

Who Pays What

An Analysis of
Beverage Container
Collection and Costs
in Canada

6TH EDITION



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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 direct communication with the authors 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).

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List of Abbreviations

ABCRC	Alberta Beverage Container Recycling Corporation	PPP	Printed Paper and Packaging
ABCC	Alberta Beer Container Corporation	PVC	Polyvinyl chloride
ADC	Alberta Dairy Council and Atlantic Dairy Council	R2R	Return-to-Retail
AGLC	Alberta Gaming and Liquor Commission	RFF	Recycling Fund Fee
BCDC	British Columbia Dairy Council	RRFB	Resource Recovery Fund Board Inc.
BCMB	Beverage Container Management Board	RVM	Reverse Vending Machine
BDL	Brewers Distributor Limited	SO	Stewardship Ontario
BGE	Boissons Gazeuses Environnement	TBS	The Beer Store (aka Brewers Retail, Inc.)
CBCRA	Canadian Beverage Container Recycling Association	UDRS	Unified Dairy Recycling System
CHF	Container Handling Fee	WDO	Waste Diversion Ontario
CRF	Container Recycling Fee		
CSP	Collection Service Provider		
DRS	Deposit-Return System		
ÉEQ	Éco Entreprises Québec		
EfW	Energy-from-Waste		
EHC	Environmental Handling Charge		
GJ	Gigajoule		
HDPE	High-density polyethylene		
IC&I	Industrial, Commercial, and Institutional		
IFO	Industry Funding Organization		
ISO	International Organization for Standardization		
ISP	Industry Stewardship Plan		
IWMC	Island Waste Management Corporation		
LCBO	Liquor Control Board of Ontario		
LDB	Liquor Distribution Branch		
LLDPE	Low-density polyethylene		
MEBCalc™	Measuring the Environmental Benefits Calculator		
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		
NewBRI	Newfoundland Beverage Recovery Inc.		
OI	Owens-Illinois		
PER	Processing Efficiency Rate		
PET	Polyethylene terephthalate		

Province Short Codes

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

Who Pays What?

An Analysis of Beverage Container Collection & Costs in Canada

A Primer

In 1970, British Columbia became the first jurisdiction in Canada to implement a deposit-return system for soft drink cans and bottles. The system was based on a return-to-retail (R2R) model, with deposits and refunds being managed by retailers and brandowners. Since then, nearly all provinces in Canada have followed suit, introducing programs aimed at increasing the collection and recycling of used beverage containers. In 2012, Canadian provinces collected approximately 70% of all the non-refillable beverage containers sold. (All data in this report is based on calendar or fiscal year 2012-2013 or 2012).

With the goal of documenting these collective efforts and offering valuable insight into the field of beverage container recycling, CM Consulting released *Who Pays What: An Analysis of Beverage Container Collection and Costs in Canada* in 2002, a comprehensive review and analysis of beverage container reuse and recycling initiatives across Canada. Meant to be an evolving document, the report is published bi-annually and has proven to be an invaluable tool and reference guide for government as well as professionals in the beverage industry and recycling field.

This sixth edition of *Who Pays What*[™] includes a number of revisions, including new sections on collection and recycling rates that account for contamination, best practices for preventing and mitigating deposit fraud, policies to encourage the use of recycled content, and an examination of new technology and methods to improve system cost efficiencies. Also new in this edition is a section on 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 resource 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 the costs of these programs, how they are performing, and who is ultimately responsible for program 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 beverage container recycling programs in Canada grow and evolve, CM Consulting looks forward to continuing to provide the most updated and comprehensive information on these initiatives, their effectiveness, and costs.

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 and suggestions that might make the report more helpful to you in the future.

Respectfully Yours,

Clarissa Morawski, Principal

Executive Summary

Objectives and Content of this Report

Twelve years ago, CM Consulting released *Who Pays What: An Analysis of Beverage Container Collection and Costs in Canada*, a first-of-its-kind report that takes an in-depth look at beverage container reuse and recycling initiatives across Canada. Published bi-annually, *Who Pays What*TM is embraced as an essential resource for government as well as professionals in the beverage industry and recycling field.

Now in its sixth edition, *Who Pays What*TM is recognized as the defining text in the field of beverage container recycling in Canada and brings together current data on collection rates, program costs, performance measurements, and environmental benefits of container recycling and reuse. This edition features new and updated content, which reflects on the latest developments in the field of beverage container recycling in Canada. New sections include those on collection and recycling rates that account for contamination, best practices for preventing and mitigating deposit fraud, policies to encourage the use of recycled content, and an examination of new technology and methods to improve system cost efficiencies. Also new in this edition is a discussion on the economic benefits of deposit-return to municipalities.

Performance Measurement

Typically, performance is measured using the **collection rate**, which represents the percentage of beverage container material (by weight or by unit) placed on the market in a given jurisdiction (excluding exports) that is shipped to the recycler by the primary processor (i.e. MRF). Measuring the performance of a deposit-return system (DRS) using the collection rate is fairly simple, since the refund provides an opportunity to track sales and collections to the last unit. Measuring the performance of multi-material collection systems, on the other hand, is much more complex since these programs collect beverage containers along with other, non-beverage containers. To determine the collection rate for containers collected in multi-material programs (like

those in Manitoba, Ontario, and Québec for non-carbonated beverages), it is necessary to extract the beverage containers (by weight) from everything else that gets shipped to market, such as plastic ketchup bottles, glass pickle jars, and aluminum food tins.

Adding to this complexity is the fact that the collection rate usually represents the *weight* of beverage containers sent for recycling, as opposed to the number of *units*. This is problematic when one considers the growing issue of contamination. 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. If the weight of contaminants is not removed from the reported collection rate, the rate will be inflated. In view of this, it is important that program operators start reporting the **recycling rate** (the amount of beverage container material recycled as a percentage of the amount of beverage container material placed on the market in that jurisdiction and not just what is collected for recycling).

This requires applying the **processing efficiency rate** (PER) to the collection rate. The PER is the amount of beverage container material received by the recycler that is used in the recycling process expressed as a percentage of the amount of material shipped to the recycler. It is important to note that this procedure is required only for collection rates that are measured and reported in weight. 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. 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.

Key Findings

Beverage Container Collection Rates for 2012

Refillable Beer Bottles

Despite the dramatic decline in the use of refillable containers, Canada’s collection rate for refillable beer bottles has been consistently high (97% nationally).

Non-refillable Containers

Non-refillable containers typically include aluminum or steel cans, and PET bottles. Figure ES.1 provides a summary of provincial collection rates for all non-refillable beverage containers in 2012, highlighting deposit versus non-deposit return programs. It is clear that provinces with deposit-return programs collect significantly more beverage containers for recycling.

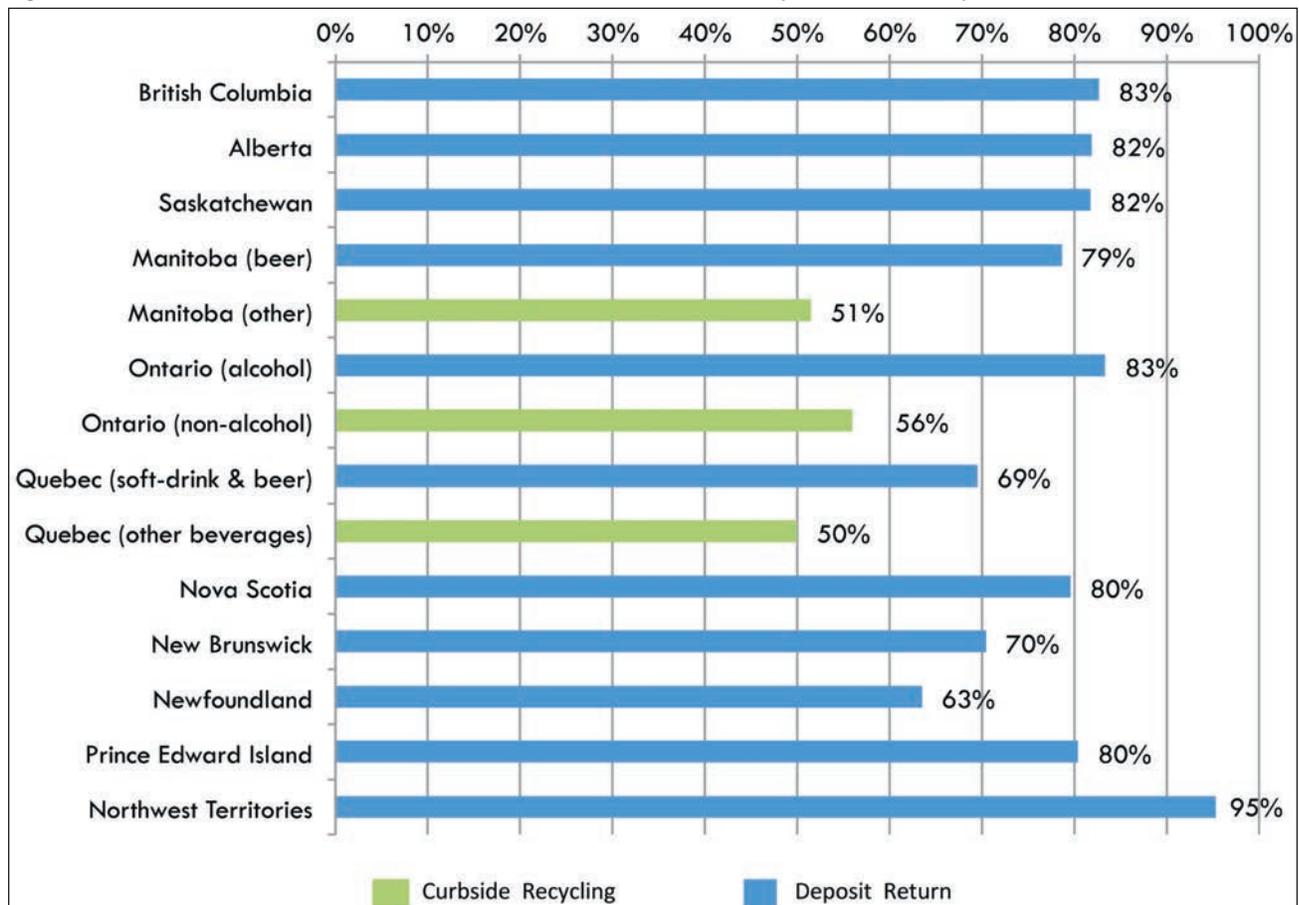
Environmental Benefits of Reusing and Recycling Beverage Containers

In 2012, Canada recycled and/or reused over 12 billion beverage containers. This level of recycling eliminated the release of over a million tonnes of greenhouse gas emissions, and is equivalent to taking over 200 thousand cars off the road.

What’s New?

The field of beverage container recycling in Canada is always evolving. Since the last edition of *Who Pays What™* was published in 2010, there has been some important updates and changes to provincial programs, from greater levels of automation to enhanced public space recycling. The most noteworthy of these new developments are described below.

Figure ES.1 Provincial Collection Rates – Non-Refillable Containers: Deposit vs. Non-Deposit



Alberta Depots First in Canada to Adopt Automated Counting and Sorting Technology

In June 2012, Alberta became the first province in Canada to adopt automated sorting and counting technology. The European manufactured equipment was successfully piloted at two bottle depots – one in Grande Prairie and the other in Edmonton – and will soon be installed at depots in St. Albert and Fort McMurray. Among other benefits, the technology has led to reduced wait times and more accurate refunds for customers. Depot owners have also seen lower direct labor costs as a result.

Goodbye to the Penny

On February 4, 2013, the Royal Canadian Mint stopped producing and distributing pennies to financial institutions. It is too early to know how the elimination of the penny will affect the costs to consumers that purchase beverages on an individual basis where different consumer fees worth pennies are charged. Typically, retailers apply a “round-up” or “round-down” rule to the net cost, but there is little information on how and if this will balance out for consumers in the end.

In Saskatchewan, SARCAN Recycling was forced to restructure its deposit-return system to eliminate penny pricing. Previously, SARCAN had offered a 1-cent refund for cans purchased outside of Saskatchewan. Other out-of-province containers, including those made out of glass or plastic, have never received any type of refund. This is now the case for all out-of-province containers, including aluminum cans. With the discontinuation of the penny, SARCAN was also unable to provide a 4-cent refund on beer bottles. Therefore, as of February 2013, the refund on refillable beer bottles has increased to 5-cents.

Away-from-home Collection

Knowing the amount of beverage containers that are consumed and discarded away-from-home (AfH) is critical to determining accurate collection rates and designing effective recovery programs. While the majority of beverages are still consumed in households (50-70%), it is estimated that anywhere

between 30-50% of beverages are consumed AfH, in areas where recycling services may not be available. In an effort to increase the recycling of such containers, various initiatives led by both government and the beverage industry have been sprouting across the country. Examples include the Canadian Beverage Container Recycling Association’s (CBCRA) “Recycle Everywhere” program in Manitoba, *La Table pour la récupération hors foyer* in Québec, and “Go Recycle,” a public spaces recycling program launched by the City of Richmond and the beverage industry in British Columbia.

CBCRA Files an Industry Stewardship Plan (ISP) with Waste Diversion Ontario

In September 2013, the CBCRA submitted an industry stewardship plan (ISP) to Waste Diversion Ontario (WDO) to operate an approved recycling program in Ontario for empty non-alcoholic, non-dairy beverage containers. These containers are currently collected through the residential Blue Box recycling program. Upon approval of this plan, the CBCRA hopes to expand on the existing Blue Box program to increase the collection and recycling rates for used beverage containers from households. In addition, it expects to benchmark and increase the collection and recycling of beverage containers consumed away-from-home (AfH). One way the CBCRA plans to achieve this is by supplying recycling bins free-of-charge to municipalities, government buildings, businesses and private sector service providers across Ontario.

New Québec Government Backtracking on Previous Government’s Decision to Increase Deposits

In July 2012, Québec’s Environment Minister released a five-year strategic plan for Recyc-Québec. Part of this plan was to increase the value of the deposit on all deposit-bearing cans, PET and glass containers for beer, soft drinks, and some energy drinks from 5- to 10-cents by the end of 2012. This plan was shelved when the PQ government won the 2012 election. The Liberals have since returned to power in Québec and it is unclear if there will be any changes to the deposit system for carbonated beverages.

Consignment Cancelled in Québec

On March 28, 2014, BGE officially announced the cancellation of CONSIGNaction – a program launched in 2008 aimed at increasing the collection of deposit containers consumed away-from-home (AfH). The program offered a free pick-up service to convenience stores, restaurants, schools, golf courses, offices, events, and others in the IC&I sector that generate large amounts of empty containers from on-site beverage consumption.

Nova Scotia Compaction Trailer Pilot Project

In July 2012, Resource Recovery Fund Board (RRFB) Nova Scotia introduced a new compaction trailer for beverage containers and began a two-year pilot project at 18 high-volume Enviro-Depots in Halifax Regional Municipality. The compaction trailer transports more than five times as many beverage containers in one load than is currently possible. In addition to saving time and reducing greenhouse gases, the trailer has already reduced costs by over \$120,000 annually.

Best Practices in Beverage Container Collection

Drop and Go

In an effort to simplify and make the redemption process more convenient for consumers, several North American jurisdictions have introduced a system whereby customers fill up pre-labelled bags with deposit containers and drop them off without the need for waiting, sorting, counting, or feeding the machines. Within 48 hours of dropping off containers at a designated location, the refund is credited to the customer's online account. Two examples of these systems are EZ-Drop in Oregon and CLYNK in Maine.

Reverse Vending Machines (RVMs)

In addition to depots and return-to-retail systems, another approach for collecting beverage containers for recycling is the use of reverse vending machines (RVMs). RVMs are commonplace in Europe and are usually located in grocery stores and other retail locations where beverages are sold. To receive their deposit refund, consumers place their empties into the machine where they are scanned, sorted by material type, and processed into separate bins.

Minimizing and Preventing Deposit Fraud

Despite Canada's success in becoming a global leader in the field of beverage container recycling, its programs – as with all systems that deal with large sums of money – will always be exposed to the risk of fraud. However, like any other business or operation, the risk of fraud can be identified, managed, and reduced. In this report, CM Consulting presents a list of best practices for preventing deposit fraud.

Economic Benefits of Deposit-Return Systems

Deposit-return systems for beverage containers create significantly more – 11 to 38 times more – jobs than curbside recycling. Together, The Beer Store (TBS) deposit system and the Ontario Deposit Return Program (ODRP) are responsible for creating approximately 500 direct jobs.¹ According to a recent study, Nova Scotia's deposit-return program creates approximately 600 jobs and \$20.1 million in salaries and wages.² Deposit-return programs also result in significant cost savings for municipalities. These savings come from the reduced or avoided costs of collection, treatment, and disposal. Following the introduction of the ODRP in 2007, the City of Toronto reported a net savings to the City's curbside program of \$448,000 in 2007 and \$381,000 in 2008.³

Part I: 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.

While measuring the performance of beverage container recycling programs may seem straightforward, in fact it is quite complex. 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. The complexity lies in the fact that not all containers are beverage containers.

Measuring the performance of a deposit-return system (DRS) is fairly simple, since the refund provides an opportunity to track sales and collections to the last unit. Multi-material collection systems, on the other hand, make measurement more difficult since beverage containers are collected commingled with other containers, making it impossible to know exactly how many beverage containers were collected.

The tricky part when trying to determine the collection rate for containers collected in multi-material programs like those in Manitoba, Ontario, and Québec (for non-carbonated beverages) is extracting the beverage containers (by weight) from everything else that gets shipped to market, such as plastic ketchup bottles, glass pickle jars, and aluminum food tins. A PET bale, for example, includes PET from non-bottle sources, like the PET thermoform containers used to package fruits and vegetables. Adding to the complexity is the fact that in multi-

material programs, the collection rate typically represents the weight of beverage containers shipped from the primary processor or sorter to the recycler (e.g. to PET reclaimers, glass beneficiators, or aluminum smelters), as opposed to the number of units collected for recycling.

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

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 of incoming materials. 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 32.2% for PET bottles recovered via single-stream

collection methods; this is significantly higher than 24.4% for deposit bottles.⁴

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 1.1 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 programs decrease as the level of contamination increases.

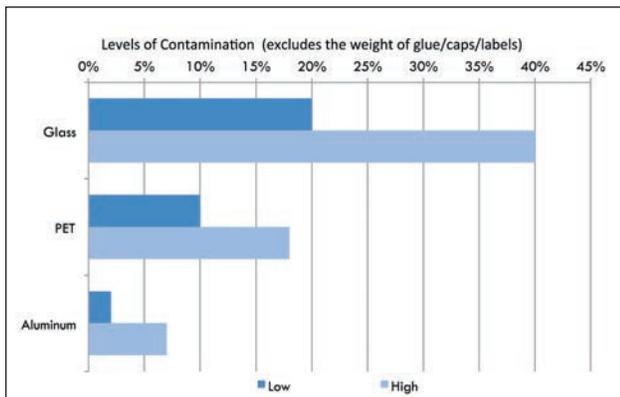
Knowing the PER (i.e. the contamination level) is critical for accurate performance measurement because it provides information on what was actually recycled – not on the material that was sent to disposal after secondary processing. To determine reasonable estimates of PERs, CM Consulting considered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

Figure 1.1 presents typical contaminant rates (low and high) that are common in today’s loads shipped from primary processors (i.e. material recycling facilities).

Table 1.1 Definitions of Different Rates

Collection Rate (CR)	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. <i>Note:</i> If material is measured by weight, the weight of caps, labels, and glue should be considered in both the numerator and denominator.
Processing Efficiency Rate (PER)	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.
Recycling Rate (RR)	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.

Figure 1.1
Contamination Rates from Multi-Material Collection



Material-specific Collection and Recycling Rates

Collection rates for beverage containers are reported annually on a province-by-province basis. The method for measuring collection in deposit-return jurisdictions (e.g. British Columbia, Alberta, Nova Scotia) is straightforward: the collection rate is determined by dividing the number of units returned by the number of units sold in that year. Determining a collection 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

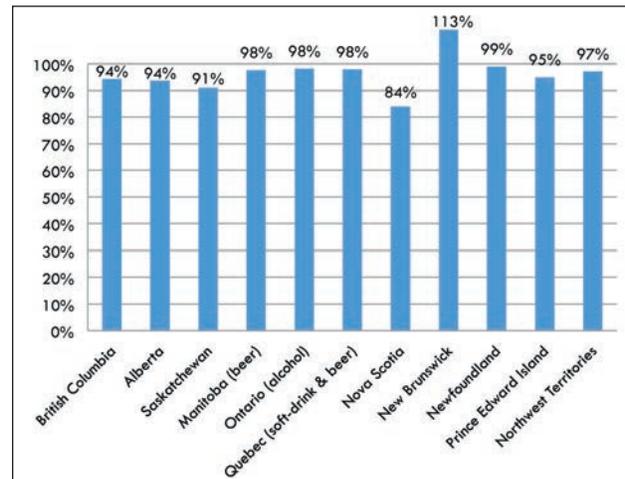
Provincial operating agencies and the Canada's National Brewers are responsible for monitoring the collection rates for refillable beer bottles. The collection rate for these bottles has a considerable influence on the trippage rate, which, in turn, determines the environmental benefit to be gained from 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 collection rate for these containers has been consistently high. Figure 1.2 summarizes the

collection rates for refillable beer bottles collected through brewer-run provincial programs in fiscal year 2012. 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 rates for these containers are not reported and so are not available to the public.)

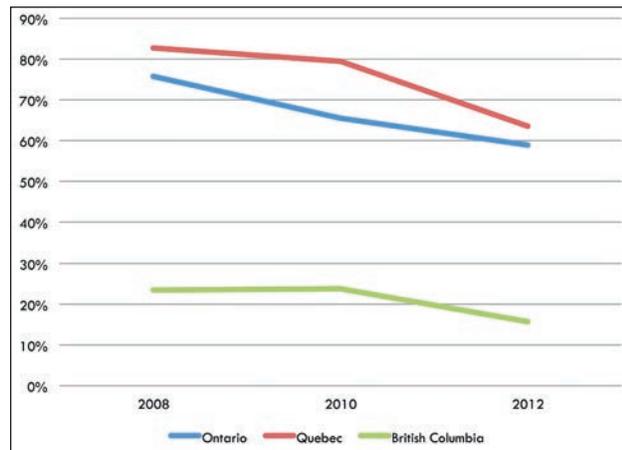
Figure 1.2
Provincial Collection Rates - Refillable Beer



The Decline in Refillable Beer Bottles

Historically, the majority of beer sold in Canada has been sold in Canada's National Brewers' Industry Standard Bottle (ISB). However, in recent years there has been a dramatic decline in the use of such refillable containers. The greatest decline has occurred in Québec (see Figure 1.3), where the market share of refillable beer bottles has dropped from 83% in 2009 to 64% in 2012. Ontario and B.C. have experienced similar declines. From 2008 to 2012, Ontario's market share for the ISB dropped from 76% to 59%. During the same time period in B.C., the percentage of beer sold in ISBs dropped from 23% to 16%. Other countries such as the United Kingdom, U.S., New Zealand and Australia have witnessed a similar decline in refillables.

Figure 1.3
Market Share of Beer in Refillable Glass Bottles



The reasons for the decline of the refillable beer bottle are varied. They include, among others, changes in the relative costs of container materials (aluminum and plastic), a shift to lighter packaging, and a change in consumer preference and behavior. Cans are becoming the container of choice for beer drinkers in Ontario and Québec, where the ISB is most common. There is an increase in 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 typically include aluminum or steel cans, and PET bottles. These are collected at higher rates in jurisdictions that have deposit-return. For example, B.C. and Alberta show non-refillable collection rates of 83% and 82%, respectively, in 2012. In contrast, Ontario's non-refillable collection rate was 59%. These rates are also significantly higher than in Manitoba, where the collection rate is only 51%.

The following charts provide summaries of collection rates for each of the non-refillable beverage container categories across Canada. Entries of "N/A" indicate that data for that category is either not available or not applicable for that province.

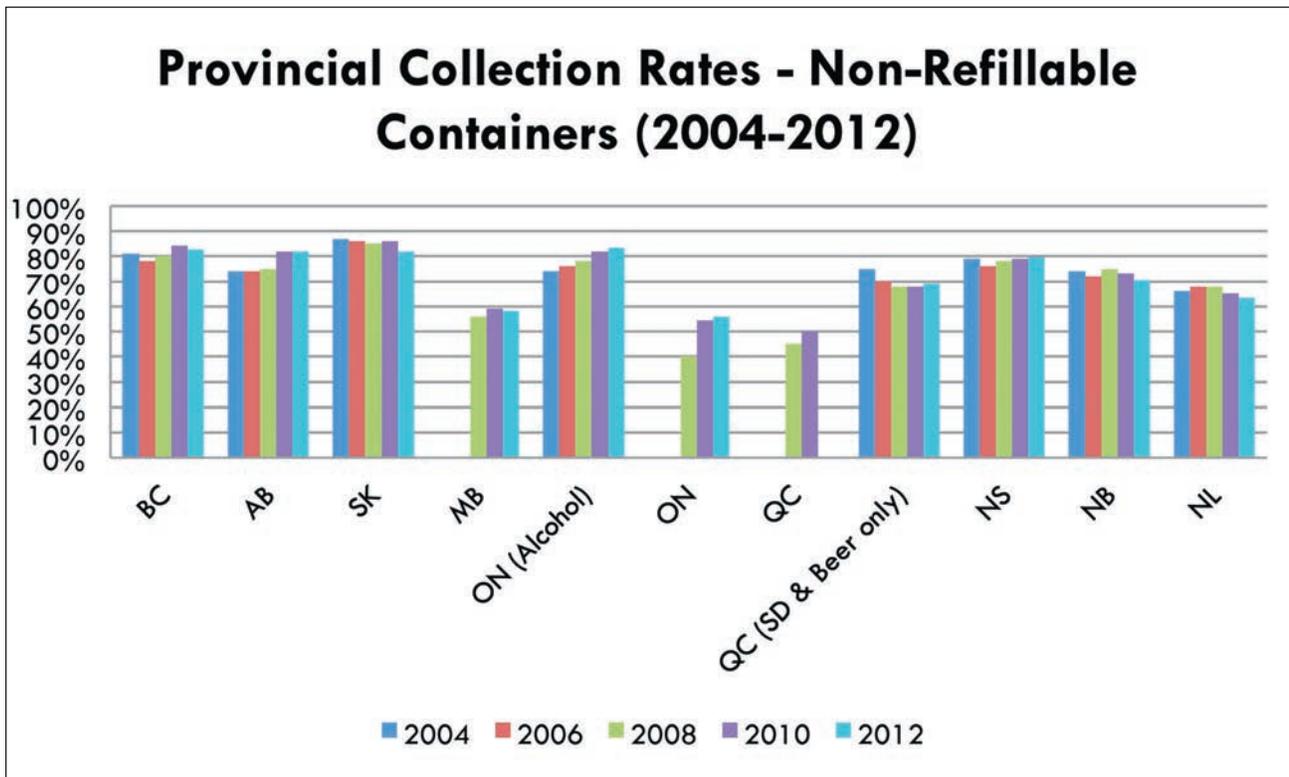
Table 1.2 shows collection rates for the different types of non-refillable containers collected through the provincial programs in 2012. This Table clearly shows the difference in performance between deposit jurisdictions (with relatively high rates of return) and non-deposit jurisdictions (with relatively low rates of return).

Figure 1.4 shows provincial collection rates for non-refillables from 2004 to 2012. The greatest increase can be seen in Alberta, where the collection rate rose from 75% in 2008 to 82% in 2012. This is likely attributable to the deposit hike in 2009.

Table 1.2 Provincial Collection Rates - Non-Refillable Containers

	British Columbia	Alberta	Saskatchewan	Manitoba (beer)	Manitoba (other)	Ontario (alcohol)	Ontario (non-alcohol)	Quebec (soft-drink & beer)	Quebec (other beverages)	Nova Scotia	New Brunswick	Newfoundland	Prince Edward Island	Northwest Territories
Aluminum Cans	88%	88%	87%	79%	61%	82%	60%	67%	-	84%	71%	66%	85%	100%
Non-Refillable Glass	94%	90%	87%	N/A	55%	89%	N/A	83%	73%	81%	83%	64%	66%	90%
PET Bottles	75%	76%	79%	-	51%	52%	50%	74%	47%	80%	72%	74%	84%	95%
Other Plastics	75%	76%	79%	-	N/A	-	59%	-	-	48%	66%	24%	-	95%
Bi-Metal	61%	82%	87%	-	56%	-	64%	-	-	93%	-	44%	-	55%
Gable/Tetra Pak/BIB	56%	68%	49%	-	18%	30%	30%	-	43%	59%	47%	45%	68%	67%
Total Non-Refillables	83%	82%	82%	79%	51%	83%	56%	69%	50%	80%	70%	63%	80%	95%
Refillable Beer	94%	94%	91%	98%	-	98%	-	98%	-	84%	113%	99%	95%	97%
Total containers	83%	83%	83%	84%	51%	90%	56%	81%	50%	80%	76%	73%	82%	95%

Figure 1.4 Provincial Collection Rates – Non-Refillable Containers



Aluminum Cans

Figure 1.5 presents 2012 aluminum can collection and recycling rates by province. As with all non-refillables, provinces with deposit-return programs in place show considerably better collection rates than those without.

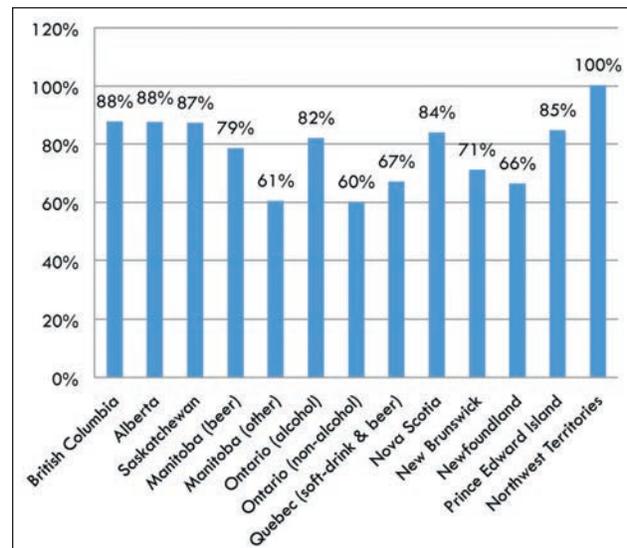
For example, B.C. and Alberta, both of which have deposits on aluminum cans, have collection rates of 88% – the highest collection rates for aluminum cans in Canada.

Despite being down from 95% in 2004, Saskatchewan’s collection rate is also high at 87%.

Québec’s collection rate for aluminum cans is 67%. Compared to other deposit jurisdictions, which generally have collection rates of between 80% and 90%, 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 (beer and soft drinks) carry a deposit. Aside from lowering performance, this creates confusion for consumers.

Figure 1.5 Provincial Collection Rates - Aluminum Cans



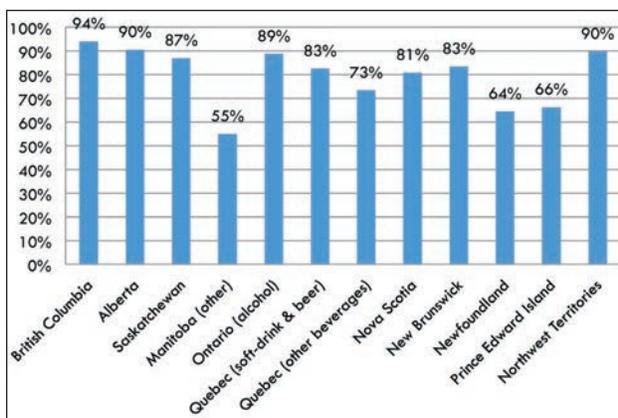
When comparing these rates, it is important to consider the different deposit values placed on beer cans versus non-alcoholic beverage cans in each province. In B.C., for example, while beer cans carry a 10-cent deposit, the deposit on non-alcoholic beverages is only 5-cents. This difference may help explain why the collection rate for beer cans is 93%, eleven percentage points higher than the 82% rate for non-alcohol cans in that province.

The greatest difference between beer can and non-alcoholic beverage can collection rates is seen in Manitoba and Ontario. In both of these provinces, beer cans are subject to a 10-cent deposit, while all non-alcoholic beverage cans are recovered through municipal curbside recycling systems.

Non-Refillable Glass

Figure 1.6 presents provincial collection rates for non-refillable glass bottles in 2012. As with other types of beverage containers, provinces with deposit-return show the highest collection rates for non-refillable glass. The province with the highest collection rate for this material is British Columbia at 94%.

Figure 1.6 Provincial Collection Rates – Non-Refillable Glass

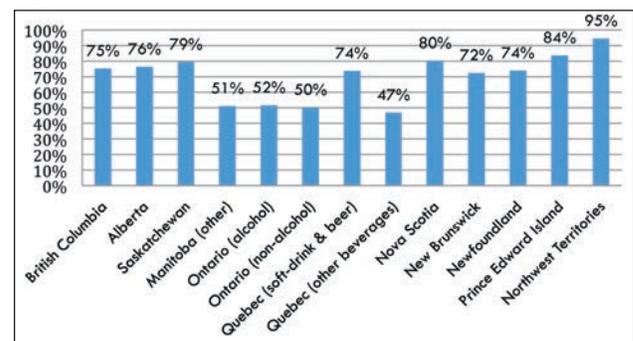


PET Bottles

Figure 1.7 shows provincial collection rates for PET bottles in 2012. In most provinces, PET bottles show a lower collection rate than aluminum cans and glass bottles.

Like the other materials, PET containers are collected at a higher rate in the deposit provinces. Nova Scotia, PEI and NT show the highest collection rates. At the other end of the spectrum is Québec, with a collection rate of 47%. The effect of using the Processing Efficiency Rate to calculate the Recycling Rate shows that contamination in the curbside streams reduces the overall amount of PET recovered for recycling even further.

Figure 1.7 Provincial Collection Rates – PET Bottles



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

Overall, the collection rates for gable top and Tetra Pak cartons, bi-metal cans, and other plastics are on the rise. Figures 1.8, 1.9, and 1.10 show 2012 collection rates for these materials in provinces that report them.

The highest collection rate for gable top and Tetra Pak cartons was shown in Alberta and Prince Edward Island. Both provinces recovered these containers at a rate of 68%.

With respect to bi-metal cans, Nova Scotia had the highest collection rate at 93%. For the 'other plastics' category, which includes bottles made from resins other than PET, or in some provinces PET or HDPE, collection rates were between 24% and 95%. (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 collection rates year over year.)

Figure 1.8 Provincial Collection Rates – Gable Top and Tetra Pak Containers

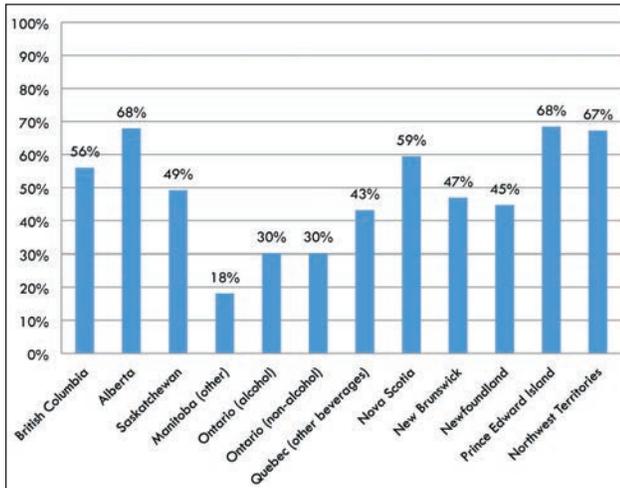
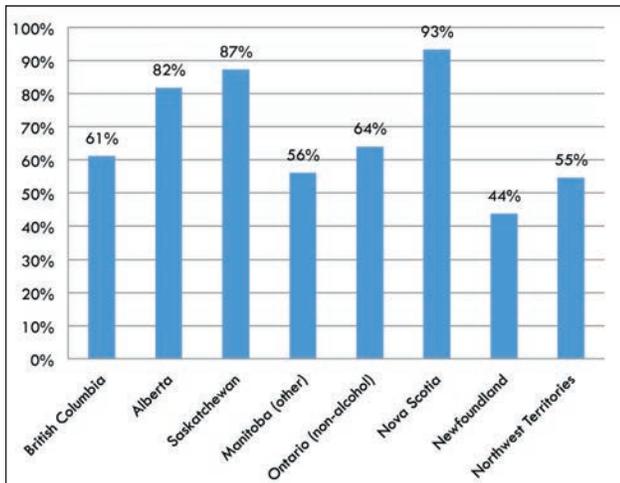


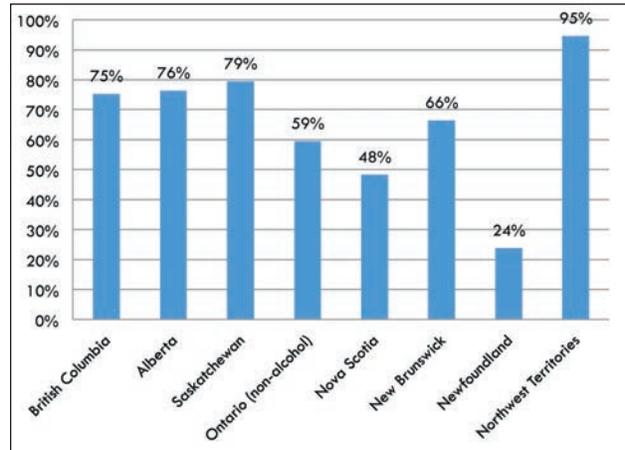
Figure 1.9 Provincial Collection Rates – Bi-Metal Cans



Milk Containers

Depending on the province, collection rates for milk container packaging are measured in different ways. In some provinces collection rates are based on data from waste audits, while in others they are based on actual unit sales and collection data. In some cases, collection 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.

Figure 1.10 Provincial Collection Rates – Other Plastics



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

In the first 6 months of 2012, B.C. collected 340,121 kg of plastic milk jugs and polycoat milk containers, an increase of over 50,000 kg from 2010 levels, and more than double what was recovered in the first half of 2008.

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

While the Northwest Territories reports milk containers alone, it does not separate HDPE and polycoat milk containers. Large milk containers with a 25-cent refundable deposit are collected at a rate of 90%, while smaller milk containers with a 10-cent refundable deposit are collected at a rate of 49%.

In 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 collection

rate specific to beverage containers. The same can be said for milk container collection rates in the provinces of P.E.I. and New Brunswick.

While Nova Scotia also collects milk containers via curbside recycling, specific collection rates are 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 compared to when the program began in 2000. Now, in 2012-2013, the ADC states that the collection rate for gable top cartons and HDPE milk jugs is 70.5%.



Part 2: Away-from-home Recycling

Table 2.1 Examples of Away-from-home (AfH) locations where beverage containers are consumed and discarded

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

Today’s beverage market is packed with convenience items, grab-and-go packages, and single-serve containers that weren’t around when curbside recycling programs were first conceived in the late 1980s. Single-serve 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” – at places like sports stadiums, concerts and parades, colleges and universities, parks, convention centers, restaurants and gas stations – is on the rise (see Table 2.1).

How Much is Generated Away-from-home?

While the majority of beverages are still consumed in households (up to 50-70%), it is estimated that anywhere between 30-50% 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 collection rates and designing effective collection 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.⁵ 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 collection rate for container collection from AfH locations. Table 2.2 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 2.2 Estimated Away-from-home (AfH) beverage container market share

Source	Study Methodology	Away-from-home beverage container market share (%)
IPSOS Study conducted in Ontario for CBCRA in 2012 ⁶	Not available to the public	<i>By container type</i> Aluminum cans: 28% PET: 28% HDPE: 20% Glass: 28% Gable top cartons: 10% All beverage containers: 26% (estimated range is between 15 and 30%)
<i>Understanding Beverage Container Recycling: A Value Chain Assessment, 2002</i> , prepared by R.W. Beck, in collaboration with Franklin Associates, Tellus Institute, Boisson & Associates, and Sound Resource Management	Figures for PET and aluminum are based on carbonated soft-drink point of sale data from Container Consulting Inc. (assumed to be indicative of alcoholic and non-carbonated beverages). Sales at vending machines, venues, and convenience stores are assumed to be consumed away-from-home, while sales at food stores are assumed to be consumed at home. Figures for glass are R.W. Beck estimates based on an understanding of the types of beverages packaged in glass.	<i>By container type</i> Aluminum cans: 13% PET: 63% Glass: 34%
American Beverage Association (ABA) report	Not available to the public	All beverage containers: 30-34%
<i>Mise en Marché et Récupération des Contenants de Boissons au Québec</i> prepared by Francois Lafortune	Based on methodology used for 2002 report by R.W. Beck (see above)	<i>By beverage type</i> Milk containers: 5% Soft-drink containers: 17% Juice containers: 22% Wine/spirits containers: 22% Water bottles: 50%
<i>Australian Beverage Packaging Consumption, Recovery and Recycling Quantification Study, 2008</i> , prepared by Clare Davey	Based on sales data. Containers purchased at grocery stores were considered to be consumed at-home. The difference between at-home sales and total sales is assumed to represent containers consumed away-from-home.	<i>By container type</i> Glass: 25% Aluminum: 25% Plastic: 45%

Existing Initiatives to Enhance Away-from-home Collection

For jurisdictions that do not have a deposit-return system (DRS) in place, establishing a comprehensive away-from-home (AfH) program in conjunction with a residential curbside collection program (single-family and multi-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 away from people's residences – especially those served in single-serve containers – various initiatives have been sprouting around the country.

Manitoba

Created and administered by the Canadian Beverage Container Recycling Association (CBCRA), Recycle Everywhere is Canada's first province-wide AfH beverage container recycling program. Formed in April 2010 by beverage producers and distributors, the CBCRA is a not-for-profit, industry-funded organization with a goal to achieve the Government of Manitoba's target of recovering 75% of all beverage containers sold in the province by 2016.

The program provides recycling bins free of charge to municipal, IC&I, sporting venues and event partners 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 36). 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. As of March 2014, over 20,000 Recycle Everywhere bins were placed in 185 communities. Currently, 368 schools and post-secondary institutions across Manitoba have Recycle Everywhere bins.⁷

Since the program began, the collection rate for beverage containers has increased from 42% in 2010, to 49% in 2011 and 53% in 2012 (by weight).⁸ The goal for 2013 is a 61% collection rate, which CBCRA expects to reach. The CBCRA is hoping to launch a similar program in Ontario, and filed an industry

stewardship plan (ISP) with Waste Diversion Ontario (WDO) in July 2013 to do so.

Québec

With the objective of optimizing the AfH collection of recyclable materials, industry created La Table pour la recuperation hors foyer in 2007 (The Issue Table for Out-of-Home Recycling). Launched in June 2008, the Table's AfH recycling program extends across Québec, and initially focused on two sectors: 1. municipal public areas and 2. restaurants, bars and hotels. Several pilot projects have been implemented, including some at service stations.

To date, the Table's program has led to the installation of 7000 multi-material recycling bins at over 3000 restaurants, bars and hotels. In June 2012, the Table released a three-year report documenting the results of its activities. The findings show that dedicated recycling bins combined with effective signage can increase collection rates for beverage containers. Depending on the location of the pilot, average collection rates varied from 52% to 81%.⁹

British Columbia

B.C.'s first public spaces recycling program "Go Recycle!" started off as a pilot project in 2011. Launched in the City of Richmond by the Canadian beverage industry, the pilot included over 80 strategically placed new bins, and specially designed instructional and promotional signage.¹⁰ 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%.¹¹ 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

Similar pilot projects have taken place in Ontario (Sarnia and Niagara Region), Nova Scotia (Halifax) and in Alberta (Calgary). Consistent with other studies, the Sarnia study found that in the

convenience stores, parks, and arenas where bins were placed and monitored, the collection rate for beverage containers was between 73% and 77%. Follow-up audits in the Niagara study showed collection rates to be an average of 65% – a 35% increase over baseline levels. The Halifax study

generated even more promising results. By placing bins and signage along the Halifax Harbourwalk, the pilot project collected approximately 95% of all containers discarded in the area.

Share of Beverage Containers Discarded Away-from-home in Deposit vs. Non-deposit Jurisdictions

While each of the pilots showed that collection 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, a city where all beverage containers bear a deposit, and Sarnia and Niagara, 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 total waste stream (PET beverage containers alone represented over 8% of the waste stream in each of the Ontario 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% (by weight) of the total waste stream (Figure 2.1).

When looked at 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 2.2). This data demonstrates that where deposit programs exist, beverage containers make up only a small portion of the AfH waste and recycling stream.

Figure 2.1 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)

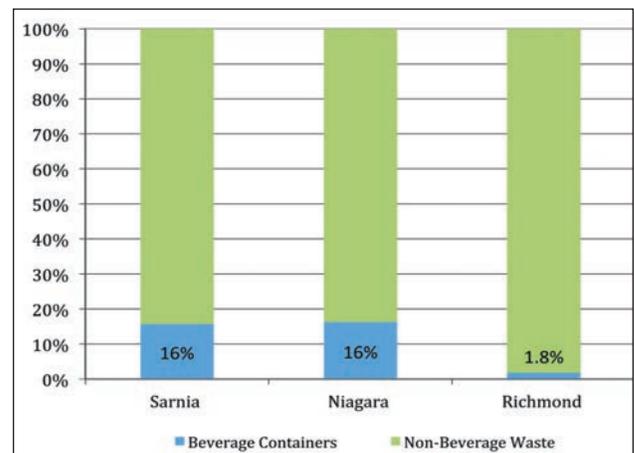
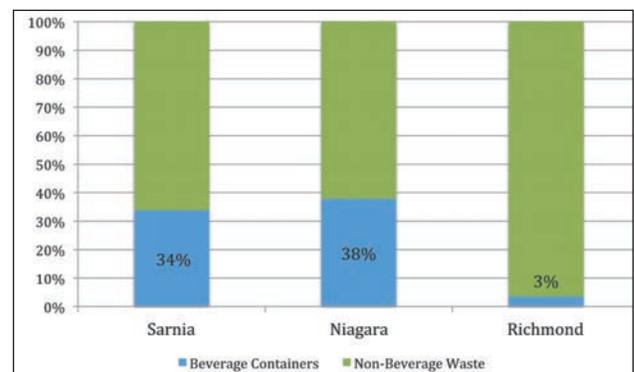


Figure 2.2 PET & Aluminum Beverage Containers as a Percentage (by volume) of Total Combined Waste and Recycling Streams in Away-from-home Locations - Non-Deposit Jurisdictions (Sarnia and Niagara, Ontario) vs. Deposit Jurisdictions (Richmond, BC)



Who Pays for Away-from-home Recycling?

As is the case with curbside collection and deposit-return programs, AfH recycling is not without costs. Primary cost drivers for AfH collection programs include the costs of recycling bins, new collection vehicles and/or modifications to existing vehicles, and hauler fees.

In general, the costs associated with AfH recycling programs 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 Québec does industry bear a share of AfH recycling costs.

Unlike municipal 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.

According to a recent report by the Massachusetts Sierra Club,¹² the total average minimum cost to municipalities for public recycling bins is estimated at \$216, 829 (USD) 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. Additionally, 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 system 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 collection 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

POPULATION: 4,582,000
POPULATION DENSITY:
4.8 PERSONS/KM²

Beverage Container Recycling Program

Supporting Regulatory Framework

Adopted in 1970 under the province’s *Litter Act*, British Columbia (B.C.)’s beverage container recycling 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 a 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 B.C. stewardship regulations (including the *Beverage Container Stewardship Program Regulation*) into a single regulation. 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.

Performance Targets

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

Who is Responsible?

The Beverage Container Recovery Program targets brand owners or first importers (stewards) of all non-refillable beverages (excluding milk products) that are sold in the province. There are currently two stewardship agencies in B.C. that carry out deposit-refund obligations on behalf of producers: Encorp Pacific (Canada) and Brewers Distributor Ltd. (BDL).

BDL represents brand owners of domestic coolers, beers, and ciders. Encorp represents brand owners of all other beverage types, including non-alcoholic beverages, wine, spirits, some ciders, coolers, as well as some import beer.

Program Financing

Program funding is the responsibility of the producer. Both Encorp Pacific and BDL pay handling fees to authorized depots and contracted retailers for handling the returned beverage containers and preparing them for shipment.¹³ Financing for the Beverage Container Recovery Program comes from various sources: 1) through revenues generated from unredeemed deposits; 2) through revenues generated from the sale of material; and 3) a container recycling fee (CRF) paid at the point of sale by consumers.

All beverage containers covered by the program carry a deposit based on their type and size. Non-alcohol beverage containers up to and including 1L carry a deposit of 5-cents, while those over 1L have a 20-cents deposit. 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 2012, there was a total of \$16,021,607 in unredeemed deposits (\$85,181,918 in total deposits - \$69,160,311 refunds issued).

When the revenues from unredeemed deposits and from sales of collected material are depleted, a non-refundable CRF is added to the price of the container to make up for the deficit. 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 varies depending on the value of the material and the collection rate for a particular container. For example, high collection rates generate less unredeemed deposit revenue and therefore higher CRFs; in contrast, lower collection rates generate greater unredeemed deposit revenue and therefore lower CRFs. 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 2014, CRFs range from 1-cent for an aluminum can to 30-cents per unit for large glass containers. Some containers (e.g. drink pouches) do not carry a CRF given that their collection rates are so low that the unredeemed deposits are sufficient to cover collection costs.

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 reasonable 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.

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

Collection System

Consumers can return empty beverage containers to depots, retail outlets, and Liquor Distribution Branch (LDB) stores. By law, retailers are required to take back what they sell, up to a maximum of 24 containers per person per day.

Encorp return centres include 171 independent depots (one fewer than in 2011) and thousands of retail outlets. BDL provides for retail returns at over 1,250 locations, including 655 private liquor stores, 197 government-run liquor stores, 229 rural agency stores, and 177 independent depots. In addition to the containers themselves, BDL collects secondary packaging (i.e. cartons, caps, and plastic can rings) associated with beer and cider containers at private retail liquor stores and at selected private bottle depots. It is currently in discussions with the LDB to expand the return network for secondary packaging to include government liquor stores as well.¹⁴

Seventy-eight percent of B.C.'s population live within 2km of a BDL return depot. As for those living in smaller communities and rural areas, there is at least one BDL contracted return location within 15km.

Containers containing milk and milk substitutes are collected as part of a voluntary (non-deposit) recovery system financed by the British Columbia Dairy Council (BCDC) and administered through Encorp Pacific under the name Return-It Milk™. At the end of 2012, the number of Encorp depots accepting milk and soy jugs and cartons was 165.¹⁵ Still, most milk jugs continue to be collected through municipal recycling programs.

Thirty-three contracted transport companies collect containers from depots and retailers and take them to about 17 central processing sites across B.C. where they are compacted for shipment. Significant transportation and handling efficiencies have been realized with the testing of compaction machines in some outlets and with the continued roll out of "Big Bags" that hold over 1800 containers each. Because they allow more material to be transported per truck, much less fuel is needed per tonne of material transported.

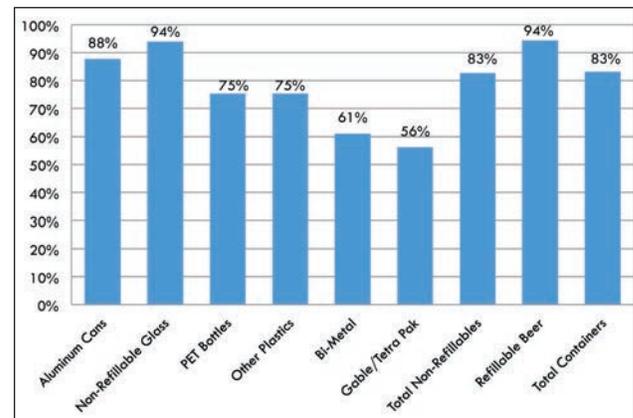
Processors receive bags of mixed containers and prepare them for the appropriate recycling market by sorting, crushing, and baling the glass, aluminum, plastic, and other materials. Baled aluminum cans are shipped to a major re-melt facility where they are turned back into sheet stock for new cans. PET and HDPE plastics are sent to separate facilities to be

cleaned and pelletized for sale into the open market. Glass is either sent to Alberta to be recycled into glass sand for producing fibreglass insulation material or to Seattle, where it is recycled into new glass bottles.¹⁶ In the case of domestic beer containers, refillable bottles are sorted and sent back to the brewers for washing and refill.

Program Performance

In 2012, over 973 million beverage containers were recycled and diverted from B.C. landfills, for an overall non-refillable collection rate of 78.7% (see Figure 3.1). This is a slight decrease from 2011 when the collection rate was 79.8%.

Figure 3.1
British Columbia Collection Rates by Material



With respect to program awareness, 85% of consumers surveyed were aware of the nearest Return-It™ Depot location to bring back containers. Ninety-two percent were aware of at least one location.

What's New?

In 2012, Encorp introduced its EXPRESS concept. As of September 2013, EXPRESS was in the final testing phase and was set to launch in September at the Kensington Depot.¹⁷ Encorp's goal in offering consumers the Return-It™ EXPRESS option is to offer a fast "in depot" experience by reducing the amount of time consumers spend at the depot sorting their containers and waiting in line to receive their deposit refunds.¹⁸ Customers create an online account, gather their empties in a standard blue bag, bring them to an EXPRESS depot, confirm their name and the

number of bags on a touch screen, and then drop off their bags at the EXPRESS window, without having to sort them beforehand. The depot then scans the bags and sends them to a Counting Center. Following count verification, the funds are credited to the customer's account. Encorp is currently looking to test EXPRESS in additional depots and marketplaces, and sees it as an important step towards reducing depot costs and increasing the return rate of beverage containers in B.C.

Also in 2012, Encorp launched a new mobile website as part of its public education strategy. It provides customers with easily accessible, online information regarding how and where to reduce, reuse, and recycle various materials, including beverage containers.



Alberta

POPULATION: 4,025,100
POPULATION DENSITY:
5.7 PERSONS/KM²

Beverage Container Recycling Program

Supporting Regulatory Framework

One of the most effective beverage container recycling programs in North America, Alberta's Beverage Container Recycling Program is regulated under the provisions of the *Beverage Container Recycling Regulation* of the *Environmental Protection and Enhancement Act*. Initiated in 1972, it was expanded in 1989 and again in 1997 to cover all beverage containers, including Tetra Pak and gable top containers. A further expansion in 2001 included all domestic beer containers; domestic beer producers were now treated the same as other beverage producers in terms of program compliance, reporting, and handling fees paid to depots.

Further amendments to the regulation came into force in November 2008, increasing deposit levels to 10- and 25-cents. On June 1, 2009, Alberta became the first jurisdiction in North America to accept and charge a deposit on containers for milk and milk products.

As of 1997, regulatory authority for the program is given to the Beverage Container Management Board (BCMB), a not-for-profit association formed by representatives of beverage producers in Alberta, container depots, and the public. 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 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

While the regulation does not specify any collection targets, the BCMB's 2012-2014 Business Plan includes annual targets for the collection and processing of used beverage containers. Specifically, by 2012, the BCMB aimed to collect and process 84% of all beverage containers sold in the province. This is to increase to 84.5% in 2013 and 85% in 2014.

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 Beverage Container Management Board (BCMB) administers the *Beverage Container Recycling Regulation*. The BCMB is a not-for-profit association consisting of representatives of Alberta beverage producers, container depots and the public (environmental organizations, municipalities and interested citizens). The BCMB 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. The BCMB and its two collection system agents – the Alberta Beverage Container Recycling Corporation (ABCRC) and the Alberta Beer Container Corporation (ABCC) – work in partnership with the Alberta Bottle Depot Association (ABDA).

The ABCC acts as a Collection Service Provider (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 alcohol. 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: from the sale of collected material; unredeemed deposits, and the Container Recycling Fee (CRF) paid at the point of purchase by consumers. The provincial government does not supply any funding for the operation of the program. All revenues generated go towards the cost of running the program: collection (93.3%), public awareness (3.4%), administration (3.2%), and post-collection activities (reuse, recycling, incineration, disposal to landfill) (0.1%).

The majority of program revenue comes from unredeemed deposits. As of 2012, the deposits are 10-cents for containers 1-litre or less in size and 25-cents for those over 1-litre. Customers receive a refund of their deposit by returning the containers to depots. For each deposit paid out on a container, depots are reimbursed by the beverage container manufacturers. In 2012, Alberta generated \$44 million in unredeemed deposits.

In addition to a fully refundable deposit, there is a non-refundable CRF placed on some of the beverage containers 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.

The CRF is a fee beverage manufacturers are required to pay the ABCRC. More often than not, it 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 consumer's receipt so that customers are aware of the direct net costs of recycling each type of container, some retailers may show it separately. For a complete list of refundable deposit and CRF values, see Tables 4.1 and 4.3 in the Financing section of the report.

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 unredeemed deposit revenue and therefore carry a higher CRF. In contrast, materials with lower collection rates generate greater unredeemed deposit revenue and therefore carry a lower CRF.

Aluminum cans do not carry a CRF because high material revenue and unredeemed deposits cover the collection costs. Similarly, gable top cartons, drink boxes, and bag-in-the-box containers over 1-litre do not have a fee because the revenue generated through unredeemed deposits is sufficient to cover the costs of collection.

In 2012, the CRF ranged from 0-cents for aluminum cans to 11-cents for glass containers 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.¹⁹ In 2012, nearly \$28 million in revenue was generated from CRFs.

Since the implementation of the CRF, the beverage industry bears no direct costs for the operation of the program. These costs have been transferred to the consumer. 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 2012, there are 212 independently owned "universal" (accepting all beverage containers) depots and 55 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.

The depot operators collect and sort containers at their facilities for the Alberta Beverage Container Recycling Corporation (ABCRC). Wine and spirits containers are sorted by colour; refillables are sorted by material type and manufacturer; and non-refillable

soft drink containers are sorted by material type (aluminum, glass, plastic, composite, etc.) and colour where applicable.

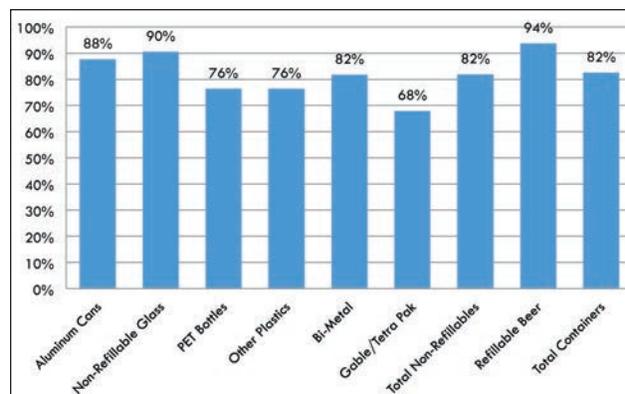
Once sorted, containers are placed in bags for pick-up. As of the end of June 2012, most depots are now using the new and improved "mega bag" shipping containers. These were introduced in the spring to offer more durability, easier handling, and greater capacity than the older bags.

On behalf of beverage manufacturers, the ABCRC (non-refillable containers) and the ABCC (refillable containers) pick up containers from every depot in the province and transport them to processing facilities where the materials are prepared for shipment to end markets, or to brewers (in the case of refillable beer bottles). Two facilities in Red Deer and Lethbridge are responsible for 9.2% of total annual processing capacity. All other processing is completed in ABCRC-operated facilities in Edmonton and Calgary. In 2012, an average of over 11,000 containers were processed per hour in Alberta, the fastest rate achieved in Canada.²⁰

Program Performance

For the calendar year of 2012, Alberta had a non-refillable containers collection rate of 81.7%.²¹ In the same year, Alberta had a refillable containers collection rate of 93.8% (a small dip from the 94.7% return rate in 2011). In total, close to two billion beverage containers were returned to Alberta depots, resulting in an overall 82.4% return rate for the year. This reflects a percentage point decrease since 2011 of just over 1 point (83.5%).

Figure 3.2 Alberta Collection Rates by Material



The collection of dairy containers continues to lag. Nevertheless, significant gains have been made in the last two years with regards to liquid cream containers (up 5 percentage points to 92%) and milk-to-go containers (up 9 percentage points to 78%).²² An IPSOS Reid Survey found that the most common reasons for not recycling or returning milk and cream containers are lack of awareness (22%), inconvenience (18%) and simply forgetting (14%)²³.

With respect to environmental performance, according to their annual report, the ABCRC saved over 689 million kilowatts of energy in 2012 – enough energy to supply 95,457 Alberta households for an entire year– by returning recycled material to markets and avoiding the need for raw materials. In doing this, it also eliminated 195,738 metric tonnes of CO₂ equivalent (MtCO₂e) emissions.

As a result of the program, 128 full-time equivalent jobs were created within the province of Alberta.

In 2012, 97% of Alberta residents were aware that they could return beverage containers for a refund, and there was a 91% participation rate in the program.

What's New?

A new Beverage Container Management Board (BCMB) Advertising Policy came into effect on January 1, 2012 requiring retailers of beverage containers to clearly identify the deposit value of purchased containers, separate from the price of the product. The price and deposit information must be advertised where the container is located for sale at a retail location (i.e. on the shelf) and on all vending machines that dispense beverage containers.

In June 2012, Alberta became the first province in Canada to adopt automated sorting and counting technology. The European manufactured equipment was successfully piloted at two bottle depots – Plus II in Grande Prairie and North Refund Centre in Edmonton – with \$76,000 in funding provided by the BCMB through its Beverage Container Recycling Innovation Fund. The equipment will soon be

installed at depots in St. Albert and Fort McMurray as well. While the technology is still new, the benefits are already clear from those using the system, namely: reduced wait times and more accurate refunds. Depot owners have also seen lower direct labor costs as a result.

As of June 2012, North Refund Center, along with four other bottle depots, is reaping the benefits gained by having compaction machines in their operations. Combined with the introduction of “mega bag” shipping containers, these two changes have saved the industry time, money, and over 135,000 kg of MtCO₂e equivalent emissions throughout 2012.²⁴ Moreover, the volume of containers a depot can return per truckload has doubled, reducing transportation demand by 6,953 km.²⁵

In an effort to reduce waste, streamline the regulatory framework, and shift the costs of waste management from taxpayers to producers, the Alberta government is proposing changes to the province's *Designated Material Recycling and Management Regulation* (Alta. Reg. 93/2004). Over fall 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 into one regulation to be called the “Designated Materials Recycling Regulation.” In addition to including drink containers, the new regulation would cover used oil, tires, electronics and paint. It would also introduce extended producer responsibility (EPR) for waste packaging and paper, and household hazardous waste.



Saskatchewan

POPULATION: 1,108,300
POPULATION DENSITY:
1.8 PERSONS/KM²

Beverage Container Recycling Program

Supporting Regulatory Framework

Established in 1988, Saskatchewan's beverage container recycling program was initially regulated under the *Litter Control Act* (1978) and the *Designated Container Regulations* (1990). The *Environmental Management and Protection Act* of 2010 repeals and regulates matters formerly covered by the *Litter Control Act* and the *Environmental Management and Protection Act* of 2002, whose "Litter Control" section (amended in 2009) was also relevant to the collection of beverage containers. Refillable beer bottles are governed by the *Litter Control Act* and the *Alcohol and Gaming Regulation Act*.

Due to a 1999 amendment to the *Litter Control Act* that added Tetra Pak and gable top containers to the program, all beverage containers – except those for milk, milk substitutes, flavored milk, infant formulas, meal replacements or dietary supplements – are now included under the regulation.

Beverage containers of dairy products are collected separately under the Unified Dairy Recycling System (UDRS). The UDRS is a program whereby the Saskatchewan dairy industry contracts with SARCAN Recycling to provide a collection and recycling option for non-deposit plastic milk jugs and paper milk cartons in beverage container depots. The province-wide program was launched in 1999 and was upgraded to the current program in February 2001 after a formal agreement was signed between the dairy industry and government.

With the approval of the *Household Packaging and Paper Stewardship Program Regulations* in February 2013, a province-wide multi-material recycling program is set to commence by early 2014. These

new regulations require brand owners and first importers of packaging and printed paper (PPP) to develop a product management program, or join a stewardship agency to submit one on their behalf. These regulations do not include containers that are regulated under the *Litter Control Act* and that are under deposit.

Performance Targets

The provincial targets for dairy containers under the UDRS are 75%. There are no specific targets set out in legislation for the beverage container program or for the anticipated Multi-Material Recycling Program.

Who is Responsible?

The beverage container recycling program is administered by SARCAN Recycling, a division of the Saskatchewan Association of Rehabilitation Centres (SARC). SARCAN operates under contract to the Saskatchewan Ministry of Environment. This ministry designates containers that can be collected for recycling and establishes the value of the deposit and the environmental handling charge (EHC) that consumers pay when purchasing a beverage.

Multi-Material Stewardship Western Inc. (MMSW) is the organization formed 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. 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

In Saskatchewan, financial responsibility for the program is borne by the consumer through environmental handling charges (EHCs) and unredeemed deposits. As of 2013, the EHC ranges from 3-cents to 7-cents per unit sold. Unlike the deposit, it is not refunded to the consumer but is used by the provincial government to offset SARCAN's contract cost and to contribute to general revenues. In 2012-2013, SARCAN's recycling contract for beverage containers was worth \$21.8 million. Excess funds generated by the provincial government are put into general revenues.

Additional funding comes from the revenue generated from material sales (\$6,333,072 in fiscal 2012-2013) and from a provincial grant awarded to SARCAN (\$2,265,834 in fiscal 2012-2013). SARCAN is also paid a handling fee for all milk containers collected through its depots or through municipalities on a per tonne basis. Currently, the fee for gable top containers is \$150 per tonne. The fee paid for HDPE milk jugs is 80% of the market value of the material; the fee as of January 2014 was \$400 per tonne. The dairy industry funds these costs plus management and advertising through a levy on milk containers. Specifically, 1- and 2-litre containers are subject to a 1-cent fee while 4-litre containers have a 2-cent fee.

The new MMRP that is set to commence in 2014 is modeled after the industry-funding programs currently operating in Ontario and Québec. In Saskatchewan, stewards (brand owners or first importers) of packaging, including all beverage-related consumer packaging, must finance 75% of the cost associated with the residential recycling program.

Collection System

Consumers can return their containers to any one of 71 SARCAN depots located in 63 communities. After sorting, the depots flatten the containers using Multi-Material Flatteners (MMFs), a technology pioneered by SARCAN employees. The baled containers are then picked up by SARCAN trucks, transported to SARCAN processing facilities, and sent to recycling end-markets. Though they are not legislated and therefore not subject to deposits, SARCAN depots will also voluntarily accept rinsed milk containers.

Refillable beer containers can be returned to Saskatchewan Liquor and Gaming Commission (SLGC) stores, hotels, and four depots. (All SARCAN depots and SLGC stores retain a 5-cent portion of the 10-cent refund as a handling fee). From there, they are sorted and sent back to Brewers Distributor Ltd. (BDL) for the full refund and for washing and refill.

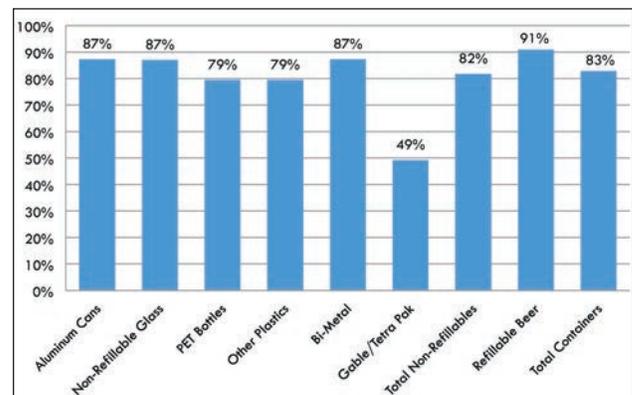
Municipalities that choose to participate in the MMRP will have the choice of what type of collection system their community will use – curbside pickup or

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 not receive a refund of their deposit in these cases.

Program Performance

In fiscal 2012-2013, Saskatchewan had a non-refillable container collection rate of 81.75% (a drop of nearly 6-percentage points from the previous year). The highest return rates for single-use containers were achieved for bi-metal and aluminum, both of which had rates of 87.26% (down from 93.05% in 2011-2012). Gable top/tetra pak containers had the lowest collection rate at 49.22%.

Figure 3.3
Saskatchewan Collection Rates by Material



What's New?

On February 4, 2013, the Royal Canadian Mint stopped producing and distributing pennies to financial institutions, marking an official end to the era of the 1-cent coin. As a result, SARCAN Recycling was forced to restructure its deposit-return system to eliminate penny pricing. Prior to the penny withdrawal, SARCAN had offered a 1-cent refund for cans purchased outside of Saskatchewan. Other out-of-province containers like those made of glass or plastic, never received any type of refund. This is now the case for all out-of-province containers, including aluminum cans. With the discontinuation of the penny, SARCAN was also unable to provide a 4-cent refund on beer bottles. Therefore, as of February 2013, SARCAN offers a 5-cent refund on refillable beer bottles.

On February 6, 2013, the Saskatchewan government approved the *Household Packaging and Paper Stewardship Program Regulations*, which require industry to finance up to 75% of the cost of municipal recycling programs for residential waste packaging and paper in Saskatchewan. (Currently, municipalities are covering 100% of the cost). The new regulations require brand owners and first importers of Packaging and Printed Paper (PPP) to develop a product management program for printed paper, newspaper, cardboard, plastic, metal and glass packaging. Stewards may develop their own individual product management program, or may join a stewardship agency, such as Multi-Material Stewardship Western Inc. (MMSW), to develop, submit, and implement a program on their behalf.

MMSW submitted its stewardship program plan to the Ministry of Environment for approval in August 2013. Implementation of the approved Multi-Material Recycling Program (MMRP) is set to commence by the early part of 2014. The beverage container collection program operated under SARCAN is not being replaced by the MMRP since containers that are regulated under the *Litter Control Act* and that are under deposit are not included. However, if customers choose to recycle designated beverage containers through MMRP by placing containers in their curbside bins, they will lose their refund.



Manitoba

POPULATION: 1,265,000
POPULATION DENSITY:
2.2 PERSONS/KM²

Beverage Container Recycling Program

Supporting Regulatory Framework

Under the *Packaging and Printed Paper Stewardship Regulation of the Waste Reduction and Prevention (WRAP) Act*, a province-wide program run by the Manitoba Product Stewardship Corporation (MPSC) was established in 1995 to maximize the amount of material collected and recycled within the province.

A new *Packaging and Paper Stewardship Regulation* under the WRAP Act was registered in 2008. In 2009, Manitoba's Minister for Conservation approved a program plan for packaging and printed paper (PPP) collection in the province. 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 recovery of all beverage containers consumed both at home and away-from-home (AfH). The AfH program targets municipalities and businesses that generate beverage containers. These could include libraries, community centres, golf courses, arenas, events venues, and other establishments.

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

The Government of Manitoba has established a 75% recovery target as part of the Guideline accompanying the *Packaging and Printed Paper Stewardship Regulation*. The target requires obligated

beverage producers to achieve a 75% recovery (collection) rate for all used beverage containers supplied into Manitoba by 2016.

Who is Responsible?

MMSM is responsible for designing and operating the enhanced residential recycling program, on behalf of obligated companies. To do this, it receives funding from the CBCRA.

The CBCRA, which is comprised of beverage producers and distributors (excluding beer), is tasked with enhancing both at home and away-from-home (AfH) collection to meet the overall 75% recovery target for beverage containers. It does this by establishing partnerships with each generator. 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.

Program Financing

Under the new regulation, all stewards of packaging and printed paper (PPP) in Manitoba are responsible for financing 80% of the total net cost of municipal recycling programs across the province. The CBCRA has responsibility for all beverage container collection and funds the residential collection through 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. Steward fees are set by MMSM and are based on a number of factors including program costs, collection rates, and a penalization factor for materials with poor collection rates. The CBCRA also operates an AfH program, which they manage themselves.

The CBCRA program has been and continues to be financed almost entirely through a 2-cent container recycling fee (CRF) charged on every non-alcoholic

beverage sold. These fees are voluntarily paid by beverage stewards (excluding those for domestic beer) to the CBCRA and are used to cover the costs of recycling beverage containers collected via curbside and AfH. In most cases, beverage companies charge the fee to the retailer who then passes it on directly to consumers (this fee is visible on most store receipts and is consistent across the province). Alcohol distributors pay MMSM directly for their Blue Box obligation.

In 2012, the CRF raised approximately \$7.7 million, \$1.4 million of which was used to pay MMSM for residential collection. The CBCRA uses the remaining money to buy recycling bins (which it provides to municipalities and the IC&I sector), provide technical support, and finance its province-wide promotion and educational campaign called "Recycle Everywhere".

Collection System

Beverage containers from the residential sector are collected via curbside recycling or depot drop-off centres. 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 material recovery facilities, 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 away-from-home (AfH) collection of containers, focuses its collection 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 March 2014, over 20,000 Recycle Everywhere bins have been placed in the province.

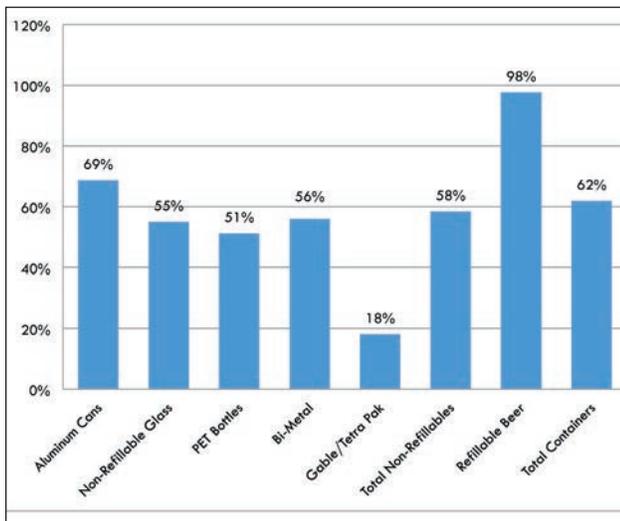
Refillable and non-refillable beer cans are collected via beer vendors, the Manitoba Liquor Commission, and rural agency stores. Brewers Distributor Limited

(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 2012, the CBCRA collected 53% (by weight) of all beverage containers (excluding beer cans) sold in Manitoba. The collection rate for refillable beer bottles was 98%, while for beer cans it was 79%.

Figure 3.4 Manitoba Collection Rates by Material



Ontario

POPULATION: 13,538,000
POPULATION DENSITY:
14.1 PERSONS/KM²

Blue Box Program and the Ontario Deposit Return Program

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

In 2002, the *Waste Diversion Act* was passed, obligating companies that introduce packaging and printed paper (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 also established Waste Diversion Ontario (WDO) as a non-crown corporation to develop, implement, and operate waste diversion programs for a range of materials, including designated Blue Box wastes (see O. Reg 273/02).

Ontario’s Blue Box Program was developed in response to the Ontario Minister of the Environment’s request for a Blue Box program in 2003. Designated waste materials and the designated Industry Funding Organization (IFO) are identified in the *Blue Box Waste Regulation* under the *Waste Diversion Act*. The *Blue Box Program Plan* (2003), developed by Stewardship Ontario (SO), is not a regulation but is a minister-approved program plan under the *Waste Diversion Act*.

In addition to the *Waste Diversion Act*, municipal recycling programs are also legislated under the

Environmental Protection Act (1990). Specific regulations of relevance include 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, polyethylene terephthalate (PET) bottles, aluminum and steel cans, glass containers, as well as a minimum of two other materials made from metal, plastic, or glass.) These supplementary materials are selected by the municipality. *Regulation 103/94 (Industrial, Commercial and Institutional Source Separation Programs)* is also relevant as it mandates IC&I recycling for most commercial sectors and for some basic recyclables (excluding multi-laminate containers).

The *Environmental Protection Act* also includes beverage-specific regulations such as the following: *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).

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.

Performance Targets

In 2004, the province announced a five-year combined diversion target of 60% for Blue Box waste, 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 2% 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?

As of February 2003, Ontario stewards (brand owners and first importers) of Blue Box materials are responsible for financing 50% of the net costs of operating municipal recycling programs.

Stewardship Ontario, as the Not-for-profit Industry Funding Organization (IFO) set up by Waste Diversion Ontario (WDO) to represent industry stewards, is responsible for identifying and collecting fees from individual industry stewards and for transferring funds to municipalities. They are also responsible for reporting activities to the WDO.

Established in 2002 to “develop, implement, and operate waste diversion programs” for a wide range of materials, the WDO is responsible for monitoring the performance of municipal Blue Box programs, overseeing SO’s operations, and reporting to the Ontario Ministry of the Environment. It also has the responsibility to collect annual cost and collection data from municipalities.

Municipalities with a population of 5,000 or more are responsible for operating multi-material curbside recycling programs for beverage containers and other packaging and printed paper (PPP) materials. They may operate these programs themselves, or decide to contract it out to a private company.

With regards to the ODRP for wine, spirits, and imported beer containers, the LCBO is the responsible entity. Unlike the LCBO, when the provincial government decided to establish the deposit-return system, 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

The costs of the Blue Box Program are currently shared 50/50 between municipalities and industry stewards (Stewardship Ontario (SO) receives no funding from government or taxpayers). The share of financial responsibility borne by industry could increase to 100% in 2014 if the proposed *Waste Reduction Act* is adopted.

Each year, the WDO conducts a tonnage and financial data call, asking municipalities to determine the total net costs of operating their recycling programs. This can include the costs to collect, transport, process, and recycle Blue Box materials, as well as to conduct research and to carry out public education initiatives. Along with material generation estimates, 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 in quarterly installments.

For the calendar year 2012, over 1,500 stewards reported into the Blue Box Program and paid a total of \$104.6 million to SO. Of this, \$85.4 million was transferred to municipalities. This amount includes program delivery, administration, and Harmonized Sales Tax (HST). Some of the funds were also used to support continuous improvement and research into best practices; specifically, \$4.45 million went towards the Continuous Improvement Fund and \$905,000 went towards research and development.

The ODRP is financed through unredeemed deposits and government revenue. Deposits range from 10-cents to 20-cents, 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. The service fee – 80% of which is collected for handling large glass bottles – has decreased since the beginning of the program. The fee for 2012 is set at 10.15-cents per container.

Collection System

Ontario has a hybrid collection system in which beverage containers are recovered via two streams. All containers for alcoholic beverages are returned for deposit refund via The Beer Store (TBS)’s Packaging Recovery Program and the Ontario Deposit Return Program (ODRP), while all other beverage containers are collected via the provincial Blue Box Program.

Beer containers, as well as any associated packaging, can be returned to 448 beer store locations, 52 breweries, 141 retail partner stores, 75 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). This adds up to a total of 835 beer container redemption points. ODRP containers can only be returned to 783 of these locations, due to the fact that the breweries do not take back wine and spirit containers. 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.

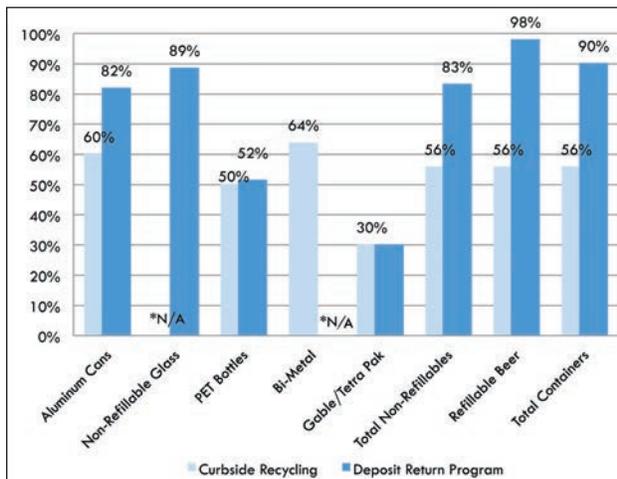
Beverage containers from the residential sector are collected via curbside recycling or depot drop-off centres. Municipalities are required by law to collect PET, glass, aluminum, and steel containers, whereas the collection of Tetra Pak, gable top, HDPE and other less common containers is voluntary.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

Even though 2-litre plastic milk jugs are subject to a deposit and are redeemable by consumers, few retailers (other than Becker’s and Mac’s) maintain a deposit-return program for these containers, as most milk in Ontario is sold in plastic film bags and gable top cartons.

Program Performance

Containers returned through the deposit-return programs show a total collection rate of 90% for 2012-2013. This rate is higher than that in other deposit programs in Canada because of a combination of the high collection 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 collection rate for non-refillable alcoholic beverage and beer containers is also high at 96%. The lowest collection rate achieved for alcoholic beverage containers is for metal cans at 82%.

Figure 3.5 Ontario Collection Rates for Deposit Program (alcohol) and Curbside Program (non-alcohol) by Material



Non-alcoholic beverage containers collected via the Blue Box Program show an overall collection rate of approximately 56%.

What's New?

In June 2013, the Ontario government released a Waste Reduction Strategy (WRS) and introduced Bill 91, the Waste Reduction Act (WRA), 2013 for first reading. Among the proposed changes under the WRS and WRA is an increase in waste diversion efforts aimed at the industrial, commercial, and institutional (IC&I) sectors. While IC&I waste accounts for nearly 60% of the waste generated in Ontario, only 13% of it is being recycled under the current regulatory framework, making the IC&I sector the largest single unaddressed recycling opportunity in the province.

At present, a soft drink producer is responsible for paying 50% of the cost to recycle a soft drink can through the Blue Box Program, but does not have to pay anything to recycle a soft drink can disposed in an office building, shopping mall, restaurant, hotel, school, hospital, and factory. If the WRA is passed and the IC&I sector is targeted for new recycling obligations for paper and packaging, many businesses will have no choice but to implement more robust recycling practices. The proposed Act would also transform Waste Diversion Ontario (WDO) into the Waste Reduction Authority (WRA), with robust oversight and enforcement powers. The WRA would have the power to carry out inspections, issue compliance orders, and impose administrative penalties against producers and intermediaries who do not comply with the regulations.

In September 2013, the Canadian Beverage Container Recycling Association (CBCRA) submitted an Industry Stewardship Plan (ISP) to WDO to operate an approved recycling program in Ontario for used non-alcoholic, non-dairy beverage containers (beverage containers are currently collected under the residential Blue Box Program). Upon approval of this plan, the CBCRA expects to expand on the existing Blue Box Program to increase the collection and recycling rates for used beverage containers from households and benchmark and increase the collection and recycling of beverage containers consumed away-from-home. One way the CBCRA plans to achieve this is by supplying recycling bins free-of-charge to municipalities, government buildings, businesses and private sector service providers across Ontario. In the plan, funding is to come from CBCRA participants, who are charged a container recycling fee (CRF) of 1-cent per container. By year three of the program the fee is to be adjusted to "reflect the costs incurred to manage each specific packaging type."



Québec

POPULATION: 8,155,300
POPULATION DENSITY:
5.8 PERSONS/KM²

Collecte sélective Québec and programme de consignation

Supporting Regulatory Framework

Introduced in 1984, Québec's deposit-return program is regulated under the *Environment Quality Act*. All non-refillable soft drink and beer containers are covered under the deposit-return program. In 2012, the Minister of Environment announced it would examine the feasibility of expanding the deposit program to other containers, such as water, sports drinks, and juice cans and bottles. These containers are currently managed through municipal curbside recycling systems.

The program details for soft-drink containers are set out in the *Agreement Relating to the Consignment, Recovery, and Recycling of Non-Refillable Soft Drink Containers*. This agreement was first reached on December 1, 1999 between the Ministère du Développement Durable, de l'Environnement et des Parcs (Minister of Sustainable Development, Environment and Parks), the Société Québécoise de récupération et de recyclage (Recyc-Québec), and 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 in Québec in non-refillable containers must obtain a

permit to do so from the Minister of Environment. To receive a permit, the applicant must do one of two things: enter into an agreement with the Société Québécoise de Récupération et de Recyclage and the Minister of the Environment, or comply with beverage container regulations set out in Section 70 of the *Environment Quality Act*.

Performance Targets

The 2011-2015 Action Plan associated with the Québec Residual Materials Management Policy sets 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, 2013. 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?

In 1990, the Québec government established the Société Québécoise de récupération et de recyclage, giving the Société, regulatory authority for the program. Recyc-Québec is a crown agency responsible for the promotion and development of reduction, reuse, recovery, and recycling of containers and packaging in Québec. Its main responsibility is program oversight. The Minister responsible for executing the incorporating Act (*An Act respecting the Société Québécoise de récupération et de recyclage*) – which specifies the mission and mandates of Recyc-Québec – is the Ministère du Développement Durable, de l'Environnement, et des Parcs.

In 1999, BGE – a non-profit organization established by the Québec soft drink industry – took over Recyc-Québec's responsibility for collecting non-refillable soft drink containers. Brewers are responsible for running the system for beer bottles and cans.

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 packaging and printed paper (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. As of 2013, ÉEQ represents over 3,000 industry stewards selling paper and food and consumer packaging.

Program Financing

The two programs in Québec are funded via different streams.

The deposit-return program for beer and soft drinks containers is almost entirely funded by the wasting consumer through unredeemed deposits. In 2012, only 66.5% of deposits were redeemed by consumers.²⁶

Because the cost data are proprietary, the actual share of costs is unavailable. Depending on the various program expenses and material revenues, the percentage of the cost borne by the beverage industry versus the consumer can change, but, in general, the wasting consumer bears the lion's share.

Industry contributes a much larger share to the municipal curbside program. In November 2004, through an amendment to the *Environment Quality Act*, Québec adopted the *Regulation Respecting Compensation for Municipal Services Provided to Recover and Reclaim Residual Materials*. This regulation obligates all beverage producers (except those for non-refillable soft drinks and beer which are on deposit) to finance Collect Sélective Québec, the municipal curbside recycling program. (Note: While soft drinks and beer containers themselves are not subject to the regulation, any associated packaging is (e.g. boxboard cases, film plastic).

In 2005, stewards of PPP became legally obligated to fund municipalities up to 50% of the net program costs. Since then, the proportion covered by industry has increased yearly. Set at 70% in 2010, industry's share of net costs increased to 80% in 2011, 90% in 2012, and to 100% in 2013.

The total compensation due to municipalities (557 municipal bodies) for 2012 was \$114.9 million.

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 (R2R) collection system. Under this program, consumers can return their empty containers for a refund of their deposit to any of over 40,000 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 containers collected via the deposit-return program 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 the brewers for washing and refill.

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 throughout most of Québec.

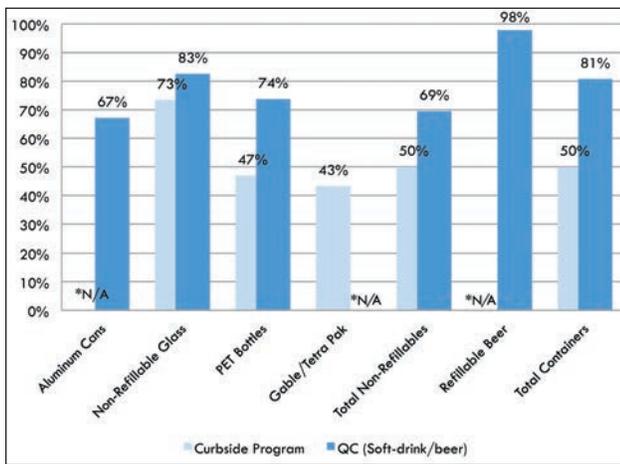
In addition to the above, other AfH recycling initiatives are pursued by those outside of government or the beverage industry, including *La Table pour la récupération hors foyer* (Issue table for out-of-home recycling). Formed in 2007 by stakeholders in the public, private, and voluntary sectors, the 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 \$3.3 million to municipalities for the installation of 7000 multi-material recycling bins, and

\$1.2 million to over 3000 restaurants, bars and hotels that now recover all their recyclable materials.

Program Performance

In 2012, the collection rate for containers recovered via the R2R program was 81% (this rate includes data for refillable bottles). During the same period, the collection rate for containers collected through the municipal curbside recycling program was approximately 50%.

Figure 3.6 Québec Collection Rates for Deposit Program (soft drink and beer) and Curbside Program (all non-carbonated beverages) by Material



What's New?

In July 2012, Québec's Environment Minister released a five-year strategic plan for Recyc-Québec. Part of this plan was to increase the value of the deposit on all deposit-bearing cans, PET and glass containers for beer, soft drinks, and some energy drinks from 5-cents to 10-cents by the end of 2012. This plan was shelved when the new government came into power. As it currently stands, the Québec government is considering expanding the deposit system to include other beverage containers, such as wine and spirits bottles, or abolishing it altogether. The Minister's decision will depend on which program is found to be more effective at achieving high recovery rates – curbside recycling or deposit-return. A decision is expected in the near future.

On April 19, 2013, Québec's Minister of Sustainable Development, Environment and Parks and the non-profit group Éco-Entreprises Québec (ÉEQ) announced an \$8 million grant to fund the collection of recyclable materials in municipal public spaces, including parks, bus shelters, arenas, and downtown streets. This investment in the away-from-home (AfH) program (created six years ago) is part of the Government's 2011-2015 Action Plan (Action 31) in Québec's Residual Materials Management Policy. Action 31 directly concerns government funding of programs designed to improve recovery of recyclable residual materials generated AfH. Thanks to such investments, Québec residents now have access to about 8,000 recovery bins to recycle their beverage containers when they are away from home.

On March 28, 2014, BGE officially announced the cancellation of CONSIGNaction – a program launched in 2008 aimed at increasing the collection of deposit containers consumed AfH. The program, which targeted small-, medium-, and large-sized businesses (and others in the IC&I sector that generate large amounts of empty containers from on-site beverage consumption), collected 1.2 billion cans and plastic bottles in 2013 alone. Under this program, convenience stores, restaurants, schools, golf courses, offices, events, and other venues were offered a free pick-up service.



New Brunswick

POPULATION: 756,100
POPULATION DENSITY:
10.5 PERSONS/KM²

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 up to a size of 5-litres. These include beverages such as soft drinks, beer, wine and spirits, water, fruit juices and vegetable juices. The regulation also covers refillable beer bottles. Containers for milk, milk products, and unpasteurized cider are exempt from the program.

Performance Targets

Neither the Act nor regulation specifies any collection target. However, the Department of Environment has established an unofficial target collection rate of 80%.

Who is Responsible?

Encorp Atlantic Inc. – a stewardship agency originally created by the soft drinks industry—is responsible for managing the collection of non-alcoholic beverage containers on behalf of obligated brand owners. It collects containers from depots, sends materials for processing, and markets these materials. In addition, Encorp collects all deposits from the distributors, reimburses the redemption centres for the refunds paid out, remits to the province a fee for the Environmental Trust Fund, and pays a handling fee to the redemption centres.

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 deposit-return system is based on a “half-back” model. Under this half-back system, consumers receive a full refund of their deposit when they return refillable containers, but receive only half (50%) of their deposit back when they return non-refillable containers. 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 half that amount when redeeming the container. The exception is for refillable beer bottles, where consumers receive the 10-cent deposit back.

Fifty-percent of this “half-back” revenue (2.5- or 5-cents depending on container size), plus the revenue generated from unredeemed deposits and from the sale of material, is used to pay for the cost of the program. These costs include sorting, transporting, and processing the containers. They also include a handling fee per unit to redemption centres.

As of January 2014, the handling fee for empty beverage containers (except for refillable beer containers) is \$0.0406 per container. Handling fees are paid to redemption centres as compensation for receiving, paying out refunds for, sorting, and storing returned beverage containers. These fees are paid directly to the redemption centres without government involvement.

The other 50% of the “half-back” revenue goes into the province’s Environmental Trust Fund where it is used for environmental conservation, education, protection, and other provincial environmental initiatives aimed at reducing waste. This fund is managed by the Department of Environment.

For containers that are returned, beverage distributors reimburse the redemption centres for the

refund paid to consumers. If a container is not returned to a redemption centre, Encorp retains the unredeemed deposit and is not required to pay the handling fee.

Collection System

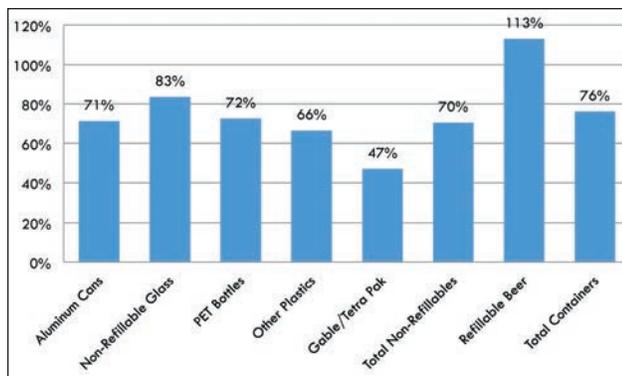
As of October 2013, consumers can return their empty beverage containers to any of 79 individually owned and operated depots through the province. All depots must be licensed with the New Brunswick Department of Environment.

At the depot/redemption centre, the containers are further sorted, bagged, and then loaded onto a truck for shipment to one of two processing facilities: Neighborhood Recycling or Encorp Atlantic. The former processes all alcoholic beverage containers, while the latter processes all non-alcoholic containers. Refillable beer bottles are returned directly to the breweries where they are sterilized and refilled.

Program Performance

In 2012, New Brunswick's collection rate for non-refillable containers was 70%. This rate represents a three-percentage point decrease from 73% in 2010. The primary reason for this decline is the drop in collection rates for aluminum cans (down to 71%) and PET bottles (down to 72%).

Figure 3.7 New Brunswick Collection Rates by Material



Nova Scotia

POPULATION: 940,800
POPULATION DENSITY: 17.4 PERSONS/KM²

Nova Scotia Deposit Return Program

Supporting Regulatory Framework

Launched on April 1, 1996, Nova Scotia's deposit-return program 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 products, soya milk, and rice beverages. Also excluded from the program are certain meal replacements, formulated liquid diets, foods for low energy diets, thickened juices, baby formulas, concentrates, and non-alcoholic beverages in containers of 5-litres 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 official targets for containers recovered under either program. As of 2006, however, through an amendment to the *Environment Act*, the province has set a disposal target of 300 kilograms per person per year by 2015.

Who is Responsible?

The Resource Recovery Fund Board Inc. (RRFB), a not-for-profit organization operating at “arms length” from government, administers Nova Scotia’s deposit-refund program. RRFB also administers the province’s tire and paint recycling programs.

Distributors of designated beverage containers must register with RRFB in order to sell or distribute these products legally within the province. They must also report sales data and remit applicable deposits directly to RRFB on a monthly basis.

Retailers are required by law to display the deposit amount on the sales receipt and to display a notice identifying the location of the nearest depot where beverage containers can be returned for a refund.

Depot owners and operators must sign a standard form agreement with RRFB in order to become an Enviro-Depot™.

For the milk program, 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 funding from different streams.

The deposit-return program is based on a “half-back” model. Under this system, deposits are paid on all containers (10-cents for non-alcoholic containers <5-litres; 10-cents for alcoholic containers 500ml or less; and 20-cents for alcoholic containers 500ml or bigger). While consumers receive a full refund of their deposit when they return refillable containers (i.e. refillable beer bottles), only half (50%) is refunded for non-refillable containers.

The remaining half of the deposit (5-cents or 10-cents, depending on container type and size), plus revenues generated from the sale of the material, is used to pay for program costs. Among other things, these costs include the handling fees paid per container to Enviro-Depot™ operators as compensation for receiving, paying out refunds for, sorting, and storing returned beverage containers. As of January 2014, the handling fee for empty beverage containers (except for empty refillable beer containers) was \$0.0403-cents per container. A portion of the unredeemed deposits is also distributed to municipalities to help offset the cost of their waste diversion initiatives.

Unlike the deposit-return program, which is funded mostly by consumers, the voluntary milk container recycling program is financed entirely by industry. 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 and quantities collected. In 2012, the ADC contributed \$434 per tonne to municipalities for a total of \$681,289. This amount equates to an industry cost of around 1-cent per milk container sold in Nova Scotia.

Collection System

Consumers may return their empty beverage containers for a refund to any one of 83 privately owned and operated Enviro-Depot™ locations throughout the province.

The depot sorts containers by type and colour, storing them in bulk bags or bins. These bags and bins are collected and trucked to the nearest of three Regional Processing Centres located in the province. At the processing facility, aluminum and plastic beverage containers are separated and then compressed in a baler into large cubes. Once baled the RRFB markets and sells these materials on the commodity market. Glass is sent directly from the processing centre to a glass processor where it is converted into cullet and sold as a commodity.

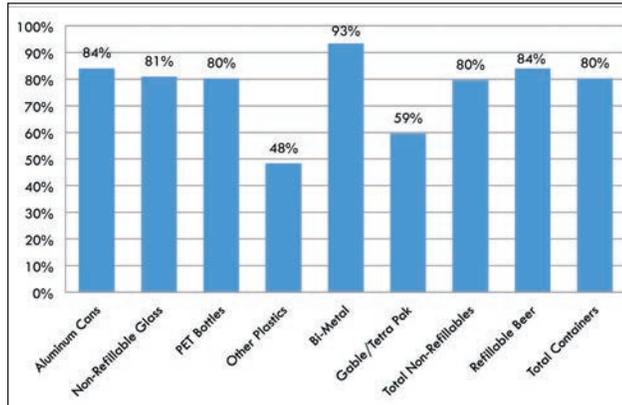
Enviro-Depot™ operators have a separate arrangement with the breweries to accept refillable domestic beer containers from consumers. These containers are sorted and sent back to the brewers for washing and refill.

Milk packaging is collected separately via municipal curbside recycling programs.

Program Performance

In fiscal 2012, Nova Scotia had an overall container collection rate of 80%. As for non-refillables, Nova Scotia matched P.E.I.'s collection rate of 80%, the highest rate reached in the Atlantic Provinces.

Figure 3.8 Nova Scotia Collection Rates by Material



In 2012, the milk container recycling program achieved a total collection rate of 70%.

What's New?

In July 2012, RRFB Nova Scotia introduced a new compaction trailer for beverage containers and began a two-year pilot project at 18 high-volume Enviro-Depots in Halifax Regional Municipality. Combining a compaction auger on a 53-foot tractor-trailer, the trailer allows Depots to compact recyclable beverage containers and then ship them directly to the end market processor.

Loading bags at a rate of approximately four bags per minute, the compaction trailer transports more than five times as many beverage containers in one load than was previously possible. As of November 25, 2013, the trailer had transported 101 loads direct to market, which would have equaled 602 loads under the previous system. Unlike the existing local cartage system, in which a regular trailer fits approximately 78 bags of containers, the compaction trailer can fit about 500. In addition to saving time and reducing greenhouse gases, the trailer has already reduced costs by over \$120,000 annually. Once the pilot phase is complete, RRFB will consider expanding the program into the rest of the province.



Prince Edward Island

POPULATION: 145,200
POPULATION DENSITY:
24.7 PERSONS/KM²

Beverage Container Management System

Supporting Regulatory Framework

In 1973, the provincial government banned the sale of beer in non-refillable containers. This was followed by a ban on the sale of all non-refillable soft drink containers in 1977. Both these bans were authorized under the *Environmental Protection Act* (1988) and the *Litter Control Regulations* (1992), and effectively required that all carbonated beer and soft drinks were to be packed in refillable containers. Not long after, deposits were placed on refillable beer and extended to soft drink containers in 1984. In 1992, the program expanded to include half-back deposits on all non-refillable wine, spirit, and cooler containers.

In late 2007, the government repealed the law prohibiting the sale of non-refillable carbonated beverage containers. In its place, the Department of Environment, Energy and Forestry implemented a deposit-return program. Launched on May 3, 2008, this expanded program covers all ready-to-drink beverage containers up to 5-litres, except those used for dairy products, milk substitutes, or nutritional supplements. It is regulated under the *Beverage Containers Act* (2008).

Performance Targets

There are no official targets specified for these materials.

Who is Responsible?

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

Program Financing

P.E.I.'s deposit-return program is based on a "half-back" model, similar to those in other Atlantic provinces. Under this system, deposits are paid on all beverage containers (10-cents for non-alcoholic containers 5-litres or less; 10-cents for alcoholic containers 500ml or less; and 20-cents for alcoholic containers 500ml or bigger). While deposits on refillable containers are completely refundable, those on non-refillable containers are only "half" refundable. To illustrate, a customer returning a non-refillable container on which a 10-cent deposit was paid will only receive a 5-cent refund.

Fifty-percent of the "half-back" revenue (2.5- or 5-cents from each container, depending on container size), plus unredeemed deposits, is used to fund beneficial environmental projects carried out by the provincial government, like watershed protection and pollution prevention. The other half is used to pay for the costs of running the program. 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 February 2014, the handling fee for empty beverage containers (except for empty refillable beer containers) was \$0.0398 per container. In fiscal year 2012-2013, depot operators received a total of \$1.7 million in handling fees.

The milk container recycling program is financed by the provincial government.

Collection System

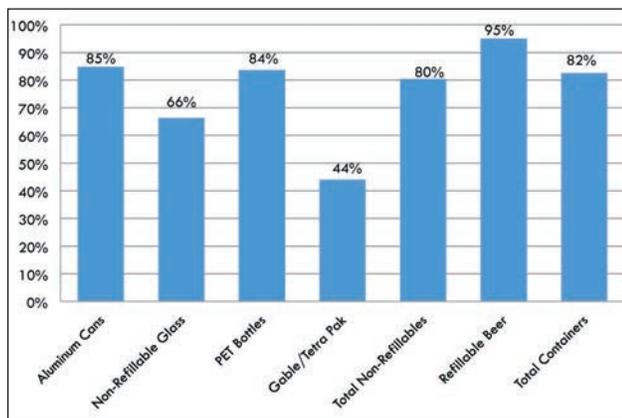
Consumers can return designated non-refillable beverage containers to any one of 10 privately run depots throughout the province. (Retail stores, including liquor stores, stopped accepting returned beverage containers and paying refunds as of May 3, 2008). Collection, sorting, transport and processing of containers is contracted out to a Charlottetown based firm. A computerized inventory control system is used to track containers from the point of consumer refund, through processing, and material sales.

Containers used for milk and other exempted containers (i.e. food containers) are collected separately through the Island Waste Management Corporation (IWMC)'s Waste Watch program, a mandatory curbside recycling program available to all 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 2012-2013, P.E.I. had a non-refillable container collection rate of 80% and a total container collection rate of 82%. This rate matches that of Nova Scotia, and is the highest collection rate reached in the Atlantic Provinces.

Figure 3.9 Prince Edward Island Collection Rates by Material



Newfoundland & Labrador

POPULATION: 526,700
POPULATION DENSITY: 1.4 PERSONS/KM²

Used Beverage Container Recycling Program

Supporting Regulatory Framework

In place since 1997, Newfoundland and Labrador's Used Beverage Container Recycling Program is regulated under the *Environmental Protection Act* (2002) and accompanying *Waste Management Regulations* (2003). The regulations apply to all ready-to-drink beverage containers, excluding milk and milk substitutes (soy milk, rice milk, and almond milk), infant formula, refillable bottles (including domestic beer bottles), concentrated liquids (including syrup and frozen juice), medicinal/nutritional supplements, and containers greater than 5-litres. Only milk products and milk substitutes with the word "beverage" on the label are covered under the program.

Performance Targets

There are no official collection targets for beverage containers specified in the Act or regulations.

Who is Responsible?

The program is managed by the Multi-Materials Stewardship Board (MMSB). Established in 1996, the MMSB is a Crown agency of the Government of Newfoundland and Labrador and reports to the Minister of Environment and Conservation. MMSB is mandated to support and promote modern waste management practices in the province with a specific focus on waste reduction and recycling. The mandate of the MMSB is derived from the *Environmental Protection Act* and pursuant *Waste Management Regulations*.

The MMSB has contracted with Newfoundland Beverage Recovery Inc. (NewBRI) to run the day-to-day operations of the program. NewBRI is a non-profit organization made up of representatives from the beverage industry.

Program Financing

Like many other programs, Newfoundland’s beverage container recycling system is financed from revenues generated from the sale of empty beverage containers and by unredeemed deposits. The MMSB does not receive any direct funding from the provincial government.

Newfoundland’s program is based on 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. For 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 deposits are used to supplement the cost of running the program. After costs are paid, any excess revenue generated by MMSB is placed in the province’s Waste Management Trust Fund to support the implementation of the Provincial Solid Waste Management Strategy.

Collection System

Beverage containers are collected through the Green Depot network. Green Depots are privately owned and operated businesses that are licensed by the MMSB to help carry out the beverage container recycling program. Green Depots receive a handling fee for receiving and sorting the used beverage containers.

Currently, there are 39 main depots, 17 sub depots, and 15 mobile collection services located throughout the province at which consumers can return their empty containers to receive a refund. After the containers are sorted, they are transported to one of the four regional processing centres where they are prepared for shipment to markets in Canada and the United States.

Because local brewers operate their own deposit-return system, domestic beer bottles (like Labatt and

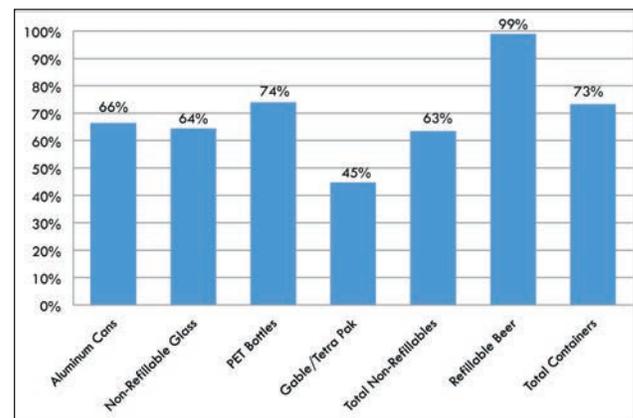
Molson) must be returned to a beer retailer or brewers bottle depot. (Containers are fully refunded at these locations). Still, some Green Depots, as a service to their customers, will accept domestic beer bottles (possibly at a reduced refund to cover their cost of handling the material).

Refillable beer bottles are sold through corner stores and two Brewers Retail Inc. (BRI) stores in St. John’s. 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

Currently, 88% of the province’s population has access to a recycling depot within 20 kilometres of their home.²⁷ In fiscal year 2012, Newfoundland collected and recycled more than 167 million used beverage containers for an overall non-refillable collection rate of 63%. This is a small decrease from the 2010 figure of 65%.

Figure 3.10 Newfoundland and Labrador Collection Rates by Material



What’s New?

In July 2012, the Multi-Materials Stewardship Board (MMSB) launched a province-wide marketing campaign called “Recycle on the Run” aimed at increasing the recycling of beverage containers consumed away-from-home (AfH).



Northwest Territories

POPULATION: 43,500
POPULATION DENSITY:
0.0 PERSONS/KM²

Beverage Container Program

Supporting Regulatory Framework

The program, which was established on November 1, 2005, 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. This includes juice, pop, water, beer, wine, liquor and other alcoholic beverages. Since 2010, the program has accepted containers for milk and liquid milk products – excluding those with infant formula or milk products in containers smaller than 30 ml.

Performance Targets

No formal targets have been set for this program.

Who is Responsible?

The Department of Environment and Natural Resources (ENR) is responsible for program administration. It enforces the Act and the accompanying regulations, coordinates and supports local depots and regional processing centres, coordinates public information, helps ensure continuous improvement of the program, and undertakes audits of distributors, importers, stores, depots, and processing centres.

Program Financing

The recycling program is financed through a surcharge applied to each beverage container sold in the Northwest Territories (NT). The surcharge consists of both a refundable deposit and a non-refundable

handling fee, both of which vary according to beverage container size and material type.

The fees are based on the estimated costs to collect, process, and transport beverage containers and to administer the program. While deposits are returned to consumers when they return the container to a depot, non-refundable handling fees – along with all unredeemed deposits – go into the NT's Environment Fund to pay for program expenses and improvements to the program. 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 income is received and all program expenses are paid out of this fund. These expenses include: refundable deposit payments, handling fees of the processing centres and depots, transportation and storage costs, minor equipment purchases, and other administration costs.

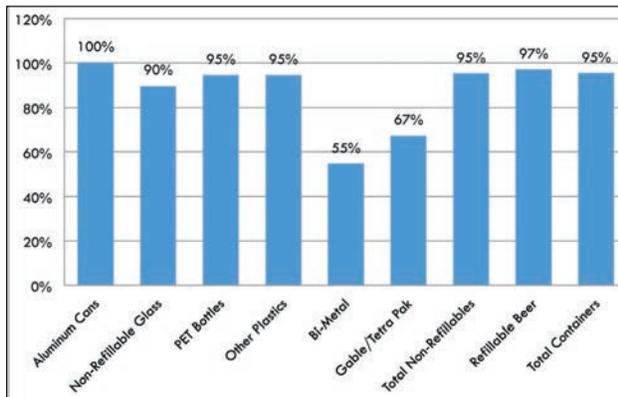
Collection System

Consumers return empty beverage containers to licensed depots to receive a refund of their deposit. As of March 2012, there were 24 locally operated beverage container depots and 4 temporary satellite depots in NT. The 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, the beverage containers are processed and shipped to southern markets for reuse or recycling. The processing centre pays each depot a handling fee to cover operating costs and money to cover the refunds provided. Processing centres also receive a handling fee from the Environment Fund to cover their operating costs.

Program Performance

In 2012-2013, NT had a non-refillable and overall container collection rate of 95%.

Figure 3.11
Northwest Territories Collection Rates by Material



Yukon

POPULATION: 36,700
POPULATION DENSITY:
0.1 PERSONS/KM²

Beverage Container Recycling Program

Supporting Regulatory Framework

Introduced in 1992, Yukon's deposit-return program is regulated under the *Environment Act* and the pursuant *Beverage Container Regulation (1992)* and the *Recycling Fund Regulation*.

Initially, the regulations covered only aluminum cans and refillable beer bottles. After amendments to the regulations in 1996 and 1998, the program was expanded to cover all ready-to-drink beverage containers (glass, plastic, steel, aluminum, and Tetra Pak), except for milk and milk substitutes such as soy and rice milk.

Performance Targets

There are no official targets for this program.

Who is Responsible?

Contrary to most programs, Yukon's beverage container recycling program is government-run and administered. Previously the responsibility of Environment Yukon, operation of the program has been transferred to the Department of Community Services. (Environment Yukon is still in charge of making any regulatory amendments).

Program Financing

When purchasing beverages, the consumer pays a surcharge, which includes a refundable deposit and a non-refundable recycling fund fee (RFF). Upon return of the empty containers, consumers receive the refundable portion of the surcharge back. The non-refundable RFF is collected by the retailer and goes into the Recycling Fund, a revolving fund that is administered by the government but kept separate from general government revenue. Unredeemed deposits also go into this fund.

The Recycling Fund is used to support related 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. Environment Yukon developed a program called the Recycling Club aimed at encouraging recycling habits in Yukon children), improve recycling facilities and community depots, and pay part-time wages for depot staff.

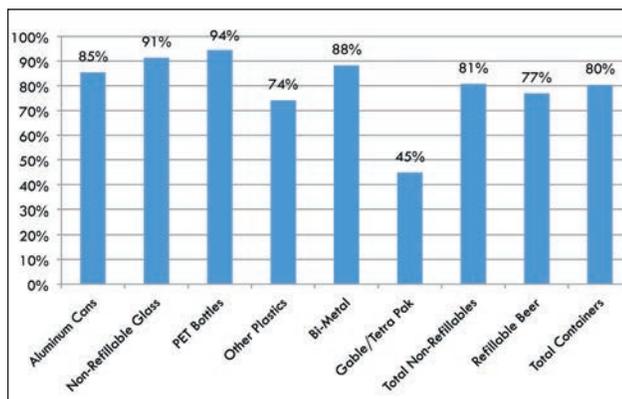
Collection System

Consumers return empty beverage containers to one of 17 depots to receive a partial refund of the initial deposit. Depots are run by individuals, private businesses, or non-profit organizations. The depots sort and bag/box the containers then send them to one of two processing facilities in the capital 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 2012-2013, Yukon had a non-refillable collection rate of 81% and an overall container collection rate of 80%.

Figure 3.12 Yukon Collection Rates by Material



Nunavut

POPULATION: 35,600
POPULATION DENSITY: 0.0 PERSONS/KM²

In 2007, Nunavut's Department of Environment established three pilot recycling projects in the communities of Iqaluit, Kugluktuk, and Rankin Inlet.²⁸ 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%).²⁹

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 (CGS) are working together to evaluate the territory's solid waste management practices as a whole. CGS is also working on establishing a Nunavut-wide solid waste management strategy.

Part 4: Financing

Consumer Fees

In many jurisdictions with deposit-return programs in place, it is the beverage industry that is responsible for paying the bulk of the system costs. In Canada, however, our 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 4.1 presents a summary of consumer fees charged in each province, by container type, as of January 2014.

Container Recycling Fee (CRF)

The Container Recycling Fee (CRF) is levied on the purchase of certain beverage containers in British Columbia and Alberta. It represents the net cost (of recycling) per unit, and fluctuates annually based on actual system costs. Typically, the CRF is paid by beverage distributors and passed down to retailers, who in turn pass it on to consumers. CRFs are charged in addition to the deposit and are non-refundable.

Unlike deposits, the CRF varies depending on 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 2013, CRFs range from 0 to 25-cents per unit in B.C., depending on the size and material of container. The fees in Alberta are somewhat lower, ranging from 0 to 11-cents per unit. Some containers (e.g. gable top cartons) do not carry a CRF because the revenue they generate from unredeemed deposits is high enough to cover the costs of recycling.

In Manitoba, the 2-cent (per unit sold) CRF (instituted April 1, 2010) is pooled and used to finance municipal and away-from-home recycling initiatives.

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 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 2013, EHCs range from 3- to 7-cents per unit, depending on the size and the material used for the container.

The Half-Back System

The Atlantic provinces of Nova Scotia, New Brunswick, and Prince Edward Island operate a half-back system, where half of the deposit paid on non-refillable beverage containers is not refunded to the consumer. Fifty-percent of this half-back revenue, plus the revenue generated from the sale of containers is used to pay for the program, which includes the handling fee per unit to redemption centres. The remaining 50% of the half-back revenue is typically used to support provincial recycling initiatives, such as beautification and conservation.

In Newfoundland and Labrador, the system is similar to a half-back program in principal, but it provides 5-cents for non-alcohol containers returned based on an 8-cent deposit (a true half-back system would provide a 4-cent refund), and 10-cents for alcohol containers returned based on a 20-cent deposit.

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 both refund only a portion of the initial deposit paid on designated beverage containers. In the case of Yukon, 5-cents is refunded on a 10-cent deposit (true half-back) and

Table 4.1 Consumer Fees in cents per unit sold

Consumer Fees in Cents per Unit Sold (as of April, 2014)												
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	5
PET up to and including 1L	3	3	6	2			5	5	3	5	5	5
PET over 1L	6	7	6	2			5	5	3	5	10	10
PVC or HDPE up to and including 1L	3	3	6	2			5	5	3	5	5	5
PVC or HDPE over 1L	6	7	6	2			5	5	3	5	10	10
HDPE Milk up to and including 1L		3										5
HDPE Milk over 1L		7										10
Plastic up to and including 1L		3	6	2			5	5	3	5	5	5
Plastic over 1L		7	6	2			5	5	3	5	10	10
Polystyrene Cups (with sealed foil lid)	3	3		2			5	5	3	5		
Polypropylene up to and including 1L	3	3	6	2			5	5	3	5	5	5
Polypropylene over 1L	6	7	6	2			5	5	3	5	10	10
Pouch up to and including 1L	0	2		2			5	5	3	5		5
Glass up to and including 1L	12	8	7	2			5	5	3	5	5	10
Glass over 1L	25	11	7	2			5	5	3	5	10	10
Drink box up to and including 500ml	2	2	3	2			5	5	3	5	5	5
Drink box 501ml to 1L	7	2	3	2			5	5	3	5	5	5
Drink box over 1L	0	6	3	2			5	5	3	5	10	10
Gabletop up to and including 500ml	0	2	3	2			5	5	3	5		5
Gabletop 501ml to 1L	0	2	3	2			5	5	3	5		5
Gabletop over 1L	6	5	3	2			5	5	3	5		10
Gabletop Milk up to and including 1L		2										5
Gabletop Milk over 1L		5										10
Bi-metal up to and including 1L	6	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	5	10
Wine/Spirits equal to or greater than 500ml							10	10	10	10	10	10



category not applicable
material covered under another category

* In NWT, 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

25-cents on a 35-cent deposit. In the Northwest Territories, 10-cents is refunded on a 15- or 20-cent deposit, and 25-cents on a 35-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, Canadian consumer fees on beverage containers have remained relatively constant from 2003 to 2014. The two exceptions are British Columbia and Alberta. The reason why rates have fluctuated in only these provinces is that consumer fees are charged in B.C. and Alberta according to how much is needed to finance the deposit program. 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.³⁰ 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 4.2 provides a historical perspective on consumer fees for various beverage container types from 2003 to 2014. Entries of “-” indicate that a province does not charge consumer fees on that

particular container type, or that there were insignificant data for the category in that program year.

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.

In some jurisdictions for certain containers, depots keep part of the refund as their handling fee, thus reducing the refund for consumers. 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 January 2014, deposits range from a low of 5-cents to a high of 35-cents. Table 4.3 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.

Effect of Inflation on Deposit Values

Despite several decades of inflation, beverage container deposits – for the most part – have barely changed. Consequently, the relative value of the deposit against the overall purchase price of a beverage has declined substantially over the years.

For instance, consider the province of British Columbia. When the program was established in 1970, the refundable deposit on carbonated soft-drinks was set at 5-cents. Forty-four years later, it is still 5-cents. While the value of the deposit hasn’t

Table 4.2 Historic Consumer Fees (2003-2014)

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

Table 4.3 Deposits and Refunds by Province as of May 20, 2014.

Province	BC	AB	SK	MB	ON	QC	NS	NB	NL	PE	YT	NT
Container Type	Deposit/Refund (in Canadian Cents)											
Containers up to 1L	5/5	10/10										
Containers over 1L	20/20	25/25										
Carbonated beverage containers						5/5						
Non-alcohol							10/5	10/5	8/5	10/5		
Metal cans under 1L			10/10								10/5	15/10
Metal cans 1L and up			20/20								35/25	20/10
Milk up to 1L		10/10										15/10
Milk over 1 L		25/25										35/25
Glass Bottles up to 300ml			10/10								10/5	20/10
Glass Bottles 301ml-999ml			20/20								10/5	20/10
Glass Bottles 1L and up			40/40								35/25	20/10
Plastic bottles less than 1L			10/10								10/5	15/10
Plastic bottles 1L and up			20/20								35/25	20/10
Juice box and Gabletop			5/5									15/10
TetraPak up to 1L											10/5	
TetraPak 1 L and up											35/25	
Wine & Spirit Containers up to 500ml	10/10	10/10					10/5	10/5	20/10	10/5	15/10	35/25
Wine & Spirit Containers 501ml to 1L	10/10	10/10					20/10	20/10	20/10	20/10	35/25	35/25
Wine & Spirit Containers over 1L	20/20	25/25					20/10	20/10	20/10	20/10	35/25	35/25
Wine & Spirit Containers up to 630ml					10/10							
Wine and Spirit Containers over 630ml					20/20							
Beer cans & bottles up to 1L	10/10	10/10		10/10	10/10		10/5	10/5	10/5	10/5	10/5	
Beer cans & bottles over 1L	20/20	25/25		20/20	20/20		20/10	20/10	20/10	20/10	10/5	
Beer cans up to 450ml (In QC)						5/5						
Beer bottles (glass) 450ml and over (QC)						10/10						
Beer containers over 450ml (QC)						20/20						
Refillable beer bottles	10/10	10/10	10/5*	10/10	10/10	10/10	10/10	10/10	10/5*	10/10	10/10	10/10

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

changed, the incentive to recycle is much smaller than it used to be. This is because 5-cents in 1970 was worth a lot more than a nickel today. In fact, according to the Bank of Canada's Inflation Calculator, a nickel in 1970 is equivalent to 30-cents in 2014.

To illustrate this point, if deposits on beverage containers in B.C. had kept up with inflation, the deposit paid on a six-pack of soft drinks in B.C. would be about \$1.50 today, as opposed to the 30-cents currently being charged.

The effect of deposit level on a consumer's incentive to recycle is clear when one considers the province of Alberta. In 2008, Alberta raised its 5- and 20-cent deposits to 10-cents and 25-cents, respectively. After only four years, collection rates for the three largest beverage container categories increased by approximately 7-percentage points. Rates for aluminum cans have increased from 80% to 88%, PET from 70% to 76%, and non-refillable glass from 86% to 90%.

Container Handling Fees

Container handling fees (CHF) are fees paid per unit by beverage distributors to redemption centre (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 without any government involvement.

CHFs can vary by container type and depot agreement. In Alberta, for example, CHFs range from a low of \$0.0302 for aluminum cans to a high of \$0.1975-cents for Tetra Pak containers over 1-litre. These fee ranges are based on the different costs of handling and storage associated with different types of beverage containers. In British Columbia, handling fees paid to grocers are privately negotiated and proprietary, and so are not publicly available.

In other provinces, the same CHF is charged on all container types. This is the case in the Atlantic Provinces. In New Brunswick, for example, all beverage containers except for beer containers are charged a CHF of \$0.4059.

Table 4.4 presents CHFs by province and container type as of 2014. It is important to note that the fees presented for B.C. are those awarded to depots only. Shaded areas of the table represent container categories that are not applicable to that particular province.

How Have Handling Fees Changed Over Time?

In the Atlantic Provinces, CHFs increased slightly from 2004 to 2012. Specifically, fees in Nova Scotia increased from 3.1-cents to 3.9-cents. New Brunswick's fees have gone from 3.3-cents to 4.06-cents. In Newfoundland and P.E.I., CHFs increased from 3.0-cents and 3.6-cents, to 4.15-cents and 3.98-cents, respectively.

In the western provinces, where the amount of the fee has been pegged to the actual cost to recycle the material, fees have fluctuated depending on the cost to collect and process each individual material.

In Québec, handling fees have remained constant at 2-cents since the program began.

Beverage Container Packaging Fees

The provinces of Ontario, Québec, and Manitoba have legislation in place mandating that a percentage of funding for municipal recycling programs come from industry. This funding comes in the form of packaging fees, or "steward" fees. In these provinces, each designated packaging material is associated with an annual fee rate. Fees vary by material type and range from 1.77-cents per kilogram for aluminum in Ontario to 36.4-cents per kilogram for mixed plastics in Québec.

The fees represent the net cost by weight of managing each material from collection through to final disposition (net of material revenues). In addition, lower performing materials tend to have a proportionately higher share of the costs. The fees act as an incentive for industry to change the type, size, and weight of printed paper and packaging (PPP) at the front end of the system.

The responsible agency collects these fees from "stewards" – the first importers, manufacturers or

Table 4.4 Handling Fees, by Province, by Material

Province	BC	AB	SK(2)	MN	QC	NS	NB	NL	PE	YT	NT
Aluminum Cans	3.26	3.05			2.00	4.03	4.06	4.15	3.98	2.50	2.20
PET up to 1L	4.90	4.10			2.00	4.03	4.06	4.15	3.98	4.00	2.20
PET over 1L	7.61	8.83			2.00	4.03	4.06	4.15	3.98	7.50	4.50
PVC up to 1L	4.90	5.85				4.03	4.06	4.15	3.98	4.00	2.20
PVC over 1L	7.61	11.47				4.03	4.06	4.15	3.98	7.50	4.50
HDPE up to 1L	4.90	5.85				4.03	4.06	4.15	3.98	4.00	2.20
HDPE over 1L	7.61	10.71				4.03	4.06	4.15	3.98	7.50	4.50
Polypropylene up to 1 L	4.90	5.85				4.03	4.06	4.15	3.98	4.00	2.20
Polypropelene over 1 L	7.61	11.47				4.03	4.06	4.15	3.98	7.50	4.50
Sealed Polystyrene Cups											
Polystyrene up to 1L	4.90	5.85				4.03	4.06	4.15	3.98	4.00	2.20
Polystyrene over 1L	7.61	11.47				4.03	4.06	4.15	3.98	7.50	4.50
Pouch (Up to 1L in AL)	4.35	4.12				4.03	4.06	4.15	3.98	4.00	2.20
Plastic up to 500ml	4.90					4.03	4.06	4.15	3.98	4.00	2.20
Plastic 501ml to 1L	4.90					4.03	4.06	4.15	3.98	4.00	2.20
Plastic over 1L	7.61					4.03	4.06	4.15	3.98	7.50	4.50
Glass bottles up to 1L	6.53	6.54			2.00	4.03	4.06	4.15	3.98	4.00	3.50
Glass bottles over 1L	7.61	10.50			2.00	4.03	4.06	4.15	3.98	7.50	3.50
Drink box up to 500ml	4.90	4.58				4.03	4.06	4.15	3.98	4.00	2.20
Drink box 501ml to 1L	5.98	4.58				4.03	4.06	4.15	3.98	4.00	2.20
Drink box over 1L		19.95				4.03	4.06	4.15	3.98	7.50	4.50
Gabletop up to 1L	6.53	5.69				4.03	4.06	4.15	3.98		2.20
Gabletop over 1L	10.65	9.51				4.03	4.06	4.15	3.98		4.50
Bag in the Box over 1L	10.88	20.20				4.03	4.06	4.15	3.98		3.50
Bi-metal up to 1L	4.90	6.83				4.03	4.06	4.15	3.98	4.00	2.20
Bi-metal over 1L	10.88	12.47				4.03	4.06	4.15	3.98	7.50	4.50
Imported beer bottles	4.90	6.54				4.03	4.06	4.15	3.98	4.00	3.50
Liquor and wine ceramic						4.03	4.06	4.15	3.98		
Sleeman bottles		5.05				4.03	4.06	4.15	3.98		
Moosehead Green Bottle						2.57					
Import beer up to 1L		6.54				4.03	4.06	4.15	3.98		
Import beer cans bi-metal		6.82				4.03	4.06	4.15	3.98		
Refillable Beer (ISB)	[1]	4.01	2,6 [4]	2.67	0.50	2.74	2.90	5 [4]	2.81	2.50	
Beer Cans		3.05		2.04							
Milk up to 1 litre											2.00
Milk over 1 litre											3.50
Milk jugs	N/A		N/A			N/A					
Milk cartons	N/A		N/A								
N/A = Not available			Container included in another category Category not applicable								
[1] In BC bottle depots independently negotiate handling fees directly with the beer industry.											
[2] Saskatchewan does not charge handling fees. SARCAN depots are paid a contracted rate per year, which is generated through the Environmental Handling Charge (EHC).											
[4] In Saskatchewan and Newfoundland a handling fee charged on refillable beer is charged at the back-end from the refund. In SK it is 5 cents at 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											

brand owners of the packaging and products that end up in curbside recycling systems – based on the amount of packaging their products contribute to the province’s waste stream. The fees are typically paid out four times per year, and help to pay for the costs of collecting, transporting, recycling, and safely disposing of producer’s end-of-life packaging.

In Ontario, industry began funding 50% of the costs of municipal recycling programs in February 2003. In Québec, industry’s share of the program began at 50% in March 2005, and has increased yearly. By 2013, it will have reached 100%. Industry funding for municipal recycling programs in Manitoba began in April 2010 at a fixed rate of 80%.

In Ontario, through an annual municipal data call, information on both the costs of municipal recycling programs and tonnages collected is gathered. From that, Stewardship Ontario (SO) (the industry funding organization representing affected stewards) determines how much each steward is required to pay for that year. The formula used to calculate the fees takes into account a number of factors, such as collection rates, net costs, 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. In 2012, approximately \$100 million was distributed to municipalities, plus an additional amount that was used for research, market development, and program management costs.

Manitoba’s funding model is a little different. In Manitoba, most non-alcoholic beverage distributors pay the 2-cent CRF, which is typically passed down the recycling chain to consumers. These funds are used to finance 80% of the costs of the municipal recycling system, in addition to buying recycling bins and for promoting the away-from-home recycling program.

In Québec, negotiated net costs are determined by both the Association of Municipalities and Éco-Entreprises Québec (ÉEQ). For 2012, the contribution

was up to \$115 million (Note: There is another contribution for printed paper, which is “in-kind” and therefore not reported as a financial contribution.).

Table 4.5 shows beverage container packaging fees in Ontario, Québec, and Manitoba for 2014. It should be noted that the fees in Manitoba apply only to those beverage containers that are not subject to the 2-cent CRF.

In Ontario, all container types carry a fee, including those made from aluminum. Up until 2010, the market value for aluminum was so high that instead of being charged a fee for each aluminum container placed on the market, brandowners would actually receive a credit for this material. This credit could be used by brandowners to offset their total amount of fees payable.

Québec is similar to Ontario in that packaging fees are levied on almost all types of containers. The exception is for aluminum beverage cans, which are subject to deposits and are therefore exempt from the municipal funding program (only the aluminum used in non-beverage packaging such as cat food cans, tins of 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.

Table 4.5 Packaging and Printed Paper Stewardship Fees, Manitoba, Ontario, and Québec

Package Type	Ontario	Quebec	Manitoba
Aluminum	2.56	18.75	-0.83
PET	14.70	21.96	19.82
HDPE	13.52	21.68	18.68
Other Plastics	23.27	26.53	26.31
Glass - Clear	2.84	9.69	6.56
Glass - Coloured	4.84	9.42	6.56
Steel / Bi-metal	5.51	11.47	9.02
Tetra Pak	18.22	28.39	27.59
Gabletop	18.19	16.25	27.59

Table 4.6 Expression of Fees by Beverage Container Type for Select Containers (in CAD cents per unit sold)

Beverage Container		Weight (g)	Ontario	Quebec	Manitoba
<i>Gabletop</i>	<i>2-litre</i>	63	1.15	1.79	1.74
<i>Gabletop</i>	<i>1-litre</i>	41	0.75	1.16	1.13
<i>Gabletop</i>	<i>Small</i>	14	0.26	0.40	0.39
<i>Tetra Pak</i>	<i>Small</i>	10.6	0.19	0.30	0.29
<i>Bi Metal</i>	<i>Small</i>	46.7	0.26	0.54	0.42
<i>Glass</i>	<i>473ml clear bottle</i>	228	0.65	2.21	1.50
<i>Glass</i>	<i>Over 1 L clear Liquor</i>	737.2	2.09	7.14	4.84
<i>Plastic</i>	<i>2-litre PET bottle</i>	58	0.85	1.27	1.15
<i>Plastic</i>	<i>Small Plastic</i>	23	0.34	0.51	0.46
<i>Plastic</i>	<i>outer milk bag - LDPE film</i>	8	0.19	0.21	0.21
<i>Aluminum</i>	<i>355ml aluminum can</i>	14	0.04	0.26	-0.012
<p><i>Italicized materials are based on Stewardship Ontario Blue Box Program Plan 2003</i> Non- italicized materials are based on Encorp Data</p>					

Because steward fees depend on material type and weight, per container fees can be calculated when the weight of each unit is measured. Table 4.6, shows 2012 fee rates for various types and sizes of containers that are commonly found on store shelves.

Overview of System Costs and Revenues

In order to determine the costs of deposit-return programs in Canada, we must review income statements from the various operating agencies. In general, this income includes revenue from the sale of empty containers collected, unredeemed deposit revenue, and revenue from a consumer fee charged up front or as an un-refunded portion of a deposit.

System Costs

Many factors can affect program costs, including the collection rate, convenience level (i.e. frequency of collection, 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 a lower cost but collect fewer containers 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. These costs are not currently part of this report's analysis.

Revenue from Material Sales

Material sales revenue plays an important role in helping to offset the gross costs of the system. This revenue will vary depending on a recycling program's level of performance, the types of containers that are being collected, and their respective market values.

In British Columbia and Alberta, where the deposit system covers all material container types (excluding those for domestic beer), program revenues generated by material sales paid for 16% and 23% 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 96% of material collected is glass bottles, which are worth significantly less than the materials that typical deposit-return programs manage. Conversely, Québec’s non-refillable deposit-return program 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, several 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 P.E.I., 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 B.C. 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 previous editions of *Who Pays What*TM, the costs associated with beverage container recycling were presented in a way that compared them on a program-to-program basis. As pointed out above, the data does not warrant being presented in this comparative manner because programs vary greatly in terms of collection rates, convenience level, and other factors that affect costs. In recognition of this issue and in an attempt to provide a better understanding of how system costs are shared among different stakeholder groups, CM Consulting introduced a new approach called “who bears the share” in 2010. This approach is meant to provide insight into the equity or fairness of the different programs by identifying the share (percentage) of program costs that each stakeholder group is responsible for.

The share is simply a function of the stakeholder’s contribution relative to total outside funding (excluding material revenues). The calculation is as follows:

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

Each group of stakeholders has a different role to play in the beverage container recycling system, from the point of distribution and sale, to the point of consumption and recycling. Understanding the roles each stakeholder group plays in the system and how economic incentives can drive system efficiency is critical to informing policy development. The following section provides an overview of the various stakeholders involved, and their roles and responsibilities when it comes to financing the system. Observations on the fairness of the funding scheme are also discussed.

Who Bears the Share: Stakeholders

Five (5) major stakeholder groups fund beverage container recycling in Canada:

The Wasting Consumer

The wasting consumer is the consumer who chooses not to redeem their containers for a refund. Likely, they put these containers into garbage bins from which even scavengers are not able to collect them so as to redeem deposits. 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:

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

Table 4.7 shows the average cost of wasting per beverage container.

The percentage of program costs borne by the wasting consumer varies from province-to-province depending on a number of factors, including the level of the deposit and whether or not 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 they will pay a greater share 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. The wasting consumer’s share of financial responsibility can also vary from year to year depending on program performance. In years with higher collection rates, the share of costs borne by the wasting consumer will be lower since more containers will be returned for a refund.

The Recycling Consumer

The recycling consumer is the consumer who returns empty containers to an authorized redemption centre or places them in a designated recycling bin (whether at home or away-from-home). Regardless of whether the recycling consumer recycles his containers through a deposit program or curbside program, he still has to pay consumer fees (i.e. CRFs, EHCs, half-back deposit) on all applicable beverage containers. These fees, passed down by the beverage industry, are non-refundable and are used to offset system costs.

To determine the average cost per unit paid by the recycling consumer, the following calculation is applied:

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

Table 4.7 Average Cost per Container paid by the Wasting Consumer, by Province.

BC	AB	SK	MB	ON	ON	QC	QC	NB	NS
wine /spirits / non-alcohol	all (excluding domestic beer)	all (excluding refillable beer)	all (excluding beer)	all non-alcohol	wine/spirits (mostly glass)	soft-drinks/non-refillalbe beer	all (excluding beer & soft drinks)	all (excluding refillable beer)	all (excluding refillable beer)
10.33	12.31	15	0	0	14	5.75	0	10.29	10.16

Table 4.8 Average Cost per Container paid by the Recycling Consumer, by Province.

BC	AB	SK	MB	ON	ON	QC	QC	NB	NS
wine /spirits / non-alcohol	all (excluding domestic beer)	all (excluding refillable beer)	all (excluding beer)	all non-alcohol	wine/spirits (mostly glass)	soft-drinks/non-refillalbe beer	all (excluding beer & soft drinks)	all (excluding refillable beer)	all (excluding refillable beer)
4.25	1.26	5.30	2	0	0	0	0	5.43	5.19

Table 4.8 shows the average cost per unit paid by recycling consumers in provinces where consumers help finance the system through consumer fees.

Municipal Government

Municipal governments are responsible for collecting and managing waste from homes and businesses for recycling, composting, and disposal. Their responsibilities also extend to litter abatement. The costs associated with providing these services are paid for directly by municipal taxpayers (i.e. property owners). The exception is when municipalities use a user-based system.

Most agree that using municipal taxes to pay for recycling and garbage disposal is inappropriate as it removes a powerful incentive to reduce waste and exhibit proper recycling behavior. When recycling is financed in this way, consumers are left with the impression that recycling is free, distorting costs and devaluing the service. A tax-based system is also unfair in that it forces those who generate little waste or recycling to subsidize those who produce a lot.

In Ontario, Manitoba, and Québec, municipalities are required by law to cover a portion of the costs of recycling beverage containers from residential, single-family and some multi-family residences. In Manitoba, this portion is 20% (the remaining 80% is financed by industry). In Ontario, the share borne by municipalities is much higher at 50%. If the proposed *Waste Reduction Act* is passed, however, the industry-funding cap for municipal blue box net costs will be removed to allow for greater than 50% producer funding. This, in turn, would decrease the share borne by municipal government. The municipal share in Québec has been on the decline since 2010. Specifically, the percentage of the net costs borne by municipalities for the multi-material recycling programs has decreased from 30% in 2010, to 20% in 2011, to 10% in 2012, and to 0% in 2013. As of January 1, 2013, industry is responsible for paying 100% of eligible net costs – nowhere else in North America is industry responsible for such a high share.

Provincial Governments or Liquor Commissions

In general, provincial governments bear no share of beverage container recycling costs. The province of Ontario is an exception to the rule. 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) (a provincial crown corporation), and the wasting consumer. Specifically, the LCBO pays about 7-cents (net) on every unit sold.

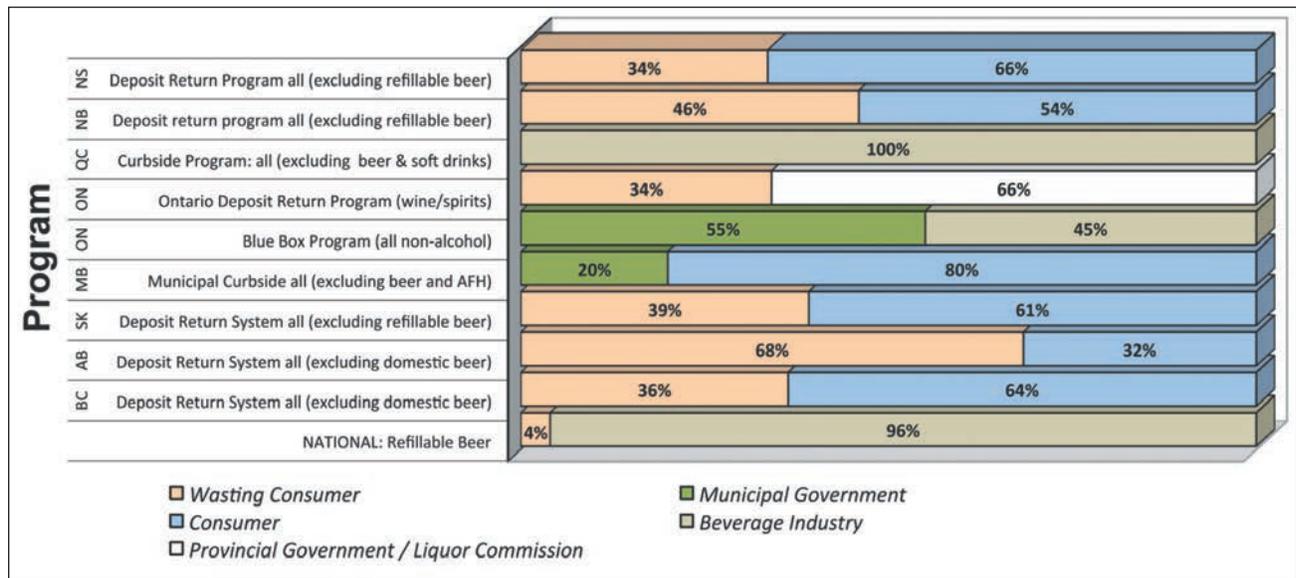
The Beverage Industry

Under regulations established by each province, industry is slowly being forced to take on an increasing share of financial responsibility for the end-of-life management of items such as beverage containers. Eventually, the ultimate goal is to achieve 100% industry responsibility. The idea behind this is sensible: beverage companies should be responsible for recovering and recycling the products they supply into the marketplace. This would be a positive development for local governments as they would be relieved of a significant economic burden.

Currently, Ontario, Manitoba, and Québec are the only provinces where industry is directly responsible for bearing a share of program costs. Beverage producers or first importers in these provinces (including milk but excluding soft drink and beer-brand owners) are required to pay levies on all their packaging (which vary by container type) sold into the residential stream. In addition, in Québec, soft drink producers bear a cost equivalent to about half a penny per container sold into the province.

In British Columbia, Alberta, Saskatchewan, Nova Scotia, Newfoundland, and New Brunswick (for liquor), the beverage industry bears no costs to run the provincial beverage recovery programs. This is because in deposit jurisdictions, the bulk of system costs are borne by consumers who choose not to return their containers. These unredeemed deposits are used to finance the programs. The only deposit jurisdiction in which industry bears a share – albeit a very small share – of recycling costs is Québec. This is because there is no CRF or half-back deposit system in this province, so recycling consumers pay

Figure 4.9 Who Bears the Share - Share of Financial Contribution by Stakeholder



nothing. In some years, the costs to the run the program are so low that it can actually run a profit because wasting consumers and material revenue make up the shortfall. It is assumed that at a collection rate of around 74%–76%, the program “pays for itself.” Actual program costs are not available, but reasonable estimates can be obtained.

The Domestic Beer Industry

The Canadian 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 refillable bottles (ISBs), a system that the brewers collectively manage. Founded on a deposit-return system 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.

Summary of Analysis

The “who pays what” analysis confirms that, in British Columbia, Alberta, Saskatchewan, Manitoba, Nova Scotia, Newfoundland, New Brunswick (for liquor), Yukon, and the Northwest Territories, the beverage industry bears no costs associated with running the provincial collection and recycling programs.

In most of these provinces, some of the system costs are borne by the consumer who chooses not to return containers—the “wasting consumer.” It is appropriate for wasting consumers to take on a larger share than the responsible consumers who ensure that their containers are being recycled.

Of these provinces, only in Alberta does the wasting consumer pay a larger share of the program costs (69%) than the recycling consumer. The higher deposit levels in Alberta mean that the wasting consumer is forfeiting more money by not recycling containers, which in turn provides more funding to offset total program costs.

Recycling consumers pay the rest of the program costs through consumer fees in British Columbia, Alberta, Saskatchewan, Nova Scotia, Newfoundland, and New Brunswick. Some portion of these consumer fees may also be used as surplus funds for other provincial initiatives, such as waste diversion and environmental enhancement.

In Ontario’s deposit-return program for alcoholic beverage containers, Québec’s program for beer and soft drink containers and all refillable beer return systems throughout Canada, the rest of the program costs are covered by industry or by provincial liquor commissions.

In Ontario and Québec, the producers or first importers of all beverages (including milk but excluding soft drinks and beer) are required to pay levies on all their packaging sold into the residential stream. In 2012, this revenue was used to finance about 45% and nearly 100%, respectively, of Ontario and Québec's total net costs of curbside recycling.



Part 5: Best Practices in Beverage Container Collection

From making recycling more convenient for the consumer to minimizing the occurrence of deposit fraud, cities across North America and Europe have identified a number of best practices to significantly increase the collection of beverage containers for recycling. Some of these practices are discussed below.

Collection Systems

Drop & Go

EZ-Drop System

For many, recycling is a time-consuming chore. In an effort to simplify and make the redemption process more convenient for its residents, the State of Oregon developed the EZ Drop System. Under this system, consumers fill up pre-labelled bags with deposit containers and drop them off at their local Redemption Center to be processed for recycling. There is no need for waiting, sorting, or feeding the machines. Customers sign up for a BottleDrop card and are given an online redemption account from which they can track their redemption activity. Within 48 hours of dropping off containers at an EZ Drop location, a refund is credited to the customer's account. Customers can redeem their balance for cash at any BottleDrop retailer kiosk.

CLYNK System

Like EZ Drop, CLYNK makes it easier for customers to recycle their refillable containers. CLYNK customers fill individually coded bags with their redeemable bottles (plastic, aluminum, and glass) and drop them off at Hannaford grocery stores in Maine. New customers receive 10 free bags; additional bags can be purchased for 15-cents. Bags are coded with customers' account info and within two business days, the account is credited with the value of the deposits, which can be redeemed for cash, used as a credit toward grocery bills, or donated to a designated charity. In addition to automatic counting, CLYNK scans barcodes on bottles and cans so it can

return each kind to its manufacturer.

Like the EZ Drop System, CLYNK has increased redemption rates. On average, stores using CLYNK collect 5 to 15% more bottles than those that do not.³¹

Reverse Vending Machines (RVMs)

In addition to depots and return-to-retail systems, another approach for collecting beverage containers for recycling is the use of reverse vending machines (RVMs). RVMs are commonplace in Europe and are usually located in grocery stores and other retail locations where beverages are sold.

To receive their deposit refund, consumers place their empties into the machine where they are scanned, sorted by material type, and processed into separate bins. Once the transaction is complete, the RVM provides a voucher that can be exchanged for cash or credit inside the store.

There are several benefits to using RVMs. Not only do they reduce customer wait times and depot labor costs, they increase depot capacities, maximize material value, and decrease transportation needs. When equipped with barcode scanners, they can also help prevent deposit fraud by identifying non-deposit containers.

Deposit Fraud

Fraud Occurrence in Canada

Despite Canada's success in becoming a global leader in the field of beverage container recycling, its programs – as with all systems that deal with large sums of money – will always be exposed to the risk of fraud.

Beverage container deposit fraud can occur in several ways. It most commonly occurs at the **back-end** of the system, for example, when beverage containers from outside the province are returned for a refund. This is possible due to the fact that bottles and cans

do not respect state boundaries and are not province-specific. This type of fraud has been observed in New Brunswick, which charges deposits on a number of beverage containers that both Ontario and Québec do not. Some bottle pickers have taken this as an opportunity to make quick money by picking up containers in central Canada – up to 20,000 in one trip – and bringing them to New Brunswick for a 5-cent refund. Because these containers were purchased outside of New Brunswick, no deposit was initially received by the system, and therefore, no refund is warranted.

Saskatchewan faces similar problems. Because Manitoba does not provide a deposit refund for its beverage containers, there is a criminal practice of bringing such containers to Saskatchewan in order to obtain a fraudulent refund at SARCAN Recycling depots.

The effect of this illegal, cross-border movement of containers is to artificially increase the recycling rate because the numerator in the rate calculation (the redemption figure) increases while the denominator (total province-wide beverage sales) remains the same, because the container was not sold in the province and therefore was never captured in distributor sales data.

Back-end fraud also occurs when the same container is redeemed more than once. Similar to when non-deposit containers are redeemed, this results in a surplus of money leaving the system.

Beverage container deposit fraud can also take place at the **front-end** of the system. This occurs, for instance, when producers and/or distributors under-report their sales data to the program operator. These types of activities result in less money entering the system.

Best Practices to Avoid Fraud

Unless beverage container recycling programs are harmonized across Canada, there will always be the potential for fraud. However, like any other business or operation, the risk of fraud can be identified, managed, and reduced. Below is a list of best practices for reducing the incidence of fraudulent redemption.

RECOMMENDATION #1

Consumer Education

Many Canadians simply aren't aware that it is against the law to buy a container in one province and return it for a refund in another. Provincial regulations must include provisions to educate the public of the law, and enforcement is crucial.

RECOMMENDATION #2

Ensure that the deposit is set at an appropriate level.

The higher the deposit value is, the greater the incentive is for fraud and the greater the need is for tighter security measures. While high deposit values (e.g. 20-cents) will result in higher collection rates, low deposit values (e.g. 5-cents) will reduce the incentive for fraud, especially when mandatory labelling and more sophisticated accountability systems are not in place.

RECOMMENDATION #3

Require that a list of all registered containers be posted and made publicly available.

When this information is accessible to the public, the accountability and integrity of the deposit-return system is enhanced. It also provides an opportunity for unregistered (free-rider) containers to be identified more easily. At a minimum, postings should include: the first importer's name; product name; unit size; type; and UPC code.

Some provinces are already doing this. In Québec, for instance, the central system administrator – Boissons Gazeuses Environnement (BGE) – on behalf of the non-alcohol beverage industry, keeps an up-to-date listing of all registered beverages in Québec, which is made publicly available on-line.

RECOMMENDATION #4

Mandate unique labelling requirements.

To more easily identify illegal containers, the backdrop law of each province can include a provision requiring beverage containers to be registered and bear a unique label or Universal Product Code (UPC) specific to each province. In California, for example, all eligible bottles have "CA cash refund" or "CA CRV" written on their labels. The

unique label would identify the product as being offered for sale in a particular province and prevent illegal redemption of containers brought in from another province.

RECOMMENDATION #5

Implement retailer standards for reverse vending machines (RVMs) and manual collection.

RVMs can be designed to include security systems that identify repeat containers and bar codes of the same type, with automatic alerts to the retailer. In Germany, for example, each container sold on the market is labelled with a standard bar code and is also marked with a label that uses a patented ink that can be read by infrared scanning technology. The special ink is used to identify containers that have legally entered the deposit-return system in Germany and to prevent the redemption of non-deposit bearing containers from neighbouring countries.

TOMRA's Sure Return™ Technology works in a similar way. Sure Return™ is a patented optical recognition technology that uses a unique illumination and photo processing system to create a high-contrast image of inserted items that can be used to quickly and accurately distinguish between thousands of different containers, as well as correctly identify their deposit value. After a container has been identified and accepted, the imaging system continues to monitor its transport through the recognition chamber. If any attempt is made to fraud the system, such as trying to pull out and re-insert the container, the system will register the attempt and cancel the refund.³²

In order to prevent theft and re-redemption, retailers should ensure secure storage of redeemed containers. Duplicate claims on containers – whether returned manually or via RVMs – can also be avoided by destroying the containers after they are returned (i.e. glass crushing, compaction of plastic, metal, and Tetra Paks). Requiring all retailers to post consumer awareness signage at their stores and to report with mass-balance should also be mandatory. In order to monitor how stores and depots respond to out-of-

state containers and suspicious redemptions, a “mystery shopper” program should be established in each province. Further, stores that report fraud that results in convictions or penalties should be rewarded.

RECOMMENDATION #6

Establish a random audit program to verify redemption counts and to identify collectors that are inaccurately reporting.

Random on-site spot audits, aimed at verifying redemption figures by comparing reported counts to the actual number of containers returned, provide real-time information on the level of fraudulent activity in the DRS. In New Brunswick, a system of minimum random audits of the loads shipped and reported by collectors, with increased random inspections when inaccurate counts were found, resulted in over \$1 million in savings for Encorp Atlantic,³³ the company responsible for managing the province's deposit-return program.

RECOMMENDATION #7

Set limits on consumer-based redemption.

By making the crime less convenient and therefore less profitable, redemption limits reduce the incentive for people to bring their containers from out-of-province. Some provinces have already taken this step. For example, in Saskatchewan, there is a \$75 limit on deposit refunds per individual per week. There are large-volume generator exemptions offered at SARCAN depots for schools, bottle drives, restaurants, public events, weddings, etc.

RECOMMENDATION #8

Implement strict penalties for illegal redemption and false reporting by first importers.

The purpose of penalties is two-fold: first, to impose a punishment so as to discourage the individual(s) from repeating the contravention, and second, to serve as a general deterrent to deter others from engaging in the behaviour. Under Michigan law, a person found to be fraudulently redeeming containers can be

punished with up to 5 years in prison, be required to pay a \$5000 fine, and may be forced to make restitution payments. In Massachusetts, the maximum penalty for illegal redemption is \$25,000,³⁴ and in Maine there is a \$100 fine per non-deposit container.³⁵

In addition to financial penalties, first importers who report false information (e.g. sales data) to program administrators should have their rights to distribute beverages in the province reduced or revoked for a certain time period.



Part 6: 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 the crash, 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 deposit-return systems (DRS). Compared to programs collecting containers that are commingled with other materials, DRSs 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. 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 2012 alone, over 6 billion cans were sold in the country.

The collection 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 2013, Ontario and Manitoba were the only two provinces that did not have deposits on soft drink cans; their collection rate for non-alcoholic beverage cans was 59%. This is considerably lower than the collection rates reported by deposit-return jurisdictions. The lowest collection rate reported for non-alcoholic cans in a deposit system was 63% in Newfoundland.

In Ontario, aluminum cans had an average monthly value of about \$1,612 per tonne from 2011-2013, or 2-cents per can. On account of their value, aluminum beverage cans are a desirable commodity to the collectors and sellers of recycled scrap. As with other beverage container materials, the price of aluminum dropped in 2009 (to \$1215/tonne), but has since recovered.

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.³⁶



Glass Bottles

Calculating the collection 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 – both beverage and food container glass – 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 province with the highest collection rate for non-refillable glass beverage containers is B.C. at 94%. At the other end of the spectrum is Manitoba. Manitoba, which does not have deposit-return legislation, has a collection rate of approximately 55%, with most collected glass currently being used as aggregate replacement rather than being recycled into new products.

The market value of recycled glass depends on the method by which it was collected. In Canada, two main glass collection systems are employed: colour-separated collection and multi-material collection. The first sorts the material at the point of collection by colour type (flint, green, brown, or mixed colour) and provides the recycler with a colour-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 is sold to Owens-Illinois (OI) for bottle-to-bottle manufacturing or to Owens Corning for fibreglass production. Most of the glass collected via the province's Blue Box program is used to produce fibreglass insulation or glass bottles, as a sandblasting medium, 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 down in 2013, most of the glass is being used as an aggregate or in landfill operations as roadbed.

In Alberta, recycled glass is spun into thin strings (like cotton candy) and used to produce fibreglass insulation.³⁷

Glass from British Columbia is either sent to Alberta where it is recycled into glass sand for making fibreglass insulation, or to Seattle where it is recycled into new glass bottles.³⁸

Glass containers collected in Saskatchewan are shipped to different end-markets depending on colour; clear glass is sent to a processing facility in Moose Jaw, Saskatchewan, while the coloured glass is sent to a facility in Airdrie, Alberta where it is manufactured primarily into new glass bottles and jars. Some coloured glass is also made into fibreglass insulation.

In Manitoba, glass is usually crushed and used locally as fill in roadways and sidewalks.³⁹

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 countrywide collection rate of approximately 98%, the refillable beer bottle is Canada's most recovered beverage container. No province has a collection rate of lower than 84%.

Following collection and sorting, refillable beer bottles are returned to the brewery for their labels to be scraped off. They are then washed, refilled,

capped, and crated. On average, the industry standard beer bottle (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

Taking up 33% of the market, 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 the deposit-return provinces, PET usually has a collection rate of 70-80%, but due to the low collection rate (56%) 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 \$485 for the period of 2011-2013. After dipping to a low of \$187/tonne in 2009 the value peaked at \$652/tonne in 2011. It has since dropped to \$373/tonne in 2013.

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 data,⁴⁰ 39% of recycled PET is turned into a fibre, 10% for strapping, 21% 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 British Columbia, plastic goes to Merlin Plastics, a facility located in the municipality of Delta, B.C. PET from Saskatchewan and Manitoba is shipped to U.S. and Canadian processors that flake the material. Some PET from Manitoba is made into plastic lumber for railway ties. PET from Québec and Ontario is brokered into the market with multiple end destinations. In the Maritime Provinces, most plastic goes to Novapet Inc., a facility located in Amherst, Nova Scotia. PET from the Northwest Territories is sent to markets in B.C. 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 collection rates for HDPE.

From 2011-2013, the average monthly value for mixed HDPE from Ontario’s Blue Box program was reported to be \$532 per tonne. 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 1%). Their average collection rate is 65%.

From 2011 to 2013, steel cans collected in Ontario’s Blue Box program were worth an average of \$289 per tonne. The value of recycled steel cans dropped from a high of \$335 per tonne in 2011 to \$254 per tonne in 2013.

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, collection rates are over 50% in each of the deposit provinces and 30% or less in Ontario and Manitoba.

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 collection rate for gable top containers as they are generally reported with Tetra Paks, as part of a larger category of collected material. Collection rates for the larger category as a whole are calculated to be at 68% in Alberta (where milk containers are on deposit), over 50% in each province where Tetra Paks are part of the deposit-return program, 30% in Ontario, and less than 20% in Manitoba.

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 gable top material is sent to facilities in the U.S., China, and Korea 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 (LLDPE) 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 bottles.⁴¹ 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.

Traditional methods used to recycle aluminum and plastics are not practical for poly pouch containers as this material is a contaminant in both processes. Although none currently exists, several recycling agents – particularly in provinces that mandate the recycling of all beverage containers (as opposed to their being sent to landfill or incinerated) – are attempting to source a permanent market for recycling this material. So far, test batches have been sent to processors in North America, Europe, and Asia.



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 collection 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 U.S., 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%.⁴² 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* 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 2011 "Waste & Opportunity" report, aluminum has the highest recycling rate and recycled content of all beverage containers.⁴³ Approximately 75% of all the aluminum ever manufactured is still in productive use today,⁴⁴ and it is estimated that 50% of all aluminum cans on retailers' shelves have been recycled at least once.⁴⁵ 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

Making new bottles from recycled PET resin requires 30% less energy than using virgin material. For every tonne of plastic produced, this is equivalent to the energy contained in about 11 barrels of oil.

Many companies have set goals for recycled PET and have made commitments to increase this percentage over the next few years. However, most claim 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 1,718 million pounds of PET containers available for recycling in 2012, only 30% were recycled.⁴⁶

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). A significant amount of recycled PET is also used for sheet and film, strapping, non-food bottles, and to produce fibre for clothing and carpet.⁴⁷

Glass

Using recycled glass cullet in the production of new glass has been acknowledged as the most beneficial end-of-life scenario for glass packaging. Glass is 100% recyclable and because it is not chemically altered by the recycling process, it is one of the very few materials that can operate forever in a closed-loop system with essentially no loss of quality or purity. 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.⁴⁸

The GPI has set a goal to manufacture all containers with a minimum of 50% recycled material by 2013, to increase to 60% by 2017. Currently, although different bottle manufacturers have varying recycled-content levels, the average recycled-content rate of glass bottles sold in North America is about 33%.⁴⁹

The Canadian brewery industry's industry standard bottle (ISB) contains a higher percentage of 60% to 65%.⁵⁰

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. While no province in Canada has enacted such laws as of yet, 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 reports annually about the amount of recycled material that is used. Certain labelling laws support the manufacturing of recycled-content products indirectly.

Other measures to promote markets for recycled-content material include: labelling laws that require products to be labelled 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 colour-separation at source.

Part 7: Economic and Environmental Benefits of Reusing and Recycling Beverage Containers

Economic Benefits

In addition to the direct financial costs and revenues, deposit-return programs 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 deposit-return systems (DRS) for beverage containers create significantly more – 11 to 38 times more – jobs than curbside recycling.⁵¹

One of the main reasons for this is the relatively greater amount of material entering and leaving the system; the average recovery rate for beverage containers in provinces with a deposit-return program is 83%, compared to the average 56% 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).⁵²

Together, The Beer Store (TBS) deposit-system and the Ontario Deposit Return Program (ODRP) are responsible for creating approximately 500 direct jobs.⁵³ The province of Nova Scotia has reaped similar benefits; according to an economic impact study, its deposit-return program for beverage containers creates approximately 600 jobs and \$20.1 million in salaries and wages.⁵⁴ This income generated approximately \$1.2 million in tax revenue for the federal and provincial governments in fiscal 2013.⁵⁵

Deposit-return programs 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 (OI). In Montreal, OI’s glass production operation employs over 400 people in highly skilled jobs.⁵⁶ Collectively, these employees are paid \$31 million in wages and benefits annually.⁵⁷

Economic Growth

Besides job creation, deposit-return programs 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 contributed approximately \$28.8 million to GDP in 2012-2013.⁵⁸ The manufacturing of glass packaging alone in Montreal drives over \$21 million in local purchases of production inputs inducing spin-off investments in Québec.

Cost Savings to Municipalities

While deposit-return programs may divert potential sources of revenue from municipal curbside programs, they also result in significant cost savings for municipal governments. These savings come 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.

Consider a study conducted in 2006 by the Association of Municipalities of Ontario (AMO) and the Association of Municipal Recycling Coordinators (AMRC). The study found that mandating deposits on clear and coloured glass bottles in Ontario would reduce the net costs of the curbside program by \$19 to \$23 million, effectively reducing the cost to Ontario taxpayers.⁵⁹ Following the introduction of the ODRP in 2007, the City of Toronto reported a net savings to the City's curbside program of \$448,000 in 2007 and \$381,000 in 2008.⁶⁰ These savings were primarily due to the reduction in glass handled by the City's recycling program.⁶¹ By far, the greatest savings came from reduced processing costs (57% and 68% of total savings in 2007 and 2008, respectively). Savings resulting from glass disposal were still significant, but accounted for less than half of total savings (42% and 31% of total savings in 2007 and 2008, respectively).

Similar cost savings have been reported by municipalities in British Columbia. Specifically, following the expansion of its deposit-return program to include alcohol, water, and juice containers, municipalities estimated their net savings at approximately \$10 million.⁶²

There are also significant savings as a result of reduced litter clean-up costs. The costs of removing litter from roadways, public parks, and commercial establishments are huge. These costs are borne not only by municipalities, but also by provincial governments, educational institutions, and private businesses.

While no data exists for Canada, Keep America Beautiful estimates that the costs of litter abatement

total approximately \$10 billion annually in the U.S. (average \$2,300 per ton).⁶³ Consistent with these findings, a study conducted for the Massachusetts Department of Environmental Conservation found that the expansion of the state's deposit program would save municipalities over \$500,000 annually in avoided litter abatement costs.⁶⁴ Although somewhat dated, a similar study for the State of Washington concluded that eliminating 90% of beverage containers from litter would result in savings of approximately \$1,071,000.⁶⁵ (It is important to note that all of these estimates are conservative.)

Further evidence comes from a 2010 report for the Campaign to Protect Rural England. According to economic analysis conducted by a U.K.-based consulting firm, a deposit-return system for beverage containers in the U.K. would save local authorities £27 million (CAD \$47.0 million based on an exchange rate of UK £1 = CAD \$1.74) in litter collection costs.⁶⁶

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 U.K., this is estimated to be £1,248 million (CAD \$2.17 million) per annum.⁶⁷

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 litter.⁶⁸

Charities and Community Organizations

Beverage container deposit-systems play an important role in the fundraising initiatives of many not-for-profit organizations (e.g. schools, community groups, youth groups) and charities by providing refunds for containers collected through bottle drives. In Nova Scotia, for example, such organizations collect approximately \$1,400 (on average) in proceeds through bottle drives (the maximum reported amount is \$8,000).⁶⁹ Moreover, in Nova Scotia, many of the redemption centres actually facilitate contributions to such organizations by allowing customers to donate their refunds to specific charities and organizations.⁷⁰

In Ontario, The Beer Store (TBS) (in partnership with United Food and Commercial Workers Local 12R24) holds an annual fundraiser to raise funds 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 2013 alone, the Returns for Leukemia fundraiser collected a total of \$1.7 million.⁷¹ Since the fundraiser began seven years ago, TBS and UFCW Local 12R24's contributions have raised over \$6.4 million.

Supplemental Income for Low/No Income Individuals

In provinces that have them, there are many people who use the deposit-return system as a means to earn and/or supplement their income. For instance, the daily processing of 55,000+ beverage containers supports 600 to 700 residents in Vancouver's inner city community year-round. Most of these people are economically disadvantaged and, in many cases, disengaged from the workforce. Without revenue from the deposits, many would have difficulty meeting their basic needs.

Environmental Benefits

Traditionally, the performance of recycling programs has been measured based on the weight of material collected and diverted from landfill. More recently, however, performance metrics are being expanded to consider factors such as the amount of energy saved and the reduction in greenhouse gas emissions from reuse and recycling. These new measurements provide a much more comprehensive understanding of the environmental impacts of beverage container diversion.

Both Environment Canada and the U.S. Environmental Protection Agency (EPA) have undertaken extensive life-cycle analysis studies that measure the inputs and outputs, from cradle to grave, of various materials. The results can be applied to beverage container diversion in order to quantify the environmental benefits associated with container recycling. Results are summarized in the table below.

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.

All container-specific tonnage collected by province and container type and the multipliers used 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 CM Consulting at jason@cmconsultinginc.com or call 416-682-8984.

Table 7.1 Environmental Benefits from Recycling Beverage Containers in Canada

Province	Avoided emissions (MTCO _{2e})	Equivalent number of cars taken off the road.	Total GJs saved	Avoided crude oil extraction (in barrels)	Value of crude oil saved (based on \$111.67/barrel) (avg price in 2012, US EIA)
British Columbia	142,465	29,680	2,184,225	354,007	39,532,001
Alberta	172,864	36,013	2,906,925	471,139	52,612,050
Saskatchewan	39,986	8,330	699,909	113,437	12,667,562
Manitoba	23,922	4,984	573,256	92,910	10,375,290
Ontario	321,962	67,075	5,706,279	924,843	103,277,167
Quebec	218,554	45,532	4,325,738	701,092	78,290,942
New Brunswick	25,778	5,370	423,441	68,629	7,663,807
Nova Scotia	36,110	7,523	683,253	110,738	12,366,096
Newfoundland	18,066	3,764	395,699	64,133	7,161,709
Prince Edward Island	5,272	1,098	109,945	17,819	1,989,883
Yukon	1,293	269	16,547	2,682	299,485
Northwest Territories	1,751	365	23,126	3,748	418,563
TOTAL	1,008,024	210,005	18,048,344	2,925,177	326,654,557

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

Notes and sources on multipliers used:

- All tonnage data are based on reported tonnes by program and container types.
- Refillable bottles tonnage is based on an average container weight of 263 grams multiplied by the number of units recovered and multiplied again 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.
- Emissions reduction and 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.
- GHGs per car per year equals 4.8. Source: www.epa.gov/cleanenergy/energy-resources/calculator.html (accessed February, 2014).
- One barrel of crude oil is equal to about 6.1 GJ of energy. Source: Oregon Dept of Energy, <http://www.oregon.gov/energy/cons/pages/industry/ecf.aspx> . 1 barrel crude = 5.848 Mbtu, which = 6.17 GJ
- The average value of a barrel of crude oil in 2012 was \$111.67 according to the US Energy Information Administration, <http://www.eia.gov/todayinenergy/detail.cfm?id=9530>

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Methodology for Calculating Collection Rates in Manitoba, Ontario and Québec

In the spirit of continuous improvement, we welcome comments on and sharing of any new information that will help to refine these estimates in future editions of *Who Pays What*.

Assumptions for Manitoba

- **Sales and collection of aluminum cans for non-alcoholic beverages** is based on an assumption that 87% of aluminum sales and collection reported by MMSM are for beverage cans.
- It is assumed that **all aluminum cans sales are reported to CBCRA**
- The non-alcoholic **aluminum can collection** comes from the values reported by MMSM (2012), assuming that 87% of the aluminum recovered is from beverage cans.
- Collection is then further increased by what is assumed to be collected away-from-home and through private buy-back channels. We estimated that **30% of the aluminum sold is available for collection outside of the residential sector, and 40% of that amount is collected.**
- **PET beverage bottle sales** reported by CBCRA on a unit basis
- **Collection of PET is based on the assumption that approximately 65% of a PET bale is comprised of PET beverage containers.** This is a decrease (from 85%) from the previous 2010 report, which used 2005 Ontario waste composition data. The downward trend from 85% to 65% is consistent with PET beverage container lightweighting and an increase in the collection of PET thermoform packaging, which is also included in PET bales sold today. (The percentage of thermoform packaging in loads is highly variable, between approximately 0% and 20% per PET bale).
- The **PET bottle collection rate is further increased** by what is assumed to be collected away-from-home. We estimated that 40% of the PET bottles sold are available for collection outside of the residential sector, and **40% of that amount was collected in 2012.**

- The collection rate for glass, Tetra Pak, and gable top beverage containers is based on the residential rate reported by MMSM for 2012. Away-from-home sales and recovery are not included in this summary.

Assumptions for Ontario

- **Sales and collection of aluminum cans for non-alcoholic beverages** is based on an assumption that 90% of aluminum sales and collection reported by Stewardship Ontario are beverage cans.
- It is assumed that **all aluminum cans sales are reported to Stewardship Ontario.**
- The non-alcoholic **aluminum can collection** is largely from the values reported by Stewardship Ontario (2012), assuming that 90% of aluminum recovered is from beverage cans.
- Can collection is further increased by the amount assumed to be collected away-from-home and through private buy-back channels. We estimated that **30% of the aluminum sold is available for collection outside of the residential sector, and 40% of that amount is collected.**
- **PET beverage bottle sales** are based on the median per capita rate of PET bottle consumption for nine Canadian provinces (134 PET bottles per year per person).
- Rates for the collection of PET are based on the assumption that **approximately 65% of a PET bale is comprised of PET beverage containers.** This is a decrease (from 85%) from the 2011 report, which used 2005 Stewardship Ontario waste composition data. The downward trend from 85% to 65% is consistent with PET beverage container lightweighting and an increase in the collection of PET thermoform packaging, which is also included in PET bales sold today. Note: approximately 58% of Ontarians have access to PET thermoform recycling (CPIA, 2011). Source: The 70% assumption is based on conversations with Ontario MRF operators.
- The **PET bottle collection rate is further increased** by what is assumed to be collected away-from-home. We estimated that **40% of the PET bottles sold are available for collection outside of the residential sector, and 30% of that amount is collected.**

- **The collection rate for Tetra Pak and gable top non-alcoholic beverage containers is based on the rate reported by Stewardship Ontario for 2010.** The away-from-home sales and collection rates are not included in this summary.
- Ontario collection rates for glass (non-alcohol) and 'other' plastic are not available

Assumptions for Québec

- **PET and glass beverage bottle sales for non-deposit beverage bottles** (e.g. juice, sports drinks, and water) are based on data from the residential waste composition study from ÉEQ and Recyc-Québec (2006–2009). 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 Boissons au Québec, Recyc-Québec, January 2008.)
- **Collection values for PET and glass are derived using the residential waste composition study from ÉEQ and Recyc-Québec (2006–2009).**
- **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.

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