

A Clean and Green Vermont

A Special Report on the Environmental and Economic Benefits of Vermont's Bottle Bill



Prepared by
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As Vermont strives for a **zero waste future**, expanding **Vermont's Bottle Bill** is the next logical step to increase recycling, prevent litter, enhance local economic activity, and cut costs for government and citizens.

Introduction

Last spring, the Vermont legislature passed Act 148, the *Universal Recycling of Solid Waste* bill. This new law recognizes the importance of an updated and integrated waste diversion program to better protect the environment and support economic development. Further, it sets ambitious mandates for diverting materials from the landfill.



Additionally, the Agency of Natural Resources released their draft *Vermont Materials Management Plan (MMP)* at the end of 2012, which adopts three priority strategies recommended by the Vermont Waste Prevention Steering Committee in 2008. This committee, a group of businesses, not-for-profits and local, state and federal government stakeholders, called for landfill bans, pay-as-you-throw programs, and mandatory recycling. Act 148 mandates all three.

One key statewide recycling program is Vermont's Bottle Bill. This bill, enacted in 1972, has proven to be an effective container collection system, placing Vermont in the "top five" of U.S. states with the highest recycling rates for beverage containers. This is quite an accomplishment, particularly considering how much beverage consumption has increased and evolved in the last decade alone. Portable disposable beverage containers are ubiquitous, used by nearly all citizens on a daily basis, and represent a much wider assortment of drinks than were covered under the original law. The logical next step to build on this program's success is to expand the Bottle Bill to cover all beverages currently on the market, including non-carbonated options such as water and sports drinks.

Expanding the Bottle Bill is projected to result in recycling an additional 96.7 million bottles and cans each year: 84 million plastic bottles, 8.7 million glass bottles, and 4 million metal beverage cans.¹ It would also yield greater energy savings, reduce greenhouse gas emissions, and avoid the pollutants associated with extraction of raw materials and the production of virgin material.

Support for an expanded Vermont beverage container deposit program has been consistent and widespread:

- ❖ In November 2012, the draft ***Vermont Materials Management Plan (MMP)*** identified product stewardship as a top priority. Vermont's oldest and most effective product stewardship program, of course, is the beverage deposit program.
- ❖ In May 2012, the ***Universal Recycling bill (Act 148)*** set out key policy instruments to be considered to maximize diversion from the landfill, including product and packaging bans, tax incentives, and a container deposit.
- ❖ In 2008, the ***Vermont Waste Prevention Steering Committee***—a group of businesses, not-for-profits and local, state and federal government entities—recommended an expanded bottle deposit as part of its review of waste prevention strategies for Vermont. The subsequent report, *Life Beyond Garbage—Vermont Waste Prevention and Diversion Strategies*, identifies several priority strategies, all of which were incorporated into Act 148. Only the expanded bottle deposit remains to be enacted.

Better Management of Beverage Containers at Home *and* On-the-Go

Vermont's deposit return program currently recycles an impressive 85% of carbonated beverages, a number that has changed little since the law passed 40 years ago. What has changed is the public's consumption habits and choices. Today, an estimated 30%-50% of all beverages in Vermont are consumed away-from-home: at work, in restaurants, in shopping malls, at sporting events, in parks, and in recreation areas.² Just as significant, one in four beverages purchased today is *not* covered by Vermont's deposit, including water and energy drinks. Since on-the-go recycling options tend to be scattered at best, having a financial incentive to recycle these empties is crucial. The recycling rate for Vermont's non-deposit containers is less than 40%, compared to 85% for deposit containers.

Despite these facts, Vermont in recent years has witnessed a significant lobbying effort backed by the beverage industry that continues to insist that beverage container recovery should be managed and financed like other household recyclables. Some materials recovery facilities (MRFs) have teamed up with the beverage industry in opposing an expanded Bottle Bill because they want to manage more material from household recycling, regardless of the expansion's certain increase in beverage container recycling and the equally certain decrease in net costs to municipalities. Ignoring these impacts amounts to blatant obfuscation of recycling best practices, and it will almost certainly leave Vermont taxpayers paying more for beverage container management through higher costs for household recycling, litter cleanup, increased garbage management, and other, less obvious costs.*

We need only consider the recent example of Rhode Island. A few years ago, pushed by the beverage industry, Rhode Island turned down a proposed Bottle Bill in favor of mandatory single-stream curbside recycling. Today, most of the glass collected in Rhode Island is unusable, and the state has seen only marginal gains in overall recycling, despite millions of state dollars invested. Vermont lawmakers should not only avoid Rhode Island's mistake in rejecting a deposit-return system; they should learn from the municipalities,³ manufacturers,⁴ informed citizens,⁵ and environmental groups⁶ who want to make Vermont's existing deposit program even more effective.

*The cost implications of lower beverage container recycling are numerous, including, but not limited to: increased waste management costs for municipalities and businesses; cost impacts on farm livestock and farm equipment; equestrian and human injuries from broken glass bottles; visual impact of litter and its impact on tourism; and harm to aquatic systems.

Beverage Redemption and Curbside Recycling Work in Harmony: Case Studies



Experience in other jurisdictions clearly demonstrates that these two parallel programs—deposit return for beverage containers, and residential curbside recycling for household packaging and paper—actually work much better together than on their own in terms of program costs and diversion of materials from the landfill.

Ontario

Twenty years ago, the Ontario legislature mandated residential curbside recycling for paper and packaging. The current system provides access to more than 95% of the population. Working in parallel is a deposit return scheme for all alcohol containers. The deposit-return system collects and recycles more than 94% of alcohol containers, while the curbside program collects 85% of household paper and 50% of household packaging.⁷ With most of the alcohol glass removed from the curbside recycling stream, municipal costs are down (they have less total material to manage) and more glass is being recycled. Household curbside recycling costs, on average, are \$218 (CAD) per ton of paper and packaging.⁸

California

The California Redemption Value (CRV) program places a deposit on nearly all beverage containers, which are then redeemable by consumers directly, or by municipalities redeeming the empty containers left in curbside bins. This mutually useful system has helped California achieve an 82% recycling rate for beverage containers while also helping finance some of the most sophisticated municipal recycling programs in the country. San Francisco, for instance, currently diverts an estimated 80% of its municipal solid waste through a hybrid of programs that includes curbside collection, organics collection,⁹ and, of course, the CRV.

Massachusetts

Like Vermont, Massachusetts charges a deposit on all carbonated beverages. Also like Vermont, its legislators are considering expanding the deposit to water and other noncarbonated drinks. As part of their research, in 2009 the state analyzed the likely impact of expansion on diversion rates and municipal costs. In total, the report concluded, Massachusetts communities could divert more material with an expanded bill while saving between \$3.8 million and \$6.5 million dollars annually on collection, recycling and landfill costs (even after netting out potential revenue losses).¹⁰ Massachusetts' "Bigger Better Bottle Bill" legislation currently has 95 cosponsors.

Germany

Germany is well known as a global leader in innovative recycling programs, including Extended Producer Responsibility (EPR) for packaging. In 2005, Germany began a container deposit return program for nearly all beverage types (about 15 billion containers), and now these containers are being recovered at a rate of 98.5%. The complementary residential curbside recycling system is funded by industry through material-based fees. Non-residential packaging is also collected through an Extended Producer Responsibility system. After the introduction of the deposit return program, program fees for the curbside system actually decreased.

The Story of Glass Recycling



Glass bottles are infinitely recyclable. Since extracting virgin material is more expensive and uses more energy than recycling, primary glass markets, such as manufacturers of new bottles and fiberglass, have increased their demand for clean, furnace-ready glass cullet. As a result, glass processing and recycling is active in the United States. Vermont's deposit program, for example, benefits from three nearby glass processors (two in Quebec and one in Franklin, MA).

Some stakeholders, however—particularly the beverage industry—support collecting glass in single-stream recycling, which Vermont is looking to expand now that Act 148 has passed.

Unfortunately, any measure that adds more glass to the single-stream system will significantly increase net costs to municipalities, even as it reduces the volume that actually gets recycled.

Rhode Island has seen this phenomenon first-hand. After opting out of a Bottle Bill and into a mandatory, statewide single-stream curbside system, the state spent \$17 million retrofitting the Rhode Island Resource Recovery Corporation (RIRRC)'s single-stream MRF. Today, the RIRRC sends all of its curbside glass to the local landfill because it doesn't meet the specifications of the local glass beneficiation facility. So even though Rhode Islanders are diligently separating their bottles and jars, none of it actually gets recycled.

Glass is a recycling challenge even in the best of conditions: it's heavy, breakable, and expensive to collect, transport, and process. That's why it's important to keep it segregated from other materials. By definition, however, segregation is not possible in single-stream recycling. The result of all that commingling and dumping and front-end-loading is that much, if not most, single-stream glass is rendered valueless and unmarketable. Even in Vermont, most of the glass collected at curbside winds up in low-end construction uses (such as roadbed fill). At best, some gets shipped to a processor for cleaning, but has high rates of loss due to poor quality. Glass processors and manufacturers agree that single-stream is bad for glass recycling.

Broken glass is also a contaminant in other material bales, such as plastic bottles and household paper. Contamination not only lowers the value of each ton collected in the single-stream program, it compromises the function and lifespan of processing equipment due to increased wear and tear and maintenance. The problem is so serious that many single-stream programs in America are either collecting glass in a separate bin at the curb, or they aren't collecting glass at all.

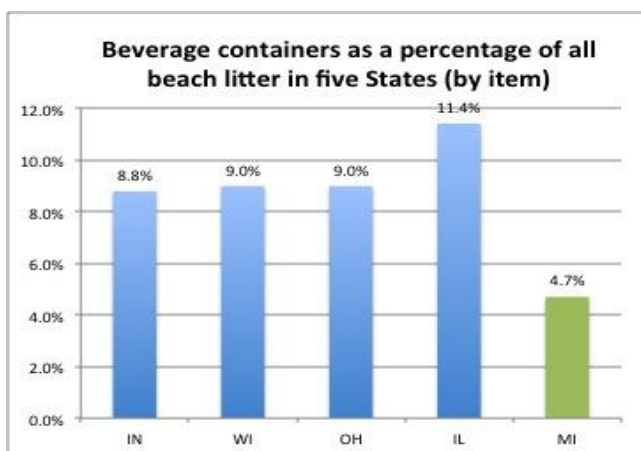
Vermont can greatly improve the economic and environmental impacts of glass recycling by (1) keeping glass bottles out of its single-stream recycling system; and (2) expanding the bottle bill to include all beverages, including those, like wine, spirits and iced teas, which are most often packaged in glass.



Prevents Beverage Container Litter on Roads and Waterways

Litter associated with deposit-bearing containers is lower in Vermont than in neighboring states.¹¹

Historically, litter reduction was a primary reason for the implementation of deposit-return programs. According to figures compiled by the Container Recycling Institute, deposits reduce littering of used beverage containers by 70%-80% (by volume), and total littering by 30%-40%.¹² In Hawaii, a new deposit return program was introduced in 2005. From 2004 to 2008, the number of metal cans, plastic bottles, and glass bottles in the litter stream was reduced by 65% (on a unit-count basis); the share of beverage container litter as a percent of all marine litter (by count) declined from 14.5% to 5.7% during the same time period.¹³



In lakefront beach clean-up litter audits conducted by the Great Lakes Alliance in four non-deposit states (Indiana, Wisconsin, Ohio and Illinois) and one deposit state (Michigan) from 2002-2013, the data suggest that deposits make a dramatic difference in beverage container litter.¹⁴ The proportion of cans and bottles in Michigan's beach litter was half in the non-deposit states. Michigan's results would have been even more impressive had its 10-cent deposit applied to water and other non-carbonated beverages. As it is, the Michigan deposit, for now, only covers carbonated drinks.

In recent years, concern about the impacts of litter on waterways and aquatic life is growing. Underwater clean-ups show that beverage container litter makes up about 20% of marine debris (on a unit basis). More recently, stormwater clean-up costs and preventative measures to keep bottles from floating into waterways from roads are revealing even higher costs being borne by municipalities and states.



Increased litter means increased costs and, far too often, these costs are underestimated. Keep America Beautiful estimates that state governments, cities, counties, educational institutions, and private businesses spend over \$11.5 billion each year to clean up land-based litter.¹⁵ In 2011, VT's Agency of Transportation spent more than \$600,000 to pick up litter on roadways.¹⁶

Costs associated with the impact of beverage container litter on tourism, farm livestock and equipment, marine life, aquatic systems, and outdoor recreation cannot be estimated financially, but they should be considered as additional problems associated with beverage container litter.

Reducing Costs to Municipalities and Taxes for Residents

With the implementation of Act 148, Vermont municipalities will be required to offer residents a series of waste diversion programs. Single-stream collection, for example, offers households the convenience of putting all their recyclable paper and packaging into one bin. Recent comprehensive cost analyses from Ontario's municipal single-stream and dual-stream recycling programs offer some interesting insights. Cost and diversion tracking, in place since 2003, shows that single-stream consistently costs at least \$20 more per ton than dual-stream recycling.¹⁷ Given the increasing array of packaging types, the challenges associated with mixed recyclables collection continues to grow for municipal governments.



Collection represents the largest cost in a curbside program—a cost borne only by municipalities and taxpayers.¹⁸ These are the costs associated with door-to-door weekly collection of all packaging and paper waste set out by the household. By reducing the amount of recyclables to be collected, municipalities can save money through reduced collection costs (trucks and labor) and lower processing costs, simply because there are fewer tons to deal with. For example, the city of Toronto reported that their net savings were \$448,000 and \$381,000 for 2007 and 2008, respectively, after the government put deposits on wine and spirits containers in 2007.¹⁹ These savings accrued from paying less for fewer tons of alcohol containers collected, processed and landfilled.

Further cost analysis from Ontario's curbside program also shows that PET bottles are extremely costly to recycle. Even after their revenue is considered, PET bottles cost \$912 per ton to recycle. Glass containers cost \$109 per ton. Only aluminum cans generate a net profit from recycling (\$282/ton).²⁰ As a rule, however, municipalities without a Bottle Bill rarely capture more than 43% of available cans—and in some places, it's far lower than that.

More Green Jobs

Vermont's Bottle Bill has a long and proud record of supporting green jobs at redemption centers, processing facilities and manufacturers in and around Vermont. A net increase of approximately 100 full-time equivalent (FTE) jobs are projected in Vermont and its surrounding region from a Bottle Bill expansion related to collection and processing of recovered beverage containers.²¹



In addition, the injection into Vermont's redemption centers of an additional 133 million empty containers (more than three-fourths of which will be plastic) will result in the flow of additional handling-fee revenue equivalent to approximately \$4.66 million per year.²² This new revenue stream will allow Vermont retailers and redemption centers better economies of scale in handling operations.

More Revenue from Valuable Container Commodities

Increased recovery of clean recyclable material will offer significant gains in total material revenues. These materials will have a market value of approximately \$2.3 million, the vast majority of which (more than \$2 million) will come from the sale of the recovered plastic bottles.²³ Clean deposit-return container material is worth more than containers from a single-stream source, and is more likely to be shipped to regional end-markets, rather than off-shore where quality is compromised.



Ideas for Continuous Improvement: Enhancing Vermont's Redemption Program



Vermont's Bottle Bill continues to achieve exemplary collection and recycling rates. The program has a high level of confidence and convenience, offering beverage consumers the option to easily return their containers to retailers when they go shopping, or to a stand-alone redemption center if that is more appealing. Consumers also have the option to voluntarily donate their containers to charities and fundraisers in support of worthy initiatives, from Scout troops to Humane Societies to the Epilepsy Foundation to Easter Seals.

In an effort to continually improve the Bottle Bill in Vermont, here are some suggestions for making the program even more efficient, sustainable, and fair.

State-Imposed Requirement for Universal Commingling

Vermont's voluntary "commingling agreement" has effectively put an end to most sorting by brand. The program is administered by the beverage industry in collaboration with the State and redemption centers. These stakeholders cooperated in developing a program whereby containers need only be sorted by material type and size rather than by brand, which greatly simplified the sorting process. The effort has been widely hailed as a significant improvement that has resulted in cost savings not only for redemption centers, but also for participating distributors, who get a half-penny discount per container on their handling fee. However, not all brands are included in this agreement. This initiative would level the playing field for everyone, while mitigating an assortment of sorting and operational inefficiencies. It is worth noting that this practice is common in other deposit-return programs in Canada and Europe, as well as in California, Oregon, and Hawaii.

Program Expansion – Include All Non-Carbonated Beverages

Expanding Vermont's Bottle Bill to include all non-carbonated beverages is the next logical step to improve the overall program. The injection of more than 133 million new containers into the system will improve overall economics for redemption centers and retailers currently using reverse vending machines. It will also mean higher recovery rates, greater revenue from unredeemed deposits, less litter, and more high-quality material for secondary recyclers and manufacturers.

Anti-Fraud

Numerous anti-fraud measures have been introduced by beverage distributors in other jurisdictions. These measures range from spot audits of bagged material received from redemption centers to specially marked containers to registration of large-volume redeemers to automated material tracking.

Easy Drop System

In an Easy Drop System (known as Clynk in New England), customers sign up for a free account, receive an electronic card and bar-coded bag labels, and purchase a supply of bags. They load their containers in a bag, apply a label and drop off the bag at a kiosk or drop site. There's no waiting; the containers are processed electronically, usually within 48 hours, and the refunds are deposited in the customer's account, which is accessed through a website or automated teller machine. Redemption centers and retailers might wish to offer this system in conjunction with hand counting or RVM (reverse vending machine) returns.

Automated Donation System

Clynk, Easy Drop, and many RVM systems make it easy for customers to donate their refunds to a local charity, automatically forwarding a designated amount directly to an organization of the customer's choice.

Universal Deposit

One deposit value for all containers, including wine, spirits, and oversized containers, simplifies accounting, reduces the number of material sorts for redemption centers, and makes it easier for consumers to calculate how much they paid and how much they should be getting back.

Sharing Ideas

Canada offers a great example of operators sharing ideas. Canadian Recycling Affiliates is a group of program operators who have been getting together for nearly 20 years to cooperatively market scrap cans, share standard operating procedures where possible, and share depot collection and processing knowledge, communications, promotional concepts, and research. Vermont's Bottle Bill stakeholders would be well-served by such an organization.

Unredeemed Deposits Directed to Municipalities for Related Uses

Currently, beverage distributors in Vermont keep all unclaimed deposits to help offset their program costs. These funds might, instead, be channeled to the State or municipalities for any number of related uses, from litter control and curbside recycling to stormwater debris clean-up, education, and development of new scrap markets. This is currently being done in California, which channels millions of dollars each year to MRF operators, municipalities, and community recycling programs.

On-Site or On-truck Compaction

Compacting containers before they leave the redemption center offers significant savings in transportation, labor, and greenhouse gases by decreasing the number of trucks and trips from redemption points. Reverse vending machines (RVMs) crush containers as soon as they've been "counted" by the electronic scanner. This process reduces volume by 60%-80%.²⁴

Compaction also is built into the process in the Easy Drop/Clynk system; on-site compactors (some of them solar-powered) are common in the portable "microsites" parked outside grocery stores in California; and in New Brunswick, Canada, collection trucks all have on-board compaction units. The compacted materials can be easily audited, if necessary, later in the process. This initiative has led to a three-fold reduction in freight and associated emissions.

To Sum Up



Every year, tens of millions of beverage containers are trashed in Vermont. This is unacceptable. But the situation would be much worse if not for our 40-year-old Bottle Bill. Year after year, our deposit-return program consistently captures the vast majority of carbonated drink containers consumed at home and on-the-go.

Nonetheless, millions of non-carbonated beverage containers, though made of precisely the same materials as their carbonated counterparts, are not part of the deposit program. The consequence is that they end up being handled by local governments and citizens, perhaps as recycling, but even more often as garbage or litter.

Vermont's Bottle Bill is a tried and true example of extended producer responsibility (EPR), wherein beverage distributors and sellers are legally and financially responsible for ensuring that their packaging is managed effectively and responsibly. Extending the deposit to non-carbonated beverages will keep costs, appropriately, on beverage producers and consumers rather than taxpayers.

Experience in numerous states and across the globe proves that expanded deposit return combined with a parallel household curbside recycling program works best for recycling, lowers overall emissions, creates green jobs, supports local charities, and keeps the environment clean and green.

Isn't that the Vermont *you* want?



ENDNOTES

- ¹ *Understanding the Impacts of Expanding Vermont's Beverage Deposit Return Program*, CM Consulting, Jan 2012.
- ² Away-from-home consumption of beverage containers is estimated to be between 30%-63% for plastic bottles; 13%-75% for aluminum cans; and 25%-55% for glass bottles. See all studies and methodologies that reference away-from-home ratios at: www.cmconsultinginc.com, *Who Pays What, 2010*, page 17, Away-from-home market shares. The American Beverage Association (ABA) suggests an away-from-home consumption rate of 30%, but does not specify by container or beverage type.
- ³ Vermont League of Cities and Towns (VLCT), representing communities across Vermont, has consistently supported the Vermont Bottle Bill. VLCT was also part of the Vermont Waste Prevention Steering Committee, which identified expansion of the Bottle Bill as a priority strategy for the State in their 2008 report – *Life Beyond Garbage: Vermont Waste Prevention and Diversion Strategies*.
- ⁴ The Association of Post Consumer Plastic Recyclers, Glass Packaging Institute, and Aluminum Association representing manufacturers have publicly supported Bottle Bills as options for increasing recycling and/or supported expansion of existing Bottle Bills.
- ⁵ Grove Insights conducted polling in 2010, which showed 86% of Vermonters support expanding the Bottle Bill to non-carbonated beverages.
- ⁶ Vermont environmental groups endorse expansion of the Bottle Bill, including the Sierra Club – Vermont Chapter, Conservation Law Foundation, Center for Biological Diversity, VPIRG, Toxics Action Center, and more.
- ⁷ Sources: Beer Store Annual Report, 2011-2012; and Blue Box Fee Calculation model 2013, Table 1, Recovery and Generation, 2011, Stewardship Ontario.
<http://www.stewardshipontario.ca/2013-bb-fee-rates>
- ⁸ Ibid., Table 2: Gross and Net Costs 2011.
- ⁹ <http://sanfrancisco.cbslocal.com/2012/10/05/san-francisco-reports-80-percent-waste-diversion-rate/>
- ¹⁰ *An analysis of the impact of an expanded Bottle Bill on Municipal Recycling Costs and Revenues*, DSM Environmental, 2009.
- ¹¹ *Northeast 2010 Litter Survey*, Environmental Resources Planning, LLC. Page 12.
- ¹² Source1: Container Recycling Institute (CRI); Source2: Perchards (2005) *Deposit Return Systems for Packaging Applying International Experience to the UK*, Peer Review, Report to Defra, March, 2005: states that deposit return systems seem to achieve a reduction of the order of 33%-38% in total litter.
- ¹³ Department of Health *Report on the Activities of the Deposit Beverage Container Program, 2010, State of Hawaii, December 2009*.
- ¹⁴ Great Lakes Alliance, Adopt-a-beach program, historical data.
<http://www.greatlakesadopt.org/Home/HistoricalData>
- ¹⁵ *2009 Visible Litter Survey and Litter Cost Study. Final Report*, September 18, 2009. Prepared by MSW Consultants for Keep America Beautiful, Inc. Stamford, CT.
- ¹⁶ State of Vermont's Agency of Transportation, July 2010 - July 2011.
- ¹⁷ *The Battle for Recycling*. Resource Recycling Magazine, February, 2013. Note: This research is consistent with research in the UK. See *Kerbside recycling: indicative costs and performance*, WRAP, 2008.
- ¹⁸ Collection usually represents at least 75%, or more, of the total costs of recycling.
- ¹⁹ City of Toronto reported that the cost impact of the new deposit return on wine and spirit containers program on their existing curbside program was a net savings of \$448,000 in 2007; and \$381,000 in 2008 due to a reduction in processing and disposal costs. Source: Amendments to Processing Fees Due to LCBO Deposit Return Program, report to Public Works and Infrastructure Committee from General Manager, Solid Waste Management Services: October 29, 2008.
- ²⁰ Blue Box Fee Calculation model 2013, Table 2, Gross and Net Costs, 2011, Stewardship Ontario.
<http://www.stewardshipontario.ca/2013-bb-fee-rates>
- ²¹ *Understanding the Impacts of Expanding Vermont's Beverage Deposit Return Program*, CM Consulting, Jan 2012
- ²² Ibid.
- ²³ Ibid.
- ²⁴ Source: Tomra North America.