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 (MTCO2e)	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