (in QC)						5/5						
Non-refillable beer > 450ml (in QC)						20/20						
Refillable beer	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 MN, 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 for returning containers, the rates of deposit and refund must be increased periodically, in line with inflation; otherwise, the value of the deposit/refund relative to the purchase price of a beverage will decrease over time to a point where there remains little to no incentive to recycle. Adjusting for inflation is also important for program operators to be able to keep up with the rising costs of managing, processing, and transporting recyclables, which have increased significantly since deposit laws were first established.

Over the last few years, some provinces have recognized this problem and have sought to address it. Consider Alberta for example: In 2008, the province raised 5- and 20-cent deposits

to 10-cents and 25-cents, respectively. After eight years, collection rates for the three largest beverage container categories increased by approximately 8-percentage points, making it clear that deposit levels have a strong impact on a consumer's incentive to recycle. Rates for aluminum cans have increased from 80% to 88%, PET from 70% to 78%, and non-refillable glass from 86% to 92%. Yukon is also proposing changes to its deposit/refund system, which would see an increase to the surcharge on all beverage containers by 5-cents.¹³³

Still, beverage container deposits have remained relatively unchanged in most provinces. As an example, consider BC, which has the oldest beverage container deposit-refund law in Canada (and North America). The refundable deposit on carbonated soft drinks and beer containers remains at 5-cents, despite the fact that inflation has reduced the value of the nickel in 2016 to less than 1/5th of its value in 1970 (according to the Bank of Canada's Inflation Calculator, a nickel in 1970 is equivalent to 32-cents in 2016).

Because the deposit has not been indexed for inflation, the incentive for British Columbians to return beverage containers for recycling is much smaller than it used to be. To illustrate, the deposit paid on a six-pack of soft drinks in BC would be about \$1.92 today if adjusted for inflation—much higher than the 30-cents that is currently charged. The same can be said for other provincial programs whose deposit levels have stayed the same over the years, like Ontario, Québec, and New Brunswick.

CONTAINER HANDLING FEES

Container handling fees (CHFs) are per unit fees paid by beverage distributors to redemption centres (depot or retail) as compensation for receiving, paying out refunds for, sorting, and storing returned beverage containers. These non-refundable handling fees are paid directly to the redemption centres with no government involvement.

CHFs can vary by container type and depot agreement. In Alberta, for example, CHFs (2016) range from a low of 3.17-cents for aluminum cans to a high of 22.79-cents for bag-in-box containers over 1-litre. These fee rates are based on the different costs of handling and storage associated with different types of beverage containers. In BC, handling fees paid to grocers are privately negotiated and proprietary, and so are not publicly available.

In other provinces, such as Newfoundland, all beverage containers except for beer containers are charged a uniform CHF.

Table 9 represents CHFs by province and container type. It is important to note that the fees presented for BC are those awarded to depots only. Shaded areas of the table represent container categories that are not applicable to that particular province.

TABLE 9 HANDLING FEES BY PROVINCE AND CONTAINER TYPE AS OF JULY 2016 (CENTS / UNIT RECOVERED)

Province	BC	AB	SK[3]	MN	QC	NS	NB	NL	PEI	YT	NT
Aluminum Cans	3.37	3.17			2.00	4.27	4.06	4.25	4.05	2.50	2.20
PET up to 1L	5.07	4.65			2.00	4.27	4.06	4.25	4.05	4.00	2.20
PET over 1L	7.89	9.99			2.00	4.27	4.06	4.25	4.05	7.50	4.50
PVC up to 1L	5.07	5.53				4.27	4.06	4.25	4.05	4.00	2.20
PVC over 1L	7.89	11.49				4.27	4.06	4.25	4.05	7.50	4.50
HDPE up to 1L	5.07	5.53				4.27	4.06	4.25	4.05	4.00	2.20
HDPE over 1L	7.89	12.01				4.27	4.06	4.25	4.05	7.50	4.50
Polypropylene up to 1 L	5.07	5.53				4.27	4.06	4.25	4.05	4.00	2.20
Polypropylene over 1 L	7.89	11.49				4.27	4.06	4.25	4.05	7.50	4.50
Sealed Polystyrene Cups											
Polystyrene up to 1L	5.07	5.53				4.27	4.06	4.25	4.05	4.00	2.20
Polystyrene over 1L	7.89	11.49				4.27	4.06	4.25	4.05	7.50	4.50
Pouch (up to 1L in AB	4.49	4.02				4.27	4.06	4.25	4.05	4.00	2.20
Plastic up to 500ml	5.07					4.27	4.06	4.25	4.05	4.00	2.20
Plastic 501ml to 1L	5.07					4.27	4.06	4.25	4.05	4.00	2.20
Plastic over 1L	7.89					4.27	4.06	4.25	4.05	7.50	4.50
Glass bottles up to 1L	6.77	7.58			2.00	4.27	4.06	4.25	4.05	4.00	3.50
Glass bottles over 1L	7.89	12.28			2.00	4.27	4.06	4.25	4.05	7.50	3.50
Drink box up to 500ml	5.08	5.08				4.27	4.06	4.25	4.05	4.00	2.20
Drink box 501ml to 1L	5.98	5.08				4.27	4.06	4.25	4.05	4.00	2.20
Drink box over 1L		14.62				4.27	4.06	4.25	4.05	7.50	4.50
Gabletop up to 1L	6.77	6.07				4.27	4.06	4.25	4.05		2.20
Gabletop over 1L	11.03	10.43				4.27	4.06	4.25	4.05		4.50
Bag in the Box over 1L	11.27	22.79				4.27	4.06	4.25	4.05		3.50
Bi-metal up to 1L	5.08	7.08				4.27	4.06	4.25	4.05	4.00	2.20
Bi-metal over 1L	11.27	13.05				4.27	4.06	4.25	4.05	7.50	4.50
Imported beer bottles	5.08	7.58				4.27	4.06	4.25	4.05	4.00	3.50
Liquor and wine ceramic						4.27	4.06	4.25	4.05		
Sleeman bottles		6.84				4.27	4.06	4.25	4.05		
Moosehead Green Bottle		10.42				2.57					
Refillable Beer (ISB)	[1]	4.64	2,6 [4]	2.67	0.50	2.74	2.90	5 [4]	2.81	2.50	
Beer Cans		3.17		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. The average rate is about 29-cents/doz or 2.42-cents/bottle.											
[2] About 166 Depots in BC are paid a handling fee for collecting milk jugs and carton. They are paid \$2.25 per bag for jugs and \$3.00 per bag for cartons. The fee shown in the table is based on 60 units per bag.											
[3] SK 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 SK and NL a handling fee on refillable beer is charged at the back-end from the refund. In SK it is 5-cents at SARCAN 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. The average for a 12-month period ending in June 2012 is approximately \$420/tonne.											

How Have Handling Fees Changed Over Time?

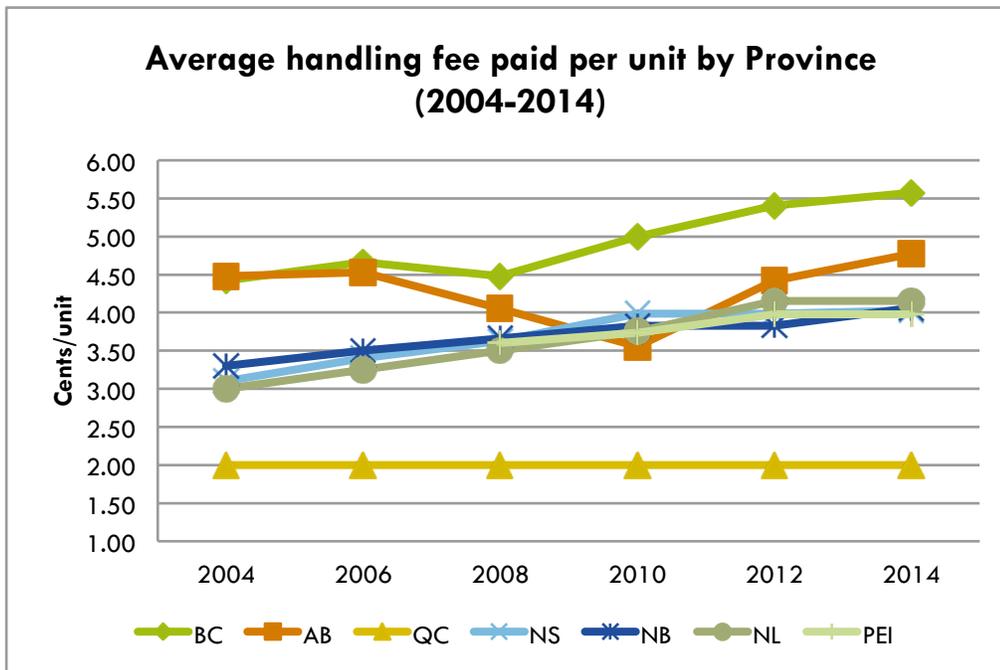
In the western provinces, where fees are pegged to the actual cost to recycle the material, fees have fluctuated up or down depending on the material and size of the container. The handling fee paid to depots for the most inexpensive to recycle container, the aluminum can, has increased very slightly from 2004 to 2016, from 3-cents to 3.37-cents in BC, and from 2.8 cents to 3.17 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 PEI, CHF's increased from 3.0-cents and 3.6-cents, to 4.25-cents and 4.05-cents, respectively over that 12 year period.

Figure 33 below shows the average handling fee paid per unit by province from 2004-2016.

FIGURE 33 AVERAGE HANDLING FEE PAID PER UNIT, BY PROVINCE (2004-2014)



BEVERAGE CONTAINER PACKAGING FEES

As of July 2016, five out of ten provinces have legislation in place requiring that industry share the costs of recycling their waste packaging and printed paper (PPP) with municipalities. Table 10 presents the percentage funding of net costs that producers pay into each program. The intention behind this is to create a financial incentive for producers to make design changes that reduce waste at the front end of the system, such as reducing the size and/or weight of packaging through material substitution or light-weighting.

TABLE 10 CURRENT PPP PROGRAMS THAT INVOLVE PRODUCERS IN FUNDING A % OF NET COSTS

	British Columbia	Saskatchewan	Manitoba	Ontario	Québec
% Net Costs Paid by Industry	100%	75%	80%	50%*	100%

*Note: The recently passed Bill 151, *Waste-Free Ontario Act* includes language that allows the Minister/Authority to increase producers' current funding cap for the Blue Box Program beyond 50%.

In each province with a PPP EPR program, the responsible agency (i.e. MMBC, MMSW, MMSM, Stewardship Ontario, and EEQ) 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 2016 PACKAGING AND PRINTED PAPER STEWARDSHIP FEES (CENTS PER KILOGRAM)

Package Type	British Columbia ¹³⁴	Saskatchewan ¹³⁵	Manitoba ^{a136}	Ontario ¹³⁷	Québec ¹³⁸
Aluminum	45	24.32	-8.98 ^b	4.11	12.96
PET	31	17.54	16.80	17.50	28.03
HDPE	31	17.54	19.21	13.81	16.37
Other Plastics	54	24.62	41.18	33.32	31.61
Glass – Clear	25	13.80	7.14	3.78	18.38
Glass – Coloured	25	13.80	7.14	5.63	18.46
Steel / Bi-metal	52	15.76	13.85	6.21	15.64
Tetra Pak	52	22.47	37.86	24.93	23.70
Gabletop	52	22.47	37.86	24.93	21.19

^aThe fees in Manitoba apply only to those beverage containers that are not subject to the 2-cent CRF.

^bWhen a material fee is in the credit position, the steward receives a credit against their fees payable. This can happen when the market value of a material is so high that the revenues generated from the sale of the material exceeds the costs associated with managing it.

When comparing 2016 fee rates by province, we can see that BC charges the highest fees in nearly every material category (with the exception of glass and PET), followed closely by Québec. This is because BC is a full EPR program, meaning that stewards are responsible for 100% of program costs (starting May 2014). There is also the fact that more beverage containers in BC are covered by deposit-return legislation, which means the program loses out on economies of scale and material revenues, especially in relation to the loss of high value commodities like aluminum and PET.

The province of Québec is similar to BC in that it also 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.¹³⁹ The fee structure also takes into account environmental criteria. In 2014, companies contributed approximately \$135 million¹⁴⁰ to 561 municipal agencies under the curbside recycling compensation plan (Note: There is another contribution for printed paper, which is "in-kind" and therefore not reported as a financial contribution.).

In Ontario, industry has been obligated to finance 50% of the net costs of municipal recycling programs since February 2003. (Under the recently passed Bill 151, producer's current funding cap for the Blue Box program could increase beyond 50%). Each municipality in the province that provides a blue box collection program is required to report the costs associated with running the program, tonnes collected, and revenue generated from the materials collected to Waste Diversion Ontario (WDO) via an online annual datacall. Once all the data submitted by municipalities has been verified, negotiations are conducted between Stewardship Ontario (SO) and municipalities to determine how much stewards are required to pay for that year. In 2014, the steward obligation to municipalities was \$115 million.¹⁴¹ The formula used to calculate steward fees takes into account a number of factors, such as material-specific collection rates, net costs of recycling each material, as well as a penalization factor for lower performing materials. Each year, as the costs and tonnages change, SO submits a new fee schedule that requires approval from the Minister of Environment.

Like Ontario, Manitoba's funding model (in place since April 2010) is based on a shared responsibility approach with industry. The difference is that in Manitoba, industry's contribution to the net costs of municipal recycling programs is set at a fixed rate of 80%, as opposed to 50%. Manitoba's funding model is also different in that it collects a 2-cent CRF from most non-alcoholic 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.

Saskatchewan is the latest Canadian province to pass legislation implementing EPR for PPP. As of January 1, 2016, stewards (brand owners or first importers) of packaging, including all beverage-related consumer packaging, are obliged to finance 75% of the costs of municipal blue box recycling in Saskatchewan. As long as they are in compliance with MMSW standards, municipalities that join MMSW are eligible to receive compensation in the form of a set fee per household served.

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 measured. The following table (Table 12) shows 2016 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) (2016)

Package Type		Weight (g)	BC	SK	MN	ON	QC
Gabletop	<i>2-L</i>	63	3.28	1.42	2.39	1.57	1.33
Gabletop	<i>1-L</i>	41	2.13	0.92	1.55	1.02	0.87
Gabletop	Small	14	0.73	0.31	0.53	0.35	0.30
Tetra Pak	<i>Small</i>	10.6	0.55	0.24	0.40	0.26	0.25
Bi Metal	Small	46.7	2.43	0.74	0.65	0.29	0.73
Glass	<i>473ml clear bottle</i>	228	5.70	3.15	1.63	0.86	4.19
Glass	<i>>1-L clear liquor</i>	737.2	18.43	10.17	5.26	2.79	13.55
Plastic	<i>2-L PET bottle</i>	58	1.80	1.02	0.97	1.02	1.63
Plastic	Small plastic	23	0.71	0.40	0.39	0.40	0.64
Plastic	<i>Outer milk bag – LDPE film</i>	8	0.43	0.20	0.33	0.06	0.18
Aluminum	<i>355ml can</i>	14	0.63	0.34	-0.13	1.57	1.33

*Italicized materials are based on Stewardship Ontario Blue Box Program Plan 2003.
Non-italicized materials are based on Encorp data.*

OVERVIEW OF SYSTEM COSTS AND REVENUES

In order to determine the costs of the various deposit-return programs operating in Canada, it is necessary to review income statements and other financial reports from the agencies managing those programs. Typical system costs include those associated with collection, transportation, processing, and marketing the materials, while revenues generally come from a combination of sources, such as from the sale of material collected, unredeemed container deposits, and consumer fees. This section discusses some of the factors that can impact recycling program costs and revenues, making the comparison of financial performance across programs very difficult.

System Costs

Many factors can affect program costs, including the collection rate, convenience level (i.e. collection frequency (weekly vs. biweekly), number of depots, etc.), economies of scale, and population density. This is why costs of provincial programs should not be directly compared with each other, as each program may have different operating parameters.

Programs in Manitoba, Ontario, and Québec have lower costs but collect fewer containers per capita than the deposit-return provinces. What is unknown is the cost of the away-from-home (AfH) programs. These costs must include collection and processing charges, the municipal share of recycling costs for beverage containers, and the incremental costs that would be incurred to achieve higher collection and recycling rates.

There may also be indirect costs associated with beverage collection programs, and these costs, which are seldom accounted for, may impact consumers or municipalities. Indirect costs might include the costs incurred by consumers when they drive containers to a depot or the costs incurred by municipalities for disposal and litter abatement (see “Economic Benefits” section).

Revenue from Material Sales

Material sales revenues play an important role in helping to offset the gross costs of the program. This revenue 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.

In British Columbia and Alberta, where the DRS covers all material container types (excluding those for domestic beer), program revenues generated by material sales paid for 15%¹⁴² and 29%¹⁴³ of total program costs, respectively. 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 90% of material collected is glass bottles, which are worth significantly less than the materials that typical deposit-return programs manage. Conversely, Québec's DRS for non-refillable containers manages mostly PET and aluminum cans, with only a minor amount of material

coming from the non-refillable glass bottles used for beer or for non-carbonated juices. In this case, revenue is relatively higher due to a high resale value for every container collected.

The Role of Surplus

As discussed above, some provinces charge consumer fees on the purchase of beverage containers as a means of generating additional revenue. Consider the EHC in Saskatchewan, the half-back schemes in the Atlantic Provinces, and the CRF in the Northwest Territories. While this revenue comes from the consumer, it is not necessarily used to offset the costs associated with operating the recycling program for that year. These funds may be used to subsidize other provincial programs or contribute to a province's general revenues.

For example, in New Brunswick, some of the half-back revenue generated is placed in the Environmental Trust Fund, which is used for beautification and conservation, among other things. In Nova Scotia, some of half-back revenue is distributed to municipalities to help offset the cost of their waste diversion initiatives.

In Saskatchewan and PEI, all excess funds accrue to the provincial treasury. In Yukon, funds generated by the recycling fund fee (RFF) go into a recycling fund administered separately from the government's general revenues and used solely for recycling purposes. In the Northwest Territories, funds generated by the program go into an environment fund that is separate from the government's general account.

In BC and Alberta, surplus revenues generated from the CRFs are used to offset the following year's recycling costs. In these provinces, surplus funds do not subsidize other programs and are adjusted regularly to reflect actual program shortfalls.

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. As pointed out above, however, this approach is not the most suitable for comparing the efficiency and effectiveness of different programs as system costs (and revenues) can be affected by a myriad of program-specific factors (e.g., collection rates, convenience level, program scope, etc.), which makes meaningful comparison impossible.

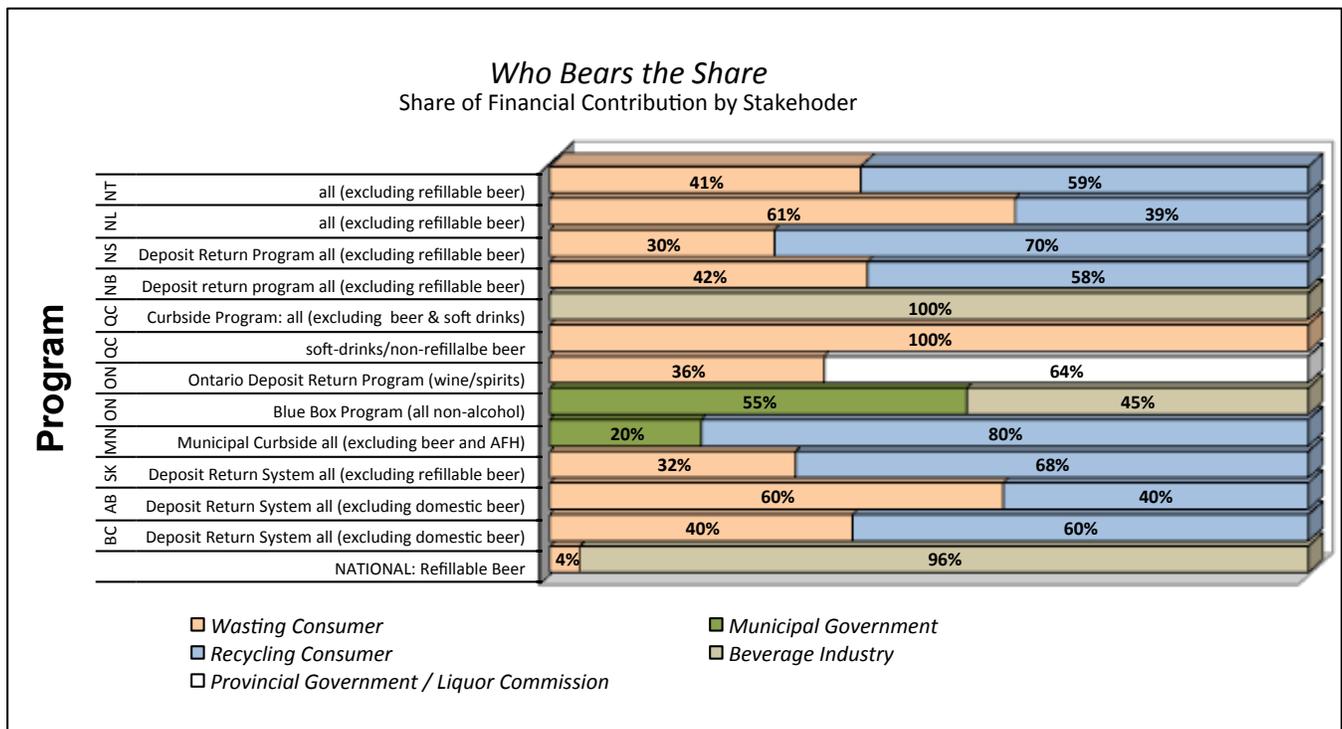
In recognition of this issue, in 2010 CM Consulting developed a new approach called "Who Bears the Share," that allows for a better understanding of how system costs are shared among the different players in each province. By identifying the share (percentage) of program costs that each stakeholder group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

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:

$$\frac{\text{STAKEHOLDER CONTRIBUTION (\$)}}{\text{TOTAL PROGRAM FUNDING (\$) (excluding material revenues)}}$$

Figure 34 shows the results of the Who Bears the Share analysis.

FIGURE 34 SHARE OF FINANCIAL CONTRIBUTION BY STAKEHOLDER, BY PROVINCE



Summary of Analysis

The *Who Bears the Share* analysis confirms that only in two provinces, Québec and Ontario, does the beverage industry pay for some portion of the costs for the collection and recycling of beverage containers. The industry pays for some costs of curbside collection because they are mandated through provincial EPR laws.

In most other provinces some or all of the system costs are also borne by the consumer. The consumer can be divided into two groups: the “wasting consumer” who does not redeem the container is paying more (per container, not necessarily overall) through unredeemed deposits; and the “recycling consumer”, who is paying through non-refundable consumer fees and halfback deposits in provinces where they are charged (BC, Alberta, Saskatchewan and

the Atlantic provinces). In addition to offsetting the costs of recovering beverage containers, a portion of these consumer fees may also be used as surplus funds for other provincial initiatives, such as waste diversion and environmental enhancement.

It is worth noting that only in Alberta, Québec, and Newfoundland do wasting consumers pay a larger share of the program costs than recycling consumers. Since 2013, Québec consumers who choose not to return their empty beverage containers bear 100% of the costs of the deposit-return program. In Alberta, wasting consumers bear approximately 60% of net program costs, whereas consumers who return their empty containers for recycling pay 40% (see Figure 35). This is because of Alberta's higher deposit levels, which translate into more revenue from unredeemed deposits. In BC, these percentages are reversed and recycling consumers pay 60% of program costs (see Figure 36). In Newfoundland, 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. Making wasting consumers pay a larger share than responsible consumers who ensure that their containers are recycled makes economic and environmental sense.

FIGURE 35 PERCENTAGE OF PROGRAM COSTS PAID BY WASTING VS. RECYCLING CONSUMER, BRITISH COLUMBIA (2014)

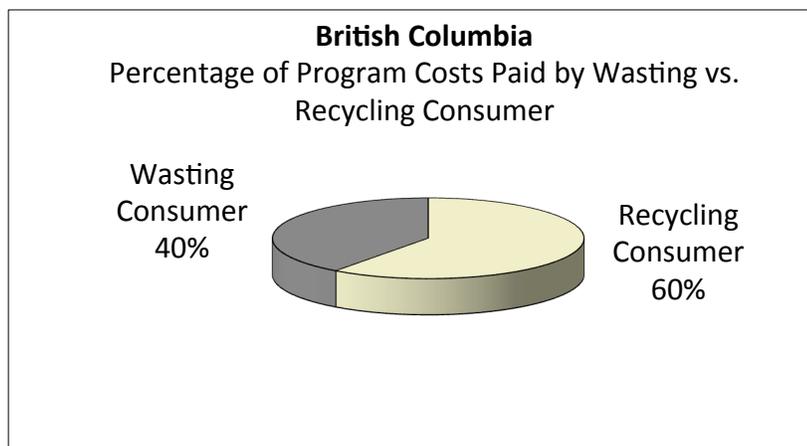
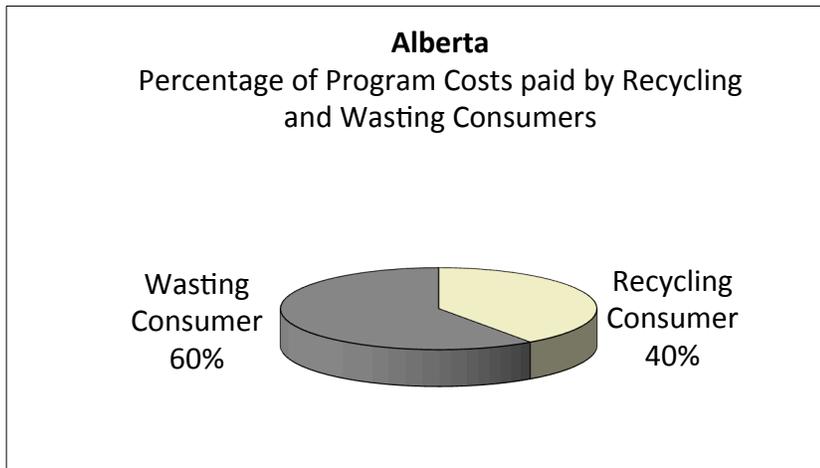


FIGURE 36 PERCENTAGE OF PROGRAM COSTS PAID BY WASTING VS. RECYCLING CONSUMER, ALBERTA (2014)



In Ontario's deposit system for alcohol beverage containers, the recycling consumer is refunded his entire deposit, so pays nothing. The wasting consumer pays 36% of the program cost and the rest is covered by the provincial liquor commission, the LCBO.

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 *Waste Diversion Act* mandates that industry reimburse municipalities 50% of the costs of the curbside recycling program. In Québec beverage producers (except those for non-refillable soft-drinks and beer which are on deposit) 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.) and the cost of collection equipment (e.g. recycling bins).¹⁴⁴

WHO PAYS WHAT?

Stakeholders

There are five (5) major stakeholder groups that fund beverage container recycling in Canada. Each group has a different role to play in the system, from the point at which a container is distributed and sold, to the point at which it is consumed and recycled.

Understanding the roles each stakeholder group plays and how economic incentives can be used to increase system efficiency is critical to informing policy development. To this end, the following section provides an analysis of the various stakeholders involved, and what their roles and responsibilities are when it comes to financing the system. Also discussed are some of the factors that impact each stakeholder 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

The recycling consumer is the consumer who returns empty containers to an authorized redemption center or places them in a designated recycling bin (whether at home or away-from-home). Regardless of whether containers are recycled via a deposit-return or curbside program, the recycling consumer still 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, passed down to consumers by the beverage industry, are non-refundable and are used to offset system costs.

$$\frac{\text{TOTAL CONSUMER FEES PAID OUT (\$)}}{\text{TOTAL NUMBER OF CONTAINERS SOLD}}$$

The wasting consumer is the consumer who chooses not to redeem their containers for a refund. By voluntarily forfeiting their deposits, the wasting consumer bears the direct costs of his actions.

The cost to the wasting consumer is equal to the value of the unredeemed deposit, which can be anywhere between 5- and 40-cents depending on the program and/or type of container. In general, wasting consumers pay a significant portion of program costs. This “cost of wasting” is determined by the following calculation:

$$\frac{\text{TOTAL UNREDEEMED DEPOSITS (\$) + NON RETURNABLE FEE ON UNREDEEMED UNITS}}{\text{TOTAL UNREDEEMED CONTAINER (UNITS)}}$$

The percentage of program costs borne by the wasting consumer varies from province-to-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 is, the more expensive it is for the wasting consumer (higher cost of wasting), and therefore the higher share they will pay of the total program costs. Wasting consumers will also pay more when they are charged an up-front fee, as in British Columbia, Alberta, and Saskatchewan.

Table 13 shows the average cost to the recycling and wasting consumer per beverage container.

TABLE 13 EXPRESSION OF FEES BY BEVERAGE CONTAINER TYPE FOR SELECT CONTAINERS (CENTS/UNIT SOLD) (2016)

Province	Program	Recycling Consumer (Cents)	Wasting Consumer (Cents)
BC	wine /spirits / non-alcohol	4.1	10.3
AB	all (excluding domestic beer)	1.8	12.6
SK	all (excluding refillable beer)	5.3	15.3
MN	all (excluding beer)	2	2.0
ON	all non-alcohol	0	0
ON	wine/spirits (mostly glass)	0	13.9
QC	soft-drinks/non-refillable beer	0	5.6
QC	all (excluding beer & soft drinks)	0	0
NB	all (excluding refillable beer)	5.8	10.7
NS	all (excluding refillable beer)	5.2	11.2
NL	all (excluding refillable beer)	3.0	8.0
NT	all (excluding refillable beer)	5.6	14.0

Municipal Government

In Canada, waste collection, diversion, and disposal operations are the responsibility of municipal governments. Their responsibilities also extend to litter abatement. Unless the municipality adopts user-pay mechanisms or an EPR program has been put in place to shift some of the financial responsibility to producers, much of the costs associated with providing these services—including collecting beverage containers from residential, single-family and some multi-family residences—are borne directly by municipal taxpayers.

This means households generating small amounts of waste or recyclables are forced to subsidize higher producers. Paying for residential waste management by using municipal property taxes could be the wrong approach as it removes a powerful incentive to reduce waste and engage in pro-recycling behavior. It also gives consumers the impression that recycling/composting is free, which distorts costs and devalues the service.

In recognition of this problem, a number of provinces have passed EPR legislation to relieve municipalities of a set portion of the cost burden that they have historically borne for waste management. The latest province to adopt such legislation is Saskatchewan. Effective January 1, 2016, producers are required to reimburse municipalities for up to 75% of the net

costs to operate residential PPP programs, leaving them to cover the remaining 25%. In Manitoba, this portion is 20%, with the remaining 80% being financed by industry. The percentage of costs borne by municipalities in Ontario is much higher at 50%. It is worth noting, however, that the current 50% industry-funding cap could be lifted under the recently passed Bill 151, allowing for industry to pay a greater share of program costs. This, in turn, would decrease the share borne by municipal government.

BC and Québec are the only two provinces where municipalities are completely relieved of the financial burden of recycling and waste management. Québec was the first to set a precedent when it moved to 100% industry-funding in January 2013. It did this incrementally, by decreasing the percentage of the net costs borne by municipalities for multi-material recycling programs from 30% in 2010, to 20% in 2011, to 10% in 2012, and finally to 0% in 2013. BC followed suit in May 2014, with the implementation of the MMBC program.

Provincial Governments or Liquor Commissions

Most provincial governments in Canada bear no share of the costs of beverage container recycling, but Ontario is an exception. In Ontario, the costs of operating the deposit-return program for wine and spirit containers are split between the province's liquor commission—the Liquor Control Board of Ontario (LCBO)—and the wasting consumer. Specifically, the LCBO pays 4.99-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 discussed above, industry is slowly being forced to take on an increasing share of financial responsibility for the end-of-life management of 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: BC (100%), Saskatchewan (75%), Manitoba (80%), Ontario (50%), 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 BC 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. Although BGE collected such fees in 2014 (to cover potential system deficits), the program generated a surplus and soft drink producers have since been reimbursed.¹⁴⁵

With respect to deposit-return programs, the only jurisdiction in which industry bears a share – albeit a very small share – of beverage container recycling costs is Québec. Whereas in other deposit-return provinces the bulk of system costs are paid by consumers through fees and

unredeemed deposits, in Quebec there is no CRF or half-back deposit system, which means that recycling consumers pay nothing. It should be noted that in the last few years the percentage of costs borne by industry has been reduced to zero because material revenue and unredeemed deposits have been high enough to cover the entire cost of the program.

The Domestic Beer Industry (Refillable Containers)

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

Part 5: Reuse and Recycling Systems for Selected Beverage Packaging

COMMODITY MARKETS

Recovered beverage containers are a global commodity. Supply and demand for recycled container material fluctuates, sometimes drastically, with ever changing market conditions. Markets vary depending on how much of a commodity is available and the consistency of its supply. The quality of the material (degree of contamination) is also a factor.

Following the market crash of 2008, commodity prices for recyclables saw a significant decline (since then, plastic and aluminum prices seem to have recovered). Buyers were increasingly discriminating when it came to contamination levels, and as a result, municipalities with curbside collection programs were hit the hardest. Nevertheless, in most cases, even though revenues were down the material was still able to move as it had in the past. This was partly due to the fact that much of this material was collected through DRs, which collect the highest quality material and earn the highest commodity price per tonne.

The following is a description, by material, of the supply and demand for empty beverage containers collected in Canada. Also included is a discussion of the recycling process and of the end uses for recycled beverage container material.

Aluminum Cans



The market share for used aluminum beverage cans is higher than all other non-refillable beverage containers in Canada; this is the case in every province. In 2014 alone, 6.9 billion cans were sold in the country.

The recycling rate for aluminum cans varies sharply by province, but is usually higher in those where cans are covered under deposit-return as opposed to curbside collection programs. As of 2014, Ontario and Manitoba were the only two provinces that did not have deposits on soft-drink cans; their collection rates for non-alcoholic beverage cans were 48% and 50%, respectively. This is considerably lower than the collection rates reported by deposit-return jurisdictions. The lowest recycling rate reported for non-alcoholic cans in a deposit system was 64% in Newfoundland.

As with other beverage container materials, the price of aluminum dropped in 2009 (to \$1215/tonne), but has since recovered. In Ontario, aluminum cans had an average monthly value of about \$1,618 per tonne from 2013-2015. Due to their high market value, aluminum beverage cans are a desirable commodity to the collectors and sellers of recycled scrap.

Following collection, sorting, and cleaning, used beverage containers are crushed, compacted into biscuits, and transported to aluminum markets (mostly in the United States, for example, in states like Kentucky, Tennessee, and New York) 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 offcuts or in-house scraps are all recycled. The entire process could take as little as 60 days.¹⁴⁶



Glass Bottles

In 2014, the province with the highest recycling rate for non-refillable glass beverage containers is Saskatchewan at 94.3%.

Calculating the recycling rate of glass beverage containers is extremely challenging when bottles are collected via municipal curbside recycling programs. This is because in such jurisdictions, all glass (beverage and food container) is jointly reported. Moreover, collection rates do not account for losses incurred in processing (due to contamination, for example) nor do they consider the fact that different end-use applications have very different environmental impacts (for example, using recycled glass to manufacture new bottles or fibreglass has a higher environmental benefit than using recycled glass as road aggregate).

The market value of recycled glass depends on the method by which it was collected. In Canada, two main glass collection systems are employed: color-separated collection and multi-material collection. The first 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 additional processing.

The second method collects glass along with all other material types. The additional handling and truck compaction in this method results in a significant amount of breakage, and thereby 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 used for low-end applications such as 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.

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.

Prior to April 2013, 70% of Québec's glass was processed at a facility in Longueuil, Québec.

Since the plant shut its doors in 2013, most of Québec's glass is being used as an aggregate or in landfills operations as roadbed. This could change in the next few years following the announcement of Éco Entreprises Québec (EEQ)'s *Innovative Glass Works Plan*.¹⁴⁷ The new program, announced in 2015, will direct an initial \$6.7 million to modernize sorting centres and develop new market outlets for recycled glass. The ultimate goal of the program is to ensure that 100% of the glass collected in Québec's municipal curbside programs goes to recycling.

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.¹⁴⁸

Glass from British Columbia is sent to glass recycling plants in BC, Alberta, and Washington State where it is recycled into wine bottles, fibreglass insulation, or sandblasting material.¹⁴⁹

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.¹⁵⁰ 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.

In Manitoba, glass is usually crushed and used locally as fill in roadways and sidewalks.¹⁵¹

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 97%, the refillable beer bottle is Canada's most recovered beverage container. No province has a collection rate of lower than 95%.

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. 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



With 27% of the total beverage market, PET plastic is the second most common material used for non-refillable beverage containers 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. In deposit-return provinces, PET usually has a recycling rate of 70-80%, but due to the low recycling rate (49.5%) in heavily populated Ontario, the national average is roughly 62%.

The average monthly value for a tonne of mixed PET from Ontario's Blue Box program was \$348 for the period of 2013-2015. After dipping to a low of \$187/tonne in 2009 the value peaked at \$652/tonne in 2011. It has since dropped to \$295/tonne in 2015.¹⁵²

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 deposit-return programs are melted down and made into new beverage containers. According to recent data¹⁵³, approximately 41% of recycled PET is turned into a fibre, 8% is used for strapping, 22% for food and beverage containers, 23% sheet and film, and 4% is used for non-food containers. A very small percentage (2%) becomes engineered resin or other materials.

In BC, collected plastic is sold to Merlin Plastics, and shipped to their facilities in BC and Alberta. PET from Saskatchewan and Manitoba is shipped to US 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 BC and Alberta.

HDPE (High-density polyethylene) Plastic Bottles



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

From 2013-2015, the average monthly value for mixed HDPE from Ontario's Blue Box program was reported to be \$591 per tonne. The yearly average value in 2015 was \$617 per tonne.¹⁵⁴ 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 the beverage container market (approximately 2%). The national recycling rate for these containers is 73%.



From 2011 to 2013, steel cans collected in Ontario's Blue Box program were worth an average of \$245 per tonne. The value of recycled steel cans dropped from a high of \$335 per tonne in 2011 to \$179 per tonne in 2015.¹⁵⁵

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

Tetra Pak Boxes

Tetra Pak cartons or drink boxes are made up of paper, an aluminum lining, and a plastic coating, and are usually 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 Tetra Paks alone. If considering the larger category as a whole, however, recycling rates are 50% or higher in each of the deposit provinces and 30% or less in Ontario and Manitoba.



From 2013 to 2015, polycoat containers collected in Ontario's Blue Box program were worth an average of \$86 per tonne. The value of recycled polycoat material dropped from a high of \$127 per tonne in 2011 to \$79 per tonne in 2014.¹⁵⁶ By 2015, this had increased to \$114 per tonne.¹⁵⁷

Tetra Pak 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.



Recycling rates for the larger category as a whole are highest in Alberta (65%) and the Northwest Territories (61%), both of which charge deposits on milk containers. Manitoba and Ontario are the poorest performing provinces, with recycling rates below 30%.

From 2013 to 2015, polycoat containers collected in Ontario's Blue Box program were worth an average of \$86 per tonne. The value of recycled polycoat material dropped from a high of \$127 per tonne in 2011 to \$79 per tonne in 2014.¹⁵⁸ By 2015, this had increased to \$114 per tonne.¹⁵⁹

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 beverage container market today, poly pouch drink containers are rapidly increasing in popularity. A typical poly pouch container is made up of an outside PET layer, ink that is printed on the inside of the PET layer, an aluminum foil adhesive layer, and an inside linear low-density polyethylene (LDPE) sealant.

Compared to other beverage container types, poly pouches take up minimal space in landfill. They are also extremely lightweight relative to their volume, and so the carbon footprint associated with their transportation is comparatively small. In fact, according to a study by the Packaging Machinery Manufacturers Institute (PMMI) trade association, the beverage volume transported in a truckload of quart-sized pouches would require nine trucks of glass or plastic bottles¹⁶⁰. Because of their associated environmental benefits, the PMMI expects poly pouches to gain a greater share of the beverage container market over the next decade.

Because it is a contaminant in both processes, traditional methods used to recycle aluminum and plastic are not practical for poly pouch containers. When removed at the recycling facility, these containers typically end up in residuals that go to landfill or EFW facilities. 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.¹⁶¹

Cups

There is another type of container that is used almost exclusively away-from-home and is not covered by deposit-return legislation in any of Canada's provinces or territories—polystyrene or paper-based, plastic-lined cups. There is no way to determine a recycling rate for these containers since their sales and returns are not tracked.



For the most part, these cups are exempt from beverage container regulations, which typically define the beverage container as one that is “sealed by the manufacturer” or “ready-to-drink.” Although some provinces like Ontario and Québec require retailers or brand owners of these cups to financially support the recycling of these containers, very few municipal recycling programs are actually accepting and recycling these materials.

There is a challenge with recycling polystyrene cups. For one, the associated cost of shipping, given their large volume to weight ratio, is very prohibitive. In general, polystyrene cups are commingled with other polystyrene materials collected in expanded recycling programs and shipped to facilities in Ontario, the US, and overseas.

Paper cups can be recycled by some paper mills either on their own, mixed with gable top containers, or mixed in with boxboard material. Depending on the end use (which is usually tissue), the yield rate is about 80%¹⁶². Paper cups can also be composted (cups with a poly-based liner can also go into municipal compost, with the liner being screened out of the final product). Wax-coated cups used for cold beverages provide even greater recycling and composting challenges because of the wax.



THE USE OF RECYCLED CONTENT IN BEVERAGE CONTAINERS

Although the focus of this report is on the *collection* of used beverage containers, *Who Pays What*TM would be incomplete without any reference to the issue of recycled content. The recycled content of a beverage container (or

any other product) is the fraction of recycled material in the final material normally expressed as a percentage.

When recycled beverage containers are converted into new products, the need to extract and consume raw materials and energy is significantly reduced because all of the primary resource extraction functions are avoided. The closed-loop system of using recycled beverage container material in the production of new containers has been acknowledged as the most beneficial end-of-life scenario for most types of packaging. Deposit-return programs offer the best chance of closed-loop recycling due to the fact that the containers collected are pre-sorted, eliminating the potential for contamination from other packaging and foodstuff residues.

Recycled Content by Material Type

Aluminum

According to the 2015 “Waste & Opportunity” report, aluminum continues to have the highest recycling rate and recycled content of all beverage containers.¹⁶³ Because aluminum can be recycled indefinitely, 75% of all aluminum ever manufactured is still in use today (with no loss in quality)¹⁶⁴ and it is estimated that 50% of all aluminum cans on retailers' shelves have been recycled at least once.¹⁶⁵ This makes sense, given the recycling process for aluminum requires 95% less energy than making a new can from virgin ore.

While, in general, aluminum cans in North America contain a significant portion of recycled content, the exact amount is difficult to ascertain because unlike glass and plastic, the percentage of recycled material in an aluminum can is not determined by the company, but rather by the aluminum supplier. The fact that manufacturers sometimes use different standards to define the amount of recycled content in their products can add to this ambiguity.

PET Plastic

Compared to using virgin material, plastic bottles made from recycled PET resin require 30% less energy. For every tonne of plastic produced, this is equivalent to the energy contained in about 11 barrels of oil.¹⁶⁶

Many companies have set goals for recycled PET and have made commitments to increase this percentage over the next few years. Pepsi, for example, has committed to use an average of 10% recycled PET plastic in all of its plastic bottles, and its Naked Juice brand bottle already uses 100% recycled resin.¹⁶⁷ Most companies claim, however, there is a lack of post-consumer PET on the market from which they can make recycled bottles. According to the National Association for PET Container Resources (NAPCOR), of the 1,812 million pounds of PET containers collected for recycling in 2014, only 31% were recycled.¹⁶⁸

Instead of bottle-to-bottle recycling, much of the recycled PET available to manufacturers is being used to make other containers (open-loop recycling), such as those for non-beverage products (e.g. shampoo, food, etc.). A significant amount of recycled PET is also used for sheet and film, strapping, non-food bottles, and to produce fiber for clothing and carpet.¹⁶⁹

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.¹⁷⁰ 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.¹⁷¹

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 as of December 2014 was 33.89%.¹⁷² The Canadian brewery industry's industry-standard bottle (ISB) contains a higher percentage of approximately 70%.¹⁷³

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

There are several ways to increase the use of recycled content in the manufacture of new containers. One of the most effective measures is minimum recycled content laws, which specify a minimum amount of recycled material that must be incorporated into products. While no province in Canada has enacted such laws, we can look to the United States and Europe for examples.

In California, manufacturers are required to use at least 35% recycled content for glass food, drink, and beverage containers made, sold, or used in the state (AB 2622, Chapter 1095, Statutes of 1990). The Department of Conservation's Division of Recycling regulates and oversees the container minimum content mandates and receives annual reports about the amount of recycled material that is used.

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 of Reusing and Recycling Beverage Containers

ECONOMIC BENEFITS

In addition to the direct financial costs and revenues, DRSs for beverage containers have indirect costs and benefits, most of which are seldom accounted for. Indirect costs may include, for example, the costs incurred by consumers (e.g. time, gas money) to return their containers to a collection depot. There are also the costs incurred by municipalities for waste disposal and litter abatement. Although sometimes difficult to quantify, these costs and benefits must be considered if we are to understand the “full picture” of beverage container recycling costs in Canada. The paragraphs that follow provide a brief overview of the indirect economic and social impacts of beverage container deposit-return programs.

Job creation

In 2011, the Container Recycling Institute 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 for beverage containers create significantly more – 11 to 38 times more – jobs than curbside recycling.¹⁷⁴

One of the main reasons for this is the relatively greater amount of material entering and leaving the system; 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).¹⁷⁵

Together, The Beer Store (TBS) deposit-system and the Ontario Deposit-Return Program (ODRP) are responsible for creating approximately 500 direct jobs.¹⁷⁶ The province of Nova Scotia has generated similar economic benefits; according to a 2016 economic impact study, its deposit-return program for beverage containers creates approximately 700 jobs and \$24.8 million in salaries and wages.¹⁷⁷

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.¹⁷⁸ Collectively, these employees are paid \$31 million in wages and benefits annually¹⁷⁹.

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.¹⁸⁰

Economic Growth

Besides job creation, DRSs generate “spin-off” activity in the wider economy. Gross Domestic Product (GDP) is the most common indicator used to measure economic activity. It is estimated that Nova Scotia’s deposit-return program contributes approximately \$32.7 million to GDP each year (and over \$496 million since the program began).¹⁸¹

Cost Savings to Municipalities

The main argument put forward by opponents of DRS is that these programs harm municipalities by diverting recyclables with the most value away from the municipal recycling stream, resulting in a reduction of the cost-effectiveness of municipal curbside systems. To support this argument, evidence is provided to show loss of material revenues as well as the reduced industry contributions from EPR schemes for packaging where they exist. However, one of the key elements missing in the majority of these analyses is the savings resulting from the reduced or avoided costs of collection, treatment, and disposal by the municipal waste management system.

The primary driver of municipal recycling costs is the volume of collected waste. This is due to the fact that the most expensive component of the municipal waste management system has to do with the frequency of waste collection, which is determined by the time it takes for garbage 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.

Another element missing from most of these studies is the savings resulting from the reduced costs of litter pick-up. 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 to measure the contribution of beverage containers to total litter. If “count” is used as an indicator, then beverage containers constitute only a small proportion of total litter. However, when measured in terms of volume, beverage containers contribute significantly to litter. Other important factors to consider when estimating the savings from deposit-return programs in terms of litter reduction 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 litter¹⁸².

Earlier this year, CM Consulting, in association with the Reloop Platform (www.reloopplatform.eu), set off on a task to compile all of the research done on the subject over the years. What we found was compelling, and sufficiently closes the case that container

deposit systems are good—not bad—for municipalities. The following table presents a compilation of 20 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 reported significant net cost savings to municipalities.

TABLE 14 SUMMARY OF STUDIES ON IMPACT OF DEPOSIT-RETURN PROGRAMS ON MUNICIPAL BUDGETS

Study Title, Author and Year	Summary of Findings
1 Summary Review of the Impacts of Container Deposit Schemes on Kerbside Recycling and Local Government in Australia ¹⁸³ , 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.¹⁸⁴) • 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.)
2 The Incentive to Recycle: The Case for a Container Deposit System in New Zealand ¹⁸⁵ , 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.¹⁸⁶) • Reduced litter control costs: undetermined • Reduced kerbside collection costs: up to \$19.26/household/year
3 A Scottish Deposit Refund System ¹⁸⁷ , Enomia 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.¹⁸⁸) • £7M for reduced litter (£1,303 per 1,000 pop.)
4 Cost Benefit Study of a Tasmanian Container Deposit System ¹⁸⁹ , Marsden Jacob Associates (prepared for the Department of Primary Industries, Parks, Water and the Environment (DPIPWE)), 2014	From 2014/15 to 2034/35, a CDS would benefit local government by \$28M NPV (Net Present Value) (\$54,139 per 1,000 pop. ¹⁹⁰) through the receipt of refunds on collected material & avoidance of some costs associated with existing kerbside recycling (undetermined).
5 Cost-Benefit Analysis of a Recycling Refund System in Minnesota ¹⁹¹ , 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.¹⁹²) • Undermined savings from reduced litter clean-up costs
6 Executive Summary: Implementing a Deposit and Return Scheme in Catalonia - Economic Opportunities for Municipalities ¹⁹³ , Retorna, 2014	<ul style="list-style-type: none"> • Reduced collection costs: €12M/year (€1,598 per 1,000 pop.¹⁹⁴) to €33M/year (€4,395 per 1,000 pop.) • Reduced treatment costs: final treatment (€6,029,686, or €803 per 1,000 pop.); 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.)
7 An Assessment of the Potential Financial Impacts of a Container Deposit System on Local Government in Tasmania ¹⁹⁵ , 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.¹⁹⁶) • 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

Study Title, Author and Year	Summary of Findings
8 Executive Summary: Report on the Temporary Implementation of a Deposit and Refund Scheme in Cadaques¹⁹⁷ , Retorna, 2013	<ul style="list-style-type: none"> • Reduced collection costs: €24,242/year (€8,536 per 1,000 pop.¹⁹⁸) 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.)
9 Comparison of System Costs and Materials Recovery Rates: Implementation of Universal Single Stream Recycling With and Without Beverage Container Deposits – Draft Report¹⁹⁹ , DSM Environmental (prepared for Vermont Agency of Natural Resources), 2013	<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.²⁰⁰) • Avoided disposal savings: \$11.1M to \$11.3M (\$17,730 to \$18,050 per 1,000 pop.)
10 The Impacts (Cost/Benefits) of the Introduction of a Container Deposit/Refund System (CDS) on recycling and councils²⁰¹ , 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.²⁰²)
11 Understanding the Impacts of Expanding Vermont's Beverage Container Program²⁰³ , 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.²⁰⁴) • 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.
12 Examining the Cost of Introducing a Deposit Refund System in Spain²⁰⁵ , Enomia 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.²⁰⁶). 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.
13 Packaging Impacts Consultation Regulation Impact Statement²⁰⁷ , 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.²⁰⁸) • Other avoided costs (landfill and litter clean up): \$247M (\$10,255 per 1,000 pop.)
14 Turning Rubbish into Community Money: The Benefits of a 10cent Deposit on Drink Containers in Victoria²⁰⁹ , 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.²¹⁰) • 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.)
15 Have We Got the Bottle? Implementing a Deposit Refund Scheme in the UK²¹¹ , Enomia 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.²¹²) • 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
16 Analysis of the Impact of an Expanded Bottle Bill on Municipal Refuse and Recycling Costs and Revenues²¹³ , DSM Environmental (prepared for Massachusetts Department of Environmental Protection (MassDEP)), 2009	<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.) • Avoided collection costs: \$4,214,071/year to \$5,033,112/year (\$620 to \$741 per 1,000 pop.²¹⁴) • 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.)
17 Analysis of Beverage Container Redemption System Options to Increase Municipal Recycling in Rhode Island²¹⁵ , DSM Environmental (prepared for Rhode Island Resource Recovery Corporation), 2009	<ul style="list-style-type: none"> • Reduction in municipal material revenues: \$1.4M/year (\$1,325 per 1,000 pop.²¹⁶) 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.)
18 Beverage Container Investigation²¹⁷ , BDA Group (prepared for the EPHC Beverage Container Working Group), 2009	<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.²¹⁸) • 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)
19 City of Toronto Staff Report: Amendments to Processing Fees Due to LCBO Deposit Return Program²¹⁹ , City of Toronto General Manager, Solid Waste Management Services (prepared for Public Works and Infrastructure Committee), 2008	<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.²²⁰) 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 • Net savings: \$447,989 (\$161 per 1,000 pop.) in 2007 and \$381,126 (\$137 per 1,000 pop.) in 2008
20 Economic & Environmental Benefits of a Deposit System for Beverage Containers in the State of Washington²²¹ , 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.²²²) • 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.)

Non-Quantifiable Benefits

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 a reduction in litter. In the United Kingdom, this is estimated to be €1,248 million (CAD \$2.17 million) per annum.²²³

Charities and Community Organizations

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

In Ontario, for example, TBS (in partnership with United Food and Commercial Workers Local 12R24) holds an annual fundraiser to collect money for leukemia and blood cancer research. Each May, TBS invites customers to donate a portion of their empty bottles (or cash), with 100% of the proceeds going directly to The Leukemia and Lymphoma Society of Canada. In 2014 and 2015, over \$3.4 million was collected through the Returns for Leukemia Bottle Drive, and over \$11 million total since the fundraiser began 10 years ago.²²⁴

In BC, 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 \$10,000.²²⁵ The results of a pilot program that ran in the Burnaby School District suggest that the average elementary school can raise approximately \$50 to \$100 a month.²²⁶

Supplemental Income for Low/No Income Individuals

In provinces that have them, there are many people who use the DRS as a means to earn and/or supplement their income. For instance, the daily processing of 55,000+ beverage containers supports 700 to 750 residents in Vancouver’s inner city community year-round.²²⁷ 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

Historically, measuring the performance of recycling efforts has been restricted to weight-based data, such as total kilograms collected for recycling. Today, a growing number of system operators are beginning to focus on new aspects of program performance, such as the amount of GHG emissions avoided from reuse and recycling, or the amount of energy saved from not having to produce new products from virgin materials. These new measurements provide a much more comprehensive understanding of the environmental impacts of beverage container diversion.

For example, a recent study conducted by Gardner Pinfold²²⁸ on the environmental impacts of Nova Scotia’s beverage container program found that recycling beverage containers in

Nova Scotia would save 7,600m³ in landfill space in 2016. The total amount of landfill space saved since 1997, when the program began, is estimated at over 129,000m³ -- equivalent to 52 Olympic-sized pools. Given that landfill space is at a premium these days, this is a particularly relevant indicator for measuring the environmental benefits of beverage container recycling programs. With regards to energy savings, the study found that if electricity were used to manufacture new containers, then 208 million KW are saved, which is equivalent to taking more than 18,500 Nova Scotia homes off the grid.

In addition to the study above, Environment Canada and the US Environmental Protection Agency (EPA) have undertaken extensive life-cycle analyses to measure the inputs and outputs, from cradle to grave, of 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 the table below.

TABLE 15 ENVIRONMENTAL BENEFITS REALIZED FROM RECYCLING BEVERAGE CONTAINERS IN CANADA (2014)

Province	Avoided emissions (MTCO ₂ e)	Equivalent number of cars taken off the road.	Total GJs saved	Avoided crude oil extraction (in barrels)	Value of crude oil saved (based on \$98.97/barrel) (avg price in 2014, US EIA)
British Columbia	159,395	33,557	2,388,311	387,084	38,309,750
Alberta	183,234	38,576	2,954,884	478,911	47,397,866
Saskatchewan	40,167	8,456	688,559	111,598	11,044,846
Manitoba	15,720	3,310	583,670	94,598	9,362,364
Ontario	382,744	80,578	5,979,656	969,150	95,916,779
Quebec	278,339	58,598	4,363,988	707,291	70,000,636
New Brunswick	29,759	6,265	449,549	72,860	7,210,995
Nova Scotia	35,085	7,386	623,214	101,007	9,996,676
Newfoundland	20,529	4,322	373,338	60,509	5,988,537
Prince Edward Island	4,924	1,037	111,709	18,105	1,791,862
Yukon	136	29	3,005	487	48,209
Northwest Territories	2,345	494	38,729	6,277	621,232
TOTAL	1,152,377	242,606	18,558,611	3,007,879	297,689,753

Note: Some tonnage information from some provinces is not available in this report. Therefore, provincial totals should not be compared with each other.

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.

The calculations used to produce Table 16 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.

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-reduction-model-warm#WARM%20Tool%20V14> accessed July 6, 2016.
- A typical passenger vehicle emits about 4.75 metric tons of GHGs per year <Source: www.epa.gov/cleanenergy/energy-resources/calculator.html (accessed June, 2016)>.
- 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 average value of a barrel of crude oil in 2014 was \$98.97 according to the US Energy Information Administration <Source: www.eia.gov/todayinenergy/detail.cfm?id=9530>

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Appendix

Methodology for Calculating Recycling Rates in Manitoba, Ontario, and Québec

Assumptions for Manitoba

- Sales are from CBCRA
- The beverage container recycling rates are derived from CBCRA tonnage and collection rates. Then, a loss rate from contamination is applied. The loss rate for aluminum is assumed to be 2% and for plastic 30%. No loss rate is assigned for glass because it is predominantly used as an aggregate substitute.
- The collection rate for non-PET plastic, Tetra Pak, and gable top beverage containers is based on the residential rate reported by MMSM for 2014. Away-from-home sales and recovery are not included in this summary.

Assumptions for 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 plastic 30%, and for glass 40% (note that this only applies to curbside collected non-alcohol beverage glass).
- The collection rate for Tetra Pak and gable top non-alcoholic beverage containers is based on the rate reported by Stewardship Ontario for 2014. The away-from-home sales and recovery rates are not included in this summary.

Assumptions for Québec

- Sales and recovery for non-deposit PET and glass beverage bottles (e.g., juice, sports drinks, and water) are based on data from the residential waste composition study from ÉÉQ and Recyc-Québec (2012-2013). These weight values (in kgs) were applied to average unit-to-weight estimates by container type and size derived from actual 2010 data from British Columbia.
- Added to the residential sales figures are sales assumed to be made away-from-home for PET and glass bottles. These are approximately 22% of wine and spirits sold away-from-home and 50% of water bottles sold away-from-home. (Source: Mise en Marché et Récupération des Contenants de Boisson au Québec, Recyc-Québec, January 2008.)
- Added to the PET collection values are containers collected away-from-home. For PET bottles collected away-from-home, the rate is assumed to be 25%.

- The collection values for glass, Tetra Pak, and gable top non-alcoholic beverage containers are based on the rate reported by the waste composition study done for ÉEQ and Recyc-Québec (2006–2009). Away-from-home sales and recovery rates are not included in this summary.
- Collected glass is reduced by 40% to account for losses and materials that are not recycled but used as alternative daily cover.

ENDNOTES

¹ National Association for PET Container Resources (NAPCOR), 2015, "Report on Post-Consumer PET Container Recycling Activity in 2014," www.napcor.com/pdf/NAPCOR_2014RateReport_FINAL.pdf

² 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>

³ Canadian Beverage Container Recycling Association, "Beverage Container Recovery in Ontario: Achieving Greater Performance and Sustainability - Draft CBCRA Industry Stewardship Plan for Submission to Waste Diversion Ontario", *Waste Diversion Ontario*, www.wdo.ca/files/9713/7935/8851/CBCRA_Beverage_Container_Draft_ISP.pdf, September 5, 2013.

⁴ Ibid.

⁵ Container Recycling Institute. n.d. "Theoretical maximum recycling rate in Michigan from curbside recycling programs only (Jan 15')." www.nrcm.org/wp-content/uploads/2015/12/CRlstudy_bottlebill.pdf

⁶ Becky MacWhirter. June 2012. "Recycling in Public." *Resource Recycling Magazine*. <http://reclaystewardedge.com/wp-content/uploads/2012/06/RR_Recycling-in-Public_2012Jun.pdf>

⁷ Ibid.

⁸ Manitoba CBCRA 2014 Annual Report

⁹ Canadian Beverage Container Recycling Association, "Media," www.recycleeverywhere.ca/media-and-press/, 2012.

¹⁰ Eco Entreprises Quebec. <www.ecoentreprises.qc.ca/eco-responsible-consumption/recycle-everywhere>

¹¹ Nestle Waters, "City of Richmond's pilot public spaces recycling program reduces beverage containers found in waste stream by 27%," <www.nestle-waters.ca/en/media/pressreleases/cityofrichmond'spilotpublicspacesrecyclingprogramreducesbeveragecontainersfoundinwastestreamby27>, 27 February 2012.

¹² City of Richmond, "Go! Recycle Around Richmond,"

www.richmond.ca/services/recycling/cleaningup/gorecycle.htm, September 2013.

¹³ Fletcher, Robson. 24 November 2013. "Street-side bins net big recycling jump in Calgary's Inglewood area." <www.metronews.ca/news/calgary/2013/11/24/street-side-bins-net-big-recycling-jump-in-calgarys-inglewood-area.html>

¹⁴ 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>

¹⁵ Massachusetts Sierra Club, "Analysis of S.379 An Act Improving Recycling in the Commonwealth, so-called," January 2014.

¹⁶ Encorp Pacific (Canada). Stewardship Plan 2014-2018. <www.return-it.ca/cfm/index.cfm?It=100&Id=112&Se=2&Lo=2&AF=100&AA=Download&AD=112,Df1>

¹⁷ Encorp Pacific. 2014 Annual Report. <www.return-it.ca/ar2014/Encorp_2014_Annual_Report.pdf>

¹⁸ Ibid.

¹⁹ Encorp Pacific (Canada). Stewardship Plan 2014-2018. <www.return-it.ca/cfm/index.cfm?It=100&Id=112&Se=2&Lo=2&AF=100&AA=Download&AD=112,Df1>

²⁰ Encorp Pacific. 2014 Annual Report. <www.return-it.ca/ar2014/Encorp_2014_Annual_Report.pdf>

²¹ Brewers Distributor Limited. Annual Report to the Director. 2014 Calendar Year. <<http://envirobeerbc.com/wp-content/uploads/2014/01/BDLs-2015-Annual-Report-to-Ministry-covers-2014-calendar-year.pdf>>

²² Brewers Distributor Ltd. December 2014. Schedule 1 Product Stewardship Plan 2015-2019 Draft. <<http://envirobeerbc.com/wp-content/uploads/2014/01/BC-Schedule-1-Stewardship-Plan-FINAL-Dec-14.pdf>>

- ²³ Ibid.
- ²⁴ Multi Material British Columbia. "Milk container recycling transition information." <www.return-it.ca/beverage/recycling/transition/>
- ²⁵ Brewers Distributor Limited. Annual Report to the Director. 2014 Calendar Year. <<http://envirobeerbc.com/wp-content/uploads/2014/01/BDLs-2015-Annual-Report-to-Ministry-covers-2014-calendar-year.pdf>>
- ²⁶ Ibid.
- ²⁷ Encorp Pacific. 2014 Annual Report. <www.return-it.ca/ar2014/Encorp_2014_Annual_Report.pdf>
- ²⁸ www.return-it.ca/forum/article-915/
- ²⁹ Ibid.
- ³⁰ Encorp Pacific (Canada). 2013 Annual Report. <www.return-it.ca/ar2013/report.html>
- ³¹ Multi Material British Columbia. n.d. "Q&A from Annual Steward Meeting – October 20, 2014." <www.multimaterialbc.ca/wp-content/uploads/2014/12/MMBC-Oct-2014-QA-FINAL.pdf>
- ³² Alberta Beverage Container Recycling Corporation. "Container Recycling Fee," <www.abcrc.com/wp-content/uploads/2015/01/Con_RecycleFee_Facing_1112.pdf>
- ³³ Beverage Container Management Board. 2014 Annual Report. <<http://bcmb.ab.ca/annual-report/2014/>>
- ³⁴ Ibid.
- ³⁵ Beverage Container Management Board. 2013. Product Registration Package. <www.bcmb.ab.ca/images/uploads/Revised_Registration_Package_August_2013.pdf>
- ³⁶ Alberta Beverage Container Recycling Corporation. 2014 Sustainability Report. <www.abcrc.com/sustainability/2014/-_home>
- ³⁷ Ibid.
- ³⁸ Beverage Container Management Board. 2014 Annual Report. <<http://bcmb.ab.ca/annual-report/2014/>>
- ³⁹ Beverage Container Management Board. 12 November 2015. "Non-dairy, flavoured coffee creamers now part of deposit-refund system." <www.bcmb.ab.ca/newsroom/article/53/non-dairy-flavoured-coffee-creamers-now-part-of-deposit-refund-system/>
- ⁴⁰ Beverage Container Management Board. 2014 Annual Report. <<http://bcmb.ab.ca/annual-report/2014/>>
- ⁴¹ SARCAN 2014-2015 Annual Report. <https://issuu.com/sarcsarcan/docs/annual_report_2014-2015>
- ⁴² SARCAN 2013-2014 Annual Report. <https://issuu.com/sarcsarcan/docs/sarcannualreport20132014_-_turning_>
- ⁴³ SARCAN 2014-2015 Annual Report. <https://issuu.com/sarcsarcan/docs/annual_report_2014-2015>
- ⁴⁴ www.durhamyorkwaste.ca/Assets/PublicOutreach/EFWWMAC/Meetings/Meeting_17/WMAC_Meeting17_Presentation_CanadaEPRstatus.pdf
- ⁴⁵ SARCAN Recycling. "Where does it go?" <www.sarcan.ca/where_does_it_go>
- ⁴⁶ Magazines Canada. 5 November 2015. "Saskatchewan Government Approves Revised MMSW Stewardship Plan." <file://localhost/www.magazinescanada.ca:medias_daffaires:pub/3430:Saskatchewan-Government-Approves-Revised-MMSW-Stew-.VoVyfxGFDHg>
- ⁴⁷ SARCAN, "SARCAN and the Deposit Beverage Container Recycling System will not be Negatively Affected by New Municipal Curbside Program in Regina," <http://www.sarcan.ca/blog/posts/curbside_recycling_launches_in_regina_sarcan_will_not_be_negatively_affected>, 13 February 2013.
- ⁴⁸ www.suma.org/cmsupload/fckeditor/Main%20Page%20News%20Photos/sarcan_milk_containers.pdf
- ⁴⁹ SARCAN 2014-2015 Annual Report. <https://issuu.com/sarcsarcan/docs/annual_report_2014-2015>
- ⁵⁰ Multi Material Stewardship Manitoba. 22 June 2009. Packaging and Printed Paper (PPP) Program Plan. <http://greenmanitoba.ca/umedia/program_plans/MMSM_PPP_Program_Plan_June_22_09_Plan_and_Appendices.pdf>
- ⁵¹ Government of Manitoba. "Recycling and Waste Reduction: A Discussion Paper." <https://www.gov.mb.ca/conservation/envprograms/recycling/pdf/mb_recycling_strategy_2014.pdf>
- ⁵² Canadian Beverage Container Recycling Association. 2014 Annual Report. <www.cbcrca-acrcb.org/annualreports/2014/>
- ⁵³ Manning Environmental Law. 1 June 2016. "Ontario Passes New Waste-Free Ontario Act." <<https://manningenvironmentallaw.com/2016/06/01/ontario-passes-new-waste-free-ontario-act/>>
- ⁵⁴ Georgakopoulos, John. 30 November 2015. "Waste-Free Ontario Act: Ontario's Proposed New Waste Reduction Regime." <www.willmsshier.com/docs/default-source/articles/article---waste-free-ontario-act-ontario-s-proposed-new-waste-reduction-regime---jg-jp---november-30-2015.pdf?sfvrsn=4>
- ⁵⁵ Zaman, Nadia. 21 March 2016. "A New Waste-Free Ontario Act Proposed by MOECC (Bill 151)." <www.martindale.com/environmental-law/article_Borden-Ladner-Gervais-LLP_2226342.htm>

- ⁵⁶ Ontario Waste Management Association. n.d. "Waste Free Ontario." <www.owma.org/Issues/WasteFreeOntario.aspx>
- ⁵⁷ Chase, Sean. 18 July 2016. "Bill 151 will mean big changes for OVWRC." <www.thedailyobserver.ca/2016/07/18/bill-151-will-mean-big-changes-for-ovwrc>
- ⁵⁸ Giroux Environmental Consulting in association with Duncan Bury Consulting and Gardner Pinfold Consulting Economists. 8 January 2014. "Framework and Implementation Plan for a Packaging and Printed Paper Stewardship Program Across Atlantic Canada – Final Jurisdictional Review." <www.recyclenb.com/vendor/laravel-filemanager/files/publications-e/nb-ppp-jurisdictional-review-e.pdf>
- ⁵⁹ Liquor Control Board of Ontario. Annual Report 2014-2015. <www.lcbo.com/content/dam/lcbo/corporate-pages/about/pdf/LCBO_AR14-15-english.pdf>
- ⁶⁰ Ontario Government. Fall 2015. A Proposed Framework for a Waste-Free Ontario. Ministry of the Environment and Climate Change Technical Briefing. <[www.municipalwaste.ca/assets/docs/Technical Briefing Deck for Stakeholders \(1Dec15\).pdf](http://www.municipalwaste.ca/assets/docs/Technical%20Briefing%20Deck%20for%20Stakeholders%20(1Dec15).pdf)>
- ⁶¹ Retail Council of Canada. 27 November 2015. "Ontario Government Tables New Waste Legislation and Strategy." <www.retailcouncil.org/advocacy/ontario-government-tables-new-waste-legislation-and-strategy>
- ⁶² Ontario Waste Management Association. n.d. "Waste Free Ontario." <www.owma.org/Issues/WasteFreeOntario.aspx>
- ⁶³ Ibid.
- ⁶⁴ Ontario Government. Fall 2015. A Proposed Framework for a Waste-Free Ontario. Ministry of the Environment and Climate Change Technical Briefing. <[www.municipalwaste.ca/assets/docs/Technical Briefing Deck for Stakeholders \(1Dec15\).pdf](http://www.municipalwaste.ca/assets/docs/Technical%20Briefing%20Deck%20for%20Stakeholders%20(1Dec15).pdf)>
- ⁶⁵ Ibid.
- ⁶⁶ This target is related to the "rate of return of consigned containers" and not the "rate of deposits refunded" (presented on Recyc-Quebec's website). The calculation made to determine whether the target has been reached considers the number of consigned containers returned through curbside without being returned for the deposit.
- ⁶⁷ Boissons Gazeuses Environnement, "Recovery Statistics," <http://www.consignaction.ca/en/current-state/recovery-statistics>, 2016.
- ⁶⁸ Environment Canada. "Packaging and Printed Materials Stewardship Program." <<http://ec.gc.ca/gdd-mw/default.asp?lang=En&n=DB7979F8-1>>
- ⁶⁹ Recyc-Quebec. 2014-2015 Annual Report. <www.recyc-quebec.gouv.qc.ca/sites/default/files/documents/rapport-annuel-2014-2015-anglais.pdf>
- ⁷⁰ Personal communication with Normand Bisson (e-mail correspondence) on February 8, 2016.
- ⁷¹ <https://conference.recycle.ab.ca/files/2015/02/JeanLucPlante.pdf>
- ⁷² Ibid.
- ⁷³ Eco Entreprises Quebec. "10,000 Bins Financed by Eco-Entreprises Quebec's Away-from-Home Recovery Program." <www.ecoentreprises.qc.ca/documents/pdf/Communique_hors_foyer_2015-04-28-VA.pdf>
- ⁷⁴ Encorp Atlantic. Spring 2015 Newsletter, <[http://encorpatl.ca/downloads/Newsletter 25 Anglais.pdf?PHPSESSID=2e6f1b7e9dbf54979963d20c03d6c0fc](http://encorpatl.ca/downloads/Newsletter%2025%20Anglais.pdf?PHPSESSID=2e6f1b7e9dbf54979963d20c03d6c0fc)>
- ⁷⁵ Personal communication with Pierre Landry (email), February 24, 2016. Fee set to increase later in 2016.
- ⁷⁶ Ibid.
- ⁷⁷ "Re-Centre." <<https://re-centre.ca/wp-content/themes/clynkchildtheme/media/Re-Center-MediaFactSheet.pdf>>
- ⁷⁸ Ibid.
- ⁷⁹ "Re-centre recycling data." <https://re-centre.ca/?page_id=265>
- ⁸⁰ Ibid.
- ⁸¹ Cormier, Brian. 3 June 2015. "Encorp Atlantic Launches New Express Service at Redemption Centres in Fredericton, Shediac." <www.briancormier.com/2015/06/03/encorp-atlantic-launches-new-express-service-at-redemption-centres-in-fredericton-shediac/ - sthash.3KBM14oo.dpbs>
- ⁸² Encorp Atlantic. Fall 2015 Newsletter. <[http://encorpatl.ca/downloads/Newsletter 27 Anglais 2015 V4.pdf?PHPSESSID=aa93cdeeee76bbfef83ac54a99b0d5b78](http://encorpatl.ca/downloads/Newsletter%2027%20Anglais%202015%20V4.pdf?PHPSESSID=aa93cdeeee76bbfef83ac54a99b0d5b78)>
- ⁸³ Encorp Atlantic. Summer 2016. "Distributor's Journal." <<http://encorpatl.ca/index.php>>
- ⁸⁴ Resource Recovery Fund Board Inc. 2015 Annual Report
- ⁸⁵ Government of Nova Scotia. "Waste Reduction in Convenience Stores." <www.novascotia.ca/nse/waste/convenience.asp>

-
- 86 Resource Recovery Fund Board Inc. "Request for Proposal – Local Carrier and Line Haul Service for RRFB Nova Scotia. RFP No. RRFB0035." <http://novascotia.ca/tenders/pt_files/tenders/RRFB0035.pdf>
- 87 Resource Recovery Fund Board Inc. 2015 Annual Report
- 88 "Nova Scotia Milk Packaging Stewardship Agreement." <www.novascotia.ca/nse/waste/docs/DairyStewardship.pdf>
- 89 http://novascotia.ca/tenders/pt_files/tenders/RRFB0037.pdf
- 90 Resource Recovery Fund Board Inc. "Request for Proposal – Local Carrier and Line Haul Service for RRFB Nova Scotia. RFP No. RRFB0035." <http://novascotia.ca/tenders/pt_files/tenders/RRFB0035.pdf>
- 91 Ibid.
- 92 Resource Recovery Fund Board Inc. 2015 Annual Report
- 93 Resource Recovery Fund Board Inc. "Request for Proposal – Local Carrier and Line Haul Service for RRFB Nova Scotia. RFP No. RRFB0035." <http://novascotia.ca/tenders/pt_files/tenders/RRFB0035.pdf>
- 94 Container Recycling Institute. n.d. "Recycling Legislation in Canada: Nova Scotia." <www.bottlebill.org/legislation/canada/novascotia.htm>
- 95 www.putwasteinitsplace.ca/uploads/file/rrfb/ppp_summit/Nicole_Warren.pdf
- 96 Resource Recovery Fund Board Inc. 16 October 2014. "Taking Innovation on the Road: Increasing Efficiency in Nova Scotia's Beverage Container System." <www.atcanswana.org/atlanticwasteconference/pdfs/presentations/TakingInnovationontheRoadIncreasingEfficiencyinNSBeverageContainerSystem.pdf>
- 97 Ibid.
- 98 Ibid.
- 99 <http://putwasteinitsplace.ca/uploads/file/2015%20July%20ReCAP%20FINAL.pdf>
- 100 Resource Recovery Fund Board Inc. 16 October 2014. "Taking Innovation on the Road: Increasing Efficiency in Nova Scotia's Beverage Container System." <www.atcanswana.org/atlanticwasteconference/pdfs/presentations/TakingInnovationontheRoadIncreasingEfficiencyinNSBeverageContainerSystem.pdf>
- 101 Government of Nova Scotia. April 2014. "Revising Our Path Forward: A Public Discussion Paper About Solid Waste Regulation in Nova Scotia." <www.novascotia.ca/nse/waste/docs/solid-waste-public-discussion.pdf>
- 102 Ibid.
- 103 Ibid.
- 104 Personal communication with John Hughes, January 11, 2016
- 105 Ibid.
- 106 Ibid.
- 107 Ibid.
- 108 Ibid.
- 109 Ibid.
- 110 Only milk products and milk substitutes with the word "beverage" on the label are covered under the program.
- 111 Multi Materials Stewardship Board. 2014-2015 Annual Report. <www.env.gov.nl.ca/env/publications/departmental_pubs/pdf/mmsb_ann_rpt_2014_15.pdf>
- 112 E-mail correspondence with Paul Russell, Field Operations Officer at MMSB, 5 February 2016
- 113 Ibid.
- 114 Ibid.
- 115 Government of Northwest Territories, Department of Environment and Natural Resources. "Beverage Container Program." <<http://www.enr.gov.nt.ca/node/3723>>
- 116 Ibid.
- 117 Government of Northwest Territories, Department of Environment and Natural Resources. Waste Reduction and Recovery Program – 2013-2014 Annual Report. <www.assembly.gov.nt.ca/sites/default/files/td214-175.pdf>
- 118 "Plain Language Summary NWT Beverage Container Regulations." <www.fortsimpsonchamber.ca/wp-content/uploads/2015/12/Plain-Language-Summary-NWT-Beverage-Container-Regulations-Feb-2016.pdf>
- 119 Government of Northwest Territories, Department of Environment and Natural Resources. Waste Reduction and Recovery Program – 2013-2014 Annual Report. <www.assembly.gov.nt.ca/sites/default/files/td214-175.pdf>
- 120 Government of Northwest Territories, Department of Environment and Natural Resources. "Beverage Container Program." <<http://www.enr.gov.nt.ca/node/3723>>
- 121 Ibid.
-

- ¹²² Government of Northwest Territories, Department of Environment and Natural Resources. Waste Reduction and Recovery Program – 2013-2014 Annual Report. <www.assembly.gov.nt.ca/sites/default/files/td214-175.pdf>
- ¹²³ Government of Northwest Territories, Department of Environment and Natural Resources. "Beverage Container Program." <<http://www.enr.gov.nt.ca/node/3723>>
- ¹²⁴ Government of Northwest Territories, Department of Environment and Natural Resources. 21 August 2015. "Drop and Go service now in Yellowknife and Hay River." <<http://icarenwt.ca/news/show/32/drop-go-service-now-yellowknife-hay-river>>
- ¹²⁵ Government of Northwest Territories, Department of Environment and Natural Resources. "Changes to the BCP." <www.enr.gov.nt.ca/programs/rethinkit/changes-bcp>
- ¹²⁶ Yukon Government. "Recycling in Yukon." <www.community.gov.yk.ca/cd/recycling.html>
- ¹²⁷ "New beverage container deposits welcome." 24 September 2014. <www.yukon-news.com/letters-opinions/new-beverage-container-deposits-welcome/>
- ¹²⁸ www.community.gov.yk.ca/cd/recycling.html
- ¹²⁹ www.community.gov.yk.ca/cd/recycling.html
- ¹³⁰ Department of Environment, "Solid Waste Management in Nunavut: A Backgrounder," <http://env.gov.nu.ca/sites/default/files/Solid%20Waste%20Management%20in%20Nunavut.pdf>, accessed 27 December 2013.
- ¹³¹ "Beverage Container Recycling in Nunavut not feasible," *Solid Waste & Recycling Magazine*, <http://www.solidwastemag.com/news/beverage-container-recycling-in-nunavut-not-feasible/1000387766/?&er=NA>, 4 October 2010.
- ¹³² Alberta Beverage Container Recycling Corporation, "2011 Annual Report," <http://www.abcrc.com/ar2011/pdf/2012-ABCRC-Annual-Report.pdf>, 2012.
- ¹³³ Yukon Environment. 2015. Comments on Proposed Changes to the Recycling System under the *Environment Act*: A summary of the Public Review held September to November 2014.
- ¹³⁴ Multi Material British Columbia. 2016 Fee Schedule. <www.multimaterialbc.ca/stewards/fees-payments/>
- ¹³⁵ www.mmsk.ca/stewards/fees/
- ¹³⁶ Stewardship Manitoba. Table of Fees for 2016. <<http://stewardshipmanitoba.org/wp-content/uploads/2013/10/Jump-to-2016-Fees.pdf>>
- ¹³⁷ Stewardship Ontario. 2016 Fee Schedule. <<http://stewardshipontario.ca/wp-content/uploads/2013/03/2016-Fee-Schedule.pdf>>
- ¹³⁸ www.ecoentreprises.qc.ca/documents/pdf/tarif/2016_07_13_tarif_2015_2016_publication%20GOQ_va.pdf
- ¹³⁹ Giroux Environmental Consulting in association with Duncan Bury Consulting and Gardner Pinfold Consulting Economists. 8 January 2014. "Framework and Implementation Plan for a Packaging and Printed Paper Stewardship Program Across Atlantic Canada – Final Jurisdictional Review." <www.recyclenb.com/vendor/laravel-filemanager/files/publications-e/nb-ppp-jurisdictional-review-e.pdf>
- ¹⁴⁰ Eco Entreprises Quebec. 11 December 2015. "First \$4million investment for Eco Entreprises Quebec's Innovative Glass Works Plan." <www.ecoentreprises.qc.ca/documents/pdf/2015-12-11_press_release_VFA.pdf>
- ¹⁴¹ Stewardship Ontario. "Updated on Blue Box Arbitration: Arbitrator Renders Decision in Stewardship Ontario vs. AMO and City of Toronto." <<http://stewardshipontario.ca/news/update-on-blue-box-arbitration/>>
- ¹⁴² Calculated by dividing 14.3 million (sale of processed containers) by 94.2 million (total revenue), on p.51 of 2014 Encorp Report
- ¹⁴³ Calculated by dividing 36,019,709 (sale of processed containers) by 124,766,828 (total revenues), on p.25 of 2014 ABCRC Report.
- ¹⁴⁴ Environment Canada. n.d. "Packaging and Printed Materials Stewardship Program." <<http://ec.gc.ca/gdd-mw/default.asp?lang=En&n=DB7979F8-1>>
- ¹⁴⁵ Personal communication with Normand Brisson (email), February 8, 2016.
- ¹⁴⁶ The Aluminum Association, "Recycling Aluminum Cans," <http://www.aluminum.org/Content/NavigationMenu/TheIndustry/Recycling/Whyrecycle/>, 2008.
- ¹⁴⁷ Eco Entreprises Quebec. 14 January 2016. "Innovative Glass Works Plan: Eco Entreprises Quebec reveals an innovative solution for glass recycling." <www.ecoentreprises.qc.ca/innovative-glass-works-plan-eco-entreprises-quebec-reveals-an-innovative-solution-for-glass-recycling>
- ¹⁴⁸ Alberta Beverage Container Recycling Corporation, "Container Information," <http://www.abcrc.com/container-information/>, 2016.
- ¹⁴⁹ Encorp Pacific. 2014 Annual Report. <www.return-it.ca/ar2014/Encorp_2014_Annual_Report.pdf>
- ¹⁵⁰ SARCAN Recycling. "Where does it go?" <www.sarcana.ca/where_does_it_go>

- 151 Manitoba Government, "To Reduce Waste," <www.gov.mb.ca/conservation/climate/what_you_can_do/reduce_waste.html>
- 152 Reclay StewardEdge. 2015. Price Sheet: Ontario Market Price Trends for December 2015. <<http://reclaystewardedge.com/wp-content/uploads/2013/05/Dec-2015-Ontario-Price-Sheet.pdf>>
- 153 National Association for PET Container Resources (NAPCOR). 2015. "Report on Postconsumer PET Container Recycling Activity in 2014," <www.napcor.com/pdf/NAPCOR_2014RateReport_FINAL.pdf>
- 154 Reclay StewardEdge. 2015. Price Sheet: Ontario Market Price Trends for December 2015. <<http://reclaystewardedge.com/wp-content/uploads/2013/05/Dec-2015-Ontario-Price-Sheet.pdf>>
- 155 Ibid.
- 156 Ibid.
- 157 Ibid.
- 158 Ibid.
- 159 Ibid.
- 160 "Pouches get popular," 18 April 2010. *Canadian Plastics* <www.canplastics.com/news/pouches-get-popular/1000368256/?&er=NA>
- 161 PACNext. December 2014. "Top 10 Packaging Challenges for Recycling in a Material Recovery Facility." <www.pac.ca/assets/pac-next_top10mrf-finalcompressed.pdf>
- 162 Based on a conversation with a contact at Atlantic Packaging.
- 163 As You Sow. 2015. "Waste & Opportunity 2015: Environmental Progress and Challenges in Food, Beverage, and Consumer Goods Packaging." <www.nrdc.org/business/files/consumer-goods-packaging-report.pdf>
- 164 Aluminum Stewardship Initiative. "About Aluminum." <<http://aluminium-stewardship.org/about-asi/aluminium-and-sustainability/>>
- 165 Encorp Pacific (Canada). Stewardship Plan 2014-2018. <www.return-it.ca/cfm/index.cfm?It=100&Id=112&Se=2&Lo=2&AF=100&AA=Download&AD=112,Df1>
- 166 As You Sow. 2015. "Waste & Opportunity 2015: Environmental Progress and Challenges in Food, Beverage, and Consumer Goods Packaging." <www.nrdc.org/business/files/consumer-goods-packaging-report.pdf>
- 167 As You Sow. 2016 Shareholder Proposal to Dr Pepper Snapple Group. Request: Adopt Beverage Container Recycling Goals. <www.asyousow.org/wp-content/uploads/2016/04/Dr-Pepper-Snapple-2016-Proxy-Memo.pdf>
- 168 National Association for PET Container Resources (NAPCOR). 2015. "Report on Postconsumer PET Container Recycling Activity in 2014," <www.napcor.com/pdf/NAPCOR_2014RateReport_FINAL.pdf>
- 169 Ibid.
- 170 Glass Packaging Institute. 2013. "Glass Facts," <www.gpi.org/recycling/glass-recycling-facts>
- 171 Ibid.
- 172 Bragg, Lynn. 10 June 2015. "Conversation in Commodities" – Glass Recycling Markets & Trends. Indiana Recycling Coalition. PowerPoint Presentation. Glass Packaging Institute. September 2014. "Achieving 50% Recycled Content for Glass Containers." <www.indianarecycling.org/wp-content/uploads/2014/10/Lynn-Bragg-Glass-Packaging-Institute.pdf>
- 173 The Beer Store. 2016. Beer Store Responsible Stewardship 2015-2016 Report. <[www.thebeerstore.ca/sites/default/files/widget/right/2016 Stewardship Report Final PDF-1.pdf](http://www.thebeerstore.ca/sites/default/files/widget/right/2016%20Stewardship%20Report%20Final%20PDF-1.pdf)>
- 174 Morawski, C., and Morris, J. 2011. "Returning to Work: Understanding the Domestic Jobs Impacts from Different Methods of Recycling Beverage Containers," *Container Recycling Institute*. <<http://www.container-recycling.org/assets/pdfs/reports/2011-ReturningToWork.pdf>>
- 175 Ibid.
- 176 The Beer Store. 2012. "85 Years of Environmental Excellence - Responsible Stewardship: 2011-2012 Annual Report." <www.wdo.ca/files/8213/6700/6925/The_Beer_Store_Annual_Report.pdf>
- 177 Gardner Pinfold Consultants Inc. May 2016. "Economic and Environmental Impact of RRFB Nova Scotia's Programs," submitted to Resource Recovery Fund Board. <http://divertns.ca/assets/files/EE_Report_2016.pdf>
- 178 "A return program for wine bottles? Glassworker union supports idea." 9 July 2016. CBC News. <www.cbc.ca/news/canada/montreal/glassworker-union-wants-return-program-1.3671970>
- 179 Owens Illinois, Montreal, QC
- 180 CM Consulting. February 2012. "Understanding the Impacts of Expanding Vermont's Beverage Deposit Return Program." <www.vpirg.org/wp-content/uploads/2015/11/Vermont-Bottle-Bill-Report-February-2012.pdf>
- 181 Gardner Pinfold Consultants Inc. May 2016. "Economic and Environmental Impact of RRFB Nova Scotia's Programs," submitted to Resource Recovery Fund Board. <http://divertns.ca/assets/files/EE_Report_2016.pdf>
- 182 Ibid.

¹⁸³ Summary Review of the Impacts of Container Deposit Schemes on Kerbside Recycling and Local Government in Australia¹⁸³, MRA Consulting Group (prepared for Container Deposit System Operators), February 2016. Report provided by Markus Fraval (Revive Recycling) via e-mail March 24, 2016.

¹⁸⁴ Scope of the study includes Darwin City Council as well as Councils in SA. Population of Darwin in 2016 is estimated at 136,245, while population of S.A. is estimated at 1.712 million. Adding these two together we get 1,848,245 people. Darwin population taken from <<http://australiapopulation2016.com/population-of-darwin-in-2016.html>>, S.A. population taken from <http://australiapopulation2016.com/population-of-south-australia-in-2016.html>

¹⁸⁵ Envision New Zealand Ltd. November 2015. "The Incentive to Recycle: The Case for a Container Deposit System in New Zealand" <www.envision-nz.com/news/2015/11/16/incentive-to-recycle-the-case-for-a-container-deposit-system-in-nz>

¹⁸⁶ Population as of Jan 1, 2016 was 4,512,004 (http://countrysometers.info/en/New_Zealand)

¹⁸⁷ Eunomia Research and Consulting. May 2015. "A Scottish Deposit Refund System." Prepared for Zero Waste Scotland. <www.eunomia.co.uk/reports-tools/a-scottish-deposit-refund-system/>

¹⁸⁸ Estimated population for Scotland is 5,373,000 (<http://www.gov.scot/Topics/People/Equality/Equalities/PopulationMigration>)

¹⁸⁹ Marsden Jacob Associates (prepared for the Department of Primary Industries, Parks, Water and the Environment). April 2014. "Cost Benefit Study of a Tasmanian Container Deposit System." <http://epa.tas.gov.au/documents/marsden_jacob_-_final_report_-_tasmanian_cds_cost_benefit.pdf>

¹⁹⁰ Population of Tasmania estimated at 517,183 in September 2015 ([www.treasury.tas.gov.au/domino/dtf/dtf.nsf/LookupFiles/Population.pdf/\\$file/Population.pdf](http://www.treasury.tas.gov.au/domino/dtf/dtf.nsf/LookupFiles/Population.pdf/$file/Population.pdf))

¹⁹¹ Reclay StewardEdge (prepared for Minnesota Pollution Control Agency (MPCA)). February 2014. "Cost-Benefit Analysis of a Recycling Refund System in Minnesota." <www.pca.state.mn.us/sites/default/files/lrp-rrr-1sy14.pdf>

¹⁹² Minnesota population (2014) estimated at 5,453,218 <www.mn.gov/admin/demography/data-by-topic/population-data/our-estimates/index.jsp>

¹⁹³ Retorna. February 2014. "Executive Summary: Implementing a Deposit and Return Scheme in Catalonia - Economic Opportunities for Municipalities." <www.retorna.org/mm/file/Municipalities_Executive_Summary.pdf>

¹⁹⁴ Population of Catalonia (2015) estimated at 7,508,106 (www.idescat.cat/pub/?id=aec&n=245&lang=en)

¹⁹⁵ Equilibrium (prepared for the Local Government Association of Tasmania). December 2013. "An Assessment of the Potential Financial Impacts of a Container Deposit System on Local Government in Tasmania." <www.lgat.tas.gov.au/webdata/resources/files/CDS_impacts_for_Tasmanian_Local_Government_FINAL_December_2013.pdf>

¹⁹⁶ Population of Tasmania estimated at 517,183 in September 2015 ([www.treasury.tas.gov.au/domino/dtf/dtf.nsf/LookupFiles/Population.pdf/\\$file/Population.pdf](http://www.treasury.tas.gov.au/domino/dtf/dtf.nsf/LookupFiles/Population.pdf/$file/Population.pdf))

¹⁹⁷ Retorna. September 2013. "Executive Summary: Report on the Temporary Implementation of a Deposit and Refund Scheme in Cadaques." <[www.retorna.org/mm/file/Resum_executiu_Cadaques_ENG_SETEMBRE\(1\).pdf](http://www.retorna.org/mm/file/Resum_executiu_Cadaques_ENG_SETEMBRE(1).pdf)>

¹⁹⁸ Population of Cadaques (2015) estimated at 2,840 (www.idescat.cat/emex/?id=170329&lang=en)

¹⁹⁹ DSM Environmental (prepared for Vermont Agency of Natural Resources). March 2013. Comparison of System Costs and Materials Recovery Rates: Implementation of Universal Single Stream Recycling With and Without Beverage Container Deposits – Draft Report. <www.anr.state.vt.us/dec/wastediv/solid/documents/DRAFT-ReportToANR-4MAR2013.pdf>

²⁰⁰ Population of Vermont (2015) estimated at 626,042 (www.census.gov/quickfacts/table/PST045215/50)

²⁰¹ Mike Ritchie & Associates (prepared for Local Government Association of NSW). August 2012. "The Impacts (Cost/Benefits) of the Introduction of a Container Deposit/Refund System (CDS) on recycling and councils." <www.lgnsw.org.au/files/imce-uploads/90/LGSA_CDS_Impact_Study_100812a.pdf>

²⁰² Population of NSW (2016) estimated at 7.64 million (<http://australiapopulation2016.com/population-of-new-south-wales-in-2016.html>)

²⁰³ CM Consulting. February 2012. "Understanding the Impacts of Expanding Vermont's Beverage Container Program." <www.vpirg.org/wp-content/uploads/2015/11/Vermont-Bottle-Bill-Report-February-2012.pdf>

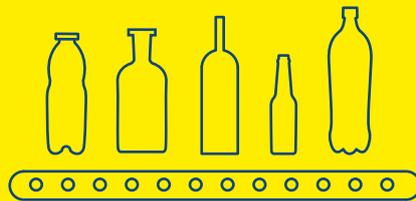
²⁰⁴ Population of Vermont (2015) estimated at 626,042 (www.census.gov/quickfacts/table/PST045215/50)

²⁰⁵ Eunomia Research & Consulting. January 2012. "Examining the Cost of Introducing a Deposit Refund System in Spain." <www.retorna.org/mm/file/Implementing_a_Deposit_Refund_System_in_Spain.pdf>

²⁰⁶ Population of Spain (2016) estimated at 46,070,012 (www.worldometers.info/world-population/spain-population/)

²⁰⁷ Packaging Impacts Consultation Regulation Impact Statement, Standing Council on Environment and Water, December 2011. <www.scew.gov.au/system/files/consultations/c299407e-3cdf-8fd4-d94d-6181f096abc8/files/packaging-impacts-consultation-ris-december-2011.pdf>

- 208 Population of Australia estimated at 24,084,961
 (<www.abs.gov.au/ausstats/abs@.nsf/0/1647509ef7e25faaca2568a900154b63?opendocument>)
- 209 Turning Rubbish into Community Money: The Benefits of a 10cent Deposit on Drink Containers in Victoria, Office of Colleen Hartland MLC, June 2011.
 <www.parliament.vic.gov.au/images/stories/documents/council/SCEP/CDL/Documents/Discussion_Paper.pdf>
- 210 Population of Victoria (2015) estimated at 5,966,700 (<www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0>)
- 211 Eunomia Research & Consulting (prepared for the Campaign to Protect Rural England). September 2010. "Have We Got the Bottle? Implementing a Deposit Refund Scheme in the UK."
 <www.bottlebill.org/assets/pdfs/campaigns/UK-CPRE-2010.pdf>
- 212 Population of UK (2016) estimated at 65,073,585 (<www.worldometers.info/world-population/uk-population/>)
- 213 DSM Environmental (prepared for Massachusetts Department of Environmental Protection). July 2009. "Analysis of the Impact of an Expanded Bottle Bill on Municipal Refuse and Recycling Costs and Revenues."
 <http://massbottlebill.org/files/Impacts_of_EBB_on_Municipal_Recycling.pdf>
- 214 Population of Massachusetts (2015) estimated at 6,794,422 (<www.census.gov/quickfacts/table/PST045215/25>)
- 215 DSM Environmental (prepared for Rhode Island Resource Recovery Corporation). May 2009. "Analysis of Beverage Container Redemption System Options to Increase Municipal Recycling in Rhode Island."
 <www.riirc.org/content/getfile.php?o=document&id=60>
- 216 Population of Rhode Island (2015) estimated at 1,056,298 (<www.census.gov/quickfacts/table/PST045215/44>)
- 217 BDA Group (prepared for the EPHC Beverage Container Working Group). March 2009. "Beverage Container Investigation." <<http://pca.org.au/application/files/4214/3769/1439/00760.pdf>>
- 218 Australia has estimated population of about 24,084,961
 (<www.abs.gov.au/ausstats/abs@.nsf/0/1647509ef7e25faaca2568a900154b63?opendocument>)
- 219 City of Toronto Staff Report: Amendments to Processing Fees Due to LCBO Deposit Return Program, City of Toronto General Manager, Solid Waste Management Services (prepared for Public Works and Infrastructure Committee), October 2008. <www.toronto.ca/legdocs/mmis/2008/pw/bgrd/backgroundfile-17103.pdf>
- 220 City of Toronto's population is estimated at 2.79 million
 (<www1.toronto.ca/wps/portal/contentonly?vgnextoid=dbe867b42d853410VgnVCM10000071d60f89RCRD>)
- 221 Jeffrey Morris (Sound Resource Management Group), Bill Smith (City of Tacoma), and Rick Hlavka (Green Solutions) (prepared for City of Tacoma Solid Waste Management). April 2005. "Economic & Environmental Benefits of a Deposit System for Beverage Containers in the State of Washington." <www.container-recycling.org/assets/pdfs/reports/2004-EconEnviroWA.pdf>
- 222 Population of City of Tacoma (2014) estimated at 205,159
 (<www.census.gov/quickfacts/table/PST045214/5370000>)
- 223 Ibid.
- 224 The Beer Store. 2015. "Responsible Stewardship 2014-2015." <www.thebeerstore.ca/sites/default/files/2014_15 OPS Report-finalweb.pdf>
- 225 BCPVPA Journal. February 2015. <www.bcpvpa.bc.ca/downloads/adminfo_pdf/Feb15AdminfoWeb.pdf>
- 226 "Encorp BC School Recycling Program." <<https://letstalktrashpr.com/sd47/encorp-bc-school-recycling-program/>>
- 227 United We Can. December 2013. "Recycling Centre." <www.unitedwecan.ca/how-we-help/recycling-centre>
- 228 Gardner Pinfold Consultants Inc. May 2016. "Economic and Environmental Impact of RRFB Nova Scotia's Programs," submitted to Resource Recovery Fund Board. <http://divertns.ca/assets/files/EE_Report_2016.pdf>



WHO PAYS WHAT
AN ANALYSIS OF BEVERAGE
CONTAINER COLLECTION
AND COSTS IN CANADA

