Moving Recycling Forward in Nevada

Like most developed countries, the United States must reduce the generation of greenhouse gases that contribute to climate change. These reductions must come from changes in domestic systems and systems that extract, transport and manufacture materials and products for export. Among the various ways available to help achieve these reductions is recovering materials for manufacturing through recycling collection and processing. Significant reductions in energy consumption are realized when goods are manufactured from secondary, versus primary materials. Thus, recycling post-consumer goods is a necessary component of the State legislative framework being designed to address climate change.

This paper is intended to enhance the level of understanding of beverage container recycling in the United States and the State of Nevada, and to demonstrate the impact of recycling on emissions reduction and the economy. The information contained in this paper should be used to further support the inclusion of Nevada State-mandated regulatory instruments for increased beverage container recycling at the state level.

This paper is presented by the Container Recycling Institute (CRI). CRI is a nonprofit organization that studies and promotes policies and programs that increase recovery and recycling of beverage containers, and shift the societal and environmental costs associated with manufacturing, recycling, and disposal of container and packaging waste from government and taxpayers to producers and consumers.

CRI plays a vital national role in educating policy makers, government officials and the general public regarding the societal and environmental impacts of the production and disposal of beverage containers and the need for producers to take responsibility for their packaging.

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

Understanding the impact of beverage container recycling on saving energy, reducing greenhouse gas emissions, and contributing to economic growth

The United States, and indeed, all nations around the world must actively participate in strategies to minimize greenhouse gas emissions. Reducing energy consumption, curtailing natural resource depletion, minimizing pollution and eliminating waste are all part of the solution. Recycling requires a small amount of effort on the parts of each link of a product's value chain, yet the total impact of these efforts can help solve this global problem. As a solid waste management strategy, recycling reduces the amount of waste sent to landfills or incinerated, but recycling in the twenty-first century is no longer merely a waste minimization tool. Mining silica or bauxite ore and drilling for petroleum and natural gas are primary extractive industries necessary for the production of glass, aluminum and plastics. Recycling post consumer goods is secondary extraction of valuable aluminum, glass and plastic containers, and the recovery of the energy embedded in those cans and bottles that was used to transform primary raw materials into consumer products in the first place. Recycling significantly diminishes all of the inputs needed to make the replacement product from virgin materials. Avoiding these "up-stream" functions means significantly reducing energy usage and associated greenhouse gas (GHG) emissions.

The Role of Recycling Beverage Containers

More than $2.9 billion worth of recyclable scrap from empty beverage containers was either buried, littered or incinerated in last year.

Every year in America, millions of tons of empty beverage containers are disposed of in garbage bins, or tossed out as litter. Communities incur considerable waste management and litter cleanup costs. From an economic perspective, empty beverage containers are worth a lot of money as a secondary commodity. In terms of aluminum and steel cans, plastic PET & HDPE, and glass bottles, more than $2.9 billion in recyclable scrap was buried in a landfill, littered, or burned in an incinerator[1] last year. This represents a loss of nearly 65 percent of potential revenues from empty containers.

Given our need to conserve energy and reduce emissions, ramping up beverage container recycling is essential. In one year alone, if Americans were to recycle 75 percent of all the aluminum, steel, PET and HDPE plastic, and glass beverage bottles sold, nearly 10 million metric tons of greenhouse gases would be avoided compared to the reductions from the current beverage container recycling rate of 35 percent (by unit). This would be equivalent to taking nearly two million cars off the road.

[1] Based on industry-reported recycled commodity values for 2010.

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

A significant improvement in beverage container recycling could help the United States achieve its 2020 greenhouse gas reduction target. Specifically, a 90 percent recovery rate will result in 25.2 million metric tons of avoided greenhouse gas emissions, equivalent to 1 percent of the 2020 reduction target. [2]

Recycling 90 percent of all beverage containers would contribute to one percent of our 2020 greenhouse gas reduction goal.

From an energy perspective, nationwide recycling of 75 percent of all beverage containers would save nearly 185 million MBTUs of energy, equivalent to the energy contained in over 1.6 billion gallons of gasoline - enough fuel for over 3 million average passenger vehicles for one year.[3]

Moving Recycling Forward in Nevada

Nevada' existing beverage container recycling rates are very low. More specifically, CRI estimates that the beverage recovery rates are:

Beverage Container Type	Aluminum Cans	Steel Cans	PET bottles	HDPE Bottles	Glass Bottles
Recycling Rate	**35%**	**63%**	**14%**	**21%**	**12%**

* Recovery rate estimates are based on the average recovery rate by container type in non-deposit states.
Source: CRI's *Beverage Market Data Analysis 2008*, based on 2006 data. Rate for Aluminum cans is reported by Alcoa.

A modern, comprehensive deposit-return program which is modeled on other successful programs in the United States can improve these recycling rates dramatically. For example, on average, deposit-return programs traditionally recover at least 75 percent of most beverage container types. These rates can further be improved through a series of mechanisms built into the program which provide greater incentives for consumers to return and recycle their containers. One benefit of deposit-return programs is that they do not rely on municipal revenues to fund the system. Instead, most deposit-return programs utilize material revenues and unredeemed deposits to help offset costs.

[2] The 2020 GHG reduction target is equal to ~2.548 billion MTCO2e, of which beverage recycling to 90 percent would contribute 1 percent of that goal (25.2 million MTCO2e).
[3] Energy savings calculated using: *Solid Waste Management and Greenhouse Gases – A Life-Cycle Assessment of Emissions and Sinks,* 3rd Edition, US EPA, September 2006; Avoided GHG Equivalents (MTCO2e/ton): Exhibit 8-8, Avoided Energy Equivalents (MBTU/ton): Exhibit 7-8; GHG emission savings derived from US EPA Waste Reduction Model (WARM) Update August 2010. One US gallon of gasoline contains 115,000 BTUs., The average consumption per year is 502 gallons per vehicle. Sources : http://www.fuelgaugereport.com/

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

Why Municipal Curbside Programs Don't Work for Beverage Containers

The beverage industry is keen to shift the burden of collection and recycling to municipal governments, by suggesting that curbside recycling programs are the most efficient and convenient way to recycle.

While curbside recycling programs are necessary for many household generated materials (like paper and other packaging), in the case of beverage container recycling, they are simply nowhere near as effective. This is primarily due to the fact that many beverage containers are generated away from home or "on-the-go" and end-up being discarded in locations where municipal curbside receptacles do not exist (offices, bars, restaurants, public parks, beaches, bus stops, tourist sites, shopping strips and malls, etc.)

Mature curbside programs throughout America have demonstrated that on average, residential recycling programs achieve less than 35 percent recycling rates for beverage containers, and increase overall recycling costs for ratepayers.

Curbside recycling for most beverage containers is also expensive. Costs of door-to-door collection, processing of highly commingled (mixed) and compacted material, and litter abatement are expensive, and the revenue generated from these lower quality commodities is significantly lower than source separated "clean" containers which are collected through deposit-return systems.

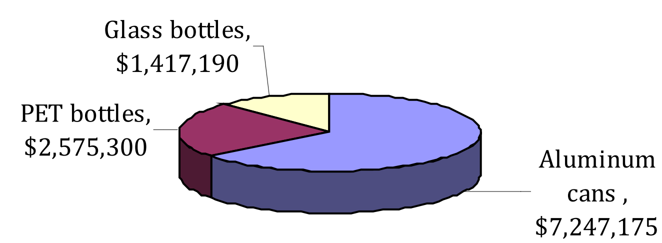
As such, ten US states and most Canadian provinces have opted for comprehensive deposit-return programs in addition to municipal curbside recycling programs. In some cases, like California or the Province of Nova Scotia, the deposit-return program financially supports municipal curbside recycling.

Moving recycling forward in Nevada requires investigating a modern, efficient deposit-return program which utilizes best practices from other operating systems in North America. Modern deposit-return programs are proven to be highly effective, low-cost, equitable, and supported by the general public. Consider the benefits from increased container recycling in Nevada (see tables on page 7 and 8):

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

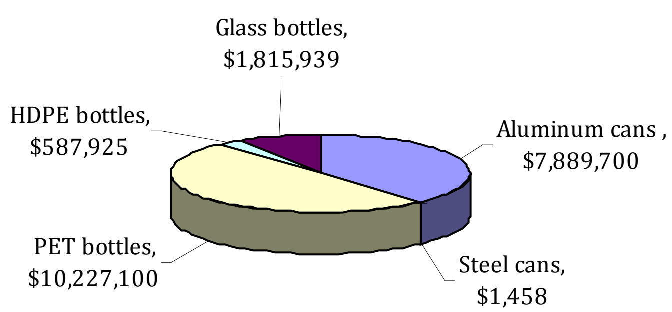
- The proposed Bill (AB427) would apply a deposit onto all “Beer and other malted beverages, mineral water, soda water and similar carbonated soft drinks”; increasing the recovery rate (for carbonated beverages only) on aluminum cans, currently at 35 percent ; glass bottles at 12 percent ; and PET bottles at 14 percent (status quo) to 75 percent through a deposit-return system. This increase would generate an additional $11.2 million in can, glass, and PET commodity revenues for the State.

Potential New Revenue from Increased Recycling of Carbonated Beverage Containers in Nevada



- Expanding the proposed bill to cover non-carbonated beverages such as water and sports drinks (here called a comprehensive bottle bill) as well, has the potential to bring in further revenue for the State. Specifically, a comprehensive bottle bill can generate approximately $20.5 million in commodity revenues for the State.

Potential New Revenue from Increased Recycling of Carbonated and Non-Carbonated Beverage Containers in Nevada



4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org
CONTAINER RECYCLING INSTITUTE

- Recycling 75 percent of all carbonated aluminum, PET, and glass beverage containers in Nevada would divert an additional 60,167 tons of waste from disposal. Recycling 75 percent of all carbonated and non-carbonated beverages in Nevada would divert an additional 87,946 tons of waste that is currently being disposed of.

- Increasing carbonated beverage container recycling to 75 percent in Nevada would lead to the avoidance of 73,707 additional (over status quo) metric tons of greenhouse gas emissions – equal in pollution mitigation to taking over 14,000 cars off the road for one year[4]. Increasing both carbonated and non-carbonated beverage container recycling to 75 percent would lead to the avoidance of over 102,587 additional metric tons of greenhouse gas emissions – equal to taking over 20,000 new cars off the road for one year.

- Increasing carbonated beverage container recycling to 75 percent in Nevada would enable savings of an additional 1.1 million MBTUs of energy – equivalent to the energy contained in nearly 10 million gallons of gasoline[5], or over 190,000 barrels of crude oil[6] - worth today over $21 million[7].

- An expanded bill that included both non-carbonated and carbonated beverages would enable energy savings of 1.9 million MBTUs of energy – equivalent to the energy contained in over 16 million gallons of gasoline[8], or about 372,000 barrels of crude oil[9] - worth over $40 million.

---

[4] Each US auto generated about 5.1 MTCO2e per vehicle per car. http://www.epa.gov/cleanenergy/energy-resources/refs.html#vehicles
[5] There are 115,000 BTUs of energy contained in a gallon of gasoline: bioenergy.ornl.gov/papers/misc/energy_conv.html
[6] There are 5.8 MBTUs of energy containers in a barrel of crude oil. Source: Ibid,.
[7] On May 4, 2010, crude oil was valued at $109/barrel. Source: Bloomberg
[8] There are 115,000 BTUs of energy contained in a gallon of gasoline: bioenergy.ornl.gov/papers/misc/energy_conv.html
[9] There are 5.8 MBTUs of energy containers in a barrel of crude oil.

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

ENERGY SAVINGS, GREENHOUSE GAS REDUCTION AND FINANCIAL BENEFITS FROM INCREASED CARBONATED BEVERAGE CONTAINER RECYCLING IN NEVADA				
	Aluminum cans	**PET bottles**	**Glass bottles**	**Total**
Estimate of number of units sold	636,990,200	171,010,260	335,560,000	1,143,560,460
Estimate of number of units collected	223,459,720	23,244,885	41,716,000	288,420,605
Units per ton	68,420	26,505	4,000	-
Tons available for recycling (based on BMDA 2006)	**9,310**	**6,452**	**83,890**	**99,652**
Tons collected (based on BMDA 2006)	**3,266**	**877**	**10,429**	**14,572**
Tons wasted (garbage/disposal)	**6,044**	**5,575**	**73,461**	**85,080**
Current recycling rates (based on units)	35%	14%	12%	25%
Current recycling rates (based on weight)	35%	14%	12%	15%
Total recovery at 75% recovery rate (in tons)	**6,983**	**4,839**	**62,918**	**74,739**
Potential recovery gains at 75% (in tons) (potential- status quo)	**3,717**	**3,962**	**52,489**	**60,167**
Avoided ENERGY per ton (MBTU/ton) (Source: EPA)	**206.95**	**53.36**	**2.65**	**-**
Energy saved with 75% recycling (MBTU)	**1,445,028**	**258,209**	**166,731**	**1,869,969**
Energy saved from status quo recycling (MBTU)	675,899	46,797	27,637	**750,332**
Un-tapped energy savings through increased recycling to 75% (MBTU) (potential - status quo)	**769,130**	**211,412**	**139,095**	**1,119,637**
Avoided GHG equivalents (MTC02E)/ton (Source: EPA)	**13.65**	**1.56**	**0.32**	
Avoided GHGs from recycling 75% of beverage containers (MTCO2e)	95,311	7,549	20,134	**122,994**
Avoided GHGs from status quo recycling (MTCO2e)	44,581	1,368	3,337	**49,286**
Un-tapped GHG avoidance through increased recycling to 75% (MTCO2e)	**50,730**	**6,181**	**16,796**	**73,707**
Value of empty beverage containers (average $/ton) - based on industry estimates of current value	**$ 1,950**	**$ 650**	**$ 27**	
Total value of recyclable beverage containers at 75%	$ 13,615,875	$ 3,145,350	$ 1,698,773	**$ 18,459,998**
Estimate of revenues gained from status quo recycling beverage containers	$ 6,368,700	$ 570,050	$ 281,583	**$ 7,220,333**
Un-tapped revenue from the sale of beverage containers from increased recycling to 75%	$ 7,247,175	$ 2,575,300	$ 1,417,190	**$ 11,239,665**

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

CONTAINER RECYCLING INSTITUTE

ENERGY SAVINGS, GREENHOUSE GAS REDUCTION AND FINANCIAL BENEFITS FROM EXPANDED BEVERAGE CONTAINER RECYCLING INCLUDING CARBONATED AND NON-CARBONATED BEVERAGES IN NEVADA						
	Aluminum cans	**Steel cans**	**PET bottles**	**HDPE bottles**	**Glass bottles**	**Total**
Estimate of number of units sold	693,505,120	420,000	679,164,120	26,592,000	428,387,288	1,828,068,528
Estimate of number of units collected	243,301,520	264,000	92,343,420	5,472,000	54,818,232	396,199,172
Units per ton	68,420	12,000	26,505	16,000	3,962	-
Tons available for recycling (based on BMDA 2006)	**10,136**	**35**	**25,624**	**1,662**	**108,124**	**145,581**
Tons collected (based on BMDA 2006)	**3,556**	**22**	**3,484**	**342**	**13,836**	**21,240**
Tons wasted (garbage/disposal)	**6,580**	**13**	**22,140**	**1,320**	**94,288**	**124,341**
Current recycling rates (based on units)	35%	63%	14%	21%	13%	22%
Current recycling rates (based on weight)	35%	63%	14%	21%	13%	15%
Total recovery at 75% recovery rate (in tons)	**7,602**	**26**	**19,218**	**1,247**	**81,093**	**109,186**
Potential recovery gains at 75% (in tons) (potential- status quo)	**4,046**	**4**	**15,734**	**905**	**67,257**	**87,946**
Avoided ENERGY per ton (MBTU/ton) (Source: EPA)	**206.95**	**20.49**	**53.36**	**51.43**	**2.65**	**-**
Energy saved with 75% recycling (MBTU)	**1,573,234**	**538**	**1,025,472**	**64,107**	**214,896**	**2,878,248**
Energy saved from status quo recycling (MBTU)	735,914	451	185,906	17,589	36,665	**976,526**
Un-tapped energy savings through increased recycling to 75% (MBTU) (potential - status quo)	**837,320**	**87**	**839,566**	**46,518**	**178,231**	**1,901,723**
Avoided GHG equivalents (MTC02E)/ton (Source: EPA)	**13.65**	**1.84**	**1.56**	**1.42**	**0.32**	
Avoided GHGs from recycling 75% of beverage containers (MTCO2e)	103,767	48	29,980	1,770	25,950	**161,515**
Avoided GHGs from status quo recycling (MTCO2e)	48,539	40	5,435	486	4,428	**58,928**
Un-tapped GHG avoidance through increased recycling to 75% (MTCO2e)	**55,228**	**8**	**24,545**	**1,284**	**21,522**	**102,587**
Value of empty beverage containers (average $/ton) - based on industry estimates of current value	**$ 1,950**	**$ 343**	**$ 650**	**$ 650**	**$ 27**	
Total value of recyclable beverage containers at 75%	$ 14,823,900	$ 9,004	$ 12,491,700	$ 810,225	$ 2,189,511	**$ 30,324,340**
Estimate of revenues gained from status quo recycling beverage containers	$ 6,934,200	$ 7,546	$ 2,264,600	$ 222,300	$ 373,572	**$ 9,802,218**
Un-tapped revenue from the sale of beverage containers from increased recycling to 75%	$ 7,889,700	$ 1,458	$ 10,227,100	$ 587,925	$ 1,815,939	**$ 20,522,122**

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

CONTAINER RECYCLING INSTITUTE

Recycling Containers is good for the Manufacturing Sector

When manufacturers use secondary feedstock like empty bottles and cans, costs associated with sourcing, extracting, processing and shipping raw virgin materials are eliminated. Manufacturers are able to reduce their need for primary feedstock and gain both environmental benefits and cost savings. For example, using recycled aluminum cans to make new cans means avoiding limestone, salt and bauxite mining; it also eliminates the need for caustic soda, chlorine, alumina, crude oil, petroleum coke, and anode production. Making a new can from a recycled can saves 95 percent of the energy and related emissions.[10]

In today's uncertain economy, producers of products and packaging can benefit greatly from the efficiencies gained from using recycled instead of virgin feedstock. Increasing the supply by 60 thousand new tons for recycling (from a 75 percent beverage container recovery rate), and maintaining a high quality of empty beverage containers for domestic recycling is an important step towards economic recovery and stimulus.

Real Economic and Socio-economic Benefits from Recycling

The value of recycling goes far beyond commodity-based revenues and energy conservation. Recycling infrastructure investment will create jobs in Nevada that cannot be outsourced. A state beverage container deposit-return system would create 'green jobs' for Nevadans. In 2007, the United States generated $236 billion in revenues from recycling and ancillary services; creating some 1 million jobs – all contributing about 2 percent of the US GDP[11]. Mandates for increased recycling helped create 1,800 new jobs in Massachusetts, 4,684 in Michigan, 3,800 in New York, and 14,000 in California. In addition, these are jobs that employ local drivers, plant and equipment construction, technicians, low-skilled labor, and administrative and management positions.

Nation-wide Beverage Container Recycling Enhancement Requires State Leadership

Across most of the United States, municipalities bear the responsibility for beverage container recycling, beverage container litter, and disposal. Local budgetary pressures, exacerbated by the economic downturn, have constrained the expansion of existing recycling programs and the adoption of new ones. Reliance on local property taxes to fund materials recovery has stagnated both private sector recycling infrastructure investments and commitments to using recycled content in

[10] Source: Novelis
[11] Business Week

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

manufacturing. Without a State mandate, many municipal recycling programs with limited budgets will opt to curtail or delay implementing recycling programs. Many of these communities have very limited investment in efficient capital, and are inexperienced in commodity brokering and social marketing. Consider that in 2006 there were 8,660 curbside recycling programs in the US, down from 8,875 programs in 2002[12].

Developing a Strategy for Increased Beverage Recycling

States like Nevada are well positioned to change the status quo, because they have jurisdiction to legislate the various elements required to improve beverage container recycling, including awarding financial assistance through grants. In late 2006, the United States Government Accountability Office (GAO) released a report entitled; *Recycling: Additional Efforts Could Increase Municipal Recycling.* The research reported findings from interviews with recycling coordinators from across the United States, including summaries of the primary practices required to increase municipal recycling. These include: making recycling more convenient, offering financial incentives for recycling through user-fees on garbage and/or incentive-based schemes like deposit-return systems and RecycleBank, and conducting public education and outreach.

Meeting Targets: Case Studies

In spite of the overall low recovery rates for beverage container recovery, some states *are* meeting high recycling targets through a combination of collection systems. While each system is different, common to all successful programs are State and/or municipal mandates.

California's many state-wide recycling initiatives have supported their achievement of a 65 percent diversion rate for 2009.[13] Among the varied recycling and composting programs is the innovative California Redemption Value (CRV) deposit-return program, which has an overall recovery rate of 82 percent. (91 percent for aluminum cans, 73 percent for PET plastic bottles, and 80 percent for glass bottles)[14]. Expanded in 2000 to redeem more beverage container categories, the California deposit-return system is considered by many as state-of-the-art in terms of system design and stakeholder equity. The California model offers convenient collection centers known as "convenience zones" within a half-mile radius of a beverage retailer. In addition, the program allocates funds for market development and municipal payments.

In addition to the beverage container program, California's state-administered grant programs for municipalities, industry and entrepreneurs funds new opportunities

[12] Biocycle Magazine, 2006
[13] Calrecycle. Larry Stevens
[14] Calrecycle, *California's Beverage Container recycling and litter reduction fact sheet. 2009*

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

to collect separated materials for recycling. For example, the CalRecycle also offers a financial incentive to any program operator for municipal recycling to improve the quality and marketability of glass beverage container material. CalRecycle will pay quality incentive payments for some recyclable materials (like glass bottles) which are substantially free of contamination for recycling. Most municipalities also offer convenient curbside and drop-off recycling services for packaging and paper generated in households.

At the state level, **Oregon** has implemented a variety of regulated initiatives that promote beverage container recycling. State regulations mandate recycled content for glass, newsprint and telephone directories[15]; and container deposit legislation for beer, carbonated drinks, and water[16]. Curbside recycling is offered to about 75 percent of the residential sector. Together this hybrid program recovers about 81 percent of all deposit bearing containers. 77 percent of beverage containers are captured through the bottle bill and 4 percent[17] through curbside recycling. Non-deposit containers collected through municipal curbside programs are recovered at a rate of 35 percent[18]. The state also offers financial grants to local governments for waste recovery projects.

Canada's largest province of **Ontario** (population 13 million) utilizes a hybrid model of comprehensive mandated curbside recycling which is partially funded by industry, as well as a deposit-return program for all alcoholic beverage containers. The curbside program, which is offered to 99 percent of the province's residents, recovers about 46 percent of all aluminum cans and 50 percent of plastic beverage bottles, while the provincial deposit-return program for beverage alcohol containers collects 82 percent of aluminum cans and 96 percent of glass bottles[19].

Currently there are ten US states that offer deposit-return for a variety of beverage containers, which include: **California, Hawaii, Connecticut, Iowa, Maine, Massachusetts, Michigan, New York, Oregon,** and **Vermont.** These states rank as leaders in America in terms of setting the bar for high recovery rates and, in some cases, very high recovery. More specifically, the leaders include: Michigan at 97 percent; Maine at 93 percent; Vermont at 85 percent; Iowa at 86 percent; Oregon at 84 percent; Hawaii at 76 percent; California at 82 percent; and New York at 70 percent.[20] Not only do deposit states lead in terms of high recovery rates, but in general, they also supply recyclers with the highest quality scrap material compared with any other type of recycling program in the US, which improves overall efficiency in terms of processing and re-manufacturing.

---

[15] Statute: ORS 459A
[16] Statute: ORS 459A.700
[17] 2005 data, prepared on January 15, 2008 by Oregon Department of Environmental Quality
[18] Ibid.
[19] *Responsible Stewardship 2009-2010*, The Beer Store
[20] Bottle Bill.org

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

These examples illustrate that recycling greater numbers of beverage containers is possible through a variety of programs that can be designed in a way to reflect consumption patterns and meet the needs of cities, states and the nation.

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

Information Sources

RECYCLING FIGURES
Beverage Market Data Analysis 2006 – Container Recycling Institute

ENERGY AND GHG SAVINGS
Solid Waste Management and Greenhouse Gases – A Life-Cycle Assessment of Emissions and Sinks, 3rd Edition, US EPA, September 2006; GHG emission savings derived from US EPA Waste Reduction Model (WARM) Update August 2010

VALUE OF EMPTY BEVERAGE CONTAINERS
Aluminum price is $1950/ton for baled aluminum: Source Evermore Recycling, Feb 2011
Steel price is $343/ton – April, 2011, Source: Steward Edge Price Sheet (accounts for metric and dollar conversions)
PET price is $650/ton - April, 2011, Source: Steward Edge Price Sheet (accounts for metric and dollar conversions)
HDPE price is 650/ton - April, 2011, Source: Steward Edge Price Sheet (accounts for metric and dollar conversions)
Glass price is based on the value of amber glass as representative of an average price for secondary clean glass: Flint: $30, Amber: $25, Green: $5, Mixed: $5 to negative $60 depending on quality. Source: Strategic Materials.

STATS USED FOR ENERGY CONVERSION CALCULATIONS
There are 115,000 BTUs of energy contained in a gallon of gasoline
There are 5.8 MBTUs of energy containers in a barrel of crude oil. Source: bioenergy.ornl.gov/papers/misc/energy_conv.html

LIGHTING
Average lighting consumption per household in the USA is 940kwh.
Source: Residential Consumption of Electricity by End Use, 2001, End-Use Consumption of Electricity 2001, www.eia.doe.gov
The national average heat rate is about 10,722 BTU per kWh of delivered electricity.
Therefore, each household consumes about 10 MBTUs of electricity per year in delivered electricity. (0.010722 MBTUs * 940 kwh = 10 MBTUs)

HOME HEATING
The average American home in a moderate climate uses about 50 MBTUs of energy for heating per year.
Source: U.S. Department of Energy – Energy Efficiency and Renewable Energy – Industrial Technologies Program

EMISSIONS FROM CARS :
Each US auto generates about 5.1 MTCO2e per vehicle per car per year.
http://www.epa.gov/cleanenergy/energy-resources/refs.html#vehicles

GASOLINE
One US gallon of gasoline contains 115,000 BTUs. Source: http://bioenergy.ornl.gov/papers/misc/energy_conv.html
Value : $4.06 per gallon of mid-level unleaded gas. Source : http://www.fuelgaugereport.com/
The average consumption per year is 502 gallons per vehicle. Source : EPA – Gateway calculator

OIL
5.8 million BTUs per barrel of crude oil
Value of a barrel of crude oil : $109 (May 4, 2011, Source Bloomberg)

4361 Keystone Ave.
Culver City, CA: (310) 559-7451
www.container-recycling.org
www.bottlebill.org

CRI
CONTAINER RECYCLING INSTITUTE