

RECOVERY QUESTIONS

WHAT IS BEING PICKED UP WHERE, FOR HOW MUCH, AND BY WHOM? COULD THE SUCCESS OF BEVERAGE CONTAINER RECOVERY IN CANADA POINT THE WAY TO A NATIONAL PROGRAM IN THE U.S.? THESE QUESTIONS, AND MORE, ARE ANSWERED.

BY CLARISSA MORAWSKI

As the debate around strategies to recover beverage containers heats up again, so too does the interest in quality information. For readers interested in said illumination, *Who Pays What 2010* (the fourth edition) fills the bill, as it houses everything one needs to know about beverage container recovery in Canada.

While some might choose to disregard the remarkable success that Canadians have had with beverage container recovery because of our small population, it should not be so quickly sloughed off. Even with its tiny population – and just one-ninth the density of the U.S. – beverage container reuse and recycling in Canada is a real success story. *Who Pays What 2010* tells a compelling story of innovative programs with low costs, high performance and funding provided by industry and/or consumers, not municipalities or taxpayers.

The economies of scale in the U.S. provide many opportunities for a possible state-based, or even a national program, that have the potential to be not only inexpensive, but to be highly successful. And in the wake of that success, such programs would attract domestic markets and incentivize new domestic recycling capacity for glass and plastics specifically, while simultaneously reducing contamination to paper streams.

An overview of packaging recycling in Canada

While the following focuses on beverage container recycling, this

does not mean that there is no other packaging recycling in Canada. In fact, most provinces have robust comprehensive curbside collection programs which target an array of paper and packaging materials. In some cases the programs are entirely funded by municipalities, some are partially funded by industry directly, and others receive grants from extra funds generated in the deposit return programs.

Incomplete data on packaging and paper recycling

Unfortunately, the data on packaging and paper generated and recovered by most provinces is simply not available. In fact, even in provinces like Ontario, Québec and Manitoba, recovery rates which are published do not represent an overall recovery rate, but instead take the amount of material collected over the amount of material which is considered generated by the industry that pays for the program. It is easy to therefore understand the limitations of this data, as it omits actual generation (which includes away-from-home packaging and paper as well as material from residents receiving private sector service, like multi-family homes), and generation from those that do not report (e.g., free riders).

In addition, the material collected may be outside of the categories included in the generation data (like deposit glass collected in the curbside program); or commercial cardboard collected by municipalities. And finally, the values published for collection do not reflect actual material recycled. Any losses which occur after

primary MRF processing are not factored in, including outthrows at plastic reclaimers, pulp mills and glass cleaning facilities.

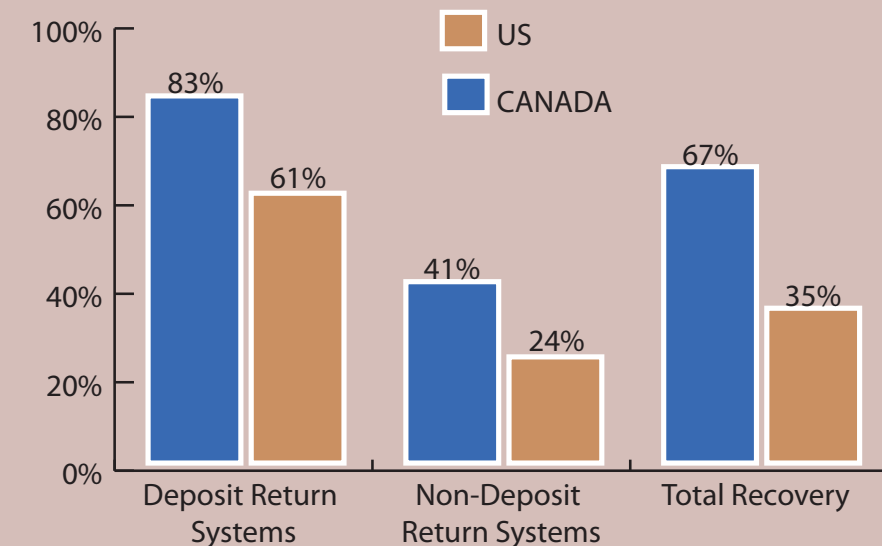
The net result is that there are no real packaging recycling rates available in Canada. This is an important point given that many U.S. policymakers today consider the rates published for Ontario, Manitoba and Québec to be reflective of actual recycling or diversion rates, but they most certainly are not.

For beverage containers, however, establishing recycling rates is much easier because all beverage sales are accounted for through mandated industry reporting, and all recovery is also accurate (fraud excepted) because there are very little loss rates (yield loss) associated with containers recovered in deposit return programs.

Performance: collection rates

It will come as no surprise to many, that in Canada deposit return programs recover approximately 83 percent of all containers sold, versus approximately 41 percent in the non-deposit system in Canada (see Figure 1). Overall, including refillable beer, the national recovery rate for beverage

Figure 1 | Collection rates for beverage containers in Canada and U.S.



Canada 2008-2009; U.S. 2006.

Sources: CAN: CM Consulting (2008-2009); US: CRI (2006)

age containers is approximately 67 percent. For non-refillable beverage containers, the rate drops to 60 percent.

In comparison, it is estimated that about 61 percent of containers are col-

lected in deposit return programs in the U.S., and just 24 percent where there is no deposit return. The national recovery rate in deposit return programs is probably a touch higher now as a result of program

Coast to coast update: Canada

Alberta

In late 2008, the Province of Alberta increased the level of its deposits (all currencies in this sidebar are Canadian) from five cents to 10 cents, and 20 cents to 25 cents. The program is reporting an overall return rate (excluding domestic beer) of 84 percent, up from 76 percent prior to the deposit increase.

In terms of the impact of the increased deposit levels on beverage container sales, according to the sales data provided by distributors, sales continued a steady, uninterrupted increase from 2006 through 2009.

In late 2009, Alberta became the first jurisdiction in North America to introduce a deposit on milk and liquid cream beverage containers. The deposits are 10 cents for containers under one liter and 25 cents for containers over one liter. Since the implementation of deposits on milk, the rate of recycled cartons grew from 22.5 percent to over 65 percent, and the rate of plastic jugs from 61 percent to 71 percent. The Alberta Dairy Council reports that new deposits have not had an impact on sales.

Manitoba

In the fall of 2009, the Province of Manitoba approved a program plan for packaging and printed paper recovery modeled after

the industry-funding programs operating in Ontario and Québec, where stewards (brand owners or first importers) of packaging, including all beverage-related consumer packaging, must finance a portion of the costs associated with the recycling program. In Manitoba's case, that portion is 80 percent. Unique to the Manitoba program is a specific performance target of at least 75 percent recovery of beverage containers. The recently-formed Canadian Beverage Container Recycling Association (CBCRA) is voluntary organization made up of the grocery sector and beverage companies. CBCRA is focused on implementing and financing an away-from-home recovery program which they hope will achieve the mandated 75-percent collection rate. The program is funded through a two cent (non-refundable) consumer fee on every beverage sold.

Ontario

In early 2007, the province expanded the provincial deposit return-to-retail system on beer to include all alcohol containers, such as wine and spirits. Now in its fourth full year of operation, the program saw significant increases in overall recovery, from 67 percent in 2007-2008, to 73 percent in 2008-2009, to 77 percent in 2009-2010. The provincial goal for 2010-2011 is

80 percent and 85 percent after that.

Québec

In late 2009, the provincial government stated that it prefers the curbside recycling program for the collection of all packaging and printed papers, including soft drink containers currently under deposit. However, unless the beverage industry can prove that they can achieve 70 percent recovery through alternative mechanisms to the existing system, deposit return for both beer and soft drinks will remain in place. On the flip side, the ministry also stated that if the recovery rates for the deposit system do not increase to 70 percent or greater in the next two years, the government may actually increase the level of the deposit on these containers.

Prince Edward Island

In May 2008, a new deposit return program for non-refillables commenced on Prince Edward Island. Just prior to the implementation of this program, the province repealed the law which prohibited non-refillable soft drinks to be sold on the island. Shipments of refillables by Coke and Pepsi ended in the fall of 2008.

expansions in Connecticut, New York and Oregon.

The drop in performance between deposit and non-deposit systems is significant, and perhaps surprising, when you consider that the curbside recycling collection programs in Canada where beverage containers are collected (e.g., non-deposit systems) are not only mandated, funded and, in many cases, over two decades old. This inability to achieve higher rates is largely because curbside collection programs are in place for residential single-family households (with some multi-family dwellings, as well), but a significant portion of beverage containers are consumed and discarded away from the curbside program or away-from-home (see Sidebar).

This is important because it illustrates that “comprehensive” or “enhanced” municipal recycling alone is simply not enough to achieve real gains in recycling of glass, plastic and most importantly, aluminium. The idea that one curbside collection system for all packaging is better than two, because each system would rob the other of efficiencies to reduce recycling costs, is not based on reality. Both systems actually draw different materials from different points of generation. A new

report issued by the UK-based Eunomia Research and Consultancy on behalf of the Campaign to Protect Rural England (a not-for-profit group which focuses on litter) examines this very assumption. They conclude that the argument is “pure speculation” and that “the commentary overlooks the point that when captures are very high from deposit schemes, there is very little duplication, and curbside schemes can concentrate on optimizing the logistics of collecting the remaining materials, such as paper and cardboard.”

These findings are consistent with conclusion of the Congressional Research Service (CRS), which prepares reports for the U.S. Congress. CRS concludes:

“Both systems can serve as elements of comprehensive recycling programs. Neither constitutes a comprehensive program by itself. Neither excludes the use of the other.”

“Deposit systems skim potential sources of revenue from curbside programs, but they also reduce the operating costs of curbside programs. Local governments would appear to achieve greater diversion of solid waste

from disposal at a lower cost per ton if both a bottle bill and a curbside collection program were in place.”

Quality issues

Reported collection rates do not reflect actual recycling rates. In fact, a more thorough analysis would further reduce the collection rates based on levels of contamination to estimate the total recycling rate.

On average with curbside collection programs, there is an extra loss rate of 12 percent from PET bottles – not including a 13 percent yield loss from glue, caps and labels associated with all collected PET bottles through deposit or non-deposit systems. The glass recycling industry reports losses of 20-to-60 percent from commingled glass. The aluminum sector reports losses of 2-to-11 percent for aluminum cans collected curbside. The ranges are dependent on the collection method (“Single-stream uncovered” from the Feb. 2010 issue of *Resource Recycling*). Deposit return material in most cases is far superior, which means that further deductions for yield loss can be applied, and will have a minimal impact on the rates. Also, paper mills report additional contamination

How much is away-from-home?

When curbside collection programs were conceived in the late 1980s, the marketplace for packaging was very different both in terms of packaging material used and the places they were being discarded. The last decade has seen the dramatic increase in the amounts and types of scrap beverage containers, as well as the number of places these containers are discarded. The table illustrates the myriad of places that comprise of away-from-home locations.

For jurisdictions that do not have deposit return, establishing a comprehensive recovery and recycling system for both residential (single-family and multi-family dwelling), and away-from-home locations is requisite to achieve higher levels of performance. The question of how many beverage containers are actually discarded away-from-home, and *where* they are discarded, is critical to assess recovery rates and design recovery programs. There is little comprehensive data on the subject anywhere in the world surprisingly, but several estimates are currently being used for analysis.

The lowest estimate is from the American Beverage Association, which suggests that about 30 percent of beverage containers are discarded away-from-home. Other reports cite higher rates like 50 percent-63 percent for PET bottles. The problem with all the data, however, is the manner in which it is derived. Essentially, it is assumed that if a beverage was purchased at a grocery store, then it will be consumed and discarded at home. Convenience store or vending machine sales will be consumed and discarded away-from-home. The reality

Public spaces	Parks, streetscapes, transit stops, etc.
Commercial recycling	Bars, restaurants, hotels, shopping malls, convenience stores, offices, gas stations, other workplaces and some multi-residential (with private waste service)
Government	Municipal and provincial government buildings, arenas, libraries, public day-cares; community centers, etc.
Educational institutions	Colleges, universities, elementary and secondary schools, etc.
Special events	Outdoor festivals, sporting events, concerts, parades, fairs, etc.

is that a purchase of a 24-pack of single-serving plastic water bottles for example may be consumed inside or outside of the home.

The beverage industry is well-aware that recycling success is dependent on recovery away-from-home. Several pilot programs and strategies are in place and being monitored in central Canada, but to date there is little to report. Of particular interest are the costs of these programs, what are their performance levels and, perhaps most important, who will pay?

rates, of approximately 15 percent or greater in the paper stream when beverage containers are collected along with the paper in single-stream programs – this is effectively collateral damage from not having deposit return.

Today about 56 percent of recovered PET is exported from the U.S. to foreign recycling markets. For the most part, deposit return PET is worth at least five cents more per pound, and is recycled domestically. Additional plastic reclamation capacity is up and running in parts of the U.S.,

and beverage manufacturers such as Nestle and Coke are promising increased recycled-content levels. Other beverage companies, too, are using greater levels of recycled PET (rPET), like Rainbow Light Nutritional Systems, Portico Spa, Naya Water, Eldorado Water, Naked Juice and Innocent Beverages. But given the current export levels due in large part to poor quality with non-deposit PET recovered, one has to ask, where will all this new rPET come from?

What are the costs?

Understanding the cost implications can be a tricky exercise because curbside recycling tends to be focused on the basket-of-goods collected, rather than on a material-by-material basis. In general, paper and cardboard make up the lion's share (more than 78 percent by weight) of any curbside mix, which results in a lower cost per ton than container-only programs like a deposit systems.

However, Ontario does have leading

edge activity-based costing ("A package of responsibility" from the May 2010 issue of *Resource Recycling*) which offers some insight into the true costs to collect certain materials through a comprehensive curbside system. Costs per ton vary dramatically from one material type to another. For example, in the Ontario program, newspaper has a net cost per ton to recycle of \$17 Canadian dollars, and PET is over 50 times higher, at CA\$907 per ton. We can use these data to make apples-to-apples comparisons, but note that there are significant performance differences between programs.

Take PET bottles for example. Table 1 provides a per-unit cost for four systems currently operating. Ontario's comprehensive curbside system costs about three cents per unit recovered, with a residential rate of about 57 percent, (3.6 lbs/cap). California's CRV program costs 1.4-cents per unit at a 73 percent return rate (10.7 lbs/cap), and Québec's return-to-retail program for PET soft-drink is the lowest cost at 0.9-cents per unit for a 70 percent return rate (2.3 lbs/

cap). Alberta's deposit return-to-depot program costs an average of 5.6-cents per unit but achieves a 78 percent return rate (7.1 lbs/cap) for PET beverage bottles.

Each of these programs is very different, where handling fees, population density and economies of scale play a major role in the costs, but the analysis shows that curbside collection is not necessarily cheaper than deposit return. In fact, California's deposit return program may indeed lead North America in terms of the best bang for the buck. **RR**

Clarissa Morawski is the principal of CM Consulting. She can be reached at clarissa@cmconsultinginc.com. For more information about *Who Pays What 2010*, please go to the CM Consulting website at www.cmconsultinginc.com.

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Table 1 | PET costs

	Cost per unit in cents	Per capita PET beverage container recovery (lbs/cap)	PET beverage collection rate
Curbside Recycling Ontario	3.0	3.6	57% (all beverage types; collection from residences only)
Deposit Return California	1.4	10.7	73% (all beverage types; collection from all sectors)
Deposit Return Quebec	0.9	2.3	70% (soft drinks only; collection form all sectors)
Deposit Return Alberta	5.6	7.1	78% (all beverage types; collection from all sectors)

Sources: ON costs: Stewardship Ontario; ON rates: Stewardship Ontario reports 57% from the residential sector only. CM Consulting's *Who Pays What 2010* calculates a provincial-wide recycling rate which also accounts for consumption and recovery away-from-home, this rate is 44%.; CA; CalRecycle Fact Sheet; QC: Recyc-Quebec; AB; ABCRC. Applies weight-to-unit ratios as per individual program reporting