FINAL REPORT

Evaluating End-of-Life Beverage Container Management Systems for California

Division of Recycling

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Section 1

Executive Summary

Introduction

The Division of Recycling ("DOR") of the California Department of Conservation ("Department") administers the California Beverage Container Recycling and Litter Reduction Act ("Act" or "AB 2020"), which was enacted in 1986. The goal of the program, as set in statute, is to achieve an 80 percent recycling rate for all aluminum, glass, plastic and bimetal containers sold in California. While the system for beverage container recycling in California is the largest and among the most comprehensive in the nation, the current recycling rate of 67 percent (2007) is still well below the stated program goal of 80 percent.

Extended Producer Responsibility ("EPR")[1] is driving successful beverage container packaging redesign (i.e., green product redesign), recycling and program innovation in Canada and Europe. Many of the Canadian and European systems have achieved overall beverage container recycling rates of over 75 percent. Some of the Canadian and European systems also have other environmentally beneficial elements, such as diversion of related packaging and the use of refillable bottles.

As the State of California and the Department undertake efforts to improve beverage container recycling rates and encourage programs to reduce the environmental impacts of containers and their end-of-life systems, valuable insights may be gained from reviewing other successful programs. This type of review may assist the Department with identifying and evaluating potential EPR concepts and other elements of successful programs that may be incorporated into California's beverage container recycling system.

Purpose of Study

The purpose of this study was to conduct research on successful beverage container and packaging end-of-life management systems around the world (case studies) to:

1. Identify system features that lead to the highest recycling rates and greatest achievement of green product redesign;
2. Evaluate the potential for incorporating those features into California's beverage container recycling system; and,

[1] Extended Producer Responsibility ("EPR") and Product Stewardship are terms that are often used interchangeably to describe a long-term solution to manage waste products by shifting the responsibility for collection, transportation and management of those products away from local governments and general taxpayers to the manufacturers.

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3. Present recommendations for changes to the California system, as appropriate.

Approach

The project involved conducting research in support of an EPR approach to improved beverage container recycling in California. Specifically, the Project Team worked with various parties in California (e.g., California Product Stewardship Council), nationally (e.g., Product Policy Institute) and internationally (with industry contacts in Canada and Germany), to identify, document and evaluate existing beverage container diversion programs that incorporate EPR concepts.

Based on initial research, fifteen international beverage container and packaging end-of-life management systems were identified as programs of interest. An evaluation of these programs was then conducted and five of these systems were selected for in-depth case studies. Each of the systems chosen for case studies are examples of EPR systems[2] and in many cases include green product redesign features. In addition to the five international systems, case studies were also developed for California's current Beverage Container Recycling and Litter Reduction Program and the California Rigid Plastic Packaging Container ("RPPC") law.

Each of the systems selected for the case studies were described and evaluated using a common framework, which is presented in Section 3 of this report. Recommendations for changes to the California system were then developed (in Section 11 of this report), in part, based on review and analysis of the program elements and outcomes of these case studies.

Summary Recommendations

As stated above, the existing California system for beverage container recycling is among the most comprehensive in the nation and is the largest overall beverage container recycling system in the United States. However, it is not yet achieving the stated program goal of an 80 percent recycling rate.

The operators of the systems we studied reported that the three major elements of success for beverage container deposit-return systems are:

- The deposit level;
- Public education; and,
- Consumer access to recycling points (both redemption centers and recycling bins in public spaces, like parks).

[2] The Ontario Blue Box Program is a hybrid system that is financed equally by municipalities and industry, and is operated by municipalities.

Currently, the Department does not fully control any of these elements. The legislature sets the value of the deposit and the public education spending limit. Consumer access is developed mainly by the private sector and municipalities.

If the California system is to have the best opportunity to maximize redemption rates, a strong case can be made that the Department needs to have:

- Greater access to the full financial resources available from the unredeemed deposits in the California Beverage Container Recycling Fund; and,
- The ability to set spending and program priorities in accordance with the strategic goal of increasing the recycling rate to 80 percent.

Our recommendations are summarized below. A detailed discussion of our recommendations is provided in Section 11.

1. Recommendations to Improve the Recycling Rate

1.a. Increase the CRV value to a level between 6 and 10 cents for small containers and between 11 and 20 cents for large volume containers;

1.b. Increase per capita public education spending; and,

1.c. Increase consumer access to redemption centers through greater visibility of existing centers and establishment of new centers or reasonable alternatives in “unserved zones”.

2. Recommendations to Support Green Product Redesign and Reduced Environmental Impacts

Make programmatic structural changes to support greater green product redesign and reduced environmental impacts including:

2.a. Adding wine and spirits to the program;

2.b. Investigating the reintroduction of refillables to the system;

2.c. Continuing support for development of “local” processing capacity;

2.d. Implementing tracking of materials to assure that all materials are recycled.

2.e. Evaluating potential changes to processing fee calculations to align with the Departmental goal of green product redesign; and,

2.f. Research expanding recycled-content requirements for beverage containers.

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3. Recommendations that Can Lead to Greater Effectiveness of the System

Evaluate other improvements that can lead to greater effectiveness of the system, including:

3.a. New fraud prevention techniques that are being used elsewhere; and,

3.b. Evaluating the amount that the Department spends per container recycled through each of the various redemption or return points to determine the cost effectiveness of the various options.

Summary of Case Studies

California Beverage Container Recycling and Litter Reduction Act (Section 4)

General Description of Program

This program places a mandatory deposit on many types of beverage containers sold in the State of California. Consumers must pay the deposit when they purchase beverage containers and the deposits are refunded when they return their empty beverage containers for recycling.

The California Beverage Container Recycling and Litter Reduction Act ("Act") is administered and monitored by the Department. As a Department report explains, "At the center of the program is the California Redemption Value. This redemption value is paid by beverage distributors[3] on every beverage container sold or offered for sale in California. Beverage distributors make a redemption value payment into the Fund, and are reimbursed for this redemption value when they sell the beverages to retail markets. Retailers charge consumers a deposit, the California Redemption Value, at the point of purchase. Consumers are then eligible to return their empty beverage containers to a recycler, who returns the money as the California Refund Value ("CRV"). The program distinguishes the "refund value" from the "redemption value." The refund value reflects the money paid out to recyclers and consumers. While the redemption value and the refund value have usually been equal, this has not always the case."[4] The deposits

[3] "Distributor" means every person who engages in the sale of beverages in beverage containers to a dealer in this state, including any manufacturer who engages in these sales. "Distributor" includes any person who imports beverages from outside of this state for sale to dealers or consumers in this state.

[4] "California Beverage Container Recycling Program History and Fund Management Options," Department of Conservation, Division of Recycling, February 28, 2007.

(or "CRV") are held by the State in the California Beverage Container Recycling Fund.

The Act was voted into law on September 29, 1986 and was implemented on September 1, 1987. The program initially included only beer and soda containers. In 2000, it was expanded to include all non-carbonated, non-alcoholic beverages, except milk. The CRV has increased three times since program inception. The current value is as shown in the following table.

TABLE 1-1
California Refund Values for Beverage Containers

Year	California Refund Value
2007 (current rates)	$0.05 for containers under 24 oz. $0.10 for containers 24 oz. or larger

Source: Report of Beverage Container Sales, Returns, Redemption and Recycling Rates, Department of Conservation, September 12, 2007

In the California system, consumers can return beverage containers to a certified collection center for a return of their deposit. If consumers are willing to forfeit the deposit, they can place beverage containers in their curbside recycling containers or deliver them to a drop-off program, in which case, the operator of the program receives the deposit refund (the CRV). Some beverage containers that have been placed into trash containers may be recovered by facility operators from mixed waste at Material Recovery Facilities ("MRFs").

There are a variety of points where money is transacted between collectors, processors, handlers, etc. The amount each party receives depends on their role. (Additional details on the system funding are provided in Section 4 of this case study).

Significant Features and Key Outcomes

Key features and key outcomes of the California system include the following:

- The California system resulted in the recycling of 14.74 billion beverage containers, while 21.92 billion beverage containers were sold in the state in 2007; the recycling rate was 67 percent for calendar year 2007, and 76 percent for the first half of 2008;
- Californians have a variety of options of locations to return containers, such as redemption centers, curbside recycling, and drop-off and community programs (retailers are required to redeem in-store in certain cases);

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- There is no sorting of containers by brand, which can lead to lower costs;
- There is State oversight and control of funds;
- Curbside programs receive CRV revenue, as well as additional curbside and processing payments;
- Unclaimed deposits support infrastructure, including collection programs, some technology and equipment grant funding, research and development, education, administration and anti-fraud activities;
- Support for demand as well as supply, through minimum content requirements for glass bottles and fiberglass, etc.;
- Manufacturers share some responsibility through payment of $4.5 million in processing fees in 2007 to partially offset processors' costs (an additional $90.5 million was paid to processors from unredeemed deposits); and,
- The program resulted in the reduction of approximately 600,000 tons of greenhouse gases in 2007, equivalent to removing approximately 563,000 cars from the road.

Summary of California Rigid Plastic Packaging Container Law (Section 5)

General Description of Program

The California Rigid Plastic Packaging Container ("RPPC") law is a law that requires source reduction, recycled-content and/or recycling of rigid plastic packaging containers. The stated purpose of this program is to reduce rigid plastic packaging, and ultimately disposal, and increase the use of post-consumer plastic.

The law imposes requirements on product manufacturers (also known as brand owners) that package products in rigid plastic packaging containers. The recycled-content provisions of the law are also aimed at creating a market for plastics recycling in the State of California. Manufacturers have a choice of compliance options under this law, and some affect end-of-life of the packaging (recycling rate compliance option and reuse/refill compliance option) while other compliance options affect the beginning-of-life of packaging (source reduction and recycled-content options). The law is summarized in this report because has significant packaging re-design features. It does not, however, affect the manufacture of beverage containers, because food and beverage containers are exempt from the law. The California Integrated Waste Management Board ("CIWMB") monitors the compliance of over 1,000 product manufacturers selling products that must comply with the RPPC law.

All rigid plastic packaging containers sold or offered for sale in the State must meet one of the following criteria:

- Be made from at least 25 percent post-consumer material;
- Be recycled at one of the following rates:
  - All product-associated rigid plastic packaging containers[5] must have a 45 percent recycling rate; or,
  - All particular-type (i.e., holds a single type of generic product, such as milk or detergent) rigid plastic packaging containers must have a 45 percent recycling rate;
- Be reused or refilled at least five times; or,
- Be a source reduced container - the package weight per unit of the source-reduced containers have been reduced by 10 percent compared to packaging used for product by manufacturer from Jan. 1st, 1990, to Dec. 31st, 1994.

Significant Features and Key Outcomes

The RPPC law is different from the other case studies included in this report because it is a regulatory compliance program for source reduction and recycled content only. It is not an end-of-life management program, and it does not affect beverage containers. The significant feature is that the program requires either source reduction of plastic containers or recycled-content in plastic containers.

As a result of the RPPC law, California has taken a lead role in promoting the use of post-consumer recycled-content within the manufacturing of rigid plastic packaging. California's law helps to promote markets for post-consumer recycled-content in plastic containers. The CIWMB obtains reports on compliance with the requirements of the RPPC law by companies selected to be part of a certification cycle.

Summary of British Columbia Beverage Container Recovery Program (Section 6)

General Description of Program

The province-wide program began in 1970 with the *Litter Act*, which made British Columbia the first jurisdiction in North America to establish a mandatory deposit-refund system for soft drink and

[5] "Product Associated Rigid Plastic Packaging Container" means a brand-specific rigid plastic packaging line which may have one or more sizes, shapes or designs and which is used in conjunction with a particular generic product line. A product associated container holds a brand-specific product such as Brand "x" salad dressing or Brand "y" automotive oil." Per regulations for the Rigid Plastic Packaging Container Program, Title 14, Chapter 4, Article 3.

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beer containers as a litter control initiative. The province later enacted the *Beverage Container Stewardship Program Regulation* (1997), which replaced the outdated 1970 *Litter Act*, and expanded the program to include all beverage containers, with the exception of containers for milk.

In October of 2004, the 1997 *Beverage Container Stewardship Program Regulation* was repealed, and was replaced by the provincial *Recycling Regulation*, which includes the *Beverage Container Recovery Program*.

This program places a mandatory deposit on all beverage containers sold in the province of British Columbia. Consumers must pay the deposit when they purchase beverages and the deposits are refunded when they return their empty beverage containers for refilling or recycling at recycling depots or retail stores that sell beverages.

Consumers must also pay a Container Recycling Fee on certain containers purchased, ranging from no fee to $0.05 (Canadian). Separate from the deposit, the Container Recycling Fee varies, based on the container type, and is not refundable. The Container Recycling Fees were established by the manufacturers in 1999 to provide additional revenue to finance the recycling system, and the fees are adjusted annually, as needed.

Under the provincial *Recycling Regulation*, the beverage manufacturers are responsible for the operation and financing of the province-wide recycling system. The manufacturers are represented by two Stewards: Encorp Pacific for non-alcohol, wine, spirits, and other beverages; and Brewers Distributors Limited for coolers, beer, cider packaged in refillable glass, and beer in cans. The Stewards must develop Stewardship Plans, which are subject to approval by the provincial government.

Significant Features and Key Outcomes

- The British Columbia system is completely financed and managed by industry (it is an “EPR” system);
- The overall recovery rate is 80 percent, and includes difficult-to-recycle items such as gabletops and aseptic containers in the overall recycling rate, and all beverages (except milk) are included in the system. The recycling rate and system revenues and expenses are verified by an outside auditing firm;
- The amount of the deposit is set by the provincial government;
- The British Columbia system uses a “Container Recycling Fee” which is a separate charge that is imposed by the manufacturers to help fund the recycling programs, and the imposition of those fees has been controversial;

- Refillable beer bottles make up a significant share of the beer containers sold in the province (about 35 percent), and they are washed and refilled about 15 times;
- Public education expenses are nearly $2 million per year, far higher per capita than is spent in California on public education; and,
- The provincial recycling regulation requires that all beverage containers that are sold in the province must be recyclable or reusable, and annual reporting from the stewards does verify the actual recycling locations and processes for all materials.

Summary of Ontario The Beer Store Program and Ontario Deposit-Return Program (Section 7)

General Description of Program

This case study describes two separate programs for refilling and recycling alcohol containers in the Province of Ontario, Canada, which has a population of over twelve million people. The two programs are operated by The Beer Store (for domestic beer containers) and the Liquor Control Board of Ontario (for wine, spirits, coolers and imported beer containers).

The Beer Store (440 stores in the Province) established a deposit-return program for its customers in 1927, and continues to place a deposit on its beverage containers. The deposit is returned to customers when they return beverage containers to The Beer Store. The Beer Store also accepts all of its packaging for recycling, including bottle caps, plastic rings, PET bottles, plastic bags, paper and cardboard used in its packaging. Collection of this additional packaging is voluntary, and is completely managed by The Beer Store, without oversight from the provincial Government.

The second program is the Ontario Deposit-Return Program. It was established by the Liquor Control Board of Ontario, which owns and operates over 600 liquor stores in the Province. When the Liquor Control Board of Ontario established its new deposit-return program for alcohol beverage containers in 2007, it decided to contract with The Beer Store and have consumers return all alcohol empty beverage containers to The Beer Store locations, rather than establishing its own, separate collection program through its own stores.

Significant Features and Key Outcomes

- The Beer Store "aims to recover 100 percent of beer packaging sold in Ontario," according to its website. Their overall recovery rate has been historically and is currently 94 percent;

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- The Beer Store has a commitment to full producer responsibility, which includes no financial or environmental subsidies and accounting for all life-cycle packaging and product costs (both financial and environmental), not just the costs or benefits of those materials recovered;
- Deposit values in Ontario are 10 and 20 cents, which are twice as high as deposit values in California and British Columbia;
- The Ontario Deposit-Return Program (for alcohol containers that are not part of The Beer Store program), was established in 2007, so it is too soon to draw major conclusions from that program;
- The program has goals for actual recycling of materials, including recycling goals for higher-order uses;
- The overall recycling rate was 67 percent, but is expected to be higher in future years as the Ontario Deposit-Return Program matures. The Beer Store recycling rate was 94 percent;
- Refillable containers are widely used for beer, and there is an "environmental levy," which is a 10 cent provincial tax placed on non-refillable alcohol containers. In Ontario, domestic brewers package 72 percent of their beer in refillables; and,
- The return location is The Beer Store, or other retail partner store.

Summary of Ontario Blue Box Program (Section 8)

General Description of Program

The Ontario Blue Box Program ("Program") was implemented in 1994. At the time, many municipalities were already operating curbside recycling programs, and the 1994 regulation mandated curbside recycling programs for all communities with over 5,000 people. The Program has two main elements:

- Municipalities in the Province are required to operate or contract with a private operator to provide curbside recycling programs; and,
- Brand owners and first importers[6] are required to fund fifty percent of the net cost of the municipally operated curbside programs (net of revenues from sale of recyclables).

[6] An example of a first importer is a grocery store that imports Tropicana orange juice from Florida. The grocery store becomes the steward of the Tropicana orange juice packaging.

Funding is managed by the stewardship organization, called "Stewardship Ontario."

The Program is designed for multiple materials including all beverage containers with the exception of beer bottles and alcohol beverage containers, which are covered under another program (see Section 7).

The program was initially called the Ontario Blue Box Program because households were given blue boxes for their household recyclable packaging to place at the curb on their regular trash collection day. Most food and beverage containers, including those made from glass, PET, aluminum and steel, are mandated to be included in the program. Other containers, including aseptic packaging, gabletop cartons (e.g., milk cartons) and HDPE bottles, may be voluntarily added to the program.

Significant Features and Key Outcomes

- Municipalities are required to provide curbside recycling, and this requirement extends to all sectors, single-family, multi-family and commercial;
- Brand owners and first importers[7] are required to fund fifty percent of net program costs;
- Recovery rates are 64 percent overall, with recovery of some material as high as 90 percent (newspaper and magazines). Recovery rates are based on the amount of material collected through municipal residential recycling programs divided by the amount of material supplied into the residential sector; and,
- In a survey sent to 100 member companies of Stewardship Ontario regarding design for the environment, 62 percent specified that minimization of packaging was their number one priority, as it incorporated cost savings from the reduction of packaging dimensions and weights.

Summary of German Packaging Ordinance (Duales System, Section 9)

General Description of Program

This program is designed to avoid, reduce, recycle or recover packaging in Germany. The brand owners are encouraged to reduce packaging first, and then required to provide for the collection of packaging from all sources, including residential and commercial sources. There are targets for collection by material type, such as a 75 percent target for glass, 60 percent for

[7] An example of a first importer is a grocery store that imports Tropicana orange juice from Florida. The grocery store becomes the steward of the Tropicana orange juice packaging.

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aluminum, etc. Brand owners pay for the system by paying fees for all packaging materials that they place into the system, by quantity and material type. Service fees are paid to a one of several stewardship organizations. Each stewardship organization, in turn, collects and recycles the appropriate percentage of the Country's packaging, in order to fulfill the obligations of the brand owners.

Significant Features and Key Outcomes

- The program has historically achieved high recycling rates, exceeding the EU targets, but due to very recent program changes, those recycling rates have not yet been released for 2008;
- Over the years, this program, in conjunction with other German waste reduction programs, has reduced waste to such an extent that waste production is now de-coupled from economic growth, i.e., as the economy has grown, while waste production has remained constant; and,
- The former system (before 2008) used only one stewardship organization. This feature of the system was determined to be monopolistic. The recent change to several, competing stewardship organizations has resulted in significant reductions in fees for the brand owners.

Summary of German Deposit-Return (Section 10)

General Description of Program

In Germany[8], there are two beverage container deposit-return systems. Refillable bottles have a voluntary deposit that was placed on the containers by the manufacturers. The government does not require a deposit on refillable bottles, but the manufacturers use the deposit to encourage consumers to return the refillable bottles. One-way containers have a mandatory deposit that was imposed by German law in 2003. Both deposit systems are managed by the manufacturers. From the consumer's point-of-view, the two systems operate together seamlessly.

The German brewers and bottled water producers have placed deposits on their refillable bottles for decades, and consumers have returned the bottles to receive a return of their deposits. In Germany, up until the 1960's, beverages were generally bottled in refillable containers with deposits.

In 2003, as a result of an on-going decreasing market share of refillable bottles, most one-way (non-refillable) beverage

[8] For reference, the population of Germany is approximately 83 million people for 2009, and the population of California is approximately 37 million people (2008 estimate).

containers were forced into a new deposit-return program as mandated by the German government and administered by beverage fillers.

The current deposit levels in Germany are as follows:

1. For refillables, the voluntary deposit is 8 eurocents for beer bottles in 0.33 liter and 0.5 liter sizes;
2. For refillables, the voluntary deposit is 15 eurocents for water, soft drink or juice bottles in 0.5, 0.7, and 1.0-liter sizes; and,
3. For one-way (non-refillable) containers, the mandatory deposit is 25-eurocents for all containers, including glass, plastic and metal containers, containing beer, water or soft drinks, in sizes of 0.1 to 3.0-liters.

Today, about 12-14 billion single-serve beverages and tens of billions of refillable beverages sold in Germany carry a deposit.

Significant Features and Key Outcomes

- Placing a large deposit on one-way beverage containers has resulted in an increase of the use of refillable beverage containers to above the 72 percent quota that was established in legislation. Approximately 85 percent of beer, 34 percent of mineral water and 31 percent of soft drinks are now packaged in refillable containers;
- It is estimated that refillable bottles provide five times the number of jobs by "volume of beverage sold" compared to non-refillables; and,
- The new deposit-return program for non-refillable containers achieves a collection rate of about 95-98 percent versus the original recovery system (residential curbside collection) that achieved only about 40 percent collection.

Stakeholder Workshop

A stakeholder workshop was held on April 24, 2009. Nearly eighty people attended the workshop, with additional attendees via the workshop's webcast. The purpose of the workshop was to have project team members and experts from Canada and Germany present various sections of the report, with an opportunity for questions and answers after each presentation. Draft findings were also presented at the workshop, and a stakeholder feedback session was included.

Stakeholders submitted written comments, all of which are included in Appendix A. Appendix A also includes the stakeholder workshop agenda.

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Section 2

Introduction and Background

Project Objective

The objective of this study was to conduct research on successful beverage container and packaging end-of-life management systems around the world (case studies) to:

1. Identify system features that lead to the highest recycling rates and greatest achievement of green product redesign;
2. Evaluate the potential for incorporating those features into California's beverage container recycling system; and,
3. Present recommendations for changes to the California system, as appropriate.

Background

Goals of the California Beverage Container and Litter Reduction Act

The Division of Recycling ("DOR") of the California Department of Conservation ("Department") is responsible for the administration of a deposit-return system in California called The Beverage Container Recycling and Litter Reduction Act ("AB 2020" or "Act"). Through this program, the Department oversees the recycling of beverage containers composed of glass, plastic, aluminum and bimetal.

The stated goals of the program are:

- To achieve and maintain high recycling rates for each beverage container type included in the program, thereby reducing the beverage container component of litter in the state; and,
- To achieve an 80 percent recycling rate for all aluminum, glass, plastic and bimetal containers sold in California.

Additional goals from the legislative findings include:

- "It is the intent of the legislature to encourage increased, and more convenient, beverage container redemption opportunities for all consumers," and,
- "It is the intent of the legislature that all empty beverage containers redeemed shall be recycled, and that the responsibilities and regulations of the department shall be determined and implemented in a manner that favors the recycling of redeemed containers, as opposed to their disposal."[1]

[1] California Public Resources Code, Division 12.1, Chapter 1, Section 14501

Introduction and Background

Recycling Rates Achieved in Recent Years in California

California's program has been expanded several times over the years to include new types of containers, such as water bottles and new plastic resins. The California Refund Value ("CRV", the amount of the consumer's deposit and the amount that is redeemed to consumers when they return containers for recycling) has been increased three times over the years, from 1 cent to 2.5 cents to 4 cents to the current 5 cents for single-serving beverage containers. (Larger containers currently carry a deposit of 10 cents.)

California's program includes beverages packaged in glass, aluminum, plastic and bi-metal containers, such as soft drinks, water, beer, sports drinks, juices, coffee and tea drinks. Notable exceptions to the program are milk, wine and distilled spirits.[2] Beverages packaged in pouches, gabletops and aseptic packaging are also exempt from this program.

The recycling rate for covered beverage containers rose to a high of 82 percent in 1992. With limited exception, that rate than fell in each of the following years reaching a low of 55 percent in 2003. This decrease may have been due in part to the fact that the deposit level, which remained at 2.5 cents during this period, did not keep pace with inflation. California's program now applies to over 22.1 billion containers, of which over 15 billion were returned for recycling in the twelve months ending June 30, 2008[3]. In 2007, the refund value was increased to 5 cents (or 10 cents for larger containers) and Californians recycled 1.5 billion more bottles and cans than in 2006. The overall recycling rates for the program were 61 percent in 2005, 60 percent in 2006, and 67 percent in 2007. In the first half of 2008 (January through June), Californians recycled a record 7.6 billion beverage containers, raising the six-month redemption rate to 76 percent.[4] This represents an increase of nearly 600 million beverage containers over the same period in 2007.

Recycling Rates for Each Material Type in California

For the first six months of 2008, the recycling rates by material types were, 85 percent for aluminum, 79 percent for glass, 63 percent for PET plastic, and 90 percent for HDPE plastic.

Key Features of the California Beverage Container Recycling Program

California's program is unique among the 11 U.S. states that have a beverage container deposit-return system. In the other 10 states

[2] "Six-Month Report of Beverage Container Recycling & Significant Carbon Reductions," report for first six months of 2008, prepared by the California Department of Conservation.
[3] ibid
[4] ibid

with deposit-return systems the cans and bottles are returned to the store from which the containers were purchased. The California system, however, has over 2,900 redemption locations statewide with many redemption locations adjacent to supermarkets. Many Californians can also recycle beverage containers through their curbside recycling programs.

The California Beverage Container Recycling Fund also supports other activities, including the following:

- Handling fee payments to convenience zone recyclers;
- Payments to local curbside programs;
- Payments to cities and counties;
- Incentives to encourage the quality of and demand for recycled materials, such as the Quality Incentive Payment ("QIP") and Plastic Market Development Payment ("MDP") programs;
- Recycling grants to the local conservation corps and to entities statewide, including studies such as this one and equipment, research and development funding to build California's recycling infrastructure;
- Public education; and,
- Program administration.

Introduction of Terms

Deposit-Return System

Deposit-return systems across the globe vary from each other in some ways, but are based on the same essential premise that recyclable beverage containers (and other items) are significantly more likely to be returned by consumers to recycling centers if they are given financial incentive to do so. This financial incentive functions by requiring a deposit on certain types of beverage containers sold within a certain area. When consumers purchase the beverage, they must pay for the beverage as well as the deposit. The deposit can be refunded only when the consumer returns the empty beverage container to an acceptable redemption location. Different systems provide for different redemption locations (such as local retailers, recycling centers or depots, etc.) where empty beverage containers can be returned for a deposit refund. Deposit-return systems can be voluntary systems that are initiated by manufacturers, such as the deposit on most beer bottles in Canada, or can be government-imposed deposits, such as California's beverage container recycling system. Note that a government-imposed or a legislated system does not mean that the government necessarily manages the deposit fund. In California, the government manages the fund, and

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in British Columbia, the stewardship organization representing beverage distributors, Encorp Pacific, Inc., manages the fund.

Without a deposit-return system, there is little or no financial incentive for consumers to participate in recycling the beverage containers. Although consumers may participate in recycling programs for other reasons, including environmental concerns. Coordination of the deposit-system requires participation and cooperation of several key players in the life-cycle of a beverage container. It must be decided who will administer the program, who will collect beverage containers, who will collect deposits, who will refund deposits, and who keeps unredeemed deposits. These key players include:

- The Consumer;
- The Retailer at point of purchase;
- The Beverage Manufacturer/Distributor;
- Depots/Recycling Centers;
- Other Recyclers/Haulers; and
- State or Provincial Government.

Collective or Stewardship Organization

A "collective" or "stewardship organization" is an independent organization that has been formed to manage the stewardship responsibility of many individual manufacturers and brand owners.

Gabletop

Gabletop packaging is commonly used for milk. Its name comes from the distinctive fold of the packaging at the top that resembles the gable-end of a house. They are often comprised of multiple layers of paper and/or a plastic (poly-coats).

Aseptic/Poly-coat

Aseptic containers are typically a mix of paper, polyethylene plastic, and aluminum, with a tight polyethylene inside layer. The "juice box" is a common aseptic beverage container. Together the materials form a tight seal against microbial organisms, contaminants, and degradation, eliminating the need for refrigeration.[5]

Redemption, Recycling and Recovery Rates

For the purposes of this report, redemption refers to the act of a consumer or customer voluntarily returning a beverage container to an appropriate collection location (e.g., recycling depot, retail store, etc.). Recycling is the physical process of converting used materials into new products. The word "recovery" is used for some systems that both recycle and recover energy through waste-to-

[5] http://en.wikipedia.org/wiki/Aseptic_processing

energy. However, each case study uses its own terminology. For instance, if the term "recovery" is used in Germany, that is the word we used in our case study.

Recycling Depot

Recycling depots are centers that accept recyclables from the public. In British Columbia, Canada, they are independently owned and operated and located in zones established by Encorp Pacific Canada.

Reverse Vending Machine

Reverse vending machines ("RVMs") are mechanical devices that accept one or more types of empty beverage containers and issue a cash refund or a redeemable credit slip with a value not less than the container's refund value.

Green Product Redesign

In this report, the term "green product redesign" is used to refer to a variety of practices that can reduce the environmental impacts of beverage containers. These features include, but are not limited to, the following:

- Design for recycling and increasing compatibility within the recycling system;
- Source reduction and lightweighting;
- Design to encourage or allow for increased recycled-content;
- Reduction of the use of toxic chemicals; and,
- Design to reduce lifecycle impacts.

In the case studies that follow, there are descriptions of the various aspects of green product redesign that were found in each of the systems. There are differences of opinion about what constitutes green product redesign, and different provinces and countries have adopted different policy approaches to address this. For instance, there is different treatment in the case studies of refillable beverage containers and aseptic and pouch beverage containers.

Introduction to Extended Producer Responsibility

What is Extended Producer Responsibility?

Extended Producer Responsibility ("EPR") is a policy approach that extends the responsibility of producers for their products throughout the products' life-cycles. The original definition by Professor Thomas Lindqvist, sometimes described as the "Father

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of EPR," emphasized "total life-cycle environmental improvement of product systems by extending the responsibilities of the manufacturer of the product to various parts of the entire life-cycle of the product, and especially to the take-back, recycling and final disposal of the product.[6] The term, "EPR" is used in California[7], British Columbia[8], and increasingly elsewhere interchangeably with Product Stewardship.

Operational definitions often emphasize the end-of-life (EOL) management of products, after consumers have consumed them. The definition used by the California Integrated Waste Management Board ("CIWMB") emphasizes reducing environmental impacts:

> *"Extended Producer Responsibility ("EPR") is the extension of the responsibility of producers, and all entities involved in the product chain, to reduce the cradle-to-cradle impacts of a product and its packaging; the primary responsibility lies with the producer, or brand owner, who makes design and marketing decisions."*[9]

All of the five international case studies in this report are examples of Extended Producer Responsibility systems, in that they are managed and/or financed by brand owners. (Note that the Ontario Blue Box Program is actually a hybrid system, because government (local municipalities) manages the system as well, through collection of curbside recyclables).

Emergence and Advancement of Extended Producer Responsibility Systems Worldwide

EPR is driving successful packaging redesign, recycling and program innovation in Canada, Europe and elsewhere worldwide. Some of the Canadian systems have achieved overall beverage container redemption rates of 80 percent, with more beverage and container types included than the California system. These other systems include material types (such as gabletop and aseptic) and beverage types (such as wine and spirits) that typically have lower redemption rates. Redemption rates for beer containers are over 90 percent in the Canadian provinces we studied.

At the core of EPR is the knowledge that when producers of products and packaging are responsible for managing the materials they produce at EOL, studies show that they have found more efficient ways to recycle and ensure market demand for the material. EPR is at the heart of sustainable systems that minimize

[6] Lindhqvist 2000
[7] By the CIWMB and by the California Product Stewardship Council.
[8] In British Columbia, "Product Stewardship" refers to "shifting of responsibility away from general taxpayers to manufacturers and users."
[9] CIWMB, EPR Framework Policy

life-cycle environmental impacts of products and packaging, including shipping and greenhouse gas ("GHG") emissions.

Goals of Extended Producer Responsibility

EPR policies address two related policy goals: (1) transfer waste management costs from local governments (taxpayers) and ratepayers to producers and consumers (user pay); and (2) reduce environmental impacts by encouraging green product redesign. As an example, the CIWMB puts special emphasis on environmental performance in formulating the goals of their EPR Framework policy adopted in January 2008:

> *"Provide measurable net environmental benefits through product design innovation; improved environmental performance throughout a product's lifecycle, that includes reduced solid waste, toxic components, energy and water consumption, and reduced greenhouse gas and air emissions; the highest and best use of products and materials in a cradle-to-cradle system; and avoidance of transferring EOL management problems to other states and countries."*[10]

Most waste management activities in the past have focused on better managing the impacts of product discards, rather than focusing on how to eliminate waste in the first place. EPR is a waste reduction strategy. By shifting costs and responsibilities of product discards to producers and others who directly benefit, EPR provides an incentive to eliminate waste and pollution through product design changes.

The twin policy goals of EPR – user pay and green product redesign (which may include source reduction or replacement of harmful chemical components with less-harmful chemicals) – are related in an interesting way. The current system for managing most product discards, the municipal solid waste management system, represents a public subsidy to product manufacturers that perpetuates waste. Solid waste only became a municipal responsibility a century ago in response to a public health crisis. At that time, there were fewer products managed by municipalities, and they were far simpler on average than today's products.[11] As the proportion, complexity and toxicity of products in the municipal waste stream mushroomed, especially in the second half of the 20th century, the provision by municipalities of "free" waste management services to product manufacturers encourages the production of throw-away products and does nothing to discourage the use of toxins in products. EPR policies, by internalizing disposal costs in the prices of products, aim to

[10] Ibid

[11] *Unintended Consequences: Municipal Solid Waste Management and the Throwaway Society,* by Helen Spiegelman & Bill Sheehan, Ph.D., Product Policy Institute, March 2005

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provide market feedback to the parties who design and market products to encourage them to design safer, more durable and less energy intensive product systems.

It must be noted that for EPR to affect product design, the system must be designed to allow for competition and "individual producer responsibility." Typically, in EPR schemes, producers fulfill their responsibility by setting up producer responsibility organizations ("PROs"). (In Canada, producer responsibility organizations are more commonly called "stewardship agencies." In the United States, the term "third party organizations" is used.) EPR laws that result in – and in some cases require – a single PRO can be monopolistic (see the Germany Duales System case study in this report for additional discussion of this topic). EPR programs may be effective at shifting costs from local government and in increasing recycling rates, but they are not as effective in addressing redesign and waste reduction.

Roles in Extended Producer Responsibility

The primary responsibility for reducing product impacts belongs ultimately to the brand owner because the brand owner controls decisions relating to product design and marketing. Brand owners can specify environmental and social standards in the commercial arrangements they make with manufacturers, distributors, and retailers, and can pass any costs or savings through to the consumer or absorb them, as the market dictates. However, all parties in the product value chain (brand owners, manufacturers, distributors, and retailers) share some responsibility. As an example, under the shared responsibility model of Extended Producer Responsibility, the roles are as follows:

- The **producer** (defined as the manufacturer/brand owner) arranges for and finances the collection and appropriate recycling or disposal of their products at the end of their useful lives. **Manufacturers/Brand owners** do not have to become collectors and recyclers themselves, but they must arrange for these services and pay for them, individually or collectively with other manufacturers/brand owners, as a precondition for the right to sell their product.
- **Local governments, community groups and local retailers** help educate consumers about location and logistics of collection and drop-off sites and services (based on a manufacturer-financed system); and,
- **Consumers** turn in their spent products at designated sites and services.

A case can be made that government should not spend limited resources providing services that the market can provide, such as product discard management. For EPR programs to be effective, however, government is needed to ensure transparency and

accountability. Government's ability to be an effective referee and regulator is compromised if it is at the same time acting as a service provider.

Comparison to Advanced Disposal Fees

Use of "advanced disposal fees" is an alternative to EPR that uses fees collected from consumers when products are purchased at retail; the fees are used to fund recycling programs for that type of product. This approach has higher administrative costs than EPR systems and has been dubbed "Extended Consumer Responsibility." Since the producer is not involved, there is no opportunity for price signal feedback to affect product design. California's *Electronics Waste Recycling Act* is an example of an advanced disposal fee system.

Key features of an advanced disposal fee system typically include:

- Consumers pay the fee at the point of purchase;
- The fees typically fund recycling collection by local governments and/or third party collectors and recyclers; and,
- Manufacturers have no responsibility for collection, recycling or improved product design to improve recycling, recyclability, or reduce toxicity.

Key Elements

There seems to be a consensus evolving in North America that good EPR programs are results-based rather than highly prescriptive. In other words, government's role is to set performance standards in the public interest (with stakeholder input), and then step aside and let producers design and operate effective programs to recover their products. Then government's role is to ensure transparency of programs and accountability for outcomes. Government's roles of setting performance standards and transparency and accountability are established in the implementing regulations. Transparency and accountability are accomplished through reporting, with government setting the parameters of the reporting process. In some cases, the reports must be independently verified by outside auditors.

Full cost internalization and competition are among a number of key elements. The Province of British Columbia[12] and the CIWMB[13] have articulated detailed EPR principles and elements that have a high degree of congruence. Two local government organizations, the California Product Stewardship Council and the

[12] *British Columbia Industry Product Stewardship Business Plan 2002 – 2004*, British Columbia Ministry of Water, Land and Air Protection, September 30, 2002. http://www.env.gov.bc.ca/epd/recycling/resources/reports/ipsbp.htm

[13] CIWMB, EPR Framework Policy

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Northwest Product Stewardship Council, have adopted a joint *Framework Principles for Product Stewardship Policy*[14] that is consistent with both British Columbia's and the CIWMB's policies. The CIWMB recently developed a checklist of 21 elements for assessing EPR policies.[15]

Limits of Extended Producer Responsibility

EPR is just one policy in a toolbox of policies used to improve the environmental performance of products, but it has limits, and it does not automatically lead to other desirable outcomes, such as green product redesign. Many current EPR systems have achieved the outcomes that were established in their governing regulation, such as a recycling rate target. The hope of proponents of EPR is that each EPR system would continue to improve beyond the initial defined goal, perhaps by achieving higher recycling rates than required, or by reducing any potentially harmful chemical constituents of products. In practice, however, most EPR systems just achieve the stated goal, and do not seek to further minimize environmental impacts beyond the stated goal.

The Growing Trend of Extended Producer Responsibility

Container deposit-return programs in North America, most of which were adopted in the 1970s and 1980s, are early forms of EPR. The great majority of beverage containers that are recovered never enter the municipal waste management system. In the 1990s, EPR programs for packaging, electronics, automobiles and other products became common in Europe, Canada, Japan and other industrialized countries – but not the United States. Meanwhile, Canadians have moved past the point of discussing whether EPR is a good policy approach. According to Duncan Bury, Head of Product Policy at Environment Canada's National Office of Pollution Prevention; "There is enough of a track record of these operating programs that there really isn't any question whether this is an appropriate kind of policy. We're now at the point of discussing how to make it more effective."[16]

In the United States, EPR for computers and televisions has gained momentum in the last four years. As of July 2008, 17 states had adopted laws to address various electronic discards, and all but one – California – used an EPR approach. The California Retailers Association now acknowledges that EPR is a

[14] *Framework Principles for Product Stewardship Policy* http://caproductstewardship.org/about/index.html

[15] http://www.ciwmb.ca.gov/EPR/Framework/Checklist.pdf

[16] Quoted in *Extended Producer Responsibility Policies in the United States and Canada: History and Status*, by Bill Sheehan and Helen Spiegelman. Product Policy Institute. Chapter 14 in: Governance of Integrated Product Policy: In Search of Sustainable Production and Consumption, Edited by Dirk Scheer and Frieder Rubik, Greenleaf Publishing Ltd., Sheffield, U.K., December 2005.

"trend that is sweeping the globe."[17] In July 2008, the National Association of Counties, an organization of elected officials representing two-thirds of US counties, adopted a resolution supporting a framework approach to EPR that covers an ever-increasing range of products.

[17] Pamela Boyd Williams, Senior Vice President of the California Retailers Association. Testimony to the Integrated Waste Management Board, Strategic Policy Development Committee, September 11, 2007.

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Program Selection

Initial Program Review

The Project Team conducted an initial literature review and worked with Department staff to identify potential programs to consider for our case studies. These programs were then screened based on their reported diversion rates and uniqueness of program features or policy approaches. This screening resulted in the identification of 15 Programs of Interest. A brief description of each of those Programs of Interest are provided below.

Additional research was then conducted on each of the 15 Programs of Interest and program summaries were developed that included:

- Program description;
- Recovery rates;
- Green product redesign features;
- Amount of deposit (if any);
- Products covered/not covered;
- Collection infrastructure; and,
- Program operating costs.

The 15 Programs of Interest were then reviewed by the Project Team and the Department to identify those to be further evaluated as case studies. The following elements were considered when identifying the programs to be further evaluated as case studies:

- Similarity or dissimilarity to the current California system;
- High recovery rates;
- Uniqueness of structural program features;
- Types of products covered/not covered;
- Level of Product Stewardship/Extended Producer Responsibility;
- Influence on product redesign; and,
- Availability of data.

Based on that review, the following five programs were selected for detailed case studies:

- British Columbia's Beverage Container Recovery Program;
- Germany's Beverage Container Deposit-Return System;
- Germany's Packaging Ordinance (Duales System);

Program Selection and Evaluation Process

- Ontario's The Beer Store Program and Ontario Deposit-Return Program; and,
- Ontario's Blue Box Program.

Case studies were also developed for California's current Beverage Container Recycling and Litter Reduction Program ("AB 2020") and the California Rigid Plastic Packaging Container ("RPPC") law.

Reasons for the selection of the specific programs for case studies included:

- All five of the programs selected have higher-than-average recovery rates, and many include a broad list of packaging types;
- All five of the programs selected have some design for environment feature, such as refillable bottles, or reduced or lighter weight packaging;
- British Columbia has the same deposit level as California, at 5 cents for a small container, and 10 cents for a large container, but has a higher redemption rate of 80 percent (versus an estimated 72-75 percent in 2008 for California);
- Germany and Ontario, Canada both have mature curbside programs as well as beverage container deposit-return programs, just as California does, and both Germany and Ontario have high recovery rates for both their curbside and deposit-return programs;
- Ontario's beverage container deposit-return program recently expanded to include wine and spirits; and,
- Four of the five case studies are operated and financed by industry, while the Ontario Blue Box Program is a hybrid system (of municipal operations and 50 percent funding by industry).

Programs of Interest

The following 15 international programs were identified as programs of interest and evaluated for consideration as case studies:

1. **Australia (South) – *System type:*** *Beverage Container Deposit-Return*

   Deposits on containers vary depending on the return option. A higher deposit is collected for material that is returned to a retailer rather than a depot.

   Redemption rates in 2002 were 70 percent for plastic, and over 85 percent for glass and aluminum.

2. **British Columbia, Canada - *System type:*** *Beverage Container Deposit-Return*

   The program is operated by two stewardship organizations[1], Encorp Pacific Canada and Brewers Distributors Ltd. Consumers pay a deposit and non-refundable container recycling fee at the point of sale. The system includes all beverage containers with the exception of milk.

   Redemption rates are currently 78 percent for non-refillables and 95 percent for refillable beer.

3. **Finland - *System type:*** *Beverage Container Deposit-Return*

   Two laws manage refillable and non-refillable containers. Deposits on containers vary by size and by whether they are refillable or not. Containers are mostly returned by RVMs.

   Redemption rates are over 75 percent for non-refillable containers, and 95-98 percent for refillables.

4. **Finland - *System type:*** *Packaging Waste Collection*

   The program was established in response to the European Union Directive 94/62/EU. The program applies to all packaging including fiber, glass, metal, plastics, and wood. Retailers are required to register (this prevents a free-rider problem). A third party, The Environmental Register of Packaging PYR Ltd, manages the program and fees for packers and importers.

   The redemption rate is 75 percent for all material.

5. **Germany - *System type:*** *Beverage Container Deposit-Return*

   This program applies to refillable and non-refillable containers. There is a standard deposit rate for non-refillable containers. However, the refillable bottle deposit rates vary based on size and type. Take-back is required at the point of sale and collection is mostly through RVMs.

   Redemption rates are 95-98 percent for non-refillables, and 96 percent for refillable beer.

[1] A “collective” or “stewardship organization” is an independent organization that has been formed to manage the stewardship responsibility of many individual manufacturers and brand owners.

Program Selection and Evaluation Process

6. **Germany - *System type:*** *Packaging Waste Collection*

   The law targets all packaging. Brand owners pay for the system by paying fees for all packaging materials that they place into the system, by quantity and material type. Several stewardship organizations provide for the collection, processing and recycling of materials. Overall recycling rates range from 66 percent to 90 percent, depending on material type.

7. **New Brunswick, Canada - *System type:*** *Beverage Container Deposit-Return*

   The law applies to most beverage containers, refillable and non-refillable. Only half of the deposit paid by consumers is refunded upon redemption. The other part of the deposit funds environmental programs. The containers can only be returned to depots. The beverage industry operates the program through a third party stewardship organization, Encorp Atlantic.

   The redemption rate for non-refillables is 72 percent and is 97 percent for refillable beer.

8. **Ontario, Canada - *System type:*** *Beverage Container Deposit-Return*

   Two systems operate: The beer industry operates its own distribution and redemption system with province-wide beer stores. Full refunds are offered to consumers who return beverage containers to the beer stores. The Liquor Control Board of Ontario ("LCBO") sells alcoholic beverages and the majority of wines and spirits in the Province. LCBO contracts with The Beer Store for the collection of containers.

   The redemption rate for 2007 was 67 percent overall and 94 percent for beer containers.

9. **Quebec, Canada - *System type:*** *Beverage Container Deposit-Return*

   All soft drinks (carbonated) and beer containers are part of their own deposit-return program. Containers are returned to retailers. The majority of retailers use RVMs. All other beverage containers are collected through municipal curbside recycling programs, which recently implemented a variation of a brand owner funding program (funds 50 percent of net costs).

   The redemption rate is 70 percent for beer and carbonated drinks and 98 percent for refillable beer containers.

10. **Sweden - *System type:*** *Beverage Container Deposit-Return*

    There are three main third party stewardship organizations that are funded by producers and handle aluminum, PET, and glass (Returpack, Returpack-PET, and Swedish Glass Organization). Deposits paid by consumers depend on the type and size of the container. All containers are coded for RVM return (over 2,500 codes). The third parties handle the deposits, refunds, collection, logistics, and recycling. Beverage containers sold in Sweden must meet labeling requirements.

    The redemption rates in 2007 were 88 percent for aluminum, 72 percent for PET less than 1 liter, and 90 percent for PET larger than 1 liter. In 2003, the glass redemption rate was 92 percent.

11. **United Kingdom - *System type:*** *Packaging Waste Collection*

    Two sets of regulations are intended to encourage the minimization of packaging and maximization of reuse. All types of packaging are targeted. Businesses must comply with the regulations by contracting with recyclers and processors to collect materials for recycling on their behalf. As a result of the regulations, there was a five percent decrease in packaging in 2004 (approximately 330,000 tons saved).

    The recovery rate of all packaging material types was 57 percent in 2007.

12. **Waste Electrical and Electronic Equipment ("WEEE") (EU Directive) - *System type:*** *Electronic Equipment Take-Back*

    Member states are required to establish separate collection systems for the recycling of electronic equipment (there are 10 categories). The Directive required that the collection rate must be four kilograms (kg) per resident and the target will change over the years. It is up to each member state to develop a program to meet the goal.

13. **WEEE (EU Directive) - *System type:*** *Hazardous Waste Component of WEEE Material*

    The program requires that hazardous elements in all WEEE material and in electric light bulbs and luminaries in households be under thresholds ranging from 0.01-0.1 percent. Some medical equipment is exempt.

Program Selection and Evaluation Process

14. **WEEE (U.K. Program) - *System type:*** *Electronic Equipment Take-Back*

    The UK program makes producers responsible for financing the collection, treatment and recovery of the equipment. Producers must work together in compliance schemes. Two schemes exist: Valpack Compliance Scheme and Distributors Take-Back Scheme. Local authorities must accept household hazardous waste and retailers must inform consumers of the regulation and how to dispose of material.

    Recovery during the first year of the program (2007) was six kg per person, which exceeded the target established by the EU.

15. **WEEE (U.K. RoHS) - *System type:*** *Program to Mandate Reduction of Hazardous Waste Components of WEEE Material*

    The UK program eliminates the tolerance level for lead and other substances. Exceptions exist for fluorescent tubes, lead in glass of Cathode Ray Tubes, etc.

Program Evaluation Process

In developing the case studies, it was important to develop criteria that could be used to evaluate the programs' effectiveness and highlight unique traits that might be helpful in improving California's current program. Two categories were identified to help evaluate the programs objectively and use consistent language: program elements and program outcomes. The elements category focuses on how the program functions—how it is funded, the impacts and requirements of stakeholders, etc. The outcomes category evaluates the results of the programs—the redemption rates achieved, change in product redesign, reduction in greenhouse gases ("GHG"), etc.

Program Elements

Ten program elements ("elements") were identified as information needed to assess the program and the manner in which it operates. The elements are defined below with the California Electronics Recycling Act used as an example throughout to highlight how each Element might be identified in a system.

The following elements were evaluated for the programs selected for case study analysis:

1. Program Description;
2. Products Covered/Not Covered through the System;
3. Program Scope and Targets;

4. Supporting Regulatory Framework;
5. Funding Mechanism;
6. Fee/Tax/Deposit Collection Point;
7. Program Operations (Collection and Processing);
8. Status of Competition within Program Operations;
9. End-of-Life Management (Reuse and Recycling); and,
10. Physical Infrastructure Needs.

Description of Program Elements

1. **Program Description**

   The Program Description provides an overview of the program including the targeted commodity and the program's goal. The start year and modifications to the program are also identified

2. **Products Covered/Not Covered through the System**

   This identifies the products that are and are not covered by the system. This enables qualitative/quantitative comparisons and assessments between programs.

3. **Program Scope and Targets**

   This provides an overview of what the program's objectives are in terms of redemption and recovery rate, green product design and future direction of the program.

4. **Supporting Regulatory Framework**

   This identifies whether the program has a stand-alone regulation or if the program acts in conjunction with other regulations.

5. **Funding Mechanism**

   The Funding Mechanism is the means by which funding for a product management system is obtained. For the case studies described in this report, the funding mechanisms include fees, taxes, material revenues, and unredeemed deposits.

   Fee. A fee is a charge that if collected by government, must be dedicated to, and used for, the governmental purpose related to the use of the item on which the fee is imposed. Fees can also be charged by entities other than government, such as Producer Responsibility Organizations that can be made up of producers, retailers, and others. Fees may cover the full or partial cost of the service or program. Examples include advanced disposal/recycling fees, franchise fees, solid waste tipping fees, utility fees, etc.

When the consumer pays the fee at the point of sale, it is either visible on the receipt or invisible because it is built in to the cost of the product. A ***visible fee*** is when the fee is a line item on a receipt so a consumer can identify the charge for the service provided. A visible fee can be considered a "retailer-based" system, whereas an ***invisible fee***, often called full-cost pricing, is when the costs are built into the price of the product without differentiating that cost to the consumer. An invisible fee is considered "producer-based" because it allows normal competitive pricing to play out in the marketplace.

Example: The California Electronics Recycling Act uses a ***visible fee*** as a Funding Mechanism by collecting $8, $16, or $25 per covered electronic device from the consumer at the Point of Sale. The extra cost is itemized on the consumer's receipt.

Tax. A tax is a compulsory payment to government by consumers, producers, or retailers. Products or services paid for with taxes do not necessarily have anything to do with the product or item on which the tax is charged.

Material Revenue. Material Revenue is the revenue generated from the sale of recovered materials (usually recyclables).

Unredeemed Deposits. Unredeemed deposits are generated when containers are not redeemed for the deposit.

6. Fee/Tax/Deposit Collection Point

The Fee/Tax/Deposit Collection Point describes any of the three points during a product's life where the fee, tax, or deposit can be levied:

Point of Manufacture. The producer pays the fee/tax/deposit. The fee/tax/deposit, if paid at this point, is generally built into the cost of the product as an invisible fee.

Example: In both Europe and British Columbia, the "producer" is defined as those who place the products on the market in the retail-supply chain for the first time or who import the product into a market. In the British Columbia Recycling Regulation Guide dated June 30, 2006, Producer is defined, "The product producer is principally the first-seller of the product in the province. In practice, the producer is typically the product manufacturer, distributor, or brand owner. The producer could be an importer, broker, or retailer who sells the product directly to a consumer, including those whose sales are transacted by catalogue or over the Internet."

***Point of Sale*.** The consumer pays the fee/tax/deposit when the product is purchased. The retailer remits the money on behalf of the consumer to the entity consolidating the funds to support the program activities.

Example: The California Electronics Recycling Act is a visible fee collected at the ***Point of Sale*** by the retailers on each covered electronic device.

***Point of Discard*.** An entity, typically the consumer, pays the fee/tax/deposit to the collector or recycler when the product is disposed.

7. **Program Operations (Collection and Processing)**

   Program Operations are conducted by the entity or entities which collect, transport, reuse and/or recycle the product and conduct public outreach for the program. This is frequently the element that involves the largest number of stakeholders.

   Example: The California Electronics Recycling Act Program Operations include the following entities: producers, retailers, consumers, approved collectors, approved recyclers, and the State Government being CIWMB, the Department of Toxic Substances Control and the Board of Equalization (for fee collection).

8. **Status of Competition within Program Operations**

   This identifies whether competition is fostered or hindered through the program. It also evaluates how many companies have a role in ensuring compliance with the program and that program standards are met operationally.

9. **End-of-Life Management (Reuse and Recycling)**

   This identifies whether there are markets for the targeted products that are able to support the volume of generated material for reuse and recycling.

10. **Physical Infrastructure Needs**

    This identifies the infrastructure needed to ensure that the recovered materials can be recycled or reused to maximize program results.

Program Outcomes

There are 12 program outcomes ("outcomes") that were identified for evaluation. Each of these outcomes provides perspective on the efficiency and successfulness of the program.

The following outcomes were evaluated for the programs selected for case study analysis:

1. Cost of Program Operation;

Program Selection and Evaluation Process

2. Redemption Rates of Containers (or Recovery Rates);
3. Level of Encouragement of Green Packaging Design and Actual Packaging or Product Redesign Achieved;
4. Ease of Use for Consumers;
5. Ease of Use for Retailers;
6. Ease of Use for Manufacturers/Brand Owners;
7. Impacts on Local Governments;
8. Ease of Administration and Enforcement for State or Provincial Governments;
9. Ease of Use for Recyclers/Haulers;
10. Continuous Improvement - Program Innovations;
11. Actual and Potential for GHG Emission Reductions; and,
12. Actual and Potential for Other Pollutant Reductions.

These Outcomes serve as a framework to assist in the comparison of the Department's program to the other case studies.

1. **Cost of Program Operation**

   This identifies the complete convenient of operating the program including agency oversight, staffing, cost to consumers and producers, any third parties, etc.

2. **Redemption Rates of Containers (or Recovery Rates)**

   This identifies the quantity of material redeemed or recovered as a result of the program.

3. **Level of Encouragement of Green Packaging Design and Actual Packaging or Product Redesign Achieved**

   This identifies whether green redesign is a requirement and/or an outcome of the program and describes the mechanism, such as lightweighting or recycled-content.

4. **Ease of Use for Consumers**

   This identifies how easy it is for the consumer to return the containers for recycling. Specific aspects of interest are whether containers need to be sorted by brand or material type, the number of outlets available for returning items (e.g., return to point of sale, curbside collection, etc.).

5. **Ease of Use for Retailers**

   This identifies the impact on retailers. Impacts relate to whether they accept the containers back, if they charge deposits and if they refund money when containers are returned. Other aspects of interest are whether there are requirements for retailers to register with the government in

order to participate in the program, whether participation is mandatory, and whether retailers have reporting requirements.

6. **Ease of Use for Manufacturers/Brand Owners**

   This identifies how the system impacts manufacturers or brand owners of products. Impacts relate to whether manufacturers or brand owners are required or encouraged to redesign products, how much effort is needed to demonstrate compliance with regulations (e.g., contract with third party, report directly to government, etc.), and which entity is responsible for tracking collection and/or production/sales.

7. **Impacts on Local Governments**

   This identifies the role(s) of local government (e.g., public education, administration, reporting, collection, etc.)

8. **Ease of Administration and Enforcement for State or Provincial Governments**

   This identifies how much time is needed for administration and enforcement, how many staff are dedicated to administration and enforcement, what level of effort is needed to collect information, etc.

9. **Ease of Use for Recyclers/Haulers**

   This identifies the role for recyclers and haulers. Specifically, it focuses on whether they have any reporting requirements, whether they work autonomously or in conjunction with third parties, and if they are part of the collection framework.

10. **Continuous Improvement - Program Innovations**

    This identifies the changes that have been made to the program since its inception. Major changes are noted, such as increases in deposit values, addition of new products, etc.

11. **Actual and Potential for GHG Emission Reductions**

    This identifies if GHG emissions reduction is an expressed goal of the program and if there are any reduction targets. Actual GHG reductions are listed in the case studies, if they have been quantified.

12. **Actual and Potential for Other Pollutant Reductions**

    Actual pollutant reductions are listed in the case studies, if they have been quantified.

Program Selection and Evaluation Process

Evaluation of Case Study Programs

Our review and analysis of the case study programs included, but was not limited to, the following tasks:

- Conducted interviews with provincial, state and federal regulators, stewardship organizations, equipment manufacturers, municipal authorities, recyclers, processors, non-profit environmental organizations, consultants, and brand owners;
- Reviewed the relevant regulations for each system and any annual reports that were prepared for the system;
- Conducted site visits:
    - British Columbia, Canada - Viewed Encorp Pacific and Save-on-Food store recycling depots. Visited public spaces and commercial establishments with recycling collection programs. Conducted on-site interviews with the provincial regulators and the CEO of Encorp Pacific, as well as one plastics processor.
    - Germany - Conducted site visits at a small beverage retailer with a manual take-back program and three grocery stores with various levels of take-back automation for beverage containers. Toured a beverage container sorting plant. Visited different types of households (single-family and multi-family) and different types of commercial establishments, to observe the collection systems from the consumer's point of view. Interviewed recycling system operators, equipment manufacturers, and environmental non-profit and a representative of Duales System Deutchland.
    - Ontario, Canada - Conducted site visits at The Beer Store, retail and other return locations to view the beverage container return process. Observed bottle sorting facilities as well as the material recovery facility for all non-refillable alcohol containers in the program. Interviewed provincial regulators, recyclers, material processors, staff at The Beer Store, and representatives from Canada's National Brewers.
- Research the California case studies by interviewing staff at the Department of Conservation and the California Integrated Waste Management Board;
- Interviewed recyclers and reverse vending machine manufacturers in California;

- Visited redemption centers to observe the redemption process in California. Observed recycling opportunities (or lack thereof) in public spaces and commercial establishments;
- Evaluated the programs for system features that lead to higher recycling rates and increased green product redesign, among others. This evaluation included direct comparisons of program elements and outcomes for the case programs including:
    - Deposit levels;
    - Public education spending per capita; and,
    - The number of Redemption locations per capita, and,
- Reviewed numerous studies, presentations and reports related to beverage container and packaging recycling programs to incorporate additional data, such as GHG data.

As each case study was completed, a regulator or key participant in that system was asked to review the case study and provide comments and any necessary corrections. Comments and corrections were then incorporated into the case studies that appear in this report.

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Program Selection and Evaluation Process

Section I. Program Summary

This program places a mandatory deposit on many types of beverage containers sold in the State of California. Consumers must pay the deposit when they purchase beverage containers, which are refunded when they return their empty beverage containers for recycling.

The California Beverage Container Recycling and Litter Reduction Act ("Act" or "AB 2020") is administered and monitored by the California State Department of Conservation ("Department"). As a Department report explains, "At the center of the program is the California Redemption Value. This redemption value is paid by beverage distributors[1] on every beverage container sold or offered for sale in California. Beverage distributors make a redemption value payment into the Fund, and are reimbursed for this redemption value when they sell the beverages to retail markets. Retailers charge consumers a deposit, the California Redemption Value, at the point of purchase. Consumers are then eligible to return their empty beverage containers to a recycler, who returns the deposit to the consumer as the California Refund Value. The program distinguishes the "refund value" from the "redemption value" – the refund value reflects the money paid out to recyclers and consumers, while redemption value and the refund value have usually been equal, although this is not always the case."[2] The deposits (redemption value payments) are held by the State in the California Beverage Container Recycling Fund ("CBCRF").

California Beverage Container Recycling Fund

Not all containers are returned for a refund of the deposit, and unredeemed deposits are therefore available for other recycling-related activities. These activities include:

- Handling fee payments to convenience zone recyclers;
- Payments to local curbside programs;
- Payments to cities and counties;
- Incentives to encourage the quality of and demand for recycled materials, such as the Quality Incentive Payment

[1] "Distributor" means every person who engages in the sale of beverages in beverage containers to a dealer in this State, including any manufacturer who engages in these sales. "Distributor" includes any person who imports beverages from outside of this State for sale to dealers or consumers in this State.

[2] "California Beverage Container Recycling Program History and Fund Management Options," Department of Conservation, Division of Recycling, February 28, 2007.

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("QIP") and Plastic Market Development Payment ("MDP") programs;

- Recycling grants to the local conservation corps and to entities statewide;
- Public education; and,
- Program administration.

Program Outcomes, Section IV of this case study, gives more information about the grant programs and other activities that are funded by the CBCRF.

Processing Fees and Processing Payments

In addition to receiving redemption value payments, the Department also receives processing fees from beverage manufacturers.

If any type of empty beverage container has a scrap value less than the cost of recycling, the Department establishes a processing fee and a processing payment for the container based on the type of material of the container.[3] The processing fee is the amount per container that is paid by the beverage manufacturers. The "processing payment" is the amount paid to processors or recyclers to offset costs when the scrap value for the recycled material is less than the cost to recycle that material. The flow of payments through the system is shown graphically in Appendix B.

The Department maintains accounts for processing payments by material type, such as the "glass processing fee account," and the "PET processing fee account."

Convenience Zones

As part of the Act, Convenience Zones were established which require a recycling center for deposit redemption and return of containers within a half-mile of supermarkets for non-rural communities and within three miles of supermarkets for rural communities. Supermarkets are defined as "full-line" stores that sell dry groceries, canned goods, or non-food items and perishable items. These include traditional grocery stores, as well as many "big box" stores, as they now carry groceries. A convenience zone is created when a store has annual gross sales of $2 million or more.

A zone is created wherever there is a retailer that meets the definition listed above. Thus, if two grocery stores are located next to each other, by definition, two zones are created, even though the second zone is redundant. The second, redundant zone can apply for an exemption.

[3] Paraphrased from Section 14575 of the State of California Public Resources Code.

As of January 13, 2009, there were 3,770 convenience zones. There were 2,150 convenience zones with a recycling center (known as "served" zones), and 1,620 zones without a recycling center. The areas with no centers are categorized as follows:

- Unserved zones (beverage dealers in the zone are required to redeem the containers in-store): 555;
- Exempt zones (recycler is outside a half-mile of the store selling beverages, but the redemption opportunities are still good; in-store redemption is not required): 950; and,
- "Hold" status zones (recycler in a zone is recently closed and the zone must undergo exemption review in February 2009): 105.

Recycled Content Requirements and Other, Related Laws

The Act also requires 35 percent recycled content in glass containers manufactured in the State. Related laws also have a rigid plastic labeling requirement and a 30 percent recycled glass content requirement for fiberglass. The Act has been amended by legislation over 50 times since being enacted in 1986.

Section II. Program Elements

1. Program Description

The Act was voted into law on September 29, 1986 and was implemented on September 1, 1987. In 2000, it was expanded to include non-carbonated, non-alcoholic beverages, except milk. Along with the increase in applicable materials, the California Refund Value has increased three times, as shown in the following table.

TABLE 4-1
History of California Refund Values for Beverage Containers

Year	California Refund Value
1987	$0.01 for all containers.
1989	$0.02 for all containers.
2004	$0.04 for containers under 24 oz. $0.08 for containers 24 oz. or larger.
2007 (current rates)	$0.05 for containers under 24 oz. $0.10 for containers 24 oz. or larger.

Source: Report of Beverage Container Sales, Returns, Redemption and Recycling Rates, Department of Conservation, September 12, 2007.

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In the California system, consumers can return beverage containers to a certified collection center for a return of their deposit. If consumers are willing to forfeit the deposit, they can place beverage containers in their curbside recycling containers or deliver them to a drop-off program, in which case, the operator of the program receives the deposit refund (the redemption payment). Some beverage containers that have been placed into trash containers may be recovered by facility operators from mixed waste at Material Recovery Facilities ("MRFs").

There are a variety of points where money is transacted between collectors, processors, handlers, etc. How much each party receives depends on their role. Additional details on the system funding are provided in Section IV of this case study. Appendix B shows the "Flow of Payments under the Beverage Container Recycling and Litter Reduction Act" and the "Flow of Payments under the Beverage Container Recycling Program (with Container Flow)".

2. Products Covered/Not Covered by the System

The Act applies to specific beverage containers made out of aluminum, glass, plastic, and bimetal; the program does not include flexible packaging, such as aseptic containers or pouches. Beverage types that are covered include carbonated mineral and soda water and other similar carbonated soft drinks, wine coolers and distilled spirit coolers, beer and malt beverages, as well as noncarbonated water including noncarbonated mineral water, sports drinks, coffee and tea drinks, vegetable juice in containers 16 oz. or less, carbonated or noncarbonated fruit drinks that contain any percentage of juice and 100 percent fruit juices that are packaged in containers less than 46 oz. in volume.

Materials that are exempt include refillable containers and wine, spirits and milk containers.

3. Program Scope and Targets

The goal of the Act as set in statute is to achieve a recycling rate of 80 percent for all materials covered by the program. A secondary goal is to reduce the beverage container component of littering. In calendar year 2007, the program achieved a 67 percent recycling rate. The recycling rate for the first six months of 2008 jumped to 76 percent, as compared to 71 percent for the first six months of 2007. The Department has not yet released a final recycling rate for 2008, but estimates that it is between 72 and 75 percent.

4. Supporting Regulatory Framework

This is a stand-alone program with separate regulations, but its activities support the state's AB 939 goal to reduce statewide disposal by 50 percent.

5. Funding Mechanism

The system (beverage container recycling program) is funded by the following:

- Unredeemed CRV deposits (redemption value);
- Sales of recycled materials for aluminum, glass, etc. (indirectly fund the program through offsetting the cost of operating local programs);
- Processing fees paid by beverage manufacturers; and,
- Interest income.

6. Fee and Deposit Collection Points

Deposit

Consumers pay a deposit at the point of purchase. The deposit is 5 cents for each container that is less than 24 ounces and 10 cents for any container 24 ounces or larger. See Appendix B for a graphical presentation of the deposit flow.

Processing Fees

In addition to the redemption payments, beverage manufacturers pay processing fees that vary by container type and by year. The intent of the processing fee is for beverage manufacturers to supplement the cost of recycling beverage containers if the cost of recycling exceeds the scrap value for the container. The fee is calculated to cover the difference between the scrap value and cost of recycling. The rate of recycling for the container is factored into how much a beverage manufacturer pays. However, because the beverage manufacturers only pay a portion of it, the Department pays the remainder recycling cost through unredeemed CRV deposits. By having the beverage manufacturers cover a portion of recycling cost, the Department is able to use other unredeemed CRV refunds for grants and other recycling programs.

The original intent of the Act was to have each container's processing fees pay for the recycling of that container. However, in 2007, the processing fees paid by manufacturers totaled approximately $4.6 million, while processing payments to recyclers totaled $101.3 million. The difference was funded by the unredeemed deposits paid into the CBCRF.

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TABLE 4-2 Total 2007 Processing Fees Paid by Manufacturers (Millions)	
Material	**Amount[4]**
Glass	$0.000
#1 PET	$0.000
#2 HDPE	$0.000
#3 PVC	$0.037
#4 LDPE	$0.147
#5 PP	$0.041
#6 PS	$0.771
#7 Other	$2.306
Bimetal	$1.289
Total Processing Fee Payments	**$4.591**

Source: California's Beverage Container Recycling and Litter Reduction Program Fact Sheet, Updated 5/28/08

7. Program Operations (Collection and Processing)

Beverage containers are mostly collected at buy-back and drop-off centers, and curbside collection at residences. After collection, the material is sent to processing facilities or recyclers. The Department tracks the amount of containers that are collected by each type of recycling program, and distributes processing payments to program operators. Other payments are also made to program operators, as later discussed in Section IV of this case study.

[4] AB 3056 (Chapter 907, Stat. of 2006) suspended the processing fee for one year effective January 1, 2007 for any material type with a recycling rate equal to or greater than 40 percent based on the previous 12-month period. As a result, there was no processing fee established for glass, PET, or HDPE during CY 2007.

TABLE 4-3 Containers Returned through Various Types of Recycling Programs, Calendar Year 2007		
Type of Recycling Program/Centers	**Number of Recycling Programs/Centers**	**Percent of Total Returned through this Program Type**
Traditional Recycling Centers (Old Line)	240	52%
Supermarket Sited Handling Fee Recycling Centers[5]	1,282	26%
Supermarket Sited Non-Handling Fee Recycling Centers	648	6%
Curbside Programs	565	12%
Collection Programs, Drop-off Programs, Community Service Programs	274	3%
TOTAL *(Note: may not add, due to rounding).*	**3,009**	**100%**

Source: "California's Beverage Container Recycling & Litter Reduction Program Fact Sheet," Updated May 28, 2008.

8. Status of Competition within Program Operations

All certified recycling centers are required to pay consumers the deposit (refund value) when containers are returned. Some centers pay higher rates to customers, in effect, sharing a portion of material sales revenues with customers, in order to attract higher volumes. Within a Convenience Zone, the Department will only pay handling fees to one certified recycling center, which may discourage other centers from locating too close to an existing center that is receiving the handling fees. Competition exists among recycling facilities to pay for the scrap material, but this is separate from the CRV deposit system.

In order to receive payments from the CBCRF, such as processing payments, handling fees, etc., each center or curbside

[5] Some supermarket-sited recycling centers are eligible to receive handling fees, as a result of being the first center established within a convenience zone. After the first center is established within a zone, other centers may be established within the same zone, but they are not eligible for handling fees.

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program must apply to become certified by the Department, using a simple registration process.

9. End-of-Life Management (Reuse and Recycling)

There are established markets for recycling of the targeted materials. In addition, the Act has a recycled-content requirement for glass food, drink and beverage containers manufactured in the State (35 percent) and there is a separate recycled-content requirement for fiberglass manufactured or sold in the State (30 percent).

There is also a Rigid Plastic Packaging Container ("RPPC") law, which affects plastic markets, although it is administered by the CIWMB. This law encourages the development of markets for plastic materials collected for recycling by requiring manufacturers to utilize increasing amounts of post-consumer recycled material in their rigid plastic packaging containers (PRC 42300).

10. Physical Infrastructure Needs

In order for the program to work, convenient collection points are needed. People can currently take material to supermarket-adjacent beverage container recycling centers, other traditional recycling centers, drop-off centers, community service programs, or use their curbside recycling program to recycle the material. Only individuals that take their material to a certified center receive the refund. Otherwise, the collector or processor of the recyclables will collect the refund, which is the case for materials placed in curbside or drop-off recycling containers.

Convenience Zones

In most beverage container deposit-return systems around the world, containers are returned to supermarkets and other retail sites where beverages are sold. The collection points are typically inside the stores. Some systems in Canada use recycling "depots." In contrast, the State of California legislation created "convenience zones," which are defined as a one half mile radius around a supermarket. Supermarket-sited recycling centers are stand-alone buildings or kiosks, located adjacent to supermarkets and/or in supermarket parking lots.

If there is not a certified recycling center within one half mile of a supermarket, that convenience zone is considered "un-served." Stores in un-served zones must comply with State law in one of the following ways:

1. Establish a certified recycling center; or,
2. Redeem all empty beverage containers at all open cash registers within the store; or,
3. Pay $100 per day to the State of California Department.

Section III. Stakeholder Roles and Responsibilities

TABLE 4-4
California Program
Summary of Stakeholder Roles and Responsibilities

Stakeholder	Role and Responsibility
Consumer	Pay the deposit at point of sale and recycle the container, at which time the consumer's deposit is refunded.
Retailer	Collect the deposit and send it to the distributor. After the beverage is consumed, and a container is recycled at a supermarket-sited recycling center, centers and retailers work together to issue refunds through the retailer. Some recycling centers may pay cash directly and don't involve the retailer. California Refund Value Paid Out: This is the sum of the $0.05 and $0.10 refunds that are paid to consumers, or paid to drop-off and curbside programs, if the consumers choose to recycle their materials through these programs.
Beverage Manufacturer/Brand Owner/Distributor	Report sales to the State and send the State redemption payments.
Convenience Zone Recycling Centers	Accept CRV material from the public and refund deposits to consumers based on Department rates.
Other Recyclers/Haulers ("Recyclers" are entities that collect beverage containers and directly market and sell the material to end-markets for the reprocessing of the material into new products)	Recycle beverage containers, pay the CRV value to consumers, and submit recycling forms to the Department. Recyclers also receive various fees from the Department (see Section IV for details).
State or Provincial Government	Manage the program and fund, enforce regulations, and encourage demand for recovered materials.

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TABLE 4-4 California Program Summary of Stakeholder Roles and Responsibilities	
Stakeholder	**Role and Responsibility**
Local Government	Ensure compliance with convenience zones, and make recycling options available if opportunities are scarce. Also enforces weight and measure and health regulations.

Section IV. Program Outcomes

1. Cost of Program Operation

In fiscal year 2007/2008, Department program revenue was $1,216.9 million and expenses were $1,226.6 million.

TABLE 4-5 Program Activity Revenues (Fiscal Year 2007/2008)	
Estimated Revenues	*(Millions)*
CRV In	$1,197.7
Interest	$19.2
Total Estimated Revenues	$1,216.90

TABLE 4-6 Program Activity Expenditures (Fiscal Year 2007/2008)*	
Estimated Expenditures	*(Millions)*
California Refund Value Paid Out	$915.9
Processing Fee Offset	$90.5
Division of Recycling Administration	$50.6
Handling Fees	$35
Curbside/Neighborhood Drop-off Supplemental Payments	$15.0
Payments to Cities and Counties	$10.5
Public Education	$5.0

TABLE 4-6
Program Activity Expenditures
(Fiscal Year 2007/2008)*

Estimated Expenditures	*(Millions)*
Market Development and Expansion Grants (annually, until January, 2012)	$20.0
Community Conservation Corps Grants	$18.4
Community Outreach Grants	$1.5
Quality Incentive Payment Program	$15.0
State Parks Recycling and Litter Reduction (one-time expenditure)	$5.0
Multifamily/ Low Income Recycling (one-time expenditure)	$5.0
Plastic Market Development Payments (annually, until January, 2012)	$5.0
Recycler Incentive Program	$10.0
SB 1021	$0.2
Local Conservation Corp Grants (one time expenditure)	$20.0
State Operations	$4.0
Total Estimated Expenditures	$1,226.60

* Note: Expenditures are annual, recurring expenditure categories, unless otherwise noted.

Description of Programs Funded by the California Beverage Container Recycling Fund

The largest fund expenditure is the "California Refund Value Paid Out." This is the sum of the $0.05 and $0.10 deposit refunds that are paid to consumers, or paid to drop-off and curbside programs, if the consumers choose to recycle their materials through these programs.

Unclaimed deposit redemption payments are used to fund various Department programs including program administration, grants, education programs, etc. These activities are described below for fiscal year 2007/08. The scale and focus of these programs changes from year to year, based on direction from the California State legislature (in State law).

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- Processing Fee Offset: The processing fee offset amount for fiscal year 2007/08 was approximately $90.5 million. Processing fees were discussed earlier in this case study, in Section II, under “Fee and Deposit Collection Points.”
- Division of Recycling Administration: program administration, monitoring and enforcement.
- Handling Fees: amounts paid to operators of supermarket-sited recycling centers, rural region recyclers, and nonprofit convenience zone recyclers, for beverage containers redeemed by the operator. These payments are additional to other program revenues recyclers receive.
- Curbside/Neighborhood Drop-off Supplemental Payments: The Department pays a total of $15 million to curbside programs and neighborhood drop-off programs, in addition to CRV payments those programs may receive. The amount of the payment is based upon the total volume of containers collected by such programs over the year, with each program receiving a proportional share of the total.
- Payments to Cities and Counties: the Act allows for annual grants (totaling $10.5 million per year) to cities and counties for beverage container recycling and litter cleanup activities. The Department allocates the total on a per-capita basis, with a minimum of $5,000 to each city and a minimum of $10,000 to each county.
- Public Education: up to $5 million may be expended annually for the purposes of undertaking a statewide public education and information campaign aimed at promoting increased recycling of beverage containers.
- Market Development and Expansion Grants ($20 million annually, until January, 2012): this is a competitive grant program for recycling market development and expansion-related activities aimed at increasing the recycling of beverage containers and encouraging more sustainable packaging systems through improved material processing and manufacturing.
- Community Conservation Corps Grants: these are annual payments to community conservation corps in the form of grants for beverage container litter reduction programs and recycling programs. The amount is adjusted annually on a cost-of-living basis.
- Community Outreach Grants: this is an annual, competitive grant program for beverage container recycling and litter reduction programs.
- Quality Incentive Payment Program: allows for up to $15 million annually to go to certified curbside programs or

other certified programs for (1) color-sorted glass, up to $60 per ton, (2) plastic beverage containers, sorted by resin type, up to $180 per ton, or (3) empty aluminum beverage containers, cleaned of all other metallic and non-metallic items, up to $125 per ton.

- State Parks Recycling and Litter Reduction: this was a one-time grant program of $5 million for the purposes of installing source separated beverage container recycling receptacles at each of the state parks, starting with those that have the highest day use.
- Multifamily/Low Income Recycling: this was a one-time program for 2008 that provided $15 million in grants to place source separated beverage container recycling receptacles in multifamily housing.
- Plastic MDPs: these payments of up to $5 million annually can be made until January, 2012 to both certified entities (which include processors and drop-off and collection programs) and product manufacturers. Certified processors only qualify for the program if they purchase recycled plastic beverage containers, clean and process them into flakes or pellets in California AND sell the finished product to a manufacturer in California. The manufacturer is eligible for PMDP as well and they have to use the plastic product in California.

  Payments are $150 per ton for plastic beverage containers that are washed and processed into flake or pellet and used in the State of California.
- Recycler Incentive Program: this program started on January 1, 2007, will end on January 1, 2010, and provides annual payments of up to $10 million to recycling centers and drop-off programs for empty beverage containers collected directly from consumers. The incentive is $0.01 per container, and is paid to centers that increase the number of containers accepted from the public by a specified percentage over the previous year's business. The percentage increase is 6.5 percent for calendar year 2007, and 5 percent for calendar years 2008 and 2009.
- SB 1021: SB 1021 created a new grant program for multi-family recycling. This budget amount in fiscal year 2007/08 was used to pay for staff to develop the new program.
- Local Conservation Corp Grants: a one-time, competitive $20 million grant program for one-time capital improvement projects.

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- State Operations: This is an annual amount that is paid to other state agencies and state departments for general administration. For example, some of this money supports the state Controller's office, which handles disbursements for the Division of Recycling.

Also, a new one-time grant program becomes effective on July 1, 2009. The amount will be $20 million, to be spent over a three-year period, and the focus is for either of the following:

1. "Beverage container recycling and litter reduction programs that emphasize the greatest and most effective collection of beverage containers per dollar spent to ensure the program's performance and accountability"; or,
2. "Focused, regional, community beverage container recycling and litter reduction programs that enable the department to more effectively organize the amount and type of resources needed for regional and statewide efforts to increase recycling"[6].

The solicitation for this new grant program is yet to be developed, and additional details are not available at this time.

Processing Fees and Handling Fees

As mentioned previously in this case study, for certain material types, the costs of handling and recycling the material are more than the scrap value of the material. Since the main source of income for the certified recycling centers is material scrap value, there is another provision in the law to reimburse certified centers for the extra costs of processing low-value materials. These are called "processing payments," and they are calculated annually by Department and paid to certified recycling centers on a per-container basis, by material type.

The processing fees originate as a charge to the beverage manufacturers. The beverage manufacturers are assessed processing fees by the Department, by container material type and number of containers. The Department, in turn, pays processing payments to the processors, drop-off or collection programs, curbside programs and recycling centers when the Department determines that the scrap value being offered by willing purchasers for a particular container material is insufficient to ensure the economic recovery of the container type at the minimum number of recycling centers or locations.[7] The "processing payments" per container are higher than the "processing fees" per container that are collected from the manufacturers, and unredeemed deposits are used to pay the

[6] California Public Resources Code Section 14581(a) (18) (A) (i) and (ii).
[7] California Public Resources Code section 14518.5, definition for "processing payment."

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amount of the processing payment that is not covered by the processing fees. For example, in calendar year 2007, the processing fees paid by manufacturers totaled $4.6 million, while the processing payments paid to processors totaled $101.3 million.

Handling fees are paid on a per-container basis to only one recycler located in each convenience zone. The per-container amount is calculated by a Department review of actual costs that is conducted every two years. The handling fee is currently just under one cent per container. Handling fees are calculated separately from the processing payments, and convenience zone recycling centers receive both handling fees and processing payments.

2. Recycling Rates of Containers

The 2007 recycling rate was 67 percent. The 2008 recycling rate has not been finalized, but the Department estimates that it is between 72 and 75 percent.

TABLE 4-7
Recycling Rates – Beverage Containers
Calendar Year 2007 and first half of 2008

Material	2007	2008, 1st half of year*
Aluminum cans	79.2%	85.4%
Glass	66.8%	79.4%
Plastic Bottles-PET #1	54.4%	63.4%
Plastic Bottles-HDPE #2	67.4%	90.3%
Plastic Bottles-PVC #3	14.3%	19.3%
Plastic Bottles-LDPE #4	0.2%	0.2%
Plastic Bottles-PP #5	3.5%	0.2%
Plastic Bottles-PS #6	1.1%	1%
Plastic Bottles-Other #7	6.4%	4.4%
Bi-Metal	9.5%	14.1%
TOTAL CONTAINERS	**67.2%**	**75.6%**

* Through June 30, 2008

3. Level of Encouragement of Green Packaging Design and Actual Packaging or Product Redesign Achieved

As previously described under the heading, "End-of-Life Management," the Act and related laws have recycled-content requirements for glass containers and fiberglass.

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4. Ease of Use for Consumers

The system is straightforward in that a consumer only has to be concerned with paying the deposit, which is clearly listed on the customer's receipt. It is then up to the consumer to decide if and how the container will be recycled. The convenience zones throughout the State provide consumers multiple locations to take their beverage containers to receive their deposit refund. The large number of recycling centers and availability of curbside collection programs offer consumers many easily accessible recycling collection points.

5. Ease of Use for Retailers

Under the structure of the law, retailers are not required to provide personnel and storage space for empty containers. However, some retailers are in convenience zones and have a separate affiliated buy-back center at their site. Others have reverse vending machines to refund the deposit. People that use the affiliated buy-back center receive a receipt from the recycling center, which can be redeemed for cash from the supermarket. Thus there exists a partnership between the centers and supermarkets.

6. Ease of Use for Manufacturers/Brand Owners

Compared to other beverage container deposit-return systems, there are several tasks that the California system does not require of manufacturers: they do not have explicit responsibilities for ensuring that materials are recycled, and they are not required to achieve a specific diversion rate. The one Extended Producer Responsibility aspect of the program is the recycling rate-dependent processing fees that manufacturers pay. All program responsibilities are administered by the Department. Distributors have responsibilities for paying deposits into the CBCRF, which are offset by the deposits that distributors receive from retailers when selling their goods to retailers.

Manufacturers pay processing fees, based on a formula that considers the beverage container material type, the recycling rate of that beverage container material type, and the cost of recycling for that material type that exceeds the material sales revenue for that material type.

7. Impacts on Local Government

Under the Act, local governments have no mandate to offer recycling programs. Local governments must reduce waste disposal under another law, AB 939, and provide public education to promote recycling. Under the Act, local governments do receive certain benefits, including direct, non-competitive grant funding from the Department for beverage container recycling and litter reduction programs. Local governments are also eligible to apply for additional grant funding, under a competitive Community

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Outreach Grant program and through Market Development and Expansion Grants. Local governments that provide municipally-operated collection programs receive CRV revenues directly. Other local governments that contract with haulers typically share some or all CRV revenues with their haulers that provide curbside recycling. This sharing of revenue helps offset some of the hauler's collection costs and reduces the service fees charged to residents and businesses.

8. Ease of Administration and Enforcement for State Government

The Department monitors the sales of beverages to determine the redemption and recycling rates. Manufacturers and distributors report their sales, while collectors, processing facilities and recyclers all submit reports to the Department as a means to collect refund values, handling fees, or other fees.

It is the responsibility of the Department to oversee the program and funding. Overall, there are approximately 3,000 manufacturers and distributors and 3,000 processors, buyback centers, curbside programs, collection points and community service programs that collect the beverage containers. The Department audits, enforces and inspects businesses that file reports with them. In fiscal year 2007/2008, the Department completed 186 compliance audits, 2,473 recycler inspections, and 5,640 dealer[8] inspections. The funding source for the enforcement is the unredeemed CRV.

9. Ease of Use for Recyclers/Haulers

Recyclers and haulers must apply for and maintain certification in order to receive payments from the state fund, the CBCRF. Other than this, recyclers and haulers do not have any requirements that are outside of their normal operations. Materials that are collected through recycling facilities or convenience zones are separated by material type and sold to end-markets. Haulers may need to sort materials and remove contamination or non-CRV material from curbside collection loads, but that process would occur even without the beverage container program. Therefore, the recyclers and haulers are not adversely impacted by the program and have very few adjustments to their operations to participate.

10. Continuous Improvement – Program Innovations

The Act has been revised over 50 times since inception to continuously improve recycling rates. The deposit level has been increased 3 times in the last 22 years. Grant programs have been expanded, or new grant programs have been created, in an

[8] "Dealers" are the businesses that sell beverages, such as grocery stores and other stores.

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attempt to expand the number of recycling locations in the State, and to expand the recycling and processing infrastructure in the State.

The primary innovation was implemented with the initial passage of the Act, which was to place the deposits into a state fund, with government control, and to restrict use of those funds to paying only for recycling of beverage containers and programs designed to improve beverage container recycling.

The Act allows for a variety of types of collection points. This is evidenced by the existence of recycling centers in convenience zones, drop-off locations, and curbside collection programs. The State also promotes the recycling of products through programs such as the Plastic Market Development Payment Program, which provides incentives for processors and manufacturers to use recycled materials in the State of California.

Key features of the California system that makes it unique from others in the U.S. are the following[9]:

- Redemption centers, not in stores (Convenience Zones);
- No sorting by brand – lower costs than traditional;
- State oversight and control of funds;
- Curbside programs receive CRV revenue (commingled rate, block payments to cities);
- Unclaimed deposits support infrastructure, including:
    - Collection programs – multifamily, Conservation Corps;
    - Technology & equipment funding;
    - Research & Development;
    - Education;
    - Handling Fees, other incentives; and,
    - Anti-fraud activities;
- Support for demand as well as supply, through the following programs:
    - Minimum recycled content for glass bottles and fiberglass;
    - Market Development and Expansion Grants;
    - Plastic Market Development Payments;
    - Green Gift Guide; and,

[9] www.bottlesandcans.com

- Quality of materials, not just quantity (Quality Incentive Payment Program); and,

- Manufacturers share some responsibility:
  - Processing Fees partially offset recyclers' costs.

11. Actual and Potential for GHG Emission Reductions

The most recent data available is for calendar year 2007. The Department determined the greenhouse gas emissions saved using the U.S. Environmental Protection Agency's Waste Reduction Model (WARM). The model used only looked at the reductions from aluminum, glass, #1PET, and #2 HDPE. The emissions reduction was 600,248 metric tons of carbon equivalents ($MTCO_2E$).

TABLE 4-8
Reduction of Greenhouse Gas (GHG) Emissions (2007)

Material	Tons of GHGs reduced ($MTCO_2E$)
Aluminum	480,685
PET	67,862
Glass	43,550
HDPE	8,151
Total	**600,248**

12. Actual and Potential for Other Pollutant Reductions

The Department does not publish data on the reduction of other pollutants.

Flow of Payments

Appendix B shows the flow of payments under the Beverage Container Recycling Program.

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Beverage Container Recycling and Litter Reduction Act

Section I. Program Summary

The California Rigid Plastic Packaging Container ("RPPC") Law is a law that requires source reduction, recycled-content and/or recycling of rigid plastic packaging containers. The law imposes requirements on product manufacturers that package products in rigid plastic packaging containers. The recycled-content provisions of the law are also aimed at creating a market for plastics recycling in the State of California. Manufacturers have a choice of compliance options under this law, and some affect end-of-life of the packaging (recycling rate compliance option and reuse/refill compliance option) while other compliance options affect the beginning-of-life of packaging (source reduction and recycled-content options). The law is summarized in this report because it may have significant packaging redesign features. It does not, however, affect the manufacture of beverage containers, because food and beverage containers are among the containers exempt from the law. The California Integrated Waste Management Board ("CIWMB") monitors the compliance of product manufacturers selling products that must comply with the RPPC Law.

Section II. Program Elements

1. Program Description

The stated purpose of this program is to reduce rigid plastic packaging, and ultimately disposal, and increase the use of postconsumer plastic. Initially, a condition of all aspects of the RPPC Law going into effect was that at least 60 percent of California single-family homes had a curbside collection recycling program (in intervals of not less than every two weeks) that included beverage container recycling. If statewide curbside recycling falls below 60 percent inclusion, the CIWMB shall grant a waiver from all requirements of the law.

On or after January 1, 1995, all rigid plastic packaging containers sold or offered for sale in the State must meet one of the following criteria:

- Be made from at least 25 percent postconsumer material;
- Be recycled at one of the following rates:
    - All product associated rigid plastic packaging containers[1] must have a 45 percent recycling rate; or,

[1] "Product Associated Rigid Plastic Packaging Container" means a brand-specific rigid plastic packaging line which may have one or more sizes, shapes or designs and which is used in conjunction with a
(Footnote continues on next page)

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  - All particular-type (i.e., holds a single type of generic product, such as milk or detergent) rigid plastic packaging containers must have a 45 percent recycling rate;

- Be reused or refilled at least five times;
- Be a source reduced container – the package weight per unit of the source reduced containers have been reduced by 10 percent compared to packaging used for product by manufacturer from Jan. 1st, 1990, to Dec. 31st, 1994;
- Floral industry only—be a container that contains floral preservatives and is reused by the floral industry for at least 2 years; or,
- In 2006 an alternative compliance option was added that allows a product manufacturer to comply with the postconsumer material requirements by allowing California generated postconsumer materials to be used in other products or packaging through actions of another entity under the same corporate ownership.

Measuring Compliance:

Not every rigid plastic container must meet a compliance criterion individually. Manufacturers may average the source reduction, postconsumer material, refill or reuse data to demonstrate compliance. Averaging for compliance is subject to the following specifics:

- Averaged containers must all use same compliance option (e.g., all containers may average using postconsumer material compliance option only or refill data only, not both);
- Averaging may be calculated by containers sold and recycled in California only or nationwide;
- Only the source reduction, postconsumer material, refill or reuse options may be used to express compliance by averaging (i.e., 45 percent recycling rates are not applicable);
- A manufacturer may elect to average an entire product line or sub-lines; and,
- If averaging is used, every rigid plastic packaging container must be included in average or comply through another compliance alternative.

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particular generic product line. A product associated container holds a brand-specific product such as Brand “x” salad dressing or Brand “y” automotive oil.” Per regulations for the Rigid Plastic Packaging Container Program, Title 14, Chapter 4, Article 3.

The previous calendar year's products sold are used for the calculation.

Revisions to the RPPC Law

There have been many revisions to the RPPC Law over the years. For the past few years, the regulations have been undergoing revisions and incorporating stakeholder feedback. It is anticipated that the formal rulemaking process will begin in 2009.

2. Products Covered/Not Covered by the System

The following types of containers are covered by this law:

- Containers made entirely of plastic, except for lids, caps or labels;
- Containers that have a capacity of at least 8 fluid ounces, and no more than 5 gallons or equivalent volumes;
- Containers that maintain their shape while not holding the product; and,
- Containers that have the capability of multiple re-closure, are sold holding a product, are composed entirely of plastic, and are sold with an attached or unattached lid or cap.

The following types of containers are not covered by this law:

- Container/blister packaging that cannot be resealed;
- Flexible packaging that does not maintain its shape while holding the product;
- Service packages that do not normally store a product for seven days;
- Plastic boxes that have at least one side that is not made of plastic; and,
- Plastic buckets with an attached metal handle.

The following types of containers are exempt from this law:

- Containers not to be sold in California;
- Containers specifically used for shipping drugs, medical devices, cosmetics, food, medical food, or infant formula as defined by the Federal Food, Drug and Cosmetic Act;
- Containers specifically used for shipping toxic or hazardous products regulated by the Federal Insecticide, Fungicide, and Rodenticide Act; and,
- Containers manufactured and specifically used for shipping hazardous materials that are prohibited by federal law from being manufactured with "used material" (postconsumer resin) by federal packaging material specifications, or are subject to specified federal testing standards, or to which

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Rigid Plastic Packaging Container Law

recommendations of the United Nations on the transport of dangerous goods are applicable.

3. Program Scope and Targets

The California State Legislature enacted the RPPC law as part of an effort to reduce the amount of plastic waste disposed in California landfills and increase the use of recycled plastic.

4. Supporting Regulatory Framework

The RPPC Law is a stand-alone law. However, since a product manufacturer could be granted a waiver from the 25 percent compliance option if a minimum of 60 percent of households did not have access to curbside recycling for beverage containers, the law supported the implementation of AB 939.

5. Funding Mechanism

There is no funding for the government-managed system. Each individual manufacturer manages their program compliance at its own cost. The CIWMB uses its own resources to fund program implementation and enforcement costs.

6. Fee or Deposit Collection Point

There are no fees or deposits associated with this program. Financial penalties are paid to the CIWMB by manufacturers found to be out of compliance.

7. Program Operations (Collection and Processing)

The system does not require any type of operations, but manufacturers must design their containers to comply with the law.

8. Status of Competition within Program Operations

There is no competition within program operations. Product manufacturers determine what the best way is to comply with the law (source reduction, recycled-content, etc.).

9. End-of-Life Management (Reuse and Recycling)

Two of the compliance options are directed at end-of-life management: (1) the reusable or refillable option, and (2) the 45 percent recycling rate option. (The other compliance options affect initial manufacturing of the packaging.)

10. Physical Infrastructure Needs

Product manufacturers need to work with recyclers, design teams and potentially the container manufacturer's supply chain to:

- Ensure compliance; and,
- Calculate the source reduction and/or postconsumer content over the entire product line offered in a rigid plastic packaging container.

This program depends upon an available recycling infrastructure and also helps drive demand for recycled materials.

Section III. Stakeholder Roles and Responsibilities

TABLE 5-1
California Rigid Plastic Packaging Container Law
Summary of Stakeholder Roles and Responsibilities

Stakeholder	Role and Responsibility
Consumer	None.
Retailer	None.
Manufacturer/Brand Owner	The manufacturers are responsible for ensuring compliance of their packaging through the available compliance options.
Recyclers/Haulers	Recyclers have no mandated roles in this system, although providing materials for recycled-content are important.
State Government	Oversees compliance by manufacturers.
Local Government	None.

Section IV. Program Outcomes

1. Cost of Program Operation

Regulatory Oversight Costs: The number of CIWMB staff administering the RPPC program changes over time based on workload. The RPPC Law states that any fines collected are used to *"assist local government agencies to develop and implement collection and processing systems for the recycling of materials that are subject to [PRC 42320], for the development of markets for these materials, and for the [CIWMB's] costs of implementing [the RPPC Law]."*

Program Compliance Costs: Manufacturers fund their own program compliance costs, and it is not known how much they spend on program compliance related to this law. Some manufacturers may be saving money by complying with this law, if they have source reduced the amount of material needed to manufacture their product packaging.

2. Recycling Rates of Containers (or Recovery Rates)

Not applicable. This program does not calculate recycling rates for the entire group of containers under regulation.

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3. Level of Encouragement of Green Packaging Design and Actual Packaging or Product Redesign Achieved

The RPPC Law encourages the use of postconsumer material of at least 25 percent for an entire product line. Product redesign is also encouraged through the potential compliance option of source reduction, (i.e., reducing the net weight of packaging by 10 percent from pre-1995 weight.)

Source reduction credit is received for the following actions:

- Using a different resin;
- Changing the rigid plastic packaging container to a flexible plastic container may be credited as part of the averaging method; or,
- Eliminating rigid plastic for a specific product sold in California and selling that same product without any packaging gives credit to other containers as part of the averaging method of compliance for rigid containers.

As stated by the law, a container is not considered a "source reduced container" if the packaging reduction was achieved by any of the following methods (per Public Resources Code 42301 (j) (2)):

- *"Substituting a different material type for a material which previously constituted the principal material of the container;*
- *Increasing the container's weight per unit or use of product after January 1, 1991; or,*
- *Packaging changes that adversely affect the potential for rigid plastic packaging, container to be recycled or to be made of post-consumer material."*

4. Ease of Use for Consumers

There are no requirements for consumers, but they do participate in the system by recycling their plastic containers through their curbside recycling program or taking California Redemption Containers to buy-back or drop-off centers.

5. Ease of Use for Retailers

There are no requirements for retailers.

6. Ease of Use for Manufacturers/Brand Owners

Manufacturers need to keep a close watch on container compliance target(s) to ensure compliance. They must also work with container manufacturers to develop products that meet the law. If contacted by the CIWMB for review, they need to be able to prove compliance or else face penalties. Unless contacted by the CIWMB, compliance with the RPPC Law is self-regulating.

7. Impacts on Local Government

There are no impacts on local government, because most curbside collection programs already have recycling programs that include the collection of rigid plastic containers. Local governments do not have an oversight or end-of-life management role for enforcement of the RPPC Law.

8. Ease of Administration and Enforcement for State Government

The CIWMB selects companies to demonstrate compliance. The CIWMB then reviews the submitted reports, verifies information, and issues penalties, as appropriate.

9. Ease of Use for Recyclers/Haulers

There is no impact on recyclers or haulers because the law focuses on the manufacturers or brand owners of the containers or products within the containers. A possible impact of the law is the creation of markets for a once non-recycled material.

10. Continuous Improvement – Program Innovations

In 2005, the State eliminated a previous compliance option of using the overall recycling rate for all plastic containers. Companies then needed to comply through the other options by either modifying their containers to be more recyclable or increasing recycled content or reusability.

11. Actual and Potential for GHG Emission Reductions

The law promotes the recycling, reduction and reuse of plastic resin, which further reduces landfill disposal and GHG generated through the manufacturing of containers and creating all-virgin plastic containers. The RPPC Law does not require manufacturers to provide information to CIWMB to calculate GHG reductions achieved as a result of this program.

12. Actual and Potential for Other Pollutant Reductions

The RPPC Law does not require manufacturers to provide information to CIWMB to calculate the reductions in pollutants that are achieved as a result of this program.

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Rigid Plastic Packaging Container Law

Section I. Program Summary

This program places a mandatory deposit on all beverage containers sold in the Province of British Columbia, Canada, ("Province") which has a population of 4.4 million residents. Consumers must pay the deposit when they purchase beverages and the deposits are refunded when they return their empty beverage containers for refilling or recycling at recycling depots or retail stores that sell beverages. Consumers must also pay a Container Recycling Fee on certain containers purchased. Separate from the deposit, the Container Recycling Fee varies, based on the container type, and is not refundable. The Container Recycling Fee was established by the manufacturers in 1999 to provide additional revenue to finance the recycling system, and it is adjusted annually, as needed.

Under the provincial *Recycling Regulation*, the beverage manufacturers are responsible for the operation and financing of the province-wide recycling system. The manufacturers are represented by two stewardship agencies ("stewards"): Encorp Pacific Canada ("Encorp Pacific") for non-alcohol, wine, spirits, and other beverages, and Brewers Distributors Limited for coolers, beer, cider packaged in refillable glass and beer in cans. These organizations are established by the respective beverage producers to carry out the responsibilities of industry in the most cost effective manner. The stewards operate and finance the recycling systems with the provincial government providing program oversight. The stewards must develop stewardship plans, which are subject to approval by the provincial government. Stewardship plans are in many ways a form of agreement between government and industry respecting how products will be collected and recycled.

Section II. Program Elements

1. Program Description

The province-wide program began in 1970 with the *Litter Act*, which made British Columbia the first jurisdiction in North America to establish a mandatory deposit-return system for soft drink and beer containers as a litter control initiative. The Province later enacted the *Beverage Container Stewardship Program Regulation* (1997), which replaced the outdated 1970 *Litter Act*. The 1997 regulation expanded the program to include all beverage containers, with the exception of containers for milk and milk substitute products.

In October of 2004, the 1997 *Beverage Container Stewardship Program Regulation* was repealed, and was replaced by the provincial *Recycling Regulation*, which includes the *Beverage*

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Beverage Container Recovery Program

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Beverage Container Recovery Program

Container Recovery Program as well as other recycling programs. The intent of the *Recycling Regulation* is to provide a single results-based framework that enables producers of a wide range of products to assume stewardship responsibility and ensure a level playing field within the private sector. Under this framework, the respective roles and responsibilities are as follows:

Provincial Government

- Define product stewardship outcomes based on governmental strategic direction and input from local governments and key stakeholders;
- Deliver the critical monitoring and enforcement functions to ensure a level playing field among producers; and,
- Approve stewardship plans.

Producers

- Design and implement product stewardship plans and achieve defined outcomes in a cost effective manner;
- Develop effective and ongoing communications programs;
- Demonstrate performance to government and consumers through annual reports;
- Where fees or charges are separately disclosed on consumer sales receipts, publicly release annual, independently audited financial statements of all program revenues and expenditures; and,
- Monitor marketplace and notify government of suspected non-compliance once reasonable efforts have been made to resolve the issue with relevant brand owners.

Consumers

- Use products efficiently prior to recycling/disposal;
- Help pay for industry's product stewardship programs through purchase price of products; and,
- Separate materials and return them to the appropriate venue for environmentally sound end-of-life management.

Local Government

- Cooperate reasonably with stewardship agencies' efforts to achieve the stewardship outcomes in areas such as municipal land-use zoning; and,
- At the option of the local government, participate with industry in providing return-collection infrastructure on an independently negotiated basis.

The Beverage Container Recovery Program requirements are now found in Schedule 1 of the new consolidated regulation[1]. Other schedules cover requirements for other materials; for example, Schedule 2 is for residual materials management, Schedule 3 is for electronic waste, etc.

All beverage containers currently carry a deposit based on their size. Mandatory minimum deposits range from $0.05 for a non-alcohol container up to and including 1 liter, $0.10 for alcohol containers up to and including 1 liter; and $0.20 for alcohol and non-alcohol containers greater than 1 liter[2]. Consumers pay the deposit when they purchase beverages, and the full deposit is returned to them when they return the container for redemption. Consumers may return their containers to independent depots[3] or to retail stores that sell beverages in order to receive a refund of their deposit. Consumers may also redeem containers through curbside recycling programs, which exist throughout most of the province. In this case, the curbside program operators may redeem the containers to receive the deposit.

The current *Recycling Regulation* requires that existing stewards submit stewardship plans consistent with the requirements set out in the umbrella regulation and their specific schedule (Schedule 1 is for beverage containers).

Stewardship plans must describe how the program provides consumers with an efficient and convenient system for collecting and recycling beverage containers. The basic components required in a stewardship plan are specified in Section 5 of the regulation and include:

- Product Recovery Target(s);
- Stakeholder Consultation;
- Collection System;
- Consumer Awareness;
- Program Performance Measurement;
- Dispute Resolution;
- Product Life Cycle Management; and,
- Pollution Prevention Hierarchy.

A company may choose to act as the individual steward of their packaging, or may band together with other brand owners in a collective (i.e., a stewardship agency) to cooperate financially and

[1] The Recycling Regulation can be found at: http://www.qp.gov.bc.ca/statreg/reg/E/EnvMgmt/449_2004.htm
[2] All currency in this case study refers to Canadian dollars.
[3] Depots are independently owned and operated in zones that are established by Encorp Pacific. Depot operators receive handling fees from Encorp Pacific, based on the volume of containers that they handle.

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Beverage Container Recovery Program

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Beverage Container Recovery Program

operationally to fulfill the mandates of the *Recycling Regulation.* Currently, there are two stewards in British Columbia representing beverage manufacturers. Stewards only manage their own beverage containers. In many cases, both Encorp Pacific and Brewers Distributors Limited collect their own beverage containers from the same stores, such as the Liquor Distribution Branch stores. The current and former stewards and the beverage types they are responsible for are as follows:

1. Encorp Pacific is an incorporated non-profit stewardship corporation with beverage container management as its core business. Encorp Pacific represents brand owners of non-alcohol, wine, spirits, some cider, coolers and beer manufacturers. Encorp return centers include 170 independent depots and hundreds of retail outlets where beverages are sold. Encorp manages about 64 percent of recovered beverage containers province-wide.

2. Brewers Distributors Limited is the second steward representing brand owners of coolers, beer and cider sold in refillable glass, and beer in cans. Brewers Distributors Limited provides for retail returns (of these beverage container types) at all Liquor Distribution Branch retail outlets, Cold Beer and Wine stores, and unlimited returns at 28 depots. Brewers Distributors Ltd. manages about 36 percent of recovered beverage containers province-wide. It is a private joint venture company owned by Labatt Breweries of Canada and Molson Breweries for the wholesale distribution of beer and the collection of returnable, refillable and recyclable beer containers.

3. The Liquor Distribution Branch has the sole right to purchase beverage alcohol in British Columbia. It is responsible for the importation, distribution and retailing of beverage alcohol in British Columbia. It has approximately 200 government liquor stores throughout British Columbia. The Liquor Distribution Branch was formerly the steward for manufacturers of alcoholic beverages other than those that were served by Brewers Distributors Limited. In 2007, however, manufacturers chose to begin using Encorp Pacific as their steward, which simplified system operations by reducing the number of stewards from three to two. The former Liquor Distribution Branch stewardship program handled less than 10 percent of the total beverage containers in the Province.

2. Products Covered/Not Covered by the System

All beverage containers are included under the Recycling Regulation. Beverages are defined as any liquid that is a ready-to-serve drink but does not include milk, milk substitutes, rice milk,

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soy milk, flavored milk, infant formulas, meal replacements or dietary supplements.

3. Program Scope and Targets

The regulation establishes a minimum goal of 75 percent recovery rate and requires that redeemed containers be either refilled or recycled. The recovery rates for various material types are calculated by taking the number of containers by size and material type redeemed and dividing by the number of containers registered for sale in the Province. The total recovery rate is based on all units redeemed divided by the total number of containers sold in the Province. This includes ALL eligible containers, which includes containers consumed away-from-home.

4. Supporting Regulatory Framework

The current regulation is called Schedule 1 of the Recycling Regulation. Existing stewards are required to submit revised plans consistent with Schedule 1 within two years of its enactment, and are required to update their stewardship plans every five years.

5. Funding Mechanism

The *Beverage Container Recovery Program* in British Columbia is funded through revenues generated from the sale of recyclable materials, revenues from unredeemed deposits, and a Container Recycling Fee paid at the point of purchase by consumers. The amount of the deposit is set by the provincial government in its regulation. The amount of the Container Recycling Fee, however, is a separate charge established by beverage container manufacturers. It varies by type of container, such as aluminum can versus plastic bottle, and is recalculated annually based on the previous year's financial results.

Container Recycling Fees are charged based on the cost of recovering specific container types, net of unredeemed deposits and material revenues. Fees are reevaluated every year, and are rounded up to the nearest penny. For example, if the net system cost to recover an aluminum can is $0.0095, the Container Recycling Fee will be $0.01 per can.

The Container Recycling Fee varies depending on the value of the material and the recovery rate for a particular container. For example, high recovery rates generate less unredeemed deposit revenue, and therefore a higher Container Recycling Fee is assessed, while lower recovery rates generate greater unredeemed deposit revenue and lower Container Recycling Fees are assessed. In 2008, the fees range from no fee to $0.05 per unit depending on the size and material used for the container. Some containers, like drink pouches, are not assessed a fee because their recovery rates are low enough that the unredeemed deposit revenue covers their collection cost.

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Beverage Container Recovery Program

With the implementation of the Container Recycling Fee in 1999, the beverage industry no longer bears any direct costs associated with the operation of the *Beverage Container Recycling Program*, because the beverage industry has transferred these costs to the product consumer/user.

6. Fee and Deposit Collection Point

Both the deposit and the Container Recycling Fee are collected at the point of purchase. Deposits are shown as separate charges on the receipt, as required by the regulation. Container Recycling Fees may be shown separately on the receipt (or not) at the election of the retailer.

7. Program Operations (Collection and Processing)

Beverage containers are redeemed at depots, retail outlets and Liquor Distribution Branch stores. Milk containers are accepted without a refund at 130 bottle depots.

In general, consumers return beer bottles in their original paperboard case, which are sized for 6, 12, 18 or 24 bottles. Depot operators open the case, count the bottles, and stack the full cases on pallets. Refillable bottles are sorted and stacked by industry standard bottle ("ISB") irrespective of brand. Non-standard refillable bottles are sorted and stacked by brand. For non-refillable (single-serve) beer bottles, the bottles are de-cased and sorted with other alcohol containers. Cases are baled by depots and sold directly to market.

In non-automated depots, sorting is mostly done by container type and refund level (e.g., all 5 cent aluminum cans go into 1 bin, all 5 cent PET bottles into another bin, 20 cent glass bottles another bin, etc.). The depots currently have about 15 different sorts. With the introduction of an automated "point-of-return" (POR) system, which tracks returns by deposit level and material type as soon as the containers are returned, the number of sorts has been reduced to about nine (9) categories. This has made it possible to streamline depot operations and reduce system costs.

Independent transporters collect the containers and take them to about 12 processing sites across the Province.

Processors receive bags of mixed containers and prepare them for the appropriate recycling market by sorting, crushing and/or baling the glass, aluminum, plastic and other materials.

In the case of all domestic beer, cider and coolers, the Brewers Distributors Limited collects these containers from Liquor Distribution Branch stores, cold beer and wine stores, and about 28 depots. In general, other independent bottle depots will also accept empty domestic beer containers, but will discount the refund as a handling fee. Empty containers are backhauled to the various distribution centers where recyclables are baled and sent

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to market. Refillable bottles are sorted and sent back to the brewers for washing and refilling.

8. Status of Competition within Program Operations

There is no competition amongst collection centers, as each is licensed for a specific area. Retailers that are actively involved in collecting beverages, like the Save-On-Foods grocery chain, may compete with depots for containers.

While all retailers and grocery stores are required to take back up to 24 units per customer per day, some may actively take more. One retailer, Save-On-Foods, voluntarily created an expanded recycling program as a way to provide a new level of customer service and customer loyalty. In addition to collecting beverage containers from the public, Save-On-Foods approached non-beverage manufacturers with an expanded recycling concept and the manufacturers agreed to assist with program funding. The Save-On-Foods program, called "Changes Recycling Centers," is a vertically integrated return center on-site (usually a separate room near the front door or at the back of the store). Because this is a dedicated return center with full-time staff and some automation, the greater the returns, the greater the handling revenues, which is why Save-On-Foods actively promotes returning beverage containers to their store. In addition to taking back beverage containers under deposit, Save-On-Foods also voluntarily takes back other packaging for some of the brands they sell. There is no regulation that requires this other packaging to be recycled; rather, Save-On-Foods and certain food manufacturers have created this recycling program as a customer service program. These brands pay Save-On-Foods for this service, and the products covered under this program have shelf tags that indicate that their packaging is returnable to the store. For example, they take back all milk jug containers, and brand-specific packaging like Unilever, Nature's Path, Highliner, Kimberly-Clark, etc. This is not only a measure to drive consumer traffic, but it is also meant to gain consumer loyalty, as refunds are also offered as loyalty points in lieu of cash. Changes Recycling Centers also take back used printer cartridges.

9. End-of-Life Management (Reuse and Recycling)

There are strong existing markets to support the recycling of the targeted materials. With the value of these materials increasing, the use of recycled material is more economical.[4] The regulation specifies that any beverage container sold in the Province must be refillable or recyclable, which has been a problem for multi-laminate materials, because only the paper fraction is currently

[4] There was a general trend of increasing prices for recyclable materials until the fall of 2008, when prices fell rapidly.

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recyclable[5]. Until recently, for example, aseptic was being sent to Michigan, as this was the only place that assured full recycling of this material. This market has recently ceased accepting this material, which means there are no viable markets in North America. All aseptic and gable tops (like milk cartons) are being sent to South Korea.

Refillable beer bottles make up a significant share (estimated at 35 percent) of the beer containers sold in the Province. Bottles are washed and refilled about 15 times. While these bottles can easily be refilled more than 15 times, competition with the more aesthetically pleasing single-serve beer bottles has caused manufacturers to limit the number of refills to 15, as bottles become scratched during the handling and washing processes.

10. Physical Infrastructure Needs

People can currently take containers to independently licensed Encorp Return It™ depots, all supermarkets, convenience stores, Liquor Distribution Branch stores (for liquor containers only) and other stores that sell beverages. The collector sorts the containers and refunds the deposit. Most depots have manual sorting. Some grocery stores are currently adopting reverse vending machines, but the investment in this technology has been slow.

The use of refillable bottles requires bottle washing and refilling facilities. Bottle washing is done on-site at the breweries in the Province.

Section III. Stakeholder Roles and Responsibilities

TABLE 6-1
British Columbia Beverage Container
Summary of Stakeholder Roles and Responsibilities

Stakeholder	Role and Responsibility
Consumer	Consumers pay the deposit and Container Recycling Fee (for some non-beer containers) when they purchase beverages. Consumers are responsible for taking empty containers to a depot or a retailer for their refund of the deposit.

[5] Multi-laminate is the umbrella term for packages like gable top, aseptic and poly-pouch.

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TABLE 6-1 British Columbia Beverage Container Summary of Stakeholder Roles and Responsibilities	
Stakeholder	**Role and Responsibility**
Retailer	Retailers are required to accept a maximum of 24 empty containers per customer, per day, and refund the full deposit.
Manufacturer/Brand Owner	Must register the sale of their beverages, and pay the initial deposit to Encorp Pacific or Brewers Distributor Limited, depending on the type of beverage they sell.
Recyclers/Haulers	Fulfill their contractual obligations with Encorp Pacific for collecting containers from depots and retailers.
State or Provincial Government	Regulate, enforce, oversee, and monitor the program.
Local Government	Manage through landfill bans, litter clean-ups and waste disposal any containers that have not been redeemed. Local governments may choose to redeem these containers themselves.

Section IV. Program Outcomes

1. Cost of Program Operation

In 2007 program income and expenses were:[6]

TABLE 6-2 British Columbia Beverage Container Program Operation Income and Expenses (excluding beer containers)		
Revenue and Expenses *(Does not include domestic beer)*	**Calendar Year 2007**	**%**
REVENUE		
Container Recycling Fees	$19,619,449	33%
Unredeemed deposits	$17,325,072	29%
Sale of recyclables	$15,630,672	26%
Other income	$ 740,571	1%
Contract fees	$ 6,270,766	11%
TOTAL	**$59,586,530**	**100%**

[6] Source: Encorp Pacific's Annual Report 2007.

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TABLE 6-2 British Columbia Beverage Container Program Operation Income and Expenses (excluding beer containers)		
Revenue and Expenses *(Does not include domestic beer)*	**Calendar Year 2007**	**%**
EXPENSES		
Handling fees (paid directly to depot operators/retailers)	$43,073,597	60.5%
Depot operations	$ 358,976	0.5%
Processing & Transportation	$20,607,721	29.0%
Consumer Awareness	$ 2,697,651	3.8%
Administration	$ 3,369,295	4.7%
Loss/Gain on foreign exchange	$ 775,692	1.0%
Amortization	$ 368,087	0.5%
Loss on disposal of capital assets	$ 0	0.0%
TOTAL	**$71,251,019**	**100%**
Surplus/(deficit)	**($11,664,489)**	

***** Paid by the Liquor Distribution Branch to manage collection and processing of their containers

The following costs are based on a stakeholder cost analysis that was conducted using 2006 cost data. This analysis demonstrates how much each stakeholder contributed towards the system, per unit sold, in 2006. [7]

TABLE 6-3 Stakeholder Cost Analysis	
Stakeholders	**Cents per unit sold**
Beverage Industry	0.0
Operating Agent	0.02
Liquor Distribution Branch (governmental entity)	7.1
Municipal Government	0.0
Redeeming Consumer	1.16
Wasting Consumer (did not return container)	5.72

[7] From Who Pays What – An Analysis of Beverage Container Recovery and Costs in Canada, 2006 – 2007, Who Pays What Analysis, CM Consulting, pages 75-76.

2. Redemption Rates of Containers:[8]

For all materials from January – December 2007, 78 percent of the materials were collected for reuse and recycling. The redemption rate for refillable bottles was 95 percent. The collection rate for aluminum cans was 84 percent (89 percent beer cans and 80 percent non-alcohol cans). The table below presents the redemption rates for all deposit-bearing containers in British Columbia.

TABLE 6-4
Redemption Rates – Beverage Containers (2007)

Container Type	Redemption Rate
Aluminum cans	80.2%
Glass (Including refillable beer bottles)	96.2%
Plastic Bottles	72.7%
Bi-Metal	53.6%
Gable/Tetra	53%
Other	42%
TOTAL	**78%**
Refillable beer	95%
TOTAL CONTAINERS	**80%**

Aluminum Can Redemption Rates	
Beer cans (deposit 10 cents)	89%
Non-Alcohol cans (deposit 5 cents)	80%

3. Level of Encouragement of Green Packaging Design and Actual Packaging or Product Redesign Achieved

Schedule 1 of the Recycling Regulation requires that all beverage containers sold in the Province be reusable or recyclable. In addition, the law requires that the stewardship plan address:

- "Eliminating or reducing the environmental impacts of a product throughout the product's life cycle, and the management of the product in adherence to the order of preference in the pollution prevention hierarchy;"[9] and,
- "The pollution prevention hierarchy is as follows in descending order of preference, such that pollution

[8] The combined rates are based on units recovered divided by units sold. Sources: Encorp Pacific and Brewers Distributors Limited, 2007.
[9] British Columbia, Environmental Management Act, Recycling Regulation, section 5 (1) (c).

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prevention is not undertaken at one level unless or until all feasible opportunities for pollution prevention at a higher level have been taken:

(a) Reduce the environmental impact of producing the product by eliminating toxic components and increasing energy and resource efficiency;

(b) Redesign the product to improve reusability or recyclability;

(c) Eliminate or reduce the generation of unused portions of a product that is consumable;

(d) Reuse the product;

(e) Recycle the product;

(f) Recover material or energy from the product; and,

(g) Otherwise dispose of the waste from the product in compliance with the Act."[10]

Encorp Pacific produces an annual report of its program operations. The report includes data on light weighting of non-refillable containers, a practice that is making each package more efficient. For example, over the past 30 years, aluminum cans have reduced their weight by about 40 percent (8 percent in the past decade). A PET container, like the 2 liter bottle, has reduced its weight by 28 percent in the last 25 years. The newest design of the 500 ml (approximately 17 ounces) single-serve bottle is 20 percent lighter than the previous design.

4. Ease of use for Consumers

Consumers are not required to sort by brand. They may return beverage containers to a depot or any store that sells beverages. There is an on-going multi-media advertising campaign dedicated to the "Return It" program.

5. Ease of use for Retailers

Retailers are required to accept a maximum of 24 units per customer per day. They must refund their entire deposit.

6. Ease of use for Manufacturers/Brand Owners

Brand owners register with Encorp Pacific or Brewers Distributors Limited as the third party agency to assume their stewardship responsibility. A brand owner can submit its own stewardship plan, but to date no brand owner of non-refillable beverages has done so.

[10] Ibid., section 5 (3).

7. Impacts on Local Government

Local government is not directly involved in the program, except to support education and awareness efforts initiated by Encorp Pacific and Brewers Distributors Limited on behalf of their distributors. Local governments may also assist with land use and zoning issues in establishing depots. Local governments have reduced waste disposal costs, recycling costs and litter abatement costs as a result of the program. The Union of British Columbia Municipalities estimated that the financial impact of the program would be about $7,000,000 in reduced curbside collection costs as well as an undetermined but very large saving from reduced/eliminated beverage container litter, which is a persistent component of litter stream that can pose health risks from broken glass.[11]

8. Ease of Administration and Enforcement for State or Provincial Governments

The majority of "enforcement" is done within Encorp Pacific to ensure a level playing field among all beverage distributors. Working with the retail sector, self-policing has all but eliminated any free riders into the system.

There is one staff person dedicated to the overseeing the beverage program at the Ministry of Environment. The Province relies on an industry annual report with a third party audit.

9. Ease of use for Recyclers/Haulers

Haulers and recyclers are responsible for meeting the operational standards as set out in the contract with Encorp Pacific. These contracts with recyclers emphasize efficiency and cost reduction, which are typical of the recycling and waste hauling industries. For both Encorp Pacific and Brewers Distributors Limited, "backhaul" contracts are sought to ensure lowest cost and maximum fuel efficiency for transport vehicles.[12]

10. Continuous Improvement – Program Innovations

A program called, "Depot Operator Training Program" was started in 2006 with the Quality Assurance and Depot Operations departments. The program improved handling of containers with decreased amount of non-refundable containers (like home brew and wine containers), and improved the bag count (i.e., the average amount of units per bag from depots, which is the number used to pay refunds back to depots).

[11] From Environment Canada's website description of the British Columbia Beverage Container Recovery Program, at www.ec.gc.ca/epr/default.asp?lang=En&n=F11195DA-1

[12] "Beverage Container Stewardship Plan," consolidated and amended November 2007, Encorp Pacific (Canada).

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By 2007, quality control to ensure that no non-deposit containers are being refunded at depots has improved from a variance of 0.52 percent in 2006 to a variance of only 0.48 percent in 2007. The variance is defined as the percentage of non-deposit containers in each bag.

11. Actual and Potential for GHG Emission Reductions

Encorp Pacific reported in their recent annual report the avoided GHG emissions from recycling. The results are:[13]

TABLE 6-5
Reduction of GHG Emissions

Material	Tons of GHGs (CO2e)* reduced
Aluminum	76,919
Plastic	18,724
Pouches/Bag-in-Box	677
Glass	19,966
Bi-Metal	1,506
Polycoat	8,116
Total	**125,909**

* CO_2e is the reduction of all greenhouse gases, expressed as equivalent units of carbon dioxide.

12. Actual and Potential for Other Pollutant Reductions

Benefits of recycling in terms of other pollution reduction are not part of the performance measurement within the regulation or stewardship plan. These data are not currently available.

Additional Program Information

In the recently approved stewardship plan, Encorp Pacific outlined the following initiatives it is undertaking over the next five years to improve performance:[14]

- Consumer Accessibility — Province-wide

  Goal: The creation of a strong network of Return-It™ depots delivering convenient access, accurate refunds and good customer service to consumers and the community;

- Consumer Accessibility — Vancouver-area

  Goal: The City of Vancouver has an estimated beverage redemption rate of approximately 50 percent compared to the provincial rate of approximately 75 percent. Depot coverage is much less than required, particularly in the City

[13] Encorp Pacific Annual Report 2007.
[14] Encorp Pacific Annual Report 2007

of Vancouver where planning permission has been very difficult to achieve. Encorp's goal is to earn City of Vancouver staff support for the opening of at least four more depots;

- Consumer Awareness — Province-wide

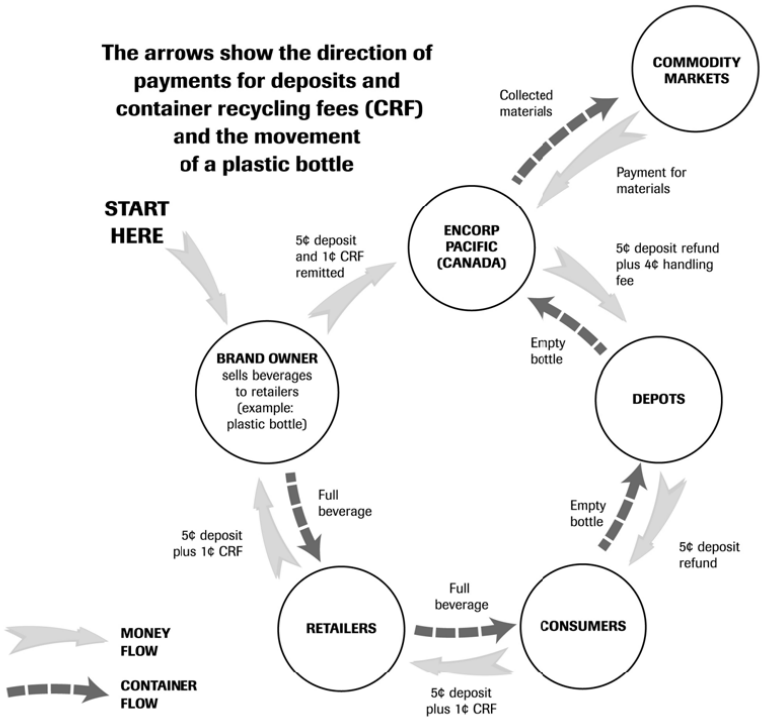
  Goal: Maintain a high public awareness of the Return-It™ programs and target those who could be encouraged to change their behavior in favor of redeeming beverage containers.

  This is achieved through regular consumer research studies to evaluate industry sales trends and develop high impact awareness and promotional activities on a province-wide basis.

  Public Awareness activities include:

  - Multi-family Building Pilot Program;
  - School Program;
  - Return-It@Work Pilot Program; and,
  - Public Space and Events Program.

FIGURE 6-1
Flow Chart for Deposits, Container Recycling Fees, and Beverage Containers



Source: Encorp Pacific (Canada), Beverage Container Recovery Plan, October 2006, Consolidated and Amended November 2007

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Beverage Container Recovery Program

Section I. Program Summary

This case study describes two separate programs for refilling and recycling alcohol containers in the Province of Ontario, Canada, ("Province") which has a population of over 12 million people. The two programs are operated by The Beer Store (for beer containers) and the Liquor Control Board of Ontario (for wine, spirits, coolers and imported beer containers not available through The Beer Store). *Though they are financially and operationally two separate programs, from the consumers' point of view, there is only one program, because consumers return all containers to the same redemption point, regardless of the steward of the individual container.*

The Beer Store established a deposit-return program for its customers in 1927, and continues to place a deposit on its beverage containers which is returned to customers when they return beverage containers to The Beer Store. Although this case study focuses on beverage container recycling, The Beer Store also accepts all of its packaging for recycling, including bottle caps, plastic rings, PET bottles, plastic bags, and paper and cardboard used in its packaging. Collection of this additional packaging is part of the program, and is completely managed by The Beer Store, without oversight from the provincial government. There are over 440 Beer Stores in the Province.

The second program is the Ontario Deposit-Return Program. It was established by the provincial government, which owns the Liquor Control Board of Ontario ("LCBO"), who operates over 600 liquor stores in the Province. When the Province established its new deposit-return program for alcohol beverage containers in 2007, it decided to contract with The Beer Store, and have consumers return all empty alcohol beverage containers to The Beer Store locations, rather than establishing its own, separate collection program through its own stores.

There are also retail partners and "agency stores" throughout rural areas of the Province. Retail partners and "agency stores" are stores that apply to sell alcoholic beverages in areas that are too rural to have a full-size The Beer Store or Liquor Control Board of Ontario store. These stores are allowed to sell alcoholic beverages through their agreements with The Beer Store or the Liquor Control Board of Ontario. There are over 200 retail partners in the Province.

There are also over 400 Ontario Winery Retail Stores in the Province. These stores sell beverages that are Ontario-made, bottled wine and that carry a deposit, but they do not redeem beverage containers.

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The Beer Store Program and Ontario Deposit Return Program

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The Beer Store Program and Ontario Deposit Return Program

Section II. Program Elements

1. Program Description

The Beer Store Program

The Beer Store was established in 1927 as a privately operated and administered retail and wholesale distribution company. Sanctioned by the Government of Ontario, the system was designed to address the special needs associated with the socially responsible distribution and sale of what were then unpasteurized beer products.

Coincident to the 1927 establishment of the retail and distribution system, The Beer Store voluntarily created a deposit-refund system for the recovery of refillable (reusable) bottles. With 12 to 15 cycles of washing and filling (lives), the refillable beer bottle helps reduce costs of purchasing new glass bottles for each serving.

Today, The Beer Store sells about 72 percent of its beer in refillable bottles and 28 percent of its beer in non-refillable containers (18 percent in cans, and 9 percent in glass bottles). All beer containers carry a deposit of 10 or 20-cents[1] (refillable bottles carry a 10-cent deposit), and kegs carry a deposit of $20 or $50. The deposits are refunded to customers when they return the containers. Irrespective of where a beer product is sold, if it is part of The Beer Store Program, all of its packaging (e.g., old corrugated cardboard, old boxboard, plastic film, etc.) is returnable to The Beer Store, Retail Partners[2], empty bottle dealers, or agency stores. There are about 800 redemption centers in the province with 86 percent of the population living within 3 miles of a redemption point.

Ontario Deposit-Return Program

The Liquor Control Board of Ontario is the governmental agency that controls the sale of alcohol in the Province. It also owns and operates retail stores that sell alcoholic beverages and sells the majority of all wine and spirits in the Province. In 2007, a deposit was placed on all alcohol containers (wine, spirits, coolers, and imported beer not sold through The Beer Store) by the provincial government through the Liquor Control Board of Ontario. This new program, called the "Ontario Deposit-Return Program," put a deposit on an additional 350 million alcohol units annually that had not previously carried a deposit. The deposit amount is $0.10 for glass containers less than or equal to 630 ml (about 21 ounces) and $0.20 for glass containers over 631 ml. For aluminum

[1] All currency in this case study refers to Canadian dollars.

[2] Retail Partners are stores in rural areas that sell alcoholic beverages in addition to other items. There are found in areas that are too sparsely populated to have a full-size Beer Store.

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containers the deposits are $0.10 on containers up to and including one liter, and $0.20 for containers over one liter in size. All empty containers can be returned to the Liquor Control Board of Ontario agency stores, empty bottle dealers and The Beer Store, which provides collection services for the Liquor Control Board of Ontario, through a contractual arrangement. Other packaging is recycled through Ontario's Blue Box Program (see Section 8 of this report).

2. Products Covered/Not Covered by the System

All alcohol containers are covered by the two programs. These include refillable beer bottles, non-refillable beer containers, wine, spirits, and coolers. Non-alcohol containers are not covered by these programs; however, they are covered by the Ontario Blue Box Program (see Section 8 of this report).

3. Program Scope and Targets

The Beer Store Program

The Beer Store "aims to recover 100 percent of beer packaging sold in Ontario," according to its website. Their overall recovery rate has been historically and is currently 94 percent. Canada's largest three brewers (Molson, Labatt and Sleeman), own The Beer Store, and have "principles that guide environmental stewardship,"[3] which include the following:

- A commitment to full producer responsibility, comprising:
  - No financial or environmental subsidies; and,
  - Accounting for all life-cycle packaging and product costs (both financial and environmental), not just the costs or benefits of those materials recovered.
- A commitment to environmental protection through reduction and reuse as environmentally preferential practices:
  - Reduction of energy and natural resource consumption, emissions and solid waste through reuse; and,
  - The substitution of knowledge and efficiency for materials, energy and waste.
- A commitment to continually setting and meeting meaningful performance targets:
  - Effecting policies and programs that ensure high rates of waste reduction, reuse and recycling;
  - Ongoing measurement and quantitative evaluation; and,

[3] Responsible Stewardship 2006-2007, The Beer Store

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- Continual improvement.

Ontario Deposit-Return Program

The Ontario Deposit-Return Program has formalized performance targets that include:

- A goal of 85 percent recovery rate for containers that are part of the program (with increases expected in this target rate over the next 10 years);
- A goal of no recyclable materials going to landfill; and,
- A goal of 90 percent of recovered glass being recycled into high value products.

4. Supporting Regulatory Framework

The Beer Store Program

The Beer Store Program is a voluntary deposit program that was created by beer manufacturers in order to get their refillable bottles returned by consumers. It is "voluntary" in the sense that it is not required by government. However, it is "mandatory" in the sense that manufacturers (mainly brewers) may not sell their products in The Beer Store unless they are part of The Beer Store's deposit program.

Ontario Deposit-Return Program

The Ontario Deposit-Return Program is a policy direction made by the Province for its governmental agency, the LCBO. The LCBO is responsible for the sale of all alcohol beverage products in the Province.

5. Funding Mechanism

The Beer Store Program

The Beer Store Program is funded from material recycling revenues, and handling fees charged internally to individual brewers. It is a privately operated program, and program financial data are not publicly available.

Ontario Deposit-Return Program

The Ontario Deposit-Return Program is funded by the Liquor Control Board of Ontario. Currently, their costs are greater than the unredeemed deposits that they collect.

6. Deposit Collection Point

Consumers pay a deposit of 10 or 20 cents at the point of purchase for both programs.

7. Program Operations (Collection and Processing)

There are approximately 800 redemption points located across the Province that accept materials covered by both programs. These include The Beer Store, retail partners, empty bottle dealers, and

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agency stores. Consumers bring in their empty beer and alcohol containers and they are counted manually and sorted. The Beer Store has always accepted all of its packaging for recycling, and accepts any recyclables that customers use to bring back beverage containers for recycling, such as plastic bags or boxes. The Beer Store makes the best possible effort to send materials to high-end recycling markets.

Beer, Refillable Bottles

All recovered containers are shipped using reverse logistics (backhauling). Pallets with empty industry standard refillable bottles[4] (of mixed brands) are picked up directly by brewers from The Beer Store when delivering full goods. They are shipped back to the brewery for washing and to be refilled. Brewers wash and refill these bottles about 15 times.

Refillable bottles from licensees (bars and restaurants) are collected by The Beer Store trucks along with non-refillable beer packaging and shipped to The Beer Store's distribution centers. Refillables from licensees are consolidated and picked up by brewers when delivering full goods to the distribution centers for licensee sales.

Non-Refillable Containers

Non-refillable containers for all alcohol beverage types are sorted by material type, deposit value (10 or 20 cents) and color (for glass). In addition to the beverage containers, the cases that hold beer bottles are also used to store the empty bottles, and they are palletized and shipped to back to Nexcycle Logistics ("Nexcycle"), The Beer Store processing company, for processing and recycling.

Wine and spirits containers, with all their various shapes and sizes, are put into totes by color and shipped directly to Nexcycle. Some wine cases are also returned and must be flattened and processed. Bins used for cans and bottles are shipped either directly or via the distribution center to one centralized processor, Nexcycle. Nexcycle processes all non-refillable containers and associated packaging (old corrugated cardboard, old boxboard, plastic film, etc.) and then ships all material to their end-use markets.

The flow of materials and deposits is demonstrated graphically in Figure 7-1, which appears at the end of this case study.

[4] The "industry standard bottle," or "ISB," refers to bottles that are the same size, shape and color. They are washed, and re-labeled each time they are used, so that they can be used to contain beers of different brands.

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The Beer Store Program and Ontario Deposit Return Program

Ontario

The Beer Store Program and Ontario Deposit Return Program

8. Status of Competition within Program Operations

The Beer Store has a contract with the Province to be the exclusive collector of empties, which means that the only return collection points for both programs are The Beer store, agency stores, retail partners, and empty bottle dealers. The empty bottle dealers are small collection points that have been contracted by The Beer Store to become official collection points in underserved (mostly rural) areas. The Beer Store has a five year contract with the Province.

The program is structured such that, in the future, any entity can bid to assume the role of collector or redemption center. Given the size of the Province, it is unlikely that any entity will be able to compete against The Beer Store, as the Ontario Deposit-Return Program expansion required little capital investment for The Beer Store, given that they were already taking back 1.9 billion units per year. With the inclusion of containers from the Ontario Deposit-Return Program, The Beer Store is now taking back 2.14 billion containers. Nexcycle Logistics is under contract to The Beer Store for 5 years.

Affect of Program on Competition between Manufacturers of Beer

Brewers using the industry standard bottle pay the lowest handling fee to The Beer Store, while brewers offering non-standard refillables and non-refillables pay a higher rate. The industry standard bottle-handling fee is lower because it drives the efficiency of the system. The industry standard bottle represents 67 percent of all units returned. Handling rates are internally determined by The Beer Store; they are not publicly available, and they are updated periodically.

9. End-of-Life Management (Reuse and Recycling)

There are existing markets that can support the recycling of the targeted materials for both programs. With the value for these materials increasing, the use of recycled material is more economical.

10. Physical Infrastructure Needs

Non-refillable bottles require a centralized facility to consolidate units before shipping to the processor.

Refillable bottles require that brewers support on-site or nearby bottle washing equipment.

Easy access collection points are required throughout the Province. Eighty-six percent of the population is located within three miles of a collection point. Collection centers require storage space, dedicated labor and container/pallets, etc.

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Section III. Stakeholder Roles and Responsibilities

TABLE 7-1
Ontario, Canada Beverage Container
Summary of Stakeholder Roles and Responsibilities

Stakeholder	Role and Responsibility
Consumer	Pays deposit and redeems container.
Retailer	Other retailers do not redeem containers, but The Beer Store collects, counts, and sorts containers, and pays out refund to consumers.
Manufacturer/Brand Owner	For domestic beer, the manufacturers collectively manage and finance The Beer Store program. For other alcohol beverages that are sold through the agency stores, the manufacturers have no role in the system, because the system is managed by the Liquor Control Board of Ontario.
Recyclers/Haulers	Recyclers are responsible for ensuring the end-use that is prescribed by The Beer Store.
State or Provincial Government	The Province finances their own portion of the program (for alcoholic beverages sold through their agency – the Liquor Control Board of Ontario).
Local Government	May collect and redeem containers themselves through curbside or drop-off programs. Local government assumes complete responsibility for waste and litter management.

Section IV. Program Outcomes

1. Cost of Program Operation

The Beer Store Program

There are no publicly available data on The Beer Store Program costs. Costs are internalized.

Ontario Deposit-Return Program

The Liquor Control Board of Ontario has a contracted rate of 10.5 cents per unit collected by The Beer Store. This rate is net of material revenues (which are low because the majority is glass).

For 2007-08:

- Estimate of gross system costs: $25 million (based on 10.5 cents per unit returned);

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- Estimate of unredeemed deposits: $16.9 million (or an average of 14 cents per unit discarded paid by the consumer); and,
- Net cost to the Liquor Control Board of Ontario: $8.1 million (or 3.4 cents/unit returned).

2. Redemption Rates of Containers (or Recovery Rates)

From May 1, 2007 to April 31, 2008, redemption/recovery rates for containers were 89% for the two programs combined. The detailed rates for each program were:

TABLE 7-2
Container Redemption Rates

Beverage Type	Container	Redemption Rate
Beer	Refillable Bottles	98%
	Non-Refillable Glass Bottles	88%
	Cans	81%
	PET Beer Bottles	36%
	TOTAL	**94%**
Wine, Spirits, Imported Beer	Glass	69%
	PET	34%
	Aseptic/Bag-in-Box	29%
	Aluminum Cans	74%
	TOTAL	**67%**[5]

3. Level of Encouragement of Green Packaging Design and Actual Packaging or Product Redesign Achieved

The only real encouragement of green design lies in the "environmental levy", which is a 10 cent provincial tax placed on non-refillable alcohol containers. This offers brewers, vintners and alcohol producers a financial incentive to package in refillable bottles. To date, only the brewers package the majority of their beer in refillable bottles. In Ontario, domestic brewers package 72 percent of their beer in refillables.

To date, there has been little interest from local vintners to refill their bottles. One winery in the Province is refilling their bottles, but only in small quantities. With the new Ontario Deposit-Return

[5] This redemption rate includes only those containers that are returned to The Beer store and other collection points. Some empty beverage containers may be placed in blue boxes for recycling, and would be recycled, but not included in the 67 percent rate, so the actual recycling rate may be higher.

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Program in place however, it is possible that wine bottles could be refilled in the future, because they are now being collected as whole bottles. In the past, wine bottles were collected through curbside programs, and were handled as a glass commodity, not as whole bottles.

4. Ease of Use for Consumers

Consumers must return their empty containers to a nearby Beer Store, agency store, retail partner, or empty bottle dealer. The Beer Stores are located in most areas and are easily accessible. Consumers simply bring in the containers and the containers are sorted by the retailer. Beer bottles come in handy cases of 6, 12, 18, and 24, which makes it easy to store and return the bottles. Because bottles are made from glass, they can be heavy to return, especially the case of 24. Alcohol containers are returned in bags or in reused corrugated boxes. The incentive to participate for cases of bottles is high because a case of six is worth $0.60, and a case of twelve is $1.20, etc. Wine and spirits are usually returned as units, which lowers the financial incentive.

Because The Beer Store Program has been in place for so long, very little education is required.

The Liquor Control Board of Ontario, on the other hand, must advertise to increase recovery rates for its new program. It is currently identifying the areas of weakness and creating a new advertising campaign targeted at those areas.

5. Ease of Use for Retailers

Retailers collect and sort containers, provide the refund to consumers, and store empty containers. The Beer Store retailers or their partner stores are also responsible for keying in the appropriate code for any returns so that they are able to track program performance and manage the deposit funds. While manual collection of empty beer bottles and cans has been going on for more than 80 years, it can still be a challenge in terms of labor required, storage space, and fraud.

6. Ease of Use for Manufacturers/Brand Owners

Producers of beer in refillable bottles are set up to receive empties, wash and refill them. Of all the refillable bottles sold, 91 percent are the industry standard bottle. This is another reason why their handling rate is lower than the others; there is no brand sorting.

7. Impacts on Local Government

The impact on local government is a reduction in the amount of material that they collect in their municipal curbside program and overall waste reduction. Several have reported economic savings when recycling contracts are based on the weight of recyclables collected. Based on existing recycling and disposal costs, it has

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The Beer Store Program and Ontario Deposit Return Program

been estimated that The Beer Store Program alone saves municipalities about $38 million.

In addition, due to higher recovery rates, there is less litter and waste for municipalities to deal with. Some local governments have generated revenue by sorting out any alcohol containers at their material recovery facility and redeeming them.

8. Ease of Administration and Enforcement for Provincial Government

Because all beverages sold are channeled through The Beer Store or the Liquor Control Board of Ontario, there is little administration and no enforcement required by the Province.

9. Ease of Use for Recyclers/Haulers

Nexcycle Logistics is the only central processor that handles all non-refillable containers. Containers enter their facility sorted, so Nexcycle is only responsible for processing and shipping materials to their end-markets. Most material is highly salable, except for the aseptic and other multi-laminate new-age packages.

10. Continuous Improvement – Program Innovations

With the implementation of the Ontario Deposit-Return Program, the amount of corrugated packaging has increased. This precipitated the purchase of balers at most of The Beer Store distribution centers. By baling the corrugated material on-site and reducing the volume of old corrugated containers, less shipping is required. In 2006-07, four new balers resulted in a reduction of over 124,000 miles of shipping.

11. Actual and Potential for GHG Emission Reductions

In 2006-07, the following actual and potential GHG emission reductions occurred.

TABLE 7-3
Actual and Potential for GHG Emission Reductions (for Beer only)

2006-2007	Glass Reuse	Glass Bottle Recycling	Aluminum Recycling	Steel Recycling	Total
Tons Diverted	357,937	29,040	3,278	114	**390,368**
Avoided GHG Emissions ($MTCO_2E$)	136,016	2,085	21,340	136	**159,577**
Avoided Energy (Gigajoules)	2,433,972	35,021	286,366	1,434	**2,756,793**

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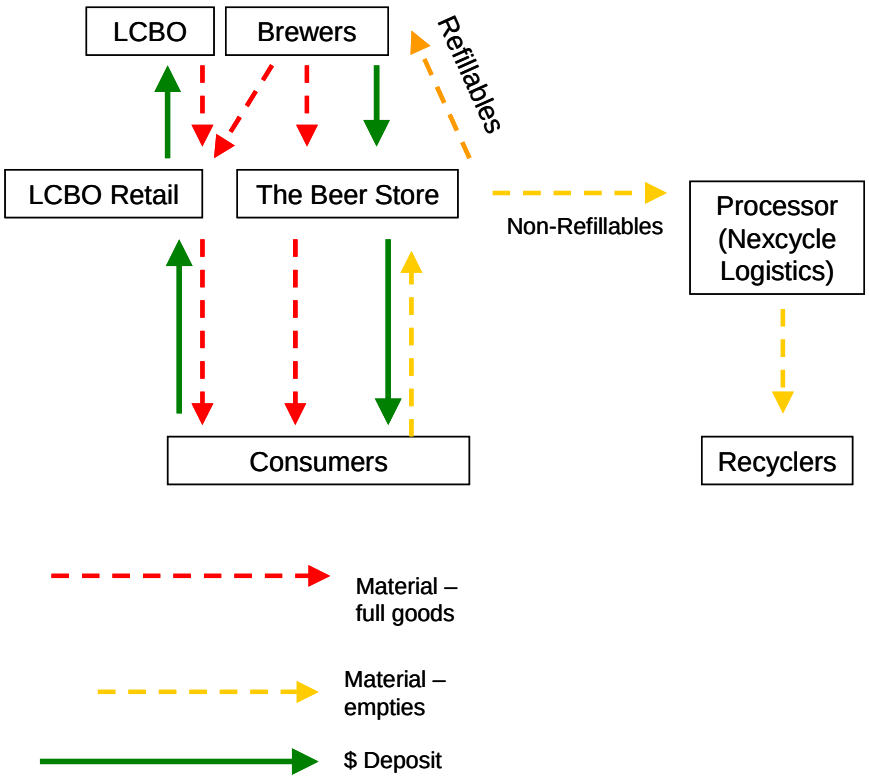
12. Actual and Potential for Other Pollutant Reductions

There are no existing data on pollutant reductions.

FIGURE 7-1
Flow Chart for Ontario's Alcohol (Beer, Wine & Spirits) Deposit-Return Program



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The Beer Store Program and Ontario Deposit Return Program

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Section I. Program Summary

The Ontario Blue Box Program Plan was implemented in 2004. At the time, most municipalities were already operating curbside recycling programs, because a 1994 regulation mandated curbside recycling programs for all communities with over 5,000 people. Ontario's blue box recycling system has two main elements:

- Municipalities in the Province are required to operate or contract with a private operator to provide curbside recycling programs; and,
- Brand owners and first importers[1] are required to fund 50 percent of the net cost of the municipally operated curbside programs (net of revenues from sale of recyclables and other program revenue).

Industry funding is managed by the stewardship organization, called "Stewardship Ontario."

Section II. Program Elements

1. Program Description

A province-wide, regulated residential curbside recycling program has been in place since 1994 (*3Rs Regulations 101/94)*. However, municipal curbside collection in some communities began as early as 1980.

The municipal curbside program is designed for multiple materials including all beverage containers with the exception of beer bottles and alcohol beverage containers. Beer bottles and alcohol beverage containers are covered under a separate deposit-return program, which is described in detail in Section 7 of this report, "Ontario: The Beer Store Program and Ontario Deposit-Return Program," although these containers can also be collected through municipal curbside if they are placed in a blue box.

The municipal curbside program offers homeowners recycling containers for their household recyclable packaging to place at the curb for collection. Most food and beverage containers, including those made from glass, PET, aluminum and steel, are mandated to be included in the program. Other containers, including aseptic packaging, gable top cartons (e.g., milk cartons) and HDPE bottles, may be voluntarily added to the program. The regulation places requirements on municipalities.

[1] An example of a first importer is a grocery store that is the first importer of Tropicana orange juice from Florida. Because Tropicana does not have an office in Ontario, then the grocery store becomes the steward of the Tropicana orange juice packaging.

Section 8

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Blue Box Program Plan

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Blue Box Program Plan

The Blue Box Program Plan, which was mandated in 2003, requires brand owners and first importers to fund 50 percent of the net costs of the municipal program.

Municipal Requirements (under the 1994 regulation: 3Rs Regulation)

Municipalities with over 5,000 people are mandated to provide curbside collection services either through a municipal program or through a private sector contractor. At a minimum, the curbside program must collect "Blue Box Waste," which is defined in law as including aluminum, steel, PET and glass containers, and paper products, such as newspapers and magazines. Municipalities may also voluntarily offer recycling services for aseptic, gable top, HDPE and other container types. About 98 percent of the Ontario population has access to curbside or depot[2] recycling services.

Requirements of Stewards (under the 2003 Blue Box Program Plan)

In this program, stewards are responsible for funding 50 percent of the net cost of municipal recycling programs for printed papers and packaging. Stewards are defined as brand owners or first importers of products supplied into Ontario with packaging or printed papers that contribute to Blue Box Waste. Stewards must also fund certain public outreach, and research and development initiatives, which are described in the following sections of this case study. The current funding arrangement is required by Ontario Regulation 273/02, which was approved in February 2003.

The stewards accomplish their funding duty through an organization called "Stewardship Ontario." There is also an oversight organization, called "Waste Diversion Ontario." Both of these organizations are described in this case study.

History of Stewardship Funding

Since the beginning of curbside recycling in the 1980s, there was a small voluntary industry-funding program in place with only a few brand owners that offered some financing for special initiatives. This voluntary group was called "Ontario Multi-Material Recycling Inc.", or OMMRI, and later became, "Corporations Supporting Recycling". When curbside recycling was broadly introduced in the late 1980s and early 1990s, the majority of voluntary contributions were provided by these brand owners (mostly beverage brand owners) for initial capital expenditures. The voluntary contributions after municipalities were regulated to offer curbside recycling in 1994 were substantially less than the initial contributions for capital purchases.

[2] Recycling depots are municipal sites where consumers bring their recyclables.

Waste Diversion Ontario

Waste Diversion Ontario is a non-governmental, non-profit organization established by legislation in 2002 "to develop, implement and operate waste diversion programs" for a wide range of materials that include Blue Box Waste. Waste Diversion Ontario oversees the implementation of the Blue Box financing program that is required by regulation 273/02. Waste Diversion Ontario collects annual cost and recovery data from municipal authorities in order to calculate the total costs of all programs. Board members originally represented affected industry, municipalities and a not-for-profit seat. More recently (2008), the Board make-up has been changed to equal representation from industry, other stakeholders such as municipalities and environmental organizations and Minister of the Environment's appointees to represent the public interest. Waste Diversion Ontario recovers its costs to perform its oversight and monitoring duties from its industry stewardship organizations including Stewardship Ontario (see following section for description). Waste Diversion Ontario also oversees other stewardship programs, such as a stewardship program for electronic waste, etc.

Stewardship Ontario

Stewardship Ontario is the not-for-profit agent representing affected industry. Stewardship Ontario is a collective of approximately 2,000 companies, or stewards, which has taken on their regulatory obligation. Stewardship Ontario's mission is to implement the approved Blue Box Program Plan and meet its members' obligations at the lowest possible cost. The primary duty of Stewardship Ontario is to collect fees from its members and pay out monies to municipalities. Because the regulation includes both packaging and printed papers, stewards include brand owners of packaged goods, retailers that market their own brands, publishers, and even cable companies and the federal government, because they are the stewards of the bills they send to customers in the mail.

Stewardship Ontario also wrote the plan, known as the Blue Box Program Plan,[3] which was developed to address the following requirements that the Ministry of the Environment placed on Waste Diversion Ontario and the Blue Box Industry Funding Organization, Stewardship Ontario.

- Calculating total net municipal costs;
- Developing municipal payment formulas, including north/south, urban/rural variations;

[3] The Blue Box Program Plan can be found on the internet at http://www.ene.gov.on.ca/envision/env_reg/er/documents/2003/RA03E0011-Blue-Box-Program.pdf

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Blue Box Program Plan

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Blue Box Program Plan

- Providing funding for performance incentives (for municipalities);
- Conducting research and development (such as program improvements and market development);
- Developing/promoting recycled products; and,
- Education and public awareness assistance.

In addition to reimbursing Waste Diversion Ontario for its costs related to the Blue Box Program Plan and 50 percent of municipal Blue Box system costs, Stewardship Ontario also provides funding for related activities, which are listed in the "Cost of Program Operation" section of this case study.

Stewards may operate their own material recycling program and opt out of the Blue Box Program Plan (where residents and municipalities participate in blue box collection programs throughout the Province and stewards share program costs with municipalities), but the opt out can only be done after the Program Plan has been approved by the Minister of the Environment. Opting out requires submitting a plan for a program that will meet or exceed the performance of the approved Program Plan to Waste Diversion Ontario. To date, no individual stewardship plans have been submitted.

2. Products Covered/Not Covered by the System

The Blue Box Program Plan sets out the program rules with which the stewards must comply. The Stewards are responsible for "Blue Box Waste," which is defined by regulation as follows:

> *Waste that consists of any of the following materials, or any combination of them, is prescribed as blue box waste for the purposes of the Act: Glass, Metal, Paper, Plastic, and Textiles.*[4]

Blue Box Waste is managed by the municipalities and generated within the municipal or residential sector, which includes waste generated in multi-family residences and public spaces[5].

Beverage containers generated away from public spaces and in the industrial, commercial & institutional ("ICI") sector, are not included in this program. There has been an ICI regulation in place since 1994 (*3Rs regulation 102/94 & 103/94)* that mandates recycling for most commercial sectors and includes basic

[4] Ontario Regulation 273/02

[5] Permanently placed recycling bins in public spaces such as parks, street containers, public arenas, etc. There is no requirement that municipalities offer recycling in public spaces. However, if they do offer public space recycling, half of the costs for public space recycling are eligible for reimbursement through the Blue Box Program Plan.

recyclables (and excludes multi-laminate containers). The Ministry of the Environment has recently been enforcing the regulation.

3. Program Scope and Targets

The Waste Diversion Act (Bill 90) (under which the program is regulated) has the following overall goal*:*

> *To promote the reduction, reuse and recycling of waste and to provide for the development, implementation and operation of waste diversion programs.*[6]

The program does not have any specific targets, but the Province has established an overall Ontario-wide waste diversion goal of 60 percent. On the subject of targets, the Blue Box Program Plan states:

> *The goal of the Program Plan for Blue Box waste is to increase the diversion of municipal Blue Box wastes from disposal in an economically sustainable manner.*[7]

The Minister of the Environment has set a program performance objective of 60 percent for the Blue Box Program Plan. The program has exceeded this target, achieving 63 percent in 2007. Recovery rates are based on the amount of material collected through municipal residential recycling programs divided by the amount of material supplied into the residential sector. Determining the amount of Blue Box materials generated within the municipal sector is primarily based on sales reported by industry. Stewards are required by law to submit data regarding their sales of packaging, by packaging type and total weight to Stewardship Ontario. Stewards' data is kept confidential and any reported data from Stewardship Ontario is amalgamated.

4. Supporting Regulatory Framework

The Waste Diversion Act is the umbrella legislation, and the Blue Box Program Plan is one program of the Waste Diversion Act. The Act sets up a multi-stakeholder board (Waste Diversion Ontario) tasked with taking direction from the Minister of the Environment, coordinating the development and implementation of the program and, if approved by the Minister, monitoring the implementation of programs by the affected industries.

Waste Diversion Ontario is responsible for:

- Developing, implementing and operating diversion programs;
- Enhancing public awareness; and,
- Ensuring that the program affects the marketplace in a fair manner.

[6] Waste Diversion Act - 2002
[7] Blue Box Program Plan, February 2003, Stewardship Ontario

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Blue Box Program Plan

The Blue Box regulation (number 273/02) defines Blue Box waste.

The Blue Box Program Plan is the industry plan that was approved by the Minister of the Environment. Chapter 9 of the report: "*Stewardship Ontario Governance, Rules and Procedures"* contains the mandated rules under which all brand owners and first importers must comply.

5. Funding Mechanism

The municipally operated recycling programs are funded by the municipalities and stewards. Stewards finance 50 percent of the net system costs.

Each year, Waste Diversion Ontario conducts a tonnage and financial data call with municipalities to determine the total net program costs. Gross costs include collection, processing, transportation, and education and awareness, as well as direct administration costs (e.g., legal, administration, etc.) and interest on municipal capital financing. Revenues from the sale of recyclables and other program revenues are subtracted from the gross costs to determine a net cost. Revenues are based on a three (3) year rolling average.

From these data, along with steward sales reports, Stewardship Ontario calculates levies to charge Stewards for each material type sold into the Ontario marketplace. Their model for calculating charges to stewards incorporates three factors, which include:

- Actual recycling costs by material type, using activity-based costing analysis;
- Each material's recovery rate; and,
- A factor that shifts some costs from better performing materials to poorer performing or hard-to-recycle materials, like multi-laminate and plastic packaging.

New levy schedules are released annually. Stewards pay levies in quarterly increments to Stewardship Ontario, which then distributes the money to municipalities. Industry contributes 50 percent program funding, with five percent (5%) being retained for projects that examine how to deliver a more effective and efficient program (called the "Effective and Efficiency Fund" or "E&E Fund"). By 2006, industry had contributed $20.2 million[8] to the E&E Fund. The remaining 45 percent (of industry's 50 percent contribution) is distributed to municipalities in cash or, in the case of the contribution from newspaper publishers, by in-kind lineage, with the specific payment to each municipality based on individual program performance (efficiency). A series of "benchmark" operating parameters are used to determine the efficiency of each

[8] Note that, in this section of the report, currency is expressed in Canadian dollars.

program. This is known as the "pay-out" model. The more efficient the program, the higher the level of funding provided. For example, a very efficient program may get 70 percent of their costs covered, whereas less efficient programs receive funding for less than 50 percent of their costs. Stewardship Ontario, in collaboration with municipalities, has and continues to define these benchmark efficiency standards.

6. Fee Collection Point

Fees are collected by Stewardship Ontario directly from brand owners or first importers into Ontario on a quarterly basis. More details on how the fees are calculated for an individual brand owner are included in the section "Ease of use for manufacturers/brand owners" in this case study.

Failure to pay, results in financial penalties enforceable by the Ministry of Environment. Costs associated with Ministry enforcement are reimbursed by Stewardship Ontario.

7. Program Operations (Collection and Processing)

There are currently over 200 municipal programs operating in the Province. Programs range from the very small, servicing only 139 households, to very large (Toronto) with over one million households[9]. About 98 percent of the Ontario population has access to curbside recycling.

Each municipality, or in some cases regions (which make up a series of municipalities), either contract with the private sector or use their own hauling services. Similarly, processing is either done directly by a municipality with their own Material Recovery Facility ("MRF"), or contracted out to the private sector operating a private MRF. In some cases, the private sector is contracted to operate a municipally owned MRF. There are over 75 MRFs in the Province of various sizes and capacity.

The flow of materials and fees is demonstrated graphically in Figure 8-1, which appears at the end of this case study.

8. Status of Competition within Program Operations

Competition may exist between municipalities as a result of the efficiency standards. More specifically, the municipality that is closest to meeting or exceeding the standards will have a higher percentage of their costs covered. Competition also exists between private sector haulers and end-markets that bid for municipal business and recyclable material.

[9] For the purposes of the Blue Box Program Plan, "households" are defined as single-family households and multi-family households of six (6) or more units.

9. End-of-Life Management (Reuse and Recycling)

The Blue Box Program Plan only requires ordinary recycling markets; there are no special or specific end-of-life management requirements. Existing recycling markets can support the recycling of most of the materials targeted in the Blue Box Program Plan. Several materials are currently more difficult to market, including multi-laminate packages like aseptics[10] and gable tops[11].

10. Physical Infrastructure Needs

Infrastructure needs include recycling containers for recycling program participants, collection vehicles and sufficient MRF capacity to process recovered materials.

Section III. Stakeholder Roles and Responsibilities

TABLE 8-1
Blue Box Program Plan
Summary of Stakeholder Roles and Responsibilities

Stakeholder	Role and Responsibility
Consumer	Participate in their municipal Blue Box Program.
Retailer	If first importer, calculate the amount of packaging imported into Ontario they supply into the residential sector. Calculate the amount of service packaging they supply into the residential sector (cups, bags, deli wrap, etc.).

[10] Aseptic cartons or drink boxes are made up of paper, an aluminum lining and a plastic coating. Aseptic cartons are hydro pulped and separated into different material types. The resulting paper pulp (~50 percent) is used to make tissue.

[11] 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. 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.

TABLE 8-1
Blue Box Program Plan
Summary of Stakeholder Roles and Responsibilities

Stakeholder	Role and Responsibility
Manufacturer/Brand Owner	Calculate the amount of packaging they supply into the residential sector. Stewardship Ontario (representing stewards) must also: ▪ Develop/implement programs in partnership with municipalities; ▪ Determine cost allocation/financing mechanism; ▪ Set *de minimis* level to exempt small stewards. De minimus level is set at under $2 million in annual revenues, or if the steward generates less than 15 metric tons of packaging and printed paper; ▪ Identify, notify and register stewards, collect fees & allocate funds; ▪ Implement cost effectiveness/efficiency program for municipally run programs; ▪ Market development program; ▪ Promotion & education program; ▪ Develop a dispute resolution mechanism; and, ▪ Reporting to Waste Diversion Ontario.
Recyclers/Haulers	Haulers contract directly with municipalities. Recyclers arrange to take municipally collected material and recycle it.
State or Provincial Government	Regulate and enforce program.
Local Government	Provide blue box service; provide program data; receive payments from Stewardship Ontario.

Section IV. Program Outcomes

1. Cost of Program Operation

For 2006 data year, the total costs of municipally operated recycling programs were just over $120 million (Canadian) which is defined as 100 percent of program costs for the purposes of determining the share for which stewards are responsible. The stewards were collectively responsible for half of that amount.

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Blue Box Program Plan

From July 2004 to June 2008, the E&E Fund supported 75 distinct projects worth $20 million (about $5 million per year). The E&E Fund was drawn from 10 percent of the fees paid by obligated Blue Box stewards per year. The intent of the E&E Fund was to provide support to Ontario municipalities to help reduce the cost of their Blue Box Program Plan.

According to the Blue Box Program Plan annual report for 2007, the stewards' half (or 50 percent) is split into two parts: 45 percent (or $48.35 million plus $1.83 million in "in-kind" advertising) is used to fund the municipal Blue Box Program, and five percent (5%) (or $5.34 million) is deposited into the E&E Fund. In addition to the 50 percent share of municipal program costs, stewards are responsible for funding other required costs, which are listed in the table below.

In 2008, the Continuous Improvement Fund ("CIF") worth $20 million for a period of three (3) years, replaced the E&E Fund. The CIF comprises 20 percent of the annual cash contribution of Blue Box stewards to Ontario municipalities, with approximately $13 million in funding available for 2008. The CIF provides grants and loans to municipalities to execute projects that will increase the efficiency of municipal Blue Box recycling and will help boost system effectiveness. The CIF started up in January 2008, and has a three (3) year mandate to direct funds to projects that will:

- Identify and implement best practices;
- Examine and test emerging technologies; and,
- Employ innovative solutions to increase blue box materials marketed and promote gains in cost-effectiveness that can be implemented province-wide.

In addition to the 50 percent share of municipal program costs, stewards are responsible for funding other required costs, which are listed in the table below.

TABLE 8-2
Funding Responsibilities of Stewards

Stewardship Ontario Program Costs	2007 Funding (millions)	2008 Funding (millions)
Payments to Municipalities	$48.35	$51.76
Newspaper advertising "In-kind"[12] Contributions	$1.36	$1.83
E&E Fund	$5.34	$ -

[12] According to the regulation, the newspaper industry is a steward, and must participate in the system. However, the newspaper industry agreed to provide "in-kind" advertising space, to advertise recycling programs, in lieu of financial contributions to Stewardship Ontario.

TABLE 8-2 Funding Responsibilities of Stewards		
Stewardship Ontario Program Costs	**2007 Funding (millions)**	**2008 Funding (millions)**
Continuous Improvement Fund	$ -	$12.94
Market Development Funds	$0.00	$2.40
Program Delivery	$2.63	$3.03
Administration	$2.17	$1.48
Adjustment for shortfall	-$3.39	-$5.00
Total	**$56.46**	**$68.44**

Total costs of all aspects of Blue Box Program Plan:

For individual stewards, the amount of fees paid per year varies based on weight of printed paper and packaging sold and type of packaging sold.

2. Recovery Rates of Materials

For all materials from January – December 31, 2006, 82.4 percent of the printed-paper material was recycled and 48 percent of packaging was recycled, as summarized in the table below.

TABLE 8-3 Recovery Rates	
Material Type	**Recovery**
Newspaper & Magazines	90.5%
Other Printed Paper	53.4%
Printed Material Total	**82.4%**
Paper Packaging	58.9%
Plastics	22.1%
Steel	60.1%
Aluminum	44.9%
Glass	69.0%
Packaging Total	**48.0%**
GRAND TOTAL	**63.5%**

Recycling rates are based on the amount of material marketed by municipal residential recycling programs divided by the amount of material supplied into the residential sector. Determining the

amount of blue box materials supplied into the municipal sector is based on sales data reported by industry.

3. Level of Encouragement of Green Packaging Design and Actual Packaging or Product Redesign Achieved

In 2006, a study was undertaken to understand the impact that brand owner-based fees have had on packaging design. The report states:

> *"In a globalized economy, many companies have limited or no influence over packaging decisions. Whereas some sectors, such as Ontario-based dairy producers, are likely producing products specifically for the Ontario market and may be influenced by Stewardship Ontario fees, this is unlikely to be the case for companies selling toys, electronics, or hardware products. These are likely produced outside of Ontario, or if produced in the Province, a large fraction of their production is typically destined for national and international markets*."[13]

In a survey sent to 100 member companies of Stewardship Ontario regarding design for the environment, the results were as follows:

- Over 80 percent indicated they had implemented at least one of the three broad optimization and efficiency measures: minimizing packaging; selecting packaging materials less costly to manage and/or recycle after use; and using recovered materials;
- 14 percent of companies indicated that the Stewardship Ontario program had been a direct factor in these decisions;
- 58 percent indicated that Stewardship Ontario fees have had no direct impact, as packaging decisions were made outside of Canada;
- 26 percent indicated that Stewardship Ontario policies have had some influence on packaging decisions and five percent (5%) indicated there had been a high level of influence; and,
- 62 percent specified that minimization of packaging was their number one priority, as it incorporated cost savings from the reduction of packaging dimensions and weights.[14]

The report concludes with the following statement:

[13] Assessment of Stewards Actions in Response to Stewardship Ontario Fees
Report to the Ontario, Minister of Environment, June 30, 2006
[14] Ibid.

> *"While individual companies are taking individual actions to reduce the impact of packaging, Stewardship Ontario fees are but one factor in the myriad of other key considerations these companies must take into account in delivering their products to the consumer and given that most of the largest stewards operate at a national or multi-national scale, rather than solely in the Ontario market. Furthermore, many stewards had already taken actions to reduce packaging materials to an optimum level before the first Stewardship Ontario fees were applied."*[15]

4. Ease of Use for Consumers

Curbside recycling in the single-family residential sector is very easy to use for consumers. Multi-family residential or apartment dwellers are faced with a greater amount of work (in most cases) as they have to carry their containers to a special recycling room, usually located in the basement or on the ground floor, and sometimes outdoors, which can be challenging in the winter, especially if the recycling bins are not maintained and can have ice and snow buildup.

There is no financial incentive for residents to participate in the curbside recycling programs, unless there is a pay-per-bag (or pay-per-bulk container in multi-unit buildings) program in place for garbage, which provides a direct economic incentive. Ongoing promotion and education is an essential element necessary to remind people about why it is important to recycle, as well as how and what to recycle.

5. Ease of Use for Retailers

Retailers are, for the most part, not physically involved in the program, but most are registered as stewards because they may be first importers and/or may have their own store brand, and provide plastic or paper carryout bags or other service packaging to customers. In this case, retailers, like all stewards, must identify what they supply into the residential marketplace in terms of packaging and printer papers, and calculate their associated fees. This can be an administrative burden that will vary depending on the retailer's approach. Depending on their size, retailers are complying with the requirements of Stewardship Ontario in different ways. Most larger retailers (e.g., Costco, Sears, etc.) are implementing systems that require their suppliers to identify the type and weight of packaging by stock-keeping unit ("SKU") sold to the retailer. In general, these retailers have automated databases, which are able to process the data and provide Stewardship Ontario with periodic reports. Retailers are permitted to use "sector calculators" which apply predetermined packaging estimates by sector to the retailer's annual gross sales. Retailers

[15] Ibid.

who choose to compile their own data rather than use the sector calculators must identify the type and weight of their own branded packaging or packaging where they act as first importer into the Province. This usually requires an auditing process where all SKUs of products are emptied from their packages and individual packaging components are weighed and tracked in a database. This usually requires annual updates because packaging formats change and new SKUs are added all the time. In some cases, retailers are taking back some packaging like plastic bags themselves, in-store. In these cases, retailers may subtract the take-back tonnage that was collected themselves from the amount that they have to pay fees on.

6. Ease of Use for Manufacturers/Brand Owners

Brand owners or first importers of packaging and printed paper must register as "Stewards" with Stewardship Ontario (there is a de minimis exemption for smaller businesses). Stewards must identify the material type (e.g., aluminum, cardboard, etc.) and weight of all packaging and printed paper that is supplied into the residential sector, apply the annual fee rates and submit an annual "Steward's Report" to Stewardship Ontario. Payments are made quarterly. Depending on the nature of the business, this can be very onerous for stewards, especially those with a large product range. Some stewards will individually weigh each empty package, record the weight of the individual package, multiply by number of units sold, and calculate the fees. Other larger stewards, like large stores, have incorporated the data request directly from their suppliers, and incorporate the data into larger databases which list packaging specification by SKU.

Today, after five (5) years of the program implementation, most stewards have turnkey systems in place for reporting. Many stewards will outsource the work to consultants that specialize in this type of reporting.

7. Impacts on Local Government

Local governments remain responsible for curbside collection programs, but now receive some financial support from stewards (approximately 50 percent of net costs).

Municipalities are also responsible for tracking and reporting their costs and tonnage collected, which are required by Waste Diversion Ontario to determine the rate of recycling and the total system costs. This is done through an annual data call.

Municipalities are also responsible for their own promotion and education, as each program varies in terms of materials collected, requested method of material setout, and schedule. Municipalities do receive newspaper lineage from the newspaper sector as an in-kind contribution in lieu of cash funding.

8. Ease of Administration and Enforcement for Provincial Government

Stewardship Ontario has a legal responsibility to notify companies that are potentially obligated under the Blue Box Program Plan and to follow-up with these companies to ensure that they file an annual Steward's Report if they are required to do so.

Enforcement under the Act is handled through the Ministry of the Environment's Investigation and Enforcement Branch ("IEB").

Stewardship Ontario carries out an established process to determine if a company is non-compliant with the program rules. The steps include:[16]

- Sending a notification letter by first class mail;
- Attempting to follow-up by telephone contact with the appropriate manager;
- Sending a reminder letter;
- Undertaking additional follow-up telephone calls;
- Sending a registered letter to notify the company that it was not in compliance and may be referred to the Ministry of Environment's IEB for further investigation;
- Documenting all attempts to make contact with the company; and,
- Documenting all information exchanged in the preparation of the case file for IEB.

The first case file that was turned over to the IEB for investigation was resolved in 2006. This case had been given to the IEB in late 2004, resulting in the company being found guilty of contravening the Waste Diversion Act, and fined $35,000. A second company was also charged with violating the Waste Diversion Act in 2006. This case remains before the courts. As stipulated in the Waste Diversion Act, costs associated with IEB investigation activities are charged to Stewardship Ontario and are included as common costs in the material fees.

In 2006, with the support of Stewardship Ontario, IEB established a different approach to handling non-compliant cases and it is currently managing 30 additional case files. Through 2006, Stewardship Ontario was constrained in its ability to resolve outstanding compliance issues by IEB's limitations on the number of case files it investigates at any given time. To address this issue, IEB initiated discussions with Stewardship Ontario, which are expected to result in an identification of opportunities to streamline the enforcement procedures.[17]

[16] Stewardship Ontario, Annual Report 2006
[17] Stewardship Ontario, Annual Report 2006, page 11.

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9. Ease of Use for Recyclers/Haulers

In the Blue Box Program Plan, there are no special requirements for recyclers and haulers; their role is the same as it would be in any typical recycling program.

10. Continuous Improvement and Program Innovations

Waste Diversion Ontario has funds dedicated to improving overall program efficiency of municipal operations, MRF efficiency, and market development. These improvement projects are funded through Stewardship Ontario, through the "Continuous Improvement Fund," and the "Market Development Fund," which were listed in the "Cost of Program Operation" section of this case study.

For example, the Glass Market Development Investment Fund, which is part of the Market Development Fund, is designed to make investments in implementation projects that improve markets for recycled glass. A portion of these funds was used to provide a capital grant to offset a portion of the costs to build a glass beneficiation facility that will effectively remove contaminants from glass so that it is more marketable. The Glass Diversion Fund provides support for smaller glass diversion projects within the Province. The Glass Market Development Investment Fund is funded entirely by stewards that use glass packaging; there are no cross-subsidies from other material types.

The Plastics Market Development Fund supports preliminary plastics market development feasibility assessment and planning studies to ultimately improve the recyclability of these materials.

As mentioned in the "Cost of Program Operations" section of this case study, a portion of the Stewardship Ontario financial obligation to municipalities is committed to municipal cost-sharing projects designed to encourage greater effectiveness and efficiency of the municipal Blue Box system. The CIF is a $20 million fund that provides grants and loans to municipalities to execute projects that will increase the efficiency of municipal Blue Box recycling and help boost system effectiveness. The CIF started up in January 2008 (replaced the E&E Fund" and has a three (3) year mandate to direct funding support on projects that will:

- Identify and implement best practices;
- Examine and test emerging technologies;
- Employ innovative solutions to increase blue box materials marketed; and,
- Promote gains in cost-effectiveness that can be implemented province-wide.

A municipality may submit a proposal to Stewardship Ontario with a project idea or study idea that might result in greater efficiency, and if approved, the project is funded.

11. Actual and Potential for GHG Emission Reductions

Table 8-4 presents the resulting reductions of greenhouse gases and other pollutants[18]. The impacts measured that affect climate change are expressed as CO_2 equivalents; human health impacts are expressed as particulates, toluene equivalents (toxics), and benzene equivalents (carcinogens); eutrophication impacts are expressed as nitrogen equivalents; acidification impacts are expressed as sulfur dioxide equivalents; and ecosystem toxicity impacts are expressed as herbicide 2,4-D equivalents.[19]

12. Actual and Potential for Other Pollutant Reductions

Data pertaining to the actual reduction in other pollutants from blue box material diversion is currently being estimated for the Ontario Ministry of Environment and should be available by summer 2009.

[18] Calculations are based on a Microsoft Excel model, which incorporates Ontario 2006 curbside recycling tonnages and the Life-Cycle Analysis multipliers by material type provided by the EPA and Research Triangle Institute (see footnote 10). The analysis is based on the following assumptions:

- Recycling and composting replaces landfilling with energy recovery;
- Recyclable material is being diverted through traditional recycling end-markets;
- Material is being collected via curbside collection (excludes depots); and,
- Collection (hauling) impacts from diversion and disposal are equal.

[19] US EPA, *Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks*, 3rd Edition, September 2006; Research Triangle Institute, *Municipal Solid Waste Life-Cycle Database*, prepared for Atmospheric Protection Branch, National Risk Management Research Laboratory, US EPA; and Carnegie Mellon University Green Design Institute's Economic Input-Output Life-Cycle Assessment model available on the Internet at www.eiolca.net.
The methodology for aggregating pollutant emissions into these environmental impact categories is explained in the documentation for US EPA's TRACI (Tool for the Reduction and Assessment of Chemical and other environmental Impacts) model.

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TABLE 8-4
Total Tons of Emissions Reductions By Material Type

Recycled Materials	Climate Change (CO_2e)	Human Health - Particulates (ePM2.5)	Human Health - Toxics (eToluene)	Human Health-Carcinogens (eBenzene)	Eutrophication (eN)	Acidification (eSO_2)	Ecosystems Toxicity (e2,4-D)
Cardboard	418,245.6	1,452.1	475,703.2	95.3	20.3	2,029.2	798.8
Mixed Paper	1,524,982.4	531.8	112,572.2	6.7	147.2	3,361.9	142.4
Glass Containers	51,861.0	226.1	23,822.1	38.8	9.0	0.8	84.0
PET Containers	51,659.2	51.6	117,289.2	109.0	27.6	910.4	10.4
HDPE Containers	22,608.7	8.0	19,149.6	19.1	6.3	115.8	1.3
Aluminum Cans	126,836.0	234.5	76,304.4	37.0	18.9	1,391.2	501.2
Other Ferrous	37,769.3	91.9	0.0	0.0	3.8	7.7	0.0
TOTAL	**2,233,962.2**	**2,596.0**	**824,840.7**	**305.9**	**233.1**	**7,817.0**	**1,538.1**

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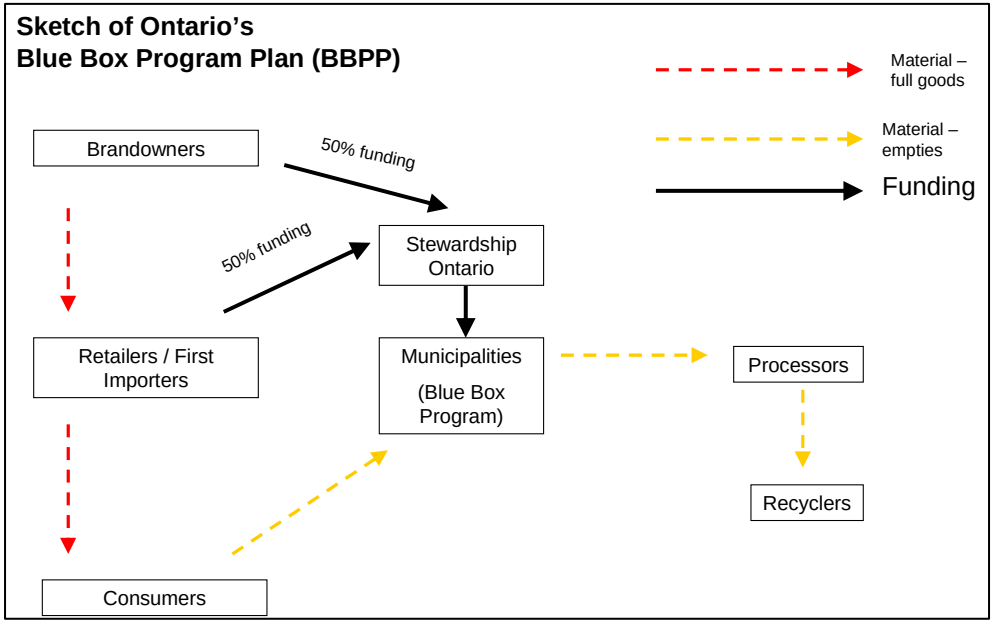
FIGURE 8-1
System Flow Chart



Section I. Program Summary

This program is designed to avoid, reduce, recycle or recover packaging in Germany. The brand owners are encouraged to reduce packaging first, and then required to provide for the collection of packaging from all sources, including residential and commercial sources. There are targets for collection by material type, such as a 75 percent target for glass, 60 percent for aluminum, etc. Brand owners pay for the system by paying fees for all packaging materials that they place into the system, by quantity and material type. These service fees are paid to a stewardship organization of the brand owners choosing, who then legally takes over the responsibility of collecting/managing the brand owner's appropriate share of packaging waste, which is based on the proportion/market share of packaging that the brand owner introduces into the market each year. The program has resulted in high recycling rates throughout the country, as well as reductions in the production of packaging, such as light weighting.

Section II. Program Elements

1. Program Description

The Duales System Deutschland GmbH ("DSD")[1] is a response to Germany's Packaging Ordinance ("Packaging Ordinance")[2] passed on June 12, 1991. The Packaging Ordinance was amended in August 2000, May 2002, May 2005 and December 2005. The most recent amendment to the Packaging Ordinance, (the 5th Amendment), was published in the Federal Law Gazette on April 4, 2008.

The Packaging Ordinance identifies both businesses located within the European Economic Community that produce goods in packaging for sale in Germany and businesses that import goods (first importer) into Germany as the obligated entities. The Packaging Ordinance obligates manufacturers/brand owners[3] to make the necessary arrangements with a collection and disposal system to manage all the one-way packaging that is placed in the

[1] Also known as, the "Dual System", DSD provides a secondary container (often yellow) for collection of packaging materials, along side the normal waste bin.

[2] Ordinance on the Avoidance and Recovery of Packaging Wastes (Packaging Ordinance - Verpackungsverordnung - VerpackV1 of 21) August 1998. (Federal Law Gazette I p. 2379). The Fifth Amendment - April 2008.

[3] The term, "manufacturer/brand owner" is used throughout this report. The German Packaging Ordnance uses the term "producer/first importer" to refer to the same type of regulated parties.

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marketplace to "private consumers." These end-destinations are defined as:

> *"Consumers within the meaning of this ordinance include anyone who no longer resells the goods in the form delivered to him/her. Private consumers within the meaning of this ordinance are households and comparable places where packaging waste originates, particularly restaurants, hotels, canteens, offices, barracks, hospitals, educational facilities, charitable institutions, the self-employed and typical places where packaging waste originates in the cultural scene, such as cinemas, opera houses and museums, and leisure facilities like holiday complexes, leisure parks, sports stadiums and motorway services."* [4]

The amended Packaging Ordinance requires that manufacturers/brand owners "participate in a collection and disposal system," but does not define "participation." Currently there are several organizations available for contracts with manufacturers/brand owners to organize collection, sorting, recycling and disposal of packaging for a fee. As of December 2008, there were 9 companies offering their services in all 16 Federal States, of which DSD is the most established and services the greatest number of manufacturers/brand owners. In total, about 25,000 companies are affected by the packaging ordinance. There are 20,000 companies circulating small enough volumes of packaging that exempts them from submitting a declaration. They are not, however, exempt from registering with a system.

These service providers charge the manufacturers/brand owners service fees, which are based on the type and quantity of packaging material sold into Germany. The government has determined that approximately 4,500 enterprises will be required to submit annual declarations representing about 93 percent of all packaging sold in Germany.

The Packaging Ordinance sets targets for the recovery and recycling of all packaging material. These targets do not depend on where the material originated from (i.e., created domestically or imported). The Packaging Ordinance applies to all material subject to the Closed Substance Cycle and Waste Management Act.[5]

The main aim of the 5th amendment was to stop free riding by skipping the individual compliance possibility at point of sale and replacing it by a general requirement to join and register/license all packaging tonnage being put on the market with one of the

[4] Source: www.gruener-punkt.de/en

[5] Source: Packaging Ordinance revised May 2005

approved Dual systems. This eliminates the option for a steward to abstain from one of the approved Dual Systems. Consumers may still leave packaging at the point of sale for recycling.

2. Products Covered/Not Covered by the System

All packaging is included in the Packaging Ordinance. Specifically, sales packaging and secondary packaging are included, as described below.

Sales packaging is defined as packaging that is made available as a sales unit for the final consumer. Sales packaging includes packaging provided by retailers, restaurants and other service providers to transfer goods to the final consumer (also known as "service packaging,") and includes items such as disposable dishes, meat trays, etc.

The deposit-return system for beverage containers is described in Section 10 of this report. All beverage containers are included in the Packaging Ordinance, though there are three separate systems: the Dual system (for all beverage containers without a deposit such as juice containers), the deposit-return system for one-way beverage containers, and the deposit-return system for refillables.

Secondary packaging is defined as packaging that is used as additional packaging for transfer to the final consumer for reasons of hygiene, durability or the protection of goods from damage or contamination. Examples of secondary packaging include a carton, which holds small pudding containers, the box that holds a bottle of aspirin, etc.

The program does have a minimum threshold. If a manufacturer/brand owner sells below the minimum in all three specific material categories, then they can merely file a declaration that states that they are below the minimum. The obligation to participate applies to all companies circulating packaged goods, regardless of size. Those with volumes above the threshold have to actively document their compliance and register in an internet platform.

More specifically, the minimum threshold exemption is obtained when all three material categories fall below the following values:

- Glass of less than 80 tons/yr;
- Paper/cardboard of less than 50 tons/year; and,
- Aluminum/plastics/steel and composites of less than 30 tons/year.

<u>Industry Specific Solutions</u>

The duty to participate in a Dual System does not apply if the manufacturers/brand owners take back and recover sales packages even at small industry sites where packaging waste

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originates, known as "industrial specific solutions." This is conditional upon an expert certifying that the (regular and free-of-charge) return is being handled through industrial specific collection structures and recovery is assured in conformity with the stipulations of the Packaging Ordinance. The authorities responsible must be formally notified in advance of the expert's certification and beginning of take-back.

Fines for Non-Compliance

If a manufacturer/brand owner does not comply with the Packaging Ordinance, the manufacturer/brand owner may be fined up to €50,000 as well as some administrative fines. The declaration of completeness must then be prepared retroactively.

Products Not Covered

The program excludes the following types of packaging:

- Sales packaging which is not disposed of by a private consumer (this packaging must be collected by the distributor, see "industrial specific solutions" above);
- Packaging made of biodegradable plastic is exempt until December 31, 2012 (plastic packaging which has been manufactured from biodegradable materials and all components of which are compostable is exempt). Also, compostability must be demonstrated by a certificate issued by an independent agency;
- Transport packaging, which must be collected by the distributor or manufacturer/brand owner at the point of delivery;
- Outer packaging – manufacturers/brand owners must remove outer packaging or provide take-back facilities free-of-charge to consumers;
- Disposable packaging for drinks for which a deposit/refund duty exists; and,
- Returnable Packaging, which is reused and where normally a deposit is charged from customers that will be refunded upon return of the packaging (refillable bottles, crates, pallets, etc.).

3. Program Scope and Targets

The purpose of this Packaging Ordinance is to avoid or reduce the environmental impacts of waste arising from packaging. Packaging waste shall in the first instance be avoided; reuse of packaging, recycling and other forms of recovery shall otherwise take priority over the disposal of packaging waste.

Specific (material) recycling targets are established in the Packaging Ordinance and updated periodically. These targets are

for glass: 75 percent; aluminum: 60 percent; steel or "tinplate": 70 percent; paper & cardboard: 70 percent; and composites: 60 percent. Additionally, 60 percent of the plastics must be recovered, and 36 percent recycled (material recycling).

4. Supporting Regulatory Framework

The Packaging Ordinance works in conjunction with Foodstuffs and Commodities Act, and Closed Substance Cycle and Waste Management Act. It is also currently working under the larger framework of the EU 1994 Packaging Waste Directive 94/62/EC to have conformity with other EU member nations.

The Green Dot program run by the DSD (with over 50 percent market share of obligated sales packaging) is also partnered with Packaging Recovery Organisation Europe ("PRO Europe") which licenses the green dot symbol to other member countries (has 22 European Union member states).

PRO Europe s.p.r.l. (Packaging Recovery Organisation Europe), founded in 1995, is the umbrella organization for European packaging and packaging waste recovery and recycling schemes which mainly use the "Green Dot" trademark as a financing symbol. In its primary role, PRO Europe is the general licensor of the "Green Dot" trademark. It also acts as the authoritative voice and common policy platform representing the interests of all packaging recovery and recycling organizations founded and run by or on behalf of regulated industry.

5. Funding Mechanism

The DSD system is funded through service fees that are charged to participating manufacturers/brand owners. The amount of the fee is based on the material used, the weight, and the number of items sold.

The most recent fee schedule for the DSD (2008) is presented in USD cents per pound. See Table 1 below[6]. As noted earlier, there are currently nine companies that offer manufacturers/brand owners the service of managing their Packaging Ordinance obligation for fees. At this time, fees for the other service providers are not available for this case study.

TABLE 9-1
DSD 2008 Service Fees

Material	USD Cent/lbs.
Glass	3.36
Paper/board/cardboard	7.95

[6] Source: PRO Europe

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TABLE 9-1
DSD 2008 Service Fees

Material	USD Cent/lbs.
Tinplate	12.4
Aluminum, other metals	33.3
Plastic	58.9
Composite cartons (LPB) with special acceptance and recycling guarantee	34.2
Other composites	46.1
Natural materials	4.6

6. Fee Collection Point

Manufacturers/brand owners pay the fee directly to the company that is chosen to take on their legal obligation for compliance with the Packaging Ordinance. Currently, DSD maintains 55-59 percent market share of sales packaging sold in Germany.[7]

7. Program Operations (Collection and Processing)

DSD is the largest third party organization that companies can contract with to fulfill compliance with the Packaging Ordinance. DSD began in September 1990 and has over 15,000 member companies. The collection of materials occurs in two places: curbside in yellow bins or a drop-off location. Collection is free to the customer. Material can also be removed at the point of sale for free; however, a customer cannot leave the store and return with material. The DSD organizes the collection, sorting and recycling of packaging waste in Germany with the support of 724 waste management partners.[8] In addition, DSD is working with recently introduced companies that also offer to fulfill Packaging Ordinance obligations. This is a complex process, as DSD's collection contracts with private companies cover all 16 Federal States and the total population of 82 million.

Antitrust authorities are working to change the bid process so that it can include the other companies. The first possibility is to differentiate responsibility after collection, where other Dual System companies could take possession of the material and service the sorting and recycling processes. These changes are

[7] Source: Wirtschaft 30.09.08
[8] Source: PRO Europe

currently being developed, but the introduction of more "competition" into the system is a difficult transition.

An independent clearing office publishes the market shares of all schemes on a quarterly basis. Every three years there is a bid process for the collection contracts. Currently, the bid process is organized by DSD under strict surveillance of the antitrust authorities.

There is no limit for the number of compliance schemes. All waste management companies fulfilling the minimum requirements can participate in the bid process (for the collection).

Residents place only packaging material in the curbside yellow bins and the sorting centers sort by commodity. Initially, local garbage collectors had no incentive to monitor the yellow bins for compliance since they were paid by DSD by volume. That has since been revised and now there is a limit to compensation for collectors. The drop-off system generally collects color-sorted glass, paper and cardboard[9].

Material is either recycled or sent as feedstock to generate energy. Recycling and use as conversion to energy both count towards the Packaging Ordinance's goal. Of note, the German quota for recycling of plastic (versus the option of conversion to energy) is much higher than other countries within the EU.

8. Status of Competition within Program Operations

Because of the size of DSD and their collection and sorting contracts, it was difficult for new sorting and collection businesses to enter the market. In addition, the vastness and prominence of the Green Dot system through Germany and Europe have made it difficult for a rival company offering the same compliance services to enter the market.

As such, in April 2001, the European Commission ("Commission") adopted a decision finding that DSD was restricting competition by abusing its dominant position in the market for organizing the collection and recycling of sales packaging in Germany. The decision was limited to one provision of DSD's trademark agreement (Green Dot symbol) and did not call into question the existence and overall functioning of the DSD system. The Commission found that in certain cases, the payment system used by DSD was a disadvantage to its customers and prevented entry of competitors in the marketplace. The Commission objected to a provision according to which DSD customers have to pay fees corresponding to the volume of packaging bearing the Green Dot trademark rather than fees corresponding to the volume of

[9] Source: Recycling Today

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packaging for which DSD is actually providing a take-back and recycling service[10].

Following this decision, a number of other service providers have entered the marketplace and are offering to take on the legal obligation of manufacturers/brand owners of packaging. In practice, DSD has contracted out services for collection nationwide so far; almost all contracts are with private waste disposal companies.

The Antitrust authorities want to change the bid process, but have not found a way to achieve this goal yet. For example, if company X has a market share of six percent in the State of Bavaria, they can demand that six percent of all collected yellow bins (collected by DSD contractors) have to be transported by the waste disposal company commissioned by DSD to some sort of "reloading point". From here, the disposal company commissioned by company X takes over and transports the waste to another sorting plant which does the sorting on behalf of company X, and hopefully cheaper than for DSD.

The current situation has been likened to the "wild west", where every Dual System company competes for customers (manufacturers/brand owners) with very cheap prices for collection, sorting and recycling. Some of these prices are well below cost price. Competitors are often subsidiaries of waste management companies. DSD on the other hand acts as an independent broker between manufacturers and waste management operators.

In addition, DSD is currently managing more packaging for recycling than the amount that is declared by its member companies. Specifically, glass is recycled at a rate of 101 percent; paper/cardboard: 143 percent; aluminum: 135 percent; tinplate/steel: 168 percent; plastics: 121 percent; and composites: 86 percent. This is due to the fact that DSD continuously collects and recycles more materials than are licensed. The share of free-rider packaging volume in the system has been at a constant rate of 20-25 percent. Overall recycling rates for the collected packaging materials in 2006 were 82.4 percent for glass; 76.6 percent for aluminum; 90.2 percent for steel, 55.7 percent for plastics (including energy recovery); 89.4 percent for paper; and 66.4 for cartons.[11]

9. End-of-Life Management (Reuse and Recycling)

On the whole, most materials are recycled. The volume may be the only issue—whether the infrastructure exists to support the amount of material collected. DSD initially had a problem of this sort with plastic. Material was exported, disposed, or warehoused.

[10] Source: Europa 2001 - http://europa.eu
[11] http://www.bmu.de/abfallwirtschaft/downloads/doc/42331.php (part 2).

Currently, about 60 percent of plastics are recycled mechanically and 40 percent are burned for energy in cement kilns, power stations, etc. The recycling/recovery target in the Packaging Ordinance is 60 percent and out of this 60 percent has to be recycled mechanically (i.e., 36 percent of all plastic must be recycled mechanically, and the remainder may be burned for energy).

10. Physical Infrastructure Needs

The program is dependent upon the ability to gather, sort and recycle materials. The program also requires an adequate number of recycling locations to make recycling convenient, including recycling at single-family residential, multi-family residential and commercial establishments.

Section III. Stakeholder Roles and Responsibilities

TABLE 9-2
German Packaging Ordinance
Summary of Stakeholder Roles and Responsibilities

Stakeholder	Role and Responsibility
Consumer	Place materials in yellow bins and/or return packaging directly at stores (before leaving the store).
Retailer	If the retailer is a manufacturer/brand owner and/or they sell in-store “service packaging”, they must prepare a “declaration of completeness”. A declaration of completeness is a record of sales packages put into circulation in a calendar year. The declaration must be checked and certified by a tax consultant, an auditor, a chartered accountant or an independent expert. The data must be transferred by the manufacturer/brand owner to a database of the responsible Chamber of Industry and Commerce, and is available solely to the monitoring regulators. Retailers must also ensure the reuse or recycling of all transport packaging, and any secondary packaging left behind by a customer immediately after purchase.

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TABLE 9-2
German Packaging Ordinance
Summary of Stakeholder Roles and Responsibilities

Stakeholder	Role and Responsibility
Manufacturer/Brand Owner	If the manufacturer/brand owner is located within the European economic community, they must prepare a "declaration of completeness" (as per above). The fees that are paid by the manufacturer/brand owner pay for collection, sorting, and processing of packaging.
Recyclers/Haulers	Recyclers and haulers compete for contracts through DSD. Other service providers compete as well. They are responsible for fulfilling the obligations of the contract.
State or Provincial Government	Compliance is on the State level, and the states decide whether a Dual System may be admitted as a service provider.
Local Government	Depending on state/local division of power, in some cases local authority oversee compliance on the part of retailers and manufacturers.

Section IV. Program Outcomes

1. Cost of Program Operation

Program operation including collection, sorting and recycling at its peak in the early 90's was about €2 billion per year. Due to higher efficiency and competition, cost for the total system including all competitors is about €1 billion per year.

2. Recovery Rates of Materials

"Mass flow verification" documents the collection and recovery performance of the entire system. As the sole service provider, DSD historically provided the mass flow verification for the entire country. Now that other companies are involved, there is a coordinated committee made up of all participating Dual System companies, which will coordinate all their sales data for one mass flow verification document.

For now however, because only DSD provides such documentation, and because they recycle more packaging than is declared to them (due to free riders), the recovery rates are in most cases higher than 100 percent. Therefore, it should be noted that currently there is no accurate recovery rate data available until all Dual System agencies amalgamate their data and produce a single mass flow verification representing all 16 federal states.

That said, DSD has long been meeting the targets mandated by the EU Commission for packaging recycling. Overall, Germany leads the European Union in terms of packaging recovery[12].

In 2007, 2.9 million tons of material that were licensed were recycled. However, approximately 393,000 tons of non-licensed material was also recycled.

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TABLE 9-3
Packaging Recycled Only by DSD GmbH, 2007*

Material	Recycled Quantity (Tons)	Licensed Quantity (Tons)	Recycling Rate
Glass	1,344,552	1,336,882	101%
Paper/ Cardboard	981,530	687,641	143%
Plastic	599,953	496,432	121%
Composites	178,892	211,936	84%
Tinplate	187,808	174,617	108%
Aluminum	29,779	21,989	135%
TOTAL	**3,322,514**	**2,929,497**	

*Complete data are not yet available for the entire system

3. Level of Encouragement of Green Packaging Design and Actual Packaging or Product Redesign Achieved

Because fees are based on weight, manufacturers/brand owners have an incentive to reduce the amount of material used in packaging. Qualitative analysis suggests that there has been some redesign for packaging, such as less exterior packaging for items like toothpaste, refills of detergents, etc.

Lightweight packaging, elimination of non-essential packaging, and increased use of concentrate and refill packs are more examples of steps taken to reduce the amount of materials used in packaging.

The German federal government commented on its waste reduction outcomes in a recent report issued by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. The report is entitled, “Waste Management in Germany: A Driving Force for Jobs and Innovation.” The 1991 Packaging Ordinance has resulted in the following reduction in packaging:

[12] Source: DSD

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"The Packaging Ordinance has proved to be an effective instrument. The annual increase in packaging consumption has been halted. Whilst in 1991 15.6 million tonnes of packaging waste was produced, that figure dropped to 13.7 million tonnes in 1997. Since 2000 the figure has leveled out at between 15.1 and 15.5 million tonnes. Overall the link has been severed between consumption of packaging and economic growth. The population is helping to create better recycling opportunities through its willingness to collect waste.

Recovery of used packaging has been continuously increased: 6.1 million tonnes were recovered in 1991, 12.7 million tonnes in 2006."

4. Ease of Use for Consumers

Consumers can leave material at the store where items are purchased (immediately after purchase only), or they may return material to a depot or use curbside containers.

5. Ease of Use for Retailers

Retailers must offer free recycling of secondary packaging at point of sale or the premises of point of sale. This applies to retailers with sales area of more than 200 square meters. If a manufacturer/brand owner or distributor has several branches, the sales area is made up of the square meters of all branches.

In addition, retailers as manufacturers/brand owners and sellers of service packaging must identify the weight of all their packaging sales and prepare a declaration of completeness.

6. Ease of Use for Manufacturers/Brand Owners

Manufacturers/brand owners must comply with the Packaging Ordinance individually and prepare a declaration of completeness. They must also organize to hire a "service provider" organization to handle compliance. After calculating the material weight and amount sold, they must calculate the total fees payable to their service provider (DSD or another Dual System company). There are fee reductions applicable depending on materials or product groups.

7. Impacts on Local Government

The majority of the collection contracts in Germany are serviced by private companies (haulers and recyclers). Therefore, there is little to no impact on local government unless they, under contract to a Dual System company, have been contracted to provide the collection service for their area.

8. Ease of Administration and Enforcement for State Governments

The state governments are responsible for the monitoring. Before 2009, the original mass flow verification data came from DSD on behalf of the other competing Dual System companies – now every company has to provide its own documentation to the states, and if it fails, its license to operate could be revoked. The Federal Ministry of Environment produces the total mass flow data and sends the data for Germany to the European Union. Note: Dual Systems only cover sales packaging. Industry and transport packaging is recycled separately, with high recycling quotas due to positive material value. There is no such organization as DSD for industry and transport packaging.

Because industry finances 100 percent of the nation's sales packaging recycling system, there is an inherent incentive to ensure that there is a minimum level of free riders in the system. As such, in terms of enforcement, there is a significant effort by all Dual System companies to ensure that all manufacturers/brand owners are complying with the Packaging Ordinance. However, with the introduction of competition, the incentive to capture smaller firms has declined, and therefore the free rider problem continues. Free riders are mainly found in service packaging and small retail structures (imports, small manufacturers, etc).

9. Ease of Use for Recyclers/Haulers

DSD contracts with sorters, recyclers, etc. Materials must be sorted and recycled as per the terms of the contract by the service provider.

10. Continuous Improvement and Program Innovations

DSD has gained efficiency in contracts and execution of services. In addition, with the introduction of other competitive Dual Systems, the service fees have declined over the years.

11. Actual and Potential for GHG Emission Reductions

By recycling sales packages, DSD saved about 68.5 billion megajoules of primary energy in 2007 – corresponding to the annual consumption of almost 410,000 Germans – and avoided the emissions of 1.5 million tons of CO_2 equivalents. This corresponds to the quantity of CO_2-emissions produced by driving 10 Billion kilometres with a compact class car – or 100,000 kilometres driven with 100.000 cars.

12. Actual and Potential for Other Pollutant Reductions

These data are not published.

Additional Program Information

PRO Europe is an organization that was founded by the DSD and others in 1995. It is the umbrella organization of all national

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Packaging Ordinance (Duales System)

producer responsibility systems and is a platform for information exchange for industry financed compliance schemes in Europe[13].

PRO Europe has 130,000 companies as licensees and over 460 billion packaging items have been labeled with the green dot symbol. Thirty-one national compliance schemes operate under the umbrella.

In addition, Germany and DSD work under the 1994 European Union Packaging and Packaging Waste Directive, but Germany has the ability to set higher diversion goals and requirements than those required by the European Union.

How the Money Flows

Each manufacturer/brand owner must register with a Dual System and pay fees to the Dual System based on the amount of packaging (by type) that is sold in the country. Each compliance scheme has an individual contract with the company responsible for the collection and pays in relation to its market share. Obliged industry pays for the collection, sorting and recycling/recovery for the packaging put on the market. DSD offers, as all other compliance schemes do, are for packaging material based on a certain price per kilogram. All schemes are using the same collection infrastructure, but are "buying" sorting capacity on the market based on their share of packaging in the system.

[13] Source: PRO Europe

Section I. Program Summary

In Germany[1], there are two beverage container deposit-return systems. Refillable bottles have a voluntary deposit that was placed on the containers by the manufacturers. The government does not require a deposit on refillable bottles, but the manufacturers use the deposit to encourage consumers to return the refillable bottles. One-way containers have a mandatory deposit that was imposed by German law in 2003. Both deposit systems are managed by the manufacturers. From the consumer's point of view, the two systems operate together seamlessly.

The German brewers and bottled water producers have placed deposits on their refillable bottles for decades, and consumers have returned the bottles to receive a refund of their deposits. In Germany, up until the 1960's, beverages were generally bottled in refillable containers with deposits.

In 2003, as a result of an ongoing decreasing market share of refillable bottles, most one-way (non-refillable) beverage containers were forced into a new deposit-return program as mandated by the German government and administered by beverage fillers.

The current deposit levels in Germany are as follows:

1. For refillables, the voluntary deposit is 8 eurocents for beer bottles in 0.33 liter and 0.5 liter sizes.
2. For refillables, the voluntary deposit is 15 eurocents for water, soft drink or juice bottles in 0.5, 0.7, and 1.0-liter sizes.
3. For one-way containers, the mandatory deposit is 25 eurocents for all containers, including glass, plastic and metal containers, containing beer, water or soft drinks, in sizes of 0.1 to 3.0-liters.

Originally, the law forced retailers to take back only those brands of beverages that they sold, which lead to an increasing number of individual bottle brands sold by retailers. The program was so complex for consumers that the government amended the law so that retailers were obligated to take back all "like" material (e.g., glass, aluminum, etc.) that they sell instead (with exemptions for very small shops that are still allowed to limit the takeback to the brands sold by them). The amendment passed in December 2004.

[1] For reference, the population of Germany is approximately 83 million people for 2009, and the population of California is approximately 37 million people (2008 estimate).

Germany

Deposit-Return

Today, about 12-14 billion single-serve beverages and tens of billions of refillable beverages sold in Germany carry a deposit.

Section II. Program Elements

1. Program Description

A deposit system was enacted in Germany on one-way beverage deposit containers because of the German Packaging Ordinance[2] ("Packaging Ordinance"), which required the implementation of a deposit if the refillable market share fell below 72 percent. The market share for refillables fell below 72 percent in 1997. The deposit came into effect in 2003 with the following objectives:

1. Protect the environmentally beneficial refillables systems;
2. Reduce littering from one-way beverage containers; and,
3. Achieve high redemption and recycling rates.

The Packaging Ordinance contains a goal for the market share for refillable and ecologically advantageous packaging:

> *"This ordinance aims to increase to at least 80 percent the share of beverages filled into reusable drinks packaging and ecologically advantageous one-way drinks packaging. The Federal Government shall conduct the necessary surveys on the respective shares and shall publish the results annually in the Federal Gazette. The Federal Government shall assess the impact on waste management of the provision contained in Articles 8 and 9 by no later than 1 January 2010."*[3]

The 25 eurocent deposit was mandated by law on non-refillable beverage containers made of metal, glass and plastic, with the exceptions of cartons, tubular bags, and stand-up pouches. The following beverage types have been added to the list of beverage affected by the law:

- In 2003, the law included mineral water, beer, and carbonated soft drinks.
- In 2006, the following beverages were added to the program: alcoholic drinks and non-carbonated drinks.
- In 2008, dietetic drinks were added to the program.

Refillable bottles have been the industry standard in Germany and have voluntarily been refilled and (at end-of-life) recycled through the independent use of voluntary deposits. (Umwelthilfe)

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[2] Source: Ordinance on the Avoidance and Recovery of Packaging Wastes (Packaging Ordinance - Verpackungsverordnung - VerpackV1 of 21) August 1998. (Federal Law Gazette I p. 2379). The Fifth Amendment - April 2008.

[3] Source: Ordinance on the Avoidance and Recovery of Packaging

2. Products Covered/Not Covered by the System

For the government-imposed mandatory deposit on one-way containers, beginning in 2003, covered products included beer, carbonated soft drinks and water. In 2006, non-carbonated soft drinks and alcohol drinks were added to this system. In 2008, dietetic drinks were added.

Containers for milk products, fruit and vegetable juices, and dietetic products directly designed for infants are not covered by the system.

In addition, beverages packaged in "eco-advantageous" packaging are exempt from the deposit return program. These include, drink cartons (brick packs, gable top cartons); drinks in the form of polyethylene bags; and stand-up bags. This "eco-advantageous" definition was attained through life-cycle assessments undertaken by the German government.

3. Program Scope and Targets

The recycling goal for one-way containers is consistent with the Packaging Ordinance. Specifically, recycling rate minimums are glass bottles: 75 percent; tin/steel: 70 percent; aluminum: 60 percent; and plastic: 36 percent. The plastic recovery minimum is 60 percent. Of that, amount 60 percent, or 36 percent of the total, must be recycled, and the remainder can be used for waste to energy.

4. Supporting Regulatory Framework

The Packaging Ordinance was adopted by the German federal government in June 1991. It placed a legal obligation on trade and industry to take back and recycle transport[4], secondary[5] and sales[6] packaging.

The Packaging Ordinance identifies a clear hierarchy for the handling of packaging waste. First packaging waste must be prevented or reduced. Secondly, used packaging must be reused

[4] "Transport" packaging is defined in the Packaging Ordinance as "*packaging that facilitates the transport of goods, protects the goods from damage during transport or is used in the interests of transport safety and arises at the distributor.*"

[5] "Secondary" packaging is defined in the Packaging Ordinance as "*packaging that is used as packaging additional to sales packaging and is not necessary for transfer to the final consumer for reasons of hygiene, durability or the protection of goods from damage or contamination.*"

[6] "Sales" packaging is defined in the Packaging Ordinance as "*packaging that is made available as a sales unit and arises at the final consumer. Sales packaging within the meaning of the Ordinance shall also include such packaging provided by retailers, restaurants and other service providers as facilitates or supports the transfer of goods to the final consumer (service packaging) and disposable dishes.*"

Germany

Deposit-Return

Germany

Deposit-Return

or recycled by returning through the production loop. Only packaging waste, which cannot be prevented, reused, or recycled may be disposed of by means of incineration or landfilling.

The Packaging Ordinance Amendment sets targets for the recycling of sales packaging.

At the beginning of 2003, mandatory deposits were introduced for most single-serve, one-way beverages, as provided for in the Packaging Ordinance. By May 2005, a third amendment to the Packaging Ordinance simplified the new deposit system.

5. Funding Mechanism

Beverage "fillers" and retailers (first importers) pay for 100 percent of the system; as well as for the deposit-return system of beverage containers and for the separate collection of the rest of the sales packaging. Costs are totally internalized, and there are no formalized fees in the system. As far as the deposit-return system for the beverage containers is concerned, industry keeps unredeemed deposits (estimated at more than €140 million) and retailers keep material revenues. Other details about the costs and funding sources for the system are not available because it is a program that is managed and funded by industry and the financial information is considered proprietary.

6. Deposit Collection Point

Deposits are originally charged by the beverage distributors to the retailers, who charge consumers at the point of purchase. Deposits are redeemed when containers are returned by consumers and subsequently by their retailers. Any unclaimed deposits are kept by the beverage fillers.

7. Program Operations (Collection and Processing)

Program operations are independent and can be through individual retailers and bottlers or through third parties managing the transactions. Collection from consumers is done by retailers. Retailers must take back any beverage containers that they sell based on material type (e.g., glass, plastic, metal, etc.). Small retailers under 200 square meters are only required to take back those same brands that they sell.

Bottlers and retailers individually choose how they will execute their responsibility for other operations. These other operations include finance clearing, information technology ("IT") systems, selling and servicing reverse vending machines ("RVMs"), logistics, sorting, and recycling.

If a retailer wants to charge a handling fee from the bottler for the service of taking containers back and sorting them, an individually agreed "clearing fee" is negotiated between the bottler and the retailer.

The flow of materials is shown graphically in Figure 10-5, at the end of this case study.

8. Status of Competition within Program Operations

Operations are undertaken by third party companies that provide some or all of the services within the operations scope (finance clearing, IT systems, sorting/counting, etc.). All containers are bar coded using a barcode system, which is supported by the Der Gruene Punkt (DPG)[7], and all automation is required to meet the basic standard. As such, companies may provide all or some of the required operational needs of bottlers and retailers. This "modular" approach to private sector servicing optimizes competition in the system.

9. End-of-Life Management (Reuse and Recycling)

Collected materials either are refilled (refillable bottles) or recycled (one-way bottles and refillable bottles after exiting the refillable loop). Refillable glass bottles are refilled at a rate of about 50 times before being recycled. Refillable PET plastic has an average of 15 trips before being recycled.

One of the reasons for introducing the mandatory deposit was that the refillable quota for beverage containers was decreasing (other reasons being reduction of littering and enabling high quality recycling). The introduction of the deposit on one-way containers has led to an overall increase in the use of refillable bottles for beer. Refillable beer bottles are now approximately 85 percent of the total beer containers, as compared to 68 percent before the deposit. For other beverage segments, like soft drinks and mineral water, the introduction of the one-way deposit led to initial increases in market shares for refillable bottles. However, mainly due to drastic market shifts (now more than 50 percent of the mineral water sold in Germany is solid by the hard discounters only selling beverages in one-way packaging), the refillable mineral water and soft drink bottles have decreased their market share and now constitute around 34 percent and 31 percent of the market, respectively. Refillable juices (which are not subject to the deposit) represent less than 10 percent of the juice market.

10. Physical Infrastructure Needs

The German bottle deposit system has been developed with both manual take-back systems and sophisticated technology that handles both voluntary deposit beverage containers and mandatory one-way deposit containers. The system utilizes the following:

[7] Der Gruene Punkt is the Green Dot Symbol trademark of Duales System Deutschland (DSD). DSD is a company that takes on the legal obligation for compliance with the Packaging Ordinance for other companies. For more, see Section 9 of this report.

1. RVMs that can read barcodes, shape of bottle and labels that are printed using a proprietary infrared ink;
2. A computer database with relevant information to provide accurate refunds;
3. Storage spaces to collect the containers (whether the retail site uses manual or automated technology);
4. A system to track deposit payments and refunds; and,
5. Large Material Recovery Facilities with specialized equipment to count and process containers.

Section III. Stakeholder Roles and Responsibilities

TABLE 10-1
German Beverage Container
Summary of Stakeholder Roles and Responsibilities

Stakeholder	Role and Responsibilities
Consumer	Pays deposit on deposit-bearing containers (refillables and single-serve) and returns containers to retail outlet. At the return of the containers, the consumer collects the deposit back.
Retailer	Retailers must collect all deposit-bearing empty beverages that they sell, based on packaging material type (metals, plastics, glass). In addition, retailers are required to: 1) Supply, finance, and electronically link RVMs, and operate counting centers; 2) Complete reverse logistics including supplying collecting boxes and/or crates; 3) Sort, process, and recycle empty beverage containers; and, 4) Document quantities of returned containers. Retailers can authorize service providers to act as a bundling interface or carry out these tasks themselves.

TABLE 10-1
German Beverage Container
Summary of Stakeholder Roles and Responsibilities

Stakeholder	Role and Responsibilities
Manufacturer/Brand Owner	Bottlers are responsible for: 1) Keeping the deposit accounts; 2) Financial clearing – reimbursing the retail service provided with the deposit amount; and, 3) Reimbursing the retailer with an individually agreed "clearing fee" or handling fee. Bottlers can authorize service providers to act as a bundling interface or carry out these tasks themselves.
Recyclers/Haulers	Recyclers and haulers are service providers that are contracted by retailers to collect, count, process, and recycle container.
State or Provincial Government	Federal government has little involvement and does **not** require reporting from the DPG.
Local Government	None.

Section IV. Program Outcomes

1. Cost of Program Operation

System costs are internalized by industry, and that information is considered proprietary. Bottlers keep the unredeemed revenue (between 170M - 300M Euros per year based on a 95-98 percent return rate), and retailers keep material revenues.

2. Redemption Rates of Containers (or Recovery Rates)

The program collects about 95-98 percent of all non-refillables sold.

3. Level of Encouragement of Green Packaging Design and Actual Packaging or Product Redesign Achieved

Drink cartons (such as brick packs and gable top cartons), drinks in the form of polyethylene bags, and stand-up bag packages are exempt from the deposit return program as a result of a life-cycle analysis undertaken by the German government which showed that these packages were as eco-friendly as refillables. Such packaging is termed "eco-advantageous" in the Packaging Ordinance.

All non-refillable recovered container materials are recycled.

Germany

Deposit-Return

The higher deposit value on non-refillables encourages the use of refillable bottles (8 and 15 eurocents for refillables versus 25 eurocents for non-refillables). The use of refillable bottles has increased for beer since deposits were added to non-refillable containers. Before introduction of the deposit on non-refillable containers, the trend for mineral water and soft drinks was clearly towards non-refillable containers. In the first years after introduction of the deposit, this trend was reversed. However, due to market changes for mineral water and soft drinks (higher market share by discounters, selling only non-refillable containers), the trend towards non-refillable containers in these segments has continued since the introduction of the deposit.

Today, the refillable beer bottle share is approximately 85 percent as compared to 68 percent before the deposit. The refillable beverage shares for mineral water and soft drinks have not experienced a sustainable increase. Currently, the refillable share for mineral water and soft drink bottles is 34 percent and 31 percent respectively. Refillable juices, which are not subject to the deposit is less than 10 percent.

Average refilling statistics are as follows:

- Glass refillable bottles are refilled and circulated an average of 50 times before being recycled.
- PET refillable bottles are refilled and circulated about 15 times before being recycled.
- Plastic crates that hold beverage containers and which are used to transport beverages by consumers are circulated an average of 100 times before being recycled.

4. Ease of Use for Consumers

Customers take bottles back to stores throughout the country to redeem refunds. Refillable bottles can be returned individually or in crates, which also carry a deposit. The crates facilitate an optimized logistics system for the refillable containers (distributing the bottles to and from the filler, and between wholesale, retail and customers). Non-refillable bottles are generally bought and returned without crates. However, one existing non-refillable system (Petcycle) is also using crates for the logistics. Returning crates of containers often necessitates that consumers have vehicles in order to get the bottles back to the store. During busy times, consumers may have to wait in line to access RVMs or the manual labor collecting the containers.

Machines can also reject some containers if they are not under deposit and further extend the return process for consumers.

5. Ease of Use for Retailers

Retailers have the greatest physical responsibility in the deposit-return system. First, they must track the payment of deposits to

bottlers and the refunds paid out to consumers. Second, retailers must provide floor space for RVMs, electricity to run the machines, maintenance and container storage. Some retailers must provide manual collection, sorting, and storing if they choose not to install RVMs. Third, retailers must also contract out the service of collection from the retailer, counting/sorting, and reporting back to bottlers in order to receive the refunds they paid out plus their clearing fee, which is negotiated by the retailer with bottlers.

6. Ease of Use for Manufacturers/Brand Owners

Manufacturers must comply with the Deutsche Pfandsystem GmbH labeling requirements. They must ensure that deposits are collected from retailers and refunded.

7. Impacts on Local Government

The program reduces littering costs and waste management costs associated with non-refillables ending up in the waste stream.

8. Ease of Administration and Enforcement for State or Provincial Governments

There are no requirements for state governments.

9. Ease of Use for Recyclers/Haulers

The universal barcode system that makes up the standard under which all service providers operate has made the system competitive for recyclers/haulers. Most of these businesses also provide other services, including IT systems, sorting/counting, clearing finance, etc. Beyond the tracking requirements, hauling and recycling of beverage containers is typical from an operations perspective.

10. Continuous Improvement – Program Innovations

The revised deposit-return system introduced in 2006 has eliminated the need for customers to keep their receipts and return containers to the store of purchase. It has also increased the types of containers subject to the deposit, and subsequently increased the level of collection and recycling of containers significantly. The proportion of beverages sold in refillable containers has also increased for beer.

Littering statistics for beverage containers have improved significantly. According to a study conducted by Witzenhausen Institute, in 2002, there were approximately one to two (1-2) million one-way beverage containers littered in Germany, and they constituted 20-25 percent of total litter. After the deposit was instituted on one-way beverage containers, littering of this type was reduced to nearly zero.

Germany

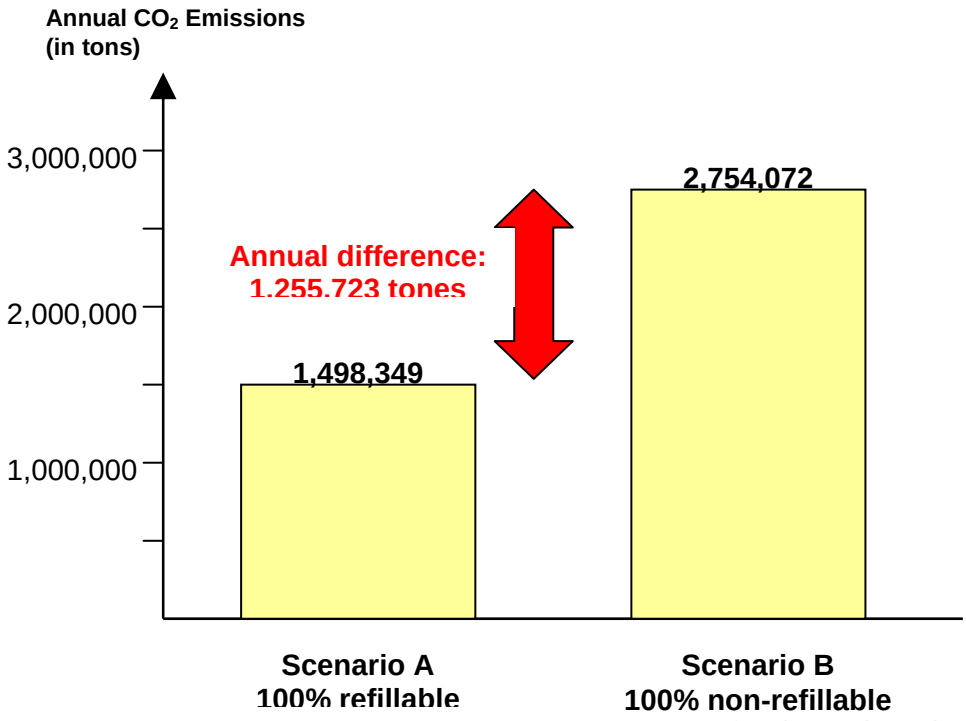
Deposit-Return

11. Actual and Potential for GHG Emission Reductions

Increasing the use of refillable bottles decreases the amount of one-way containers needed and the GHG emissions associated with producing them. Increasing the level of recycling by collecting significantly more non-refillable containers has also resulted in GHG reductions through the replacement of virgin materials (and its associated upstream primary resource extraction activities) with secondary feedstock.

The following chart shows the difference in annual GHG emissions resulting from the use of non-refillable and refillable bottles for non-alcoholic beverages in Germany. In “Scenario A”, all non-alcoholic beverages are filled in refillable bottles (20 percent glass refillable bottles and 80 percent PET refillable bottles). In “Scenario B”, all non-alcoholic beverages are filled in non-refillable bottles and drink cartons (80 percent one-way PET, 10 percent one-way PET with separate recycling (Petcycle system) and 10 percent drink cartons). The conclusion is that annually over 1.2 million tons of CO_2 can be saved if all non-alcoholic beverage containers are served in refillable bottles compared to non-refillable containers. This clearly demonstrates that refillable beverages are environmentally preferable to single-serve containers. See the following figures for details.

FIGURE 10-1
Comparison of Annual CO_2 Emissions
Resulting From Non-refillable and Refillable Bottles
for Non-Alcoholic Beverages in Germany



Source: Ifeu /GDB (2008)

12. Actual and Potential for Other Pollutant Reductions

Increasing the use of refillable bottles decreases the amount of non-refillable containers needed and the pollution associated with producing them. Increasing the level of recycling by collecting significantly more non-refillable containers has also resulted in pollution reductions through the replacement of virgin materials.

The following charts provide a comparative environmental impact analysis by container type. Specifically, environmental indicators such as material consumption, global warming, summer smog, and acidification were all measured for various beverage containers packaging (e.g., aluminum, tin plate (steel), PET recyclable, PET refillable, and glass refillable). The results consistently demonstrate that refillable PET bottles, followed by refillable glass bottles are the most environmentally friendly in all categories.

FIGURE 10-2
Material Consumption

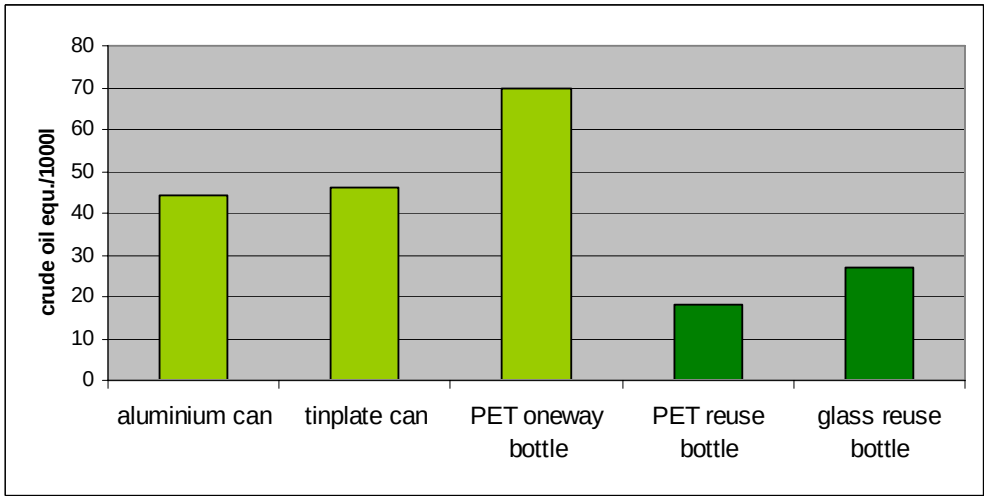
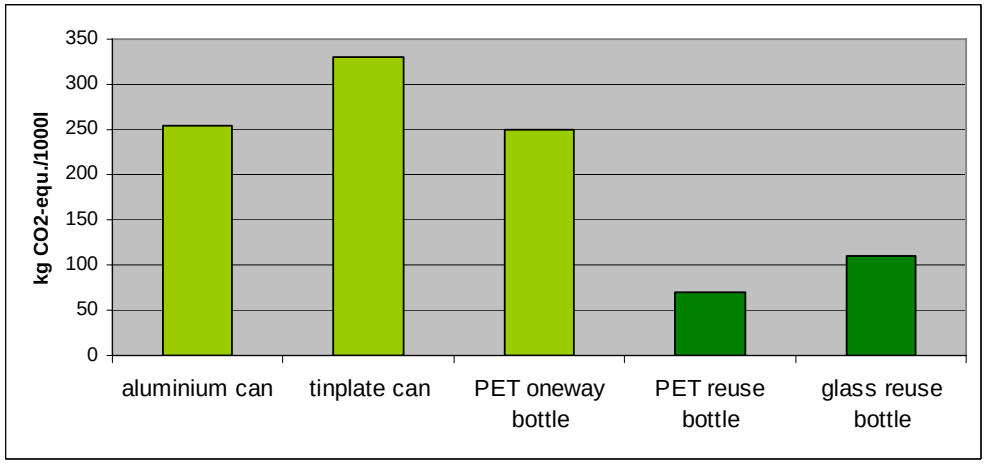


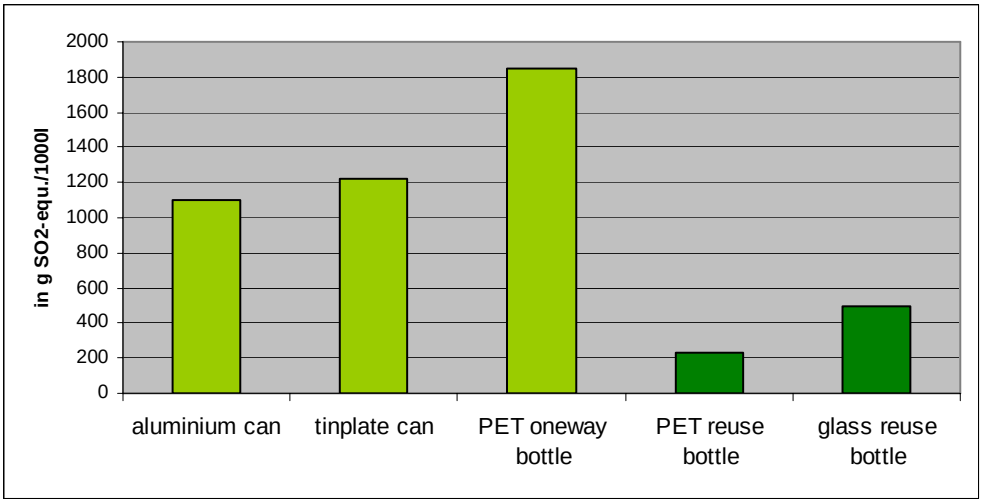
FIGURE 10-3
Global Warming Potential



Germany

Deposit-Return

FIGURE 10-4
Acidification



Additional Program Information

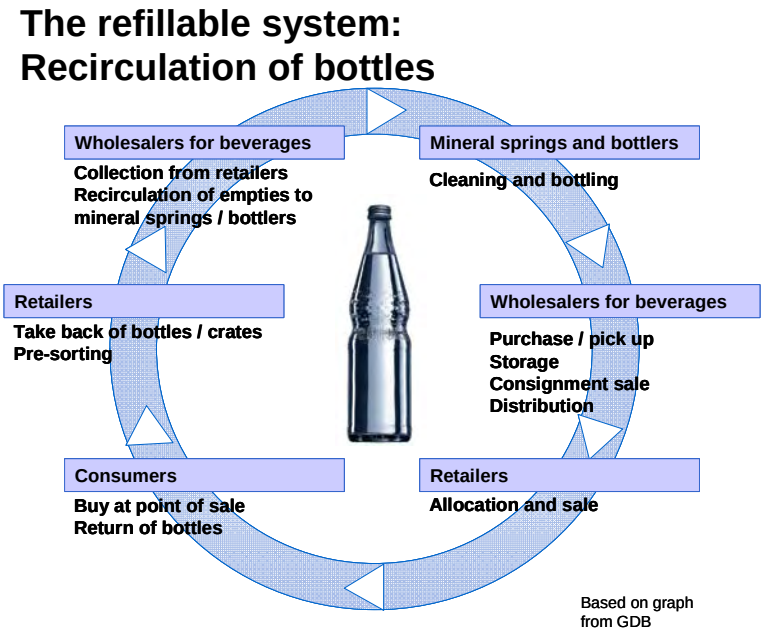
It is estimated that refillable bottles provide 5 times the number of jobs by volume to beverages sold than non-refillable beverages.

The new deposit-return program for non-refillable containers achieves a collection rate of about 95-98 percent versus the original recovery system (residential curbside collection) which achieved only ~40 percent collection.

In addition, the quality of material collected is more preferable from recyclers, enabling higher-end (bottle-to-bottle) recycling, and rendering greater material revenues from the sale of material.

The following figure (10-5) identifies the flow of refillable bottles in Germany.

FIGURE 10-5



Section 11

Findings and Recommendations

Introduction

The existing California System for beverage container recycling in California is among the most comprehensive in the nation and is the largest overall beverage container recycling system in the United States. However, it is not yet achieving the stated program goal of an 80 percent statutory recycling rate[1]. The recycling rate for 2007 was 67%.

The operators of the systems we studied reported that the three major elements of success for beverage container deposit-return systems are:

- The deposit level;
- Public education; and,
- Consumer access to recycling points (both redemption centers and recycling bins in public spaces, like parks).

Currently, the Department does not fully control any of these elements. The legislature sets the value of the deposit and the public education spending limit. Consumer access is developed mainly by the private sector and municipalities.

Each of these three elements of success is currently at lower levels in California than they are for other systems we studied:

- Beverage container deposit refund amounts are lower than many of the other systems we studied;
- Public education spending per capita is lower than other systems we studied; and,
- Consumer access to redemption centers (on a per capita basis) is also lower than most of the other systems we studied.

In addition, the Department has limited operational and financial control of other system components:

- Many of the program activities are chosen through the legislative process rather than by the Department, such as the recent programs for multi-family recycling and state parks (see Table 4-6 for program expenditures); and,
- State Government approves expenditure budgets and personnel levels for the Department.

Furthermore, from 2002 through the 2007/08 fiscal year, the California Beverage Container Recycling Fund ("CBCRF") has

[1] California Public Resources Code Division 12.1, Chapter 1, Section 14501 (c)

Findings and Recommendations

made loans that total $352.3 million to the State General Fund.[2] Additional loans are budgeted for the 2008/09 and 2009/10 fiscal years.[3] Recent temporary borrowing of cash from the fund to assist with the current statewide deficit has resulted in the Department suspending millions of dollars of grant-funded projects that had already been awarded and initiated.

The financial resources that have been borrowed from the CBCRF (i.e., over $352 million dollars of unredeemed deposits, through 2008) may have been more than sufficient, if spent on program improvements, to increase the recycling rate to 80 percent. As stated above, the Department's spending authority has been limited to the programs approved by the legislature. In contrast, the other non-governmental case study systems that were reviewed (in Canada, for example) have operational and financial control of their systems[4] and set their own program priorities to ensure that they meet the recycling rate goal. In fact, all of the other case study systems reviewed had full access to unredeemed deposit funds and the ability to use those funds to implement programs to meet the key system goals.

If the California system is to have the best opportunity to maximize redemption rates, a strong case can be made that the Department needs to have:

- Greater access to the full financial resources available from the unredeemed deposits in the CBCRF; and,
- The ability to set spending and program priorities in accordance with the strategic goal of increasing the recycling rate to 80 percent.

Many of the recommendations in this report are dependent upon the Department having greater financial and operational control of the system.

Summary of Recommendations

A summary of our recommendations is provided below. A more detailed discussion of these recommendations is provided in the following section.

[2] Loans were made from the CBCRF, and from two sub-accounts, namely, the Glass Processing Fee Account and the PET Processing Fee Account. These loans must be repaid with interest.
[3] Additional loans of $99.4 million to the General Fund and $67 million to the Air Pollution Control Fund are budgeted, but have not yet been made.
[4] See each case study for a description of the decision-making structure, which is usually the stewardship organization, in consultation with the provincial government.

Findings and Recommendations

1. Recommendations to Improve the Recycling Rate

1.a. Increase the CRV value to a level between 6 and 10 cents for small containers and between 11 and 20 cents for large volume containers;

1.b. Increase per capita public education spending; and,

1.c. Increase consumer access to redemption centers through greater visibility of existing centers and establishment of new centers or reasonable alternatives in “unserved zones”.

2. Recommendations to Support Green Product Redesign and Reduced Environmental Impacts

Make programmatic structural changes to support greater green product redesign and reduced environmental impacts including:

2.a. Adding wine and spirits to the program;

2.b. Investigating the reintroduction of refillables to the system;

2.c. Continuing support for development of “local” processing capacity;

2.d. Implementing tracking of materials to assure that all materials are recycled;

2.e. Evaluating potential changes to processing fee calculations to align with Departmental goal of green product redesign; and,

2.f. Research expanding recycled-content requirements for beverage containers.

3. Recommendations that Can Lead to Greater Effectiveness of the System

Evaluate other improvements that can lead to greater effectiveness of the system, including:

3.a. New fraud prevention techniques that are being used elsewhere; and,

3.b. Evaluating the amount that the Department spends per container recycled through each of the various redemption or return points to determine the cost effectiveness of the various options.

Findings and Recommendations

Discussion of Recommendations

1. Recommendations to Improve the Recycling Rate

Recommendation 1.a. – Increase the Deposit and Redemption Value

It is recommended that the legislature:

- Increase the CRV for small beverage containers from the current level of 5 cents to a level between 6 cents and 10 cents; and,
- Increase the CRV for large beverage containers from the current level of 10 cents to a level between 11 cents and 20 cents.

The selection of the exact deposit amount should be made through careful study. In the past, regression analysis was used in a UC Berkeley study to determine the appropriate level of the deposit. A separate report by the Legislative Analyst's Office estimated the impacts on the fund balance of the CBCRF, and also recommended the increase in the deposit to raise recycling rates.

Goal of Deposit Refund

The goal of placing a deposit on containers is to provide an incentive to return the containers for recycling. According to a recent report for the United Kingdom on beverage container recycling, "If the deposit level is too low and the consumer is not sufficiently incentivized to return the empty beverage container, the return rate will be low and the deposit system has in effect failed."[5] We are not aware of any systems that achieve high beverage container recycling rates without a deposit, including mature curbside recycling programs that are fully-funded or partially-funded by industry, like those being operated in Germany and Ontario, Canada. Indeed, the U.S. average for beverage container recycling is less than 40 percent, while the recycling rates in states with deposit-return systems are above 60 percent for containers with a deposit.

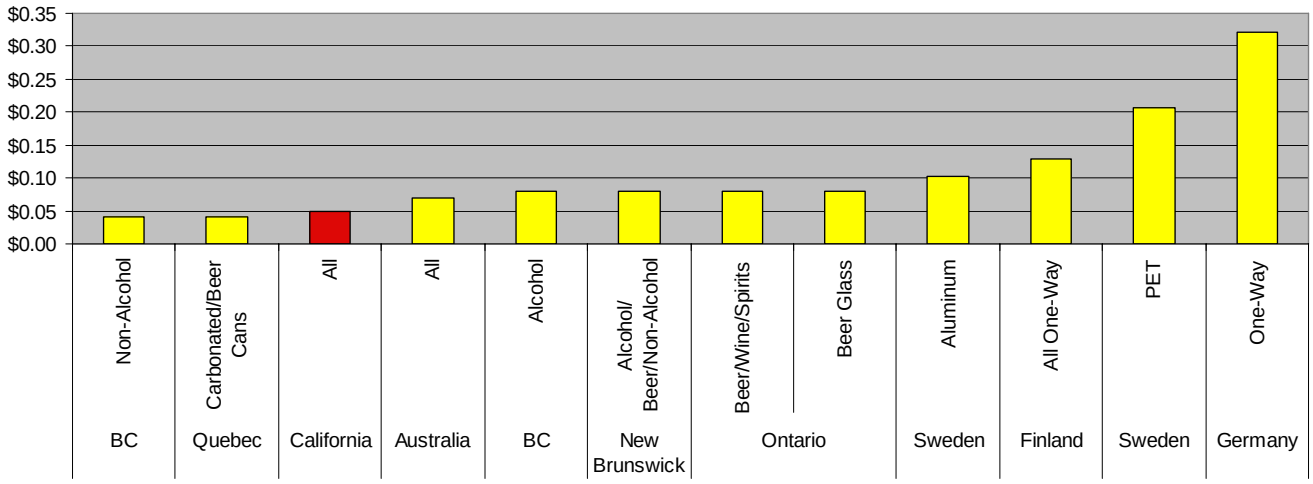
California's Current Deposit Refund Level and Comparisons to Other Deposit Refund Levels

California's current deposit/redemption values, at 5 cents for small containers and 10 cents for large containers, are among the

[5] "Deposit Schemes & Reverse Vending Systems: a review," Environmental Resources Management, 2008, prepared under contract to the UK Department for Environment, Food and Rural Affairs (DEFRA).

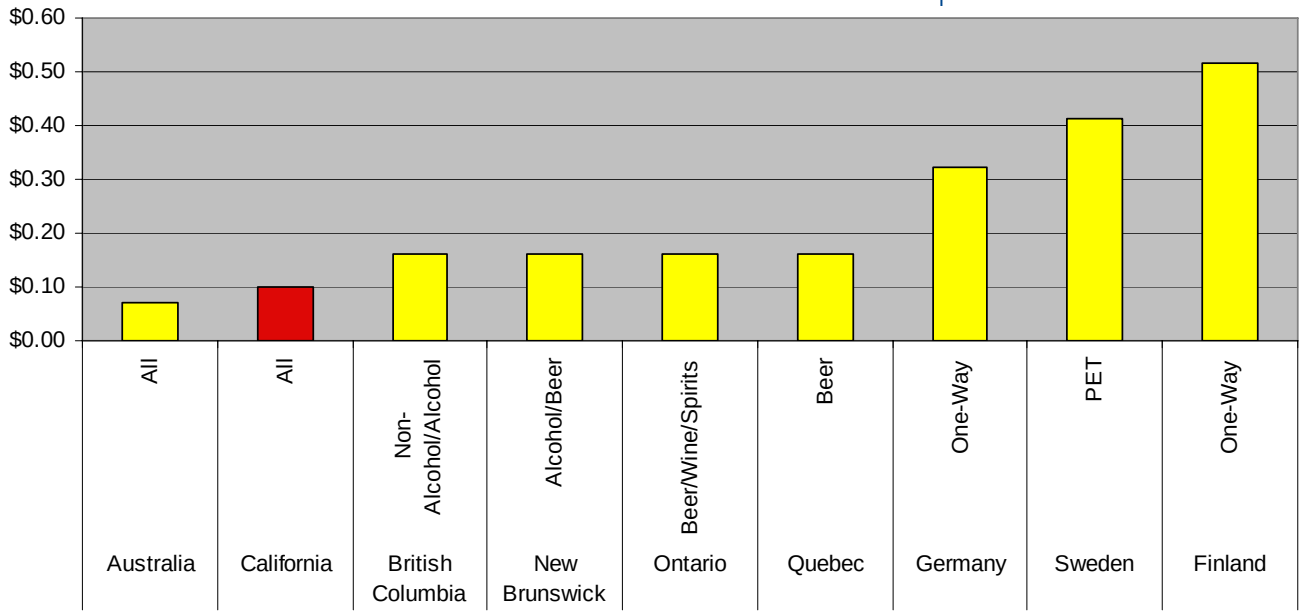
lowest of all the deposit programs we researched for this study, as shown in Figure 11-1 and Figure 11-2 below.

FIGURE 11-1
Small Container Beverage Refunds
(Under 1 Liter or 33.8oz)



Note: All values are shown in US Dollar equivalent values.

FIGURE 11-2
Large Container Beverage Refunds
(Over 450ml or 15.2oz)



Note: All values are shown in US Dollar equivalent values.

Findings and Recommendations

Table 11-1 provides a comparison of redemption values and recycling rates for California's program compared to other programs in various provinces and countries.[6] The California overall recycling rate is the lowest in the table, at 67% for 2007.

TABLE 11-1
Redemption Values and Recycling Rates for Various Provinces and Countries

Country, State or Province	Redemption		Product	Amount of Deposit (in USD)	
	Type	Rate		Small Containers (< 1 Liter unless otherwise noted)	Large Containers (> 1 Liter unless otherwise noted)
California	Non-refillable	67%	All	$0.05	$0.10
British Columbia, Canada	Non-refillable	76%	Non-alcohol	$0.04	$0.16
			Alcohol	$0.08	$0.16
	Refillable	95%	Beer	$0.08	$0.08
Finland (1)	Non-refillable	75%	All	$0.26	$0.52
	Refillable	95% - 98%	All	$0.08	$0.08
Germany	Non-refillable	95% - 98%	All	$0.32	$0.32
	Refillable	96%	Beer containers (0.33 & 0.5 L)	$0.10	$0.10
			Water & soda containers (0.5, 0.7, & 1 L)	$0.19	$0.19
New Brunswick, Canada	Non-refillable	72%	Non-alchohol	$0.08	$0.08
	Refillable	97%	Alcohol/Beer	$0.08	$0.16
Ontario, Canada	Non-refillable	78%	Beer	$0.08	$0.16
		67%	Wine/Spirits (<630 mL)	$0.08	$0.16
	Refillable	98%	Beer - Glass	$0.08	$0.16
Quebec, Canada	Non-refillable	68%	Carbonated Soft Drinks	$0.04	$0.04
		76%	Beer - Cans	$0.04 (size <450 mL)	$0.16 (size >450 mL)
	Refillable	98%	Beer - Glass	$0.08 (size <450 mL)	$0.16 (size >450 mL)
Sweden	Non-refillable	72% - 92% depending on container size and material type	Aluminum	$0.10	$0.10
			PET	$0.21	$0.41

(1) Finland also has higher deposit levels for certain containers

[6] When comparing recycling rates from one program to another, one should consider differences in the types of beverages and types of

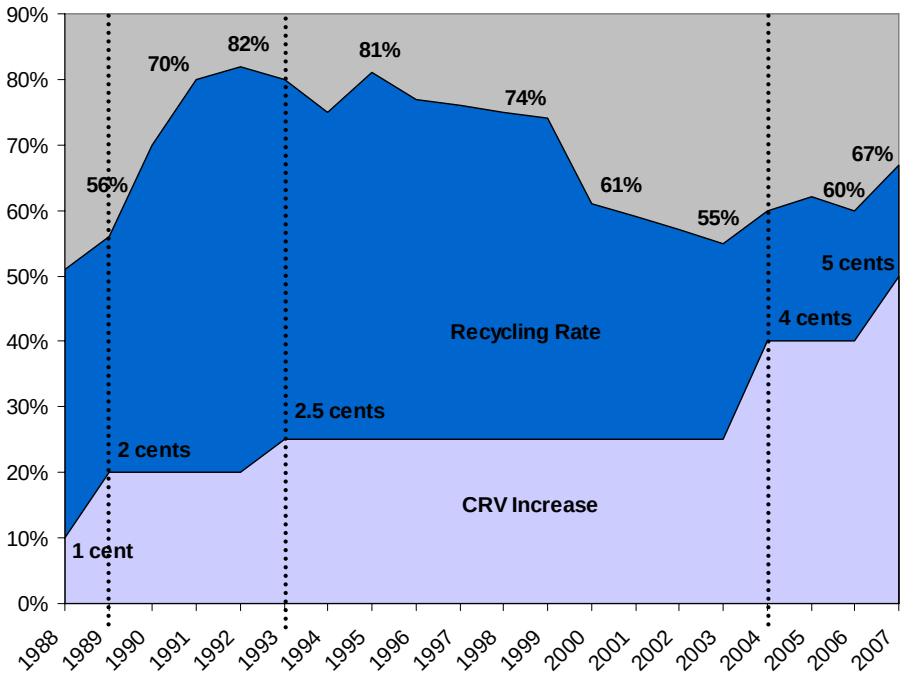
(Footnote continues on next page)

R3

History of California's Recycling Rate and CRV

Figure 11-3 depicts the relationship between the CRV paid and the recycling rate for the California system from the beginning of the program through 2007. As shown, in general, within two or three years of each CRV increase, the recycling rate increased and then peaked[7].

FIGURE 11-3 [8]
California CRV Increase versus Recycling Rates



containers covered, as well as many other differences between programs.

[7] In addition to the increase in CRV value in 2007, the State also invested an additional $5 million to educate the public about the increased deposit and redemption value, beyond the standard annual $5 million public education budget.

[8] According to the Department, "The sharp decreases in the recycling rates during calendar years 2000 and 2001 were due primarily to a change in the total sales resulting from the passage of SB 332 (Chapter 815, Statutes of 1999) and SB 1906 (Chapter 731, Statutes of 2000). These two pieces of legislation added new beverages and beverage container types, primarily new plastic resins, to the program. These actions created a notable rise in the sales of beverage containers, specifically PET. As a result, returns lagged behind sales, causing a notable decline in the recycling rates." (Source: California Department of Conservation. Calendar Year 2007 Report of Beverage Container Sales, Returns, Redemption & Recycling Rates, August 19, 2008).

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Regression Analysis and Studies of Deposit Levels

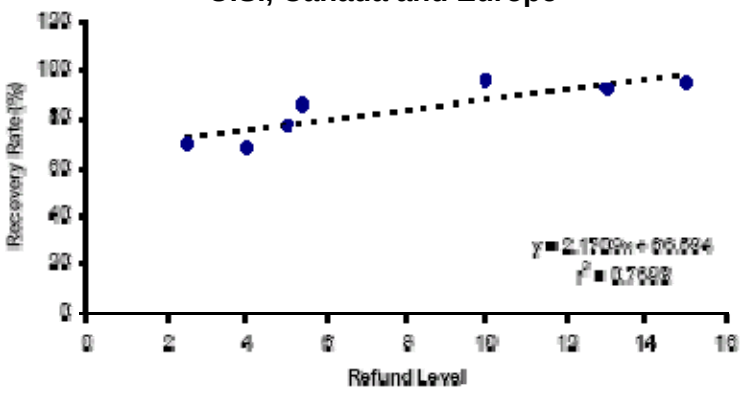
Two previous studies conducted in California recommended an increase in the CRV. A 2003 study conducted by the University of California at Berkeley[9] used regression analysis to choose the optimum value of the deposit. In 2003, the CRV was 2.5 cents, and the Berkeley study recommended increasing the CRV to 5 cents.

The other study was conducted by the Legislative Analyst's Office in 2006.[10] That study found, among other things, that:

- "While the legislature can reduce the recycling fund balance over time simply by decreasing the money coming in to the fund or by increasing the money flowing out of it, we think that it should, in general, be guided by actions that encourage consumers to recycle more than they do today;" and,
- "Raising the CRV beyond 5 cents and 10 cents may induce greater consumer recycling."

A study conducted by CM Consulting for the Alberta Beverage Container Management Board[11] provides a regression analysis using deposit levels from Europe, Canada and the US. The analysis, which is presented in Figure 11-4, shows a very strong relationship between the level of the deposit and return rates.

Figure 11-4
Plot of Recovery Values by Refund Level
U.S., Canada and Europe



[9] *California Beverage Container Recycling and Litter Reduction Study: A Report to the California Legislature* by University of California at Berkeley and by more than one report from the California Legislative Analyst's Office.

[10] State of California Legislative Analyst's Office. Analysis of the 2006-07 Budget Bill, Department of Conservation (3480). http://www.lao.ca.gov/analysis_2006/resources/res_05_3480_anl06html

[11] *Evaluating the Effectiveness of Deposit Levels on Beverage Container Recovery*, by CM Consulting, for the Alberta Beverage Container Management Board (BCMB), 2003.

A more recent 2007 study prepared for Alberta Environment in 2007[12] used a host of Canadian deposit levels for various categories of containers and their relative performance rates. Table 11-2 below, which is taken from the report, presents the total samples for refund levels used; the mean (average of redemption rates); and the median (the number separating the higher half of a sample, a population, or a probability distribution, from the lower half) for 5, 10, 20 and 40 cent refunds. In general, the 5 and 10 cent levels are for small containers. As shown, the 5 cent refund levels had an average redemption rate of just over 60 percent, and the 10 cent refund levels had an average redemption rate of over 83 percent.

TABLE 11-2
Refund Values and Redemption Rates
Regression Analysis Results

	Refund Levels			
	5-cents	10-cents	20-cents	40-cents
Total Samples	37	15	19	1
Mean (average of redemption rates)	60.6%	83.5%	72.5%	99.9%
Median	64.2%	85.2%	81.0%	99.9%

While the refund level is an important incentive to encourage container return, it is not the only factor that contributes to performance. Other factors highlighted in the Alberta study that may impact performance include:

- Convenience - method of return (i.e., retail or depot), hours of operation, cleanliness, etc.;
- Whether or not the material is a 'traditional beverage material' (e.g., glass, aluminum, PET);
- Duration of program (i.e., the length of time the program has been in place); and,
- Whether or not the beverage is primarily consumed either at home or in a licensed establishment (e.g., liquor, wine, or spirits).

Discussion of the Impact on Sales of Beverages from Increasing the Deposit

There are several factors that can impact sales of beverage containers, such as seasonal temperatures, economic climate, etc. As such, it is difficult to accurately measure the economic impact of an increase in the deposit level on sales. To date, there is no research that we are aware of that attributes a direct decline

[12] *A Review of cross Canada recovery rates and program elements for deposit return systems,* CM Consulting, August 2007.

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in sales as a result of a new deposit, or an increased level of a deposit. Conversely, data from a number of programs tends to support that there is no link between increased deposit levels and decreased sales.

A new consumer fee[13] was introduced in Alberta, Canada in 2001 on all non-alcohol beverage containers. The new fees ranged from 1 cent to 8 cents per container, by material type. Figure 11-5 below shows that there was no impact on sales as a result of the new fees.

FIGURE 11-5

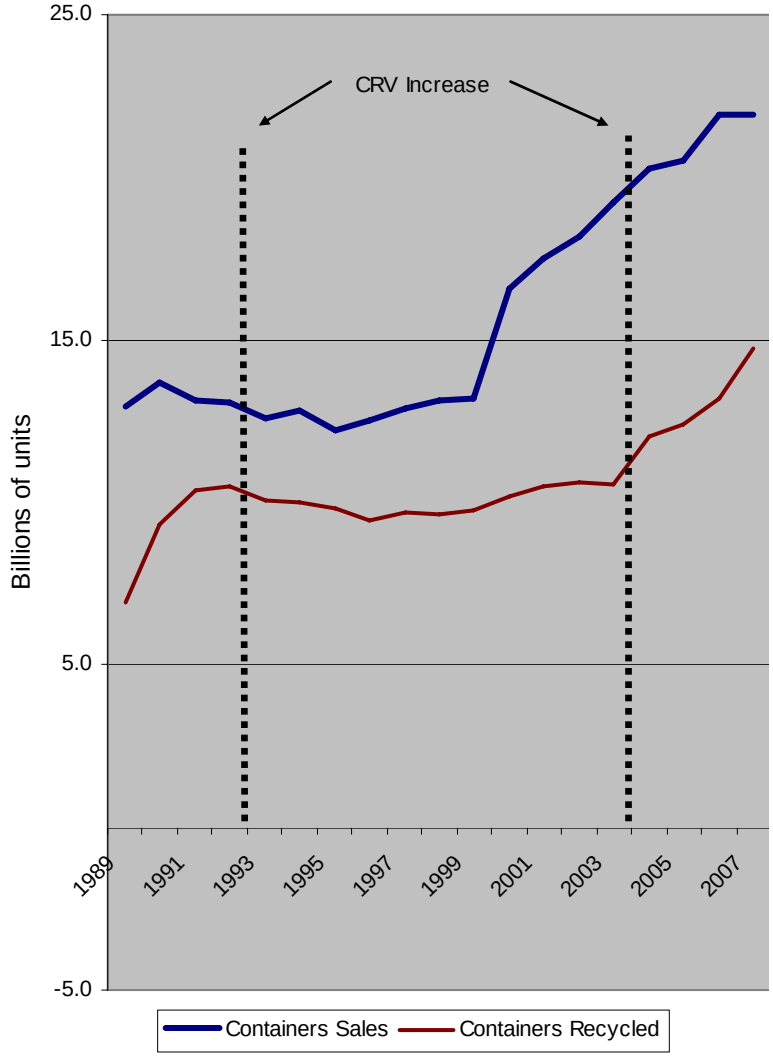
Similarly, in British Columbia, according to Encorp Pacific, there was no impact on beverage sales after the Container Recycling Fee (front-end fee) was implemented in 1999.

A third example is in California, where deposits were increased in 1989 from 1 cent to 2 cents; in 1993 from 2 cents to 2.5 cents; and in 2004 from 2.5 cents to 4 cents. More recently, in January 2007, the deposit was further increased from 4 cents to 5 cents for small containers and from 8 cents to 10 cents for large containers. As shown in Figure 11-6, for the first few years following the implementation of the CRV program in 1989, sales increased steadily until 1991, after which they had several years of decline

[13] The fee is called the "container recycling fee," and it is paid in addition to the deposit. It varies, based on material type.

and then in 2000 began to increase steadily again[14]. In the years directly following both CRV increases there was no disruption of sales trends, either upwards or downwards. This suggests that the introduction of the CRV, as well as two increases to the CRV, had no impact on sales.

Figure 11-6
Beverage Containers Sold and Recovered in California



Summary of Advantages and Disadvantages of Increasing the Deposit Level in California

Table 11-3 summarizes the advantages and disadvantages of increasing the deposit refund level in California.

[14] Note that a portion of the increases in 2000 and 2001 were due to adding more beverage types and container types to the program, as a result of the previously mentioned passage of SB 332 and SB 1906.

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TABLE 11-3
Advantages and Disadvantages of Increasing the CRV

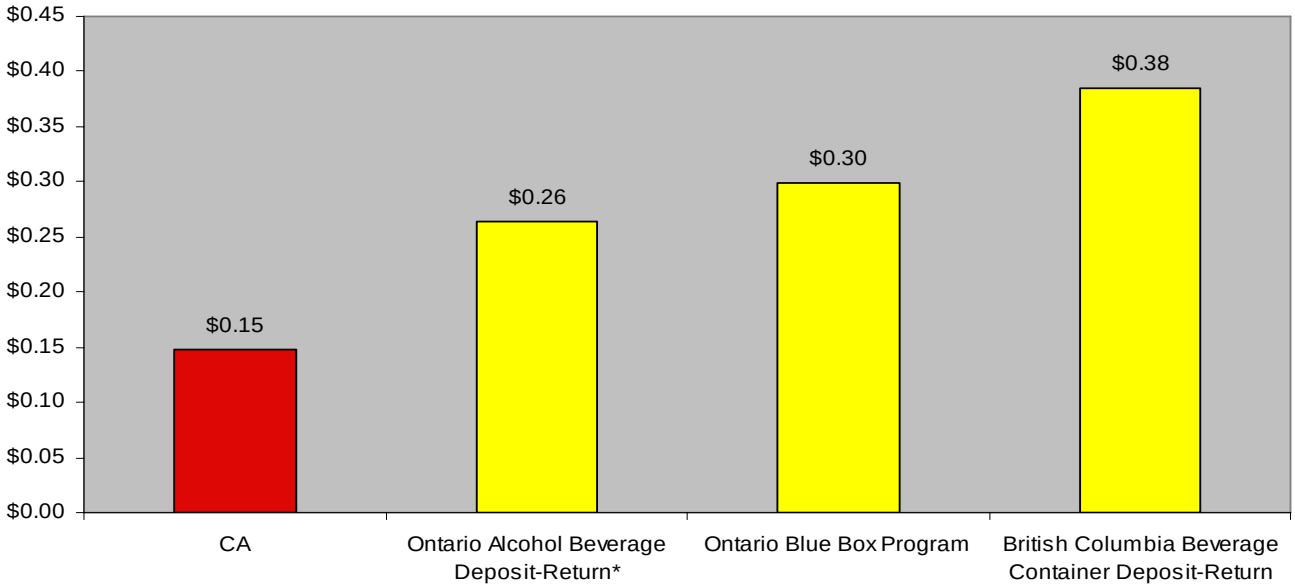
ADVANTAGES	DISADVANTAGES
▪ Increased recovery rates. ▪ Increased amounts of unredeemed deposits in fund. ▪ Increased volumes of returns in redemption centers, leading to better economies of scale in the centers, and potentially leading to improved overall service from redemption sites. ▪ Improved overall quality of material for recycling, as more materials are returned to redemption centers, rather than mixed with other materials in curbside programs.	▪ Potentially less redemption revenue for municipalities or operators of curbside programs, if containers are redeemed instead of placed in curbside bins. The increased value of the redemption may, however, compensate for the decrease in number of containers.

Recommendation 1.b. – Increase Public Education Budget

It is recommended that the legislature consider increasing the Department's public education budget to more effectively educate the public about how, what and where to recycle. Recent research conducted by the Department indicates that many Californians do not know how, what and where to recycle their beverage containers, and are calling for more information about recycling programs[15] [16]. The legislature has set public education spending at five million dollars per year through statute. As we researched beverage container recycling systems in other countries, we found that California's spending on public education is far below the spending of three other programs we studied (the beverage container recycling systems in British Columbia and Ontario, Canada and the Blue Box Program in Ontario, Canada). In order to compare the systems, which serve different sized populations, we calculated the spending on a per capita basis, and also converted Canadian to American dollars (Figure 11-7).

[15] "Maximizing California Consumer Commitment to Beverage Container Recycling: 2008 CA Statewide, Culver City, Riverside, Tracy, Los Angeles, San Diego," RIESTER, October 2008.
[16] The Province of British Columbia conducted similar research and has tailored their public education messages to give consumers very specific information about how, what and where to recycle.

FIGURE 11-7
Consumer Awareness Expenditures per Capita



Note: All values are shown in US Dollar equivalent values.
* LCBO Spending on public education for wine and spirits only.

As shown, California spends approximately $0.15 per capita per year on public education. The Ontario Alcohol Beverage Deposit-Return program spends $0.26 per capita per year, the Ontario Blue Box Program spends $0.30 per capita per year and the British Columbia Beverage Container Deposit-Return program spends $0.38 per capita per year.[17]

Recommendation 1.c. – Increase Access to Redemption Centers

Access to Redemption Centers

It is recommended that the Department increase access to redemption centers through greater visibility of existing centers and establishment of new centers or alternative redemption opportunities in "unserved zones". This will serve to both increase the overall number of centers and improve the equity of the system for all consumers. Alternative redemption opportunities may include additional supermarket-sited recycling centers, new in-store reverse vending machines, such as those being installed

[17] It is also worth noting that dollars spent on public education in California may not have as large an impact as dollars spent in Canada, because California residents are more culturally diverse, speak more languages, and the California media markets are very expensive.

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in several stores in California in the spring of 2009,[18] or Department-sponsored, separately located recycling centers. Increased enforcement at stores that are at the center of an unserved zone may also encourage those stores to provide a redemption center.

Every person who purchases a beverage that is covered by the Act pays a deposit on the beverage container. Ideally, every person who pays a deposit would have a convenient mechanism to return their empty beverage container and receive a refund of the deposit they have paid. Indeed, the Findings section of the Act states that, "it is the intent of the Legislature to encourage increased, and more convenient, beverage container redemption opportunities for *all* consumers"[19] (emphasis added).

It is true that most Californians who live in single-family housing have access to a curbside recycling program, and can therefore recycle their beverage containers conveniently in curbside bins. However, curbside programs do not refund the deposit to the consumer. Department statistics for 2007 also reflect the fact that only twelve percent of the total beverage containers redeemed are recovered through curbside recycling programs. Also, many residents of multi-family housing do not have access to curbside recycling programs, and opportunities to recycle in the commercial sector and public spaces are lacking in many areas of the State.

The Act was originally written to require redemption centers at or near many grocery stores. Convenience zones require a recycling center for deposit redemption and return of containers within a half-mile of supermarkets for non-rural communities and within three miles of supermarkets for rural communities. As of January, 2009, there were 3,770 convenience zones in the State. There were 2,150 zones with a recycling center (known as "served" zones), and 1,620 zones without a recycling center. The areas with no centers are categorized as either unserved zones, exempt zones or "hold" status zones ("hold" status indicates a zone is undergoing administrative review). Zones may be "exempt" when there is another reasonable recycling opportunity nearby, or when the number of containers redeemed is likely to be too small to support a center, which is sometimes the case in rural areas. There are 950 "exempt" zones in the State.

There are also 555 "unserved" zones, which is 15 percent of the total number of zones. In these unserved zones, the retailers are required to redeem a limited number of containers per customer at any open cash register or alternate location within the store. While

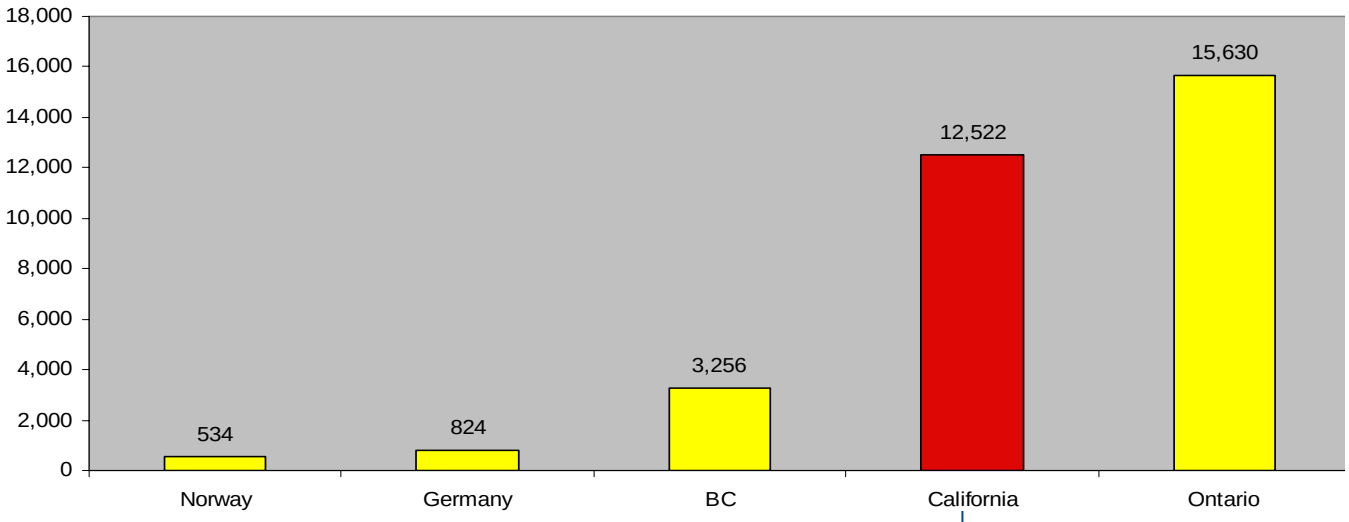
[18] TOMRA press release, March 10, 2009, regarding installation of new reverse vending machines in Albertson's stores.
[19] California Public Resources Code, Division 12.1, Chapter 1, Section 14501. (a)

this redemption option is technically available to consumers, it is not widely advertised, is not well known, and the number of containers collected directly through stores is likely very small (although specific estimates are not available). Given the number of unserved zones, a substantial portion of the State does not have easy access to a redemption center, although they likely have access to in-store redemption opportunities.

According to the Department, most of the unserved zones are in densely populated urban areas, including Long Beach and San Francisco, for example. One issue that creates unserved zones is that some cities have zoning requirements that do not allow recycling centers. Another issue that creates unserved zones is lack of space in urban areas. Encorp Pacific reported similar challenges with finding sites for a sufficient number of depots in the most urban sections of Vancouver, Canada.

The capita served per redemption location for five systems, is shown in Figure 11-8[20]. Germany and Norway are examples of systems that have redemption locations at most large beverage retailers, and so the capita served per redemption location is small (meaning there are a larger number of redemption locations per capita). British Columbia has four times as many redemption locations per capita as California. California and Ontario, Canada have the largest populations served by each redemption location (meaning there are a smaller number of redemption locations per capita). In Ontario, redemption locations are at The Beer Store, so returning containers is equally convenient as purchasing beer.

FIGURE 11-8
Capita Served per Redemption Location



[20] Figure 11-8 addresses redemption locations only. It does not address other recycling locations, such as recycling through residential curbside, commercial establishments or public space recycling.

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Recycling Center Aesthetics

In addition to improving access to redemption centers, the aesthetics of redemption centers may also play a role in their effectiveness. We visited various recycling centers in California to observe the condition of the centers and the consumer process of redeeming containers. We also discussed the condition of the various centers with Department staff that had observed additional centers in other parts of the State. We found a significant difference in the aesthetic appeal between many of the supermarket-sited recycling centers and the traditional (old-line) recycling centers, with the supermarket-sited centers being generally more aesthetically appealing. We also noted significant differences in the customer base of the two types of recycling centers. Many of the supermarket-sited recycling centers have a policy of not serving customers who use grocery store shopping carts to transport containers. We noticed that the customers at the supermarket-sited recycling centers had lower volumes of containers than the customers at the traditional (old-line) recycling centers. These latter customers often arrived with a shopping cart (or carts) full of containers, or a pick-up truck loaded with containers.

In addition, many of the "served" zones are served by traditional (old-line) recycling centers that may not meet the comfort and cleanliness standards of many consumers, and leave those consumers without the convenience of recycling that the Act intended. Even some of the supermarket-sited recycling centers are sometimes located behind a supermarket, for instance, and certain consumers may not consider it safe to use these sites to redeem their beverage containers.

While researching the beverage container system in British Columbia, we learned that Encorp Pacific had worked on an extensive remodeling program with the independent recycling center operators to bring the aesthetics and cleanliness of each center up to a similar minimum standard. The Department could work to improve recycling center aesthetics by setting minimum aesthetic standards and/or creating a funding source, such as a grant program, to assist with remodeling costs.

2. Recommendations to Support Green Product Redesign and Reduced Environmental Impacts

Recommendation 2.a. – Add Wine and Spirits to the Program

It is recommended that the California deposit-return system be expanded to include wine and spirits to increase the recycling rate of these containers, reduce problems caused by glass breakage in single stream recycling programs and to increase the supply of clean glass cullet in California.

Ontario Experience with Expanding Program to Include Wine and Spirits

In February 2007, Ontario (population 13 million) became the newest jurisdiction in Canada to introduce deposits on all wine and spirit containers (there were already deposits on beer containers). Ontario maintains one of the world's most comprehensive, regulated residential curbside programs with coverage of 99 percent of single-family households.

In a press release relating to the program expansion, the Environmental Commissioner of Ontario[21] explained, "About one-third of bottles and half of all plastic containers and aluminum cans sold at the Province's liquor stores are not recycled properly and are sent to landfills." He also cited concerns about glass breakage that occurs during collection and processing of recyclables from curbside programs.

Municipalities in Ontario that were collecting wine and spirit containers (mostly glass) in their curbside program were the main group supporting the expansion of the deposit system to include wine and spirit containers. Municipalities running curbside programs cited the high costs associated with glass collection, the wear and tear glass has on processing equipment and the low value this glass was worth, due to its poor quality once it had been processed. Poor quality glass meant low-end recycling markets, for uses like road aggregate and drainage material. The primary glass processor in Ontario[22] reports that expanding the deposit-return program to include wine and spirits resulted in a rapid and significant increase not only in quality, but quantity of secondary cullet, beyond what they had forecasted. It is assumed that the additional tonnage was not only from increased containers from the residential sector, but also from commercial generators (hotels, bars and restaurants), which were not recycling their wine and spirit containers prior to their inclusion in the deposit-return program.

California Demand for Clean Glass Cullet

There may be a future need in California for a greater supply of clean glass cullet, which can only be achieved through increased collection of a clean stream of glass containers. For many years, manufacturers in the State faced a lack of clean cullet availability. Some manufacturers did not meet the minimum content requirements, and this resulted in penalty payments. While

[21] The Environmental Commission of Ontario is the agency that enforces the provincial Environmental Bill of Rights and takes citizen complaints concerning environmental degradation and pollution.

[22] NexCycle, is a division of Strategic Materials Inc. and is the only beneficiation facility in Ontario, currently processing blue box glass and deposit-return glass.

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minimum content levels are being met today, with the growth of single stream recycling programs throughout California, availability of clean cullet in the future is not guaranteed. Some manufacturers have installed special equipment to clean glass from curbside single stream programs to make it useable for recycled content in glass bottles.

Inclusion of Wine and Spirits in Other Programs

Table 11-4 shows that about half of the programs we researched include wine and spirits in the deposit-return system. Germany Sweden and Denmark do not include wine and spirits in their deposit programs, but do have separate community glass collection sites nationwide.

TABLE 11 – 4
Systems Expanded to Wines/Spirits

Deposit System	Wine	Spirits
Australia	✓	✓
British Columbia	✓	✓
California	x	x
Denmark	x	x
Finland	✓	✓
Germany	x	x
Netherlands	x	x
New Brunswick	✓	✓
Ontario	✓	✓
Quebec	x	x
Sweden	x	x

Potential Benefits of Shifting Wine and Spirits Glass Containers from Curbside Recycling Programs to Redemption Centers

Many California municipalities employ a single stream approach for their curbside recycling program (i.e., collecting all paper fiber and containers mixed together in the same truck, as opposed to separate collection of paper versus containers). Single stream recycling programs may offer several cost advantages over source separated collection programs; however, the impact on lowering the quality of materials destined for recycling can be significant. Broken glass has the greatest negative impact on the

quality of other materials such as paper fiber destined for paper mills and plastic destined for plastic recyclers.[23]

On average, about 40 percent of glass collected through single stream programs is landfilled, while 20 percent (small broken glass/glass fines) is used for low-end applications.[24] Only 40 percent is recycled into containers and fiberglass. Much of the breakage occurs during compaction in the single stream truck or in the MRF separation process. In an effort to deal with the glass contamination issue, some of the programs in Canada have excluded glass containers entirely from curbside collection and offer municipal drop-off centers for glass recycling instead. Germany has had separate drop-off collection for glass containers nationwide for many years. The quality issues associated with glass collected through curbside single stream programs supports the rationale for expanding the CRV program to include wine and spirit containers.

One glass processor summarized the benefits of collecting more glass containers through redemption centers as follows:

- The quality of glass destined for beneficiation would be greatly improved as would the overall quantity;
- Significantly less material will be sent to landfill and nearly all of the collected glass will be marketable to higher-end uses like new bottle and fiberglass manufacturing; and,
- Bottle makers will have a greater supply of on-spec material and can increase their recycled-content levels, which will reduce overall manufacturing costs and reduce pollution and GHGs associated with the bottle making process.

For each 10 percent increase in secondary cullet used to make new bottles, manufacturers can reduce their energy requirements (natural gas and electricity) by 2.5 percent[25]. In addition, secondary cullet replaces soda ash and limestone, both of which contribute carbon dioxide to the atmosphere when heated in the glass bottle making process.[26]

<u>Estimated Quantities of Glass from Wine and Spirit Containers in California</u>

We are unable to accurately estimate the potential increase in recovered tons of clean quality glass with an expansion of wine

[23] Source: *To Single Stream or Not to Single Stream?*, power point presentation, Lori Scozzafava, SWANA, U.S EPA Meeting, July 19, 2007 Philadelphia, PA
[24] Corley, Tex, President and CEO of Strategic Materials, March 30, 2009.
[25] Personal communication, P. Smith, Owens Illinois, March 31, 2009.
[26] Ibid.

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and spirits because data on container sales within this sector are proprietary. However, we can provide a rough estimate based on the increase experienced when Ontario, Canada expanded their program to include wine and spirits.

The single glass beneficiator for Ontario, Canada, NexCycle, reported that it experienced an increase of 75 percent in the quantity of glass processed immediately following the program expansion to include wine and spirits. NexCycle attributes this large increase not only to the increase in recovery from the home consumption market, but also from commercial generators like bars, restaurants and hotels. Many of these commercial generators were not recycling their glass wine and spirits bottles prior to the expansion.

Table 11-5 summarizes the advantages and disadvantages of expanding California's program to include wines and spirits.

TABLE 11 – 5
Advantages and Disadvantages
of Expanding the Program to Include Wines & Spirits

ADVANTAGES	DISADVANTAGES
▪ Provide greater capture of glass containers. ▪ Provide improved quality of secondary cullet for recycling into new containers, allowing for higher minimum content levels. ▪ Reduced energy costs for bottle manufacturers that are able to incorporate increased amounts of secondary cullet. ▪ Reduce the amount of glass in curbside recycling programs, which will reduce the levels of broken glass contamination in other recyclable commodities, reduce wear and tear on trucks and processing equipment, and reduce waste from broken glass being sent to landfill. ▪ Contribute more unredeemed revenue to the fund. ▪ Provide better economies of scale for redemption centers in terms of greater throughput. ▪ For any wine and spirit containers that do end up in the curbside system, municipalities (or their haulers) will be compensated for the eligible container in the form of new processing payments and CRV.	▪ Some additional costs to manufacturers of wine and spirits in the form of processing fees, however, these fees could be waived for an initial period, in order to ease entry into the system.

Recommendation 2.b. – Investigate the Reintroduction of Refillables to the System

It is recommended that the Department investigate the reintroduction of refillables to the California system to improve environmental impacts, including reduced GHG emissions and reduced production of toxics (with or without an environmental levy on non-refillables). This should include a study of the potential GHG reductions, creation of new jobs that could be achieved through such a change, lifecycle environmental impacts,

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water use, changes to collection infrastructure, costs, etc. The three beverage container deposit-return case studies in this report all documented that refillable beverage containers were in widespread use in those areas (British Columbia and Ontario, Canada and Germany).

In Ontario, the Province uses an "environmental levy" of $0.10/unit on non-refillable alcohol containers to encourage the use of refillables. In addition, The Beer Store charges several handling fees associated with non-refillable containers to finance their handling and end-of-life management. Collectively, this levy and these fees amount to an additional $3.90 (Canadian dollars) per 24 non-refillable units. This financial incentive has ensured a dominant market share (73 percent) for refillable beer bottles in the Province.

In Germany, there is a refillables quota of 72 percent, and deposit-return law mandates a higher deposit level on non-refillables to incentivize purchasing beverages in refillable containers (25 eurocents on non-refillables versus 8 and 15 eurocents on refillables). Currently, the beer in refillable bottles has an 85 percent market share of total beer sold, and the bottled water in refillable bottles has a 37 percent market share. Single-serve refillable bottles in Germany include both PET and glass.

In the case study for the German beverage container deposit-return system (Section 10), we include results of a study by the German Packaging Institute that show a marked reduction in GHG production through the use of refillable rather than one-way beverage containers.

Recommendation 2.c. – Continue Support for "Local" Processing Capacity to Reduce Shipping Impacts and Increase Green Jobs

It is recommended that the Department continue periodic assessments of the availability of in-state processing capacity, as well as the subsequent incentives provided to build necessary processing capacity in California.

For several years, the Department has studied California's processing infrastructure for plastic, glass, bimetal and aluminum beverage containers, including both initial processing and eventual remanufacture into a consumer product. The Department's Market Development and Expansion Grant Program has focused on increasing or improving the technology or availability of equipment at California facilities that process recyclables in-state. Examples are facilities that produce plastic flakes from plastic bottles and convert such processed recyclables into usable products, such as the manufacturer of strawberry baskets. The Department has identified areas that were lacking in in-state processing capacity, (one such example is "PET processing to plastic flake"), and has made such areas a focus of

subsequent grant funding. The focus changes from year to year, based on the then-current assessment of statewide need for processing capacity of different types of materials. The legislature has also authorized incentive funding for plastic and glass that is processed and/or recycled into new products in the State. Together, these programs are reducing the shipping distances of materials that would otherwise be shipped out-of-state or overseas to available markets. These programs are also creating "green jobs" in California.

Recommendation 2.d. – Implement Tracking of Materials to Assure that they are Recycled

It is recommended that the Department implement tracking of materials to ensure that they are actually recycled. The Department has a strong focus on recycling and emphasizes the reintroduction of recycled-content materials into the marketplace. However, California's current recycling infrastructure is such that a significant percentage of plastic bottles are shipped overseas, mainly to China.[27] The California system does not require tracking of materials to their final destination, and the Department has no means to verify that these materials are actually recycled.

The California statutory intent is "that all empty beverage containers redeemed shall be recycled, and that the responsibilities and regulations of the Department shall be determined and implemented in a manner that favors the recycling of redeemed containers, as opposed to their disposal."

In contrast, British Columbia requires adherence to a pollution prevention hierarchy that favors recycling over waste-to-energy. The Province requires tracking of materials to their final destination, and Encorp Pacific reports on the locations of recycling in their annual report to the government. For example, Encorp Pacific sends aseptic and gabletop containers to Korea to a facility that can ensure full recycling, and this information is included in their annual report. Likewise, Germany's packaging ordinance requires tracking and documentation of actual recycling versus use for waste-to-energy.

Recommendation 2.e. – Evaluate Potential Changes to Processing Fee Calculations to Align with Departmental Goal of Green Product Redesign

Over the years, the processing fee has been the key "Extended Producer Responsibility" feature of the California deposit-return system. As a result of the existing processing fees, some container manufacturers have taken measures to encourage

[27] Note that exact quantities of material types and product types that are shipped overseas are not known and the CIWMB began to study this issue in 2008 in its "Infrastructure Project".

Findings and Recommendations

greater recycling of materials. It is recommended that the Department study potential changes to processing fee calculations that will align with the Department's goal of green product redesign. As California moves forward with its work to continuously improve its CRV program, the Department has expressed an interest in using its program as a tool to promote green product redesign.

In terms of green product redesign for non-refillable containers, there are several approaches that could be used. The first is to use Life Cycle Analysis to identify which beverage packaging types have the lowest overall ecological footprint, and apply financial or regulatory instruments to compel producers to shift to more eco-friendly packaging types. While this approach may seem logical at first glance, it can be extremely difficult to accurately measure the ecological footprint for a beverage type given the many variables that contribute to the eco-profile, including, but not limited to:

- Energy types associated with primary resource extraction processes;
- Transportation methods (shipping, trucks or trains); and,
- Transportation distances.

Additionally, these variables are in a constant state of change. There is, however, one factor in packaging design that has a consistently positive impact on the environment, and is within the control of beverage container manufacturers and beverage producers: recycled content. All packaging types used for beverage containers have an improved ecological profile for each increased percent of recycled content used in their manufacture.

Figures 11-9 through 11-13 illustrate the benefits derived in terms of pounds of carbon dioxide equivalent ("CO2e") per beverage unit at various recycled content levels. The data used to run these recycled content scenarios are based on US EPA data, representing the average profile of materials throughout the Country, NOT actual profiles for California. That said, the different recycled content levels illustrate the decline in overall emissions when recycled content levels are increased – differences which would likely be the same if actual California data were used. In fact, if secondary materials were sourced locally, or within the State, these benefits might be much higher.

FIGURE 11-9

GHG Emissions from the Manufacture of Selected Materials (lbs of CO2e per unit) ALUMINUM CANS (based on 68,420 cans/ton)

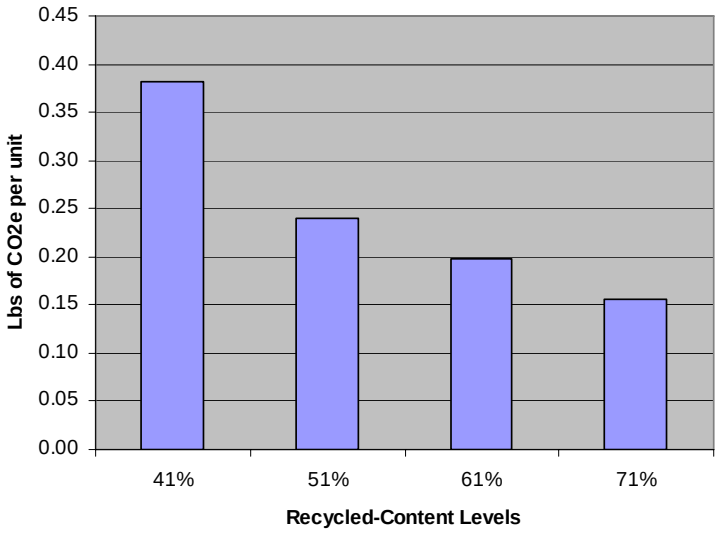
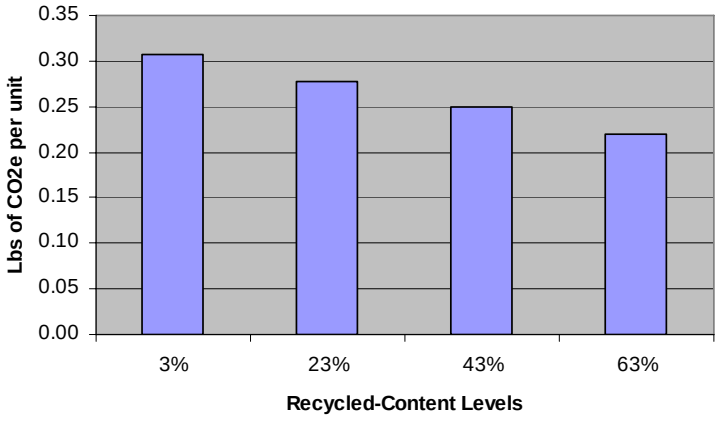


FIGURE 11-10

GHG Emissions from the Manufacture of Selected Materials (lbs of CO2e per unit) GLASS BOTTLES (based on 4,000 cans/ton)



Findings and Recommendations

FIGURE 11-11

GHG Emissions from the Manufacture of Selected Materials (lbs of CO2e per unit) STEEL CANS (based on 12,000 cans/ton)

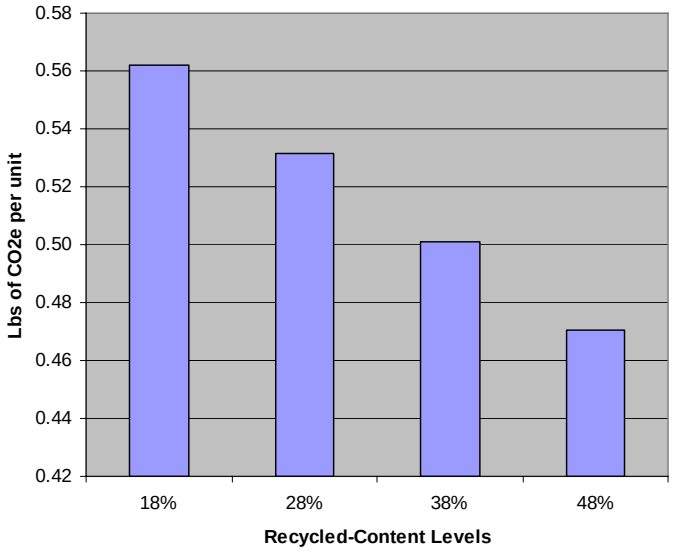


FIGURE 11-12

GHG Emissions from the Manufacture of Selected Materials (lbs of CO2e per unit) HDPE BOTTLES (based on 16,000 cans/ton)

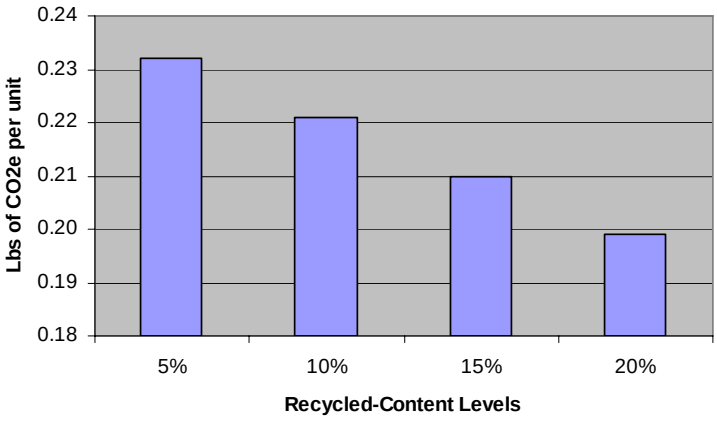
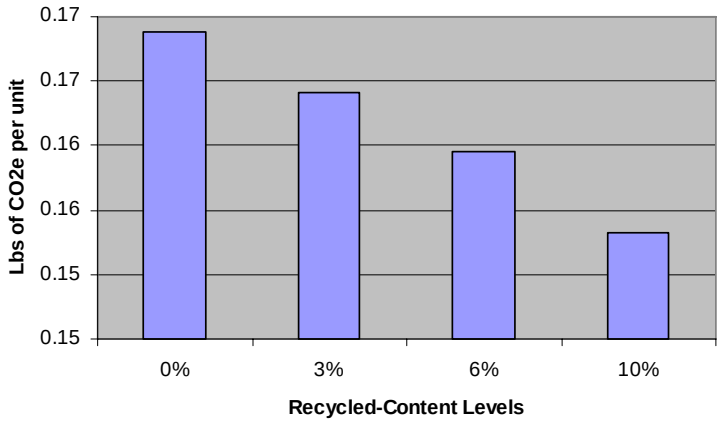


FIGURE 11-13

GHG Emissions from the Manufacture of Selected Materials (lbs of CO2e per unit)
PET BOTTLES
(based on 26,505 cans/ton)



Currently, the processing fees paid by beverage manufacturers are based on a percentage of the processing payment or net cost associated with processing/recycling each material. The percentage is based on the recycling rate of the container type (e.g., PET, aluminum, etc.). The higher the recycling rate, the lower the percentage of the processing payment required to be paid by the beverage manufacturer. However, beverage manufacturers have only indirect ability to affect the recycling rate. If a beverage manufacturer wants to avoid paying processing fees altogether, they can choose packaging that is not assessed a processing fee, such as aluminum, or not covered by the deposit-return program, such as aseptic, or pouches, etc. Note that two of the case study programs, Ontario and British Columbia, do include a variety of container types in their programs.

In an effort to stimulate green product redesign, it would be preferable to calculate processing fees at a decreasing amount for increased recycled content utilization by producers, instead of using material recycling rates as the basis for the calculation. The percentages of processing fees can be based on material-specific content levels. Content levels can be set by the Department from a base up to maximum feasible levels. These recycled content levels should be material specific, should apply to all materials, and in the case of glass, should be color specific as well.

Recommendation 2.f. – Research the Concept of Expanding Recycled-Content Requirements for Beverage Containers

It is recommended that the Department research the concept of expanding recycled-content requirements for beverage containers.

Findings and Recommendations

The State already has a recycled-content law for glass containers and another recycled-content law for plastic containers, and this recommendation proposes researching expansion of those laws to include additional container types or higher recycled-content levels. Section 4 of this report includes a description of the 35 percent minimum content law for glass containers manufactured in the State of California. Section 5 of this report discusses California's Rigid Plastic Packaging Container ("RPPC") Law, which does not apply to packaging containers for food and beverage containers. When the RPPC law was introduced in 1993, the Food and Drug Administration had not yet approved recycled-content for plastic food packaging containers. Since 2001, the FDA has begun to approve certain processes (on a case-by-case basis) to manufacture recycled-content plastic food and beverage packaging, including using old beverage bottles to make new bottles (i.e., "bottle-to-bottle" recycling)[28]. The Department should research recent developments in recycled-content processing, as new or expanded recycled-content laws for bottles and cans of various materials may now be appropriate. Recycled-content has a significant impact on the GHG footprint of a beverage container, as demonstrated in Figures 11-9 through 11-13.

3. Recommendations that can lead to Greater Effectiveness of the System

Recommendation 3.a. – Investigate New Fraud Prevention Techniques

The scope of this study did not include investigating methods for fraud prevention. We are aware, however, that the Department has expended significant efforts to detect and prevent fraud over many years. Fraud can occur in several ways, including accepting containers for recycling that were purchased in a neighboring state or country. If the containers are purchased outside of California, then no deposit is initially received by the California system, and therefore, a refund is not warranted. It is recommended that the Department investigate fraud prevention techniques being used in other provinces or countries to evaluate whether new techniques will benefit the California system.

While researching the case study in Germany, we noted that the German system for receiving redeemed containers is highly automated, and involves the use of sophisticated scanning equipment to detect container types and confirm container authenticity. Each container sold into the German market is coded

[28] In January 2009, The Coca-Cola Company opened the "world's largest bottle-to-bottle recycling plant in Spartanburg, South Carolina." http://www.greenbiz.com/blog/2009/01/14/pet-project-coke-recycling

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 redeeming "fraudulent" containers from neighboring countries.[29]

Recommendation 3.b. – Evaluate Department Spending per Container Recycled through each of the Various Program Types

It is recommended that the Department evaluate its spending per container recycled through each of the various redemption or return points, including curbside recycling, supermarket sited redemption centers, community drop-off programs and traditional recycling centers. As the Department seeks to expand the existing program to reach the 80 percent recycling rate goal, it would be useful to know which container return options are the most cost effective to operate. The Department may use this information to encourage or incentivize the development of one type of redemption option over another.

Other Observations

The following are observations that came from our research.

Observation 1. – Certain Program Expenditures are linked to the Deposit Value

If there is another increase in the CRV, there would be automatic increases in certain payment amounts as well, because certain system expenditures are defined in statute as a percentage of the CRV. The State should carefully evaluate whether these other items should increase at the same rate as the CRV. For instance, if the CRV increases from 5 cents to 6 cents, that would be a 20 percent increase. There may not be a corresponding need to increase the following items by 20 percent as well:

- Department Administration is five percent of annual deposit revenue;
- Distributors keep 1.5 percent of the deposit as an administrative fee; and,
- Processors and recyclers keep a percentage of the deposit as well (defined by formula in statute).

[29] The German deposit-return system receives no deposit revenues from containers sold in neighboring countries, and therefore, it would be a loss to the German system to refund deposits for those containers.

Findings and Recommendations

Observation 2. – There are Many Differences Between Programs Regarding the Material Types of Beverage Packaging Containers Included and Excluded

California

- Includes glass, plastic, aluminum, bi-metal; and,
- Excludes asceptic, pouches, all others.

British Columbia

- Does not exempt any material type, so it includes aluminum, glass, bi-metal, gabletop, aseptic, and poly-pouches.

Ontario

- Includes alcohol container glass, aluminum, plastic, bag-in-box, polycoat, and aseptic; and,
- The Beer Store Program aims to recover 100 percent of packaging, including secondary packaging. Secondary packaging includes the cardboard cases in which beer is packaged, and the larger cardboard boxes that store many cases of beer.

Germany

- "Eco-advantageous" packaging is exempt (drink cartons, gabletop, stand-up pouches, and polyethylene bags); and,
- All other material types are included.

Observation 3. – There are Too Many Differences between GHG Emissions Calculations to Make Direct Comparisons from Program to Program

While each case study presents findings in a table of the GHG emissions reduced by the respective program, it was determined that a side-by-side comparison would be ill-suited for the following reasons:

- Materials used for beverage packaging vary between programs, due to regional differences, policy differences, etc. The production of different packaging material types, such as aluminum, glass and plastic, create different amounts of GHGs. Therefore, each program has a different GHG production profile;
- GHG reduction as a raw number and even as a per capita figure is inflated by the contradictory reality of GHG production. That is, locations where GHG production per capita are high can reduce GHG by a greater amount with a 50 percent recycling rate than other locations that also recycle at a 50 percent rate that have lower per capita GHG production rates;

- One particular factor in the calculation methodology, avoided energy use, is different in each country. GHG reduction is expressed as an offset of energy used. Since US energy use is largely coal-based, which emits a proportionately high level of GHGs, a US GHG reduction figure would be much larger than a European or Canadian energy offset figure, for the same materials and same recycling practice. This is due to the fact that Canadians and Europeans use energy sources that have significantly lower energy emissions, such as nuclear and hydro, respectively; and,
- Canadian and European metric "tonnes" measurements must be converted in any comparison to US "tons."

In summary, GHGs reduction figures are used to further describe the benefits of recycling but are not suited for comparison across borders. Therefore, despite GHG emission reduction figures serving as a useful measurement of the success of the recycling programs, there are too many underlying conflicts to make direct comparisons from program to program.

Observation 4. – With One Exception, Every Program Studied Excludes Milk Containers from the Deposit

The main reason given for excluding milk is that returned milk containers pose particular health and safety concerns. A second reason is that milk is considered a staple food and increasing the sale price of milk by applying a deposit is not generally considered acceptable. Many recycling programs, however, do collect milk containers, and in the U.K., milk containers contain up to 50 percent recycled content, with the recyclable materials coming from old milk containers.[30] Furthermore, milk is consumed mainly at home and therefore if a curbside recycling program is mature, many of these containers could be collected through the municipal curbside recycling program. One exception to this rule is the Province of Alberta, Canada. On June 1st, 2009, Alberta will be the first Canadian province to expand their deposit-return program to include all milk containers.

[30] Personal communication, Dr. Helene Roberts, Head of Packaging, Marks and Spencer Department and Grocery Stores.

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Findings and Recommendations

Appendix A

Stakeholder Workshop Agenda and Written Comments

Draft Agenda for Stakeholder Workshop

Evaluating End-of-Life Beverage Container Management Systems for California

Friday, April 24, 2009
EDD Auditorium
722 Capitol Mall
Sacramento, CA 95814
9:30- 4:00 pm

I. INTRODUCTION 9:30 -10:10 am
   a. Introductions of DOC Staff and Project Team
   b. Study Background and Goals
   c. Study Methodology
      i. Framework of the Analysis (Elements and Outcomes)
      ii. Case Study Selection
      iii. Overview of California System

II. GERMAN SYSTEM CASE STUDIES 10:10 – 10:50 am
   a. German Bottle Deposit System
   b. German Duales System Deutchland (formerly called Green Dot)

   Presenter: Jurgen Resch, German Environment Aid (invited, no response yet)

10:50 - 11 am - Break

III. CANADIAN SYSTEM CASE STUDIES 11:00 am -12:00 pm
   Presenter: Clarissa Morawksi, CM Consulting (member of the project team, confirmed)
   a. Ontario Beer Store and Deposit Return Systems
   b. Ontario Blue Box

12:00 – 1:30 Lunch

IV. BRITISH COLUMBIA PANEL DISCUSSION 1:30 – 2:30 pm
   a. Greg Tyson, Provincial Government (invited; response pending approval)
   b. Neil Hastie, Encorp Return-It (confirmed)
   c. Tony Moucachen, Merlin Plastics (invited)

2:30 – 2:45 pm Break

V. OBSERVATIONS AND RECOMMENDATIONS 2:45- 4:00 pm
   a. Overview of report findings and recommendations
   b. Stakeholder input and suggestions on Draft Report

R3 Stakeholder Workshop on End-of-Life Beverage Container Management Systems for California

Funding provided, in whole or in part, through a grant awarded by the California Department of Conservation

Stakeholder Comment Form

Stakeholder Information			
Name:	NICK MORELL	Date:	4/24/09
Company:	L.A. COUNTY SANITATION DISTS	Title:	RECYCLING COORDINATOR
Phone:	(562) 908-4288, x 2444	Email:	NMORELL@LACSD.ORG

Comment Review Guidelines

All comments will be summarized in the final report presented to the California Department of Conservation.

Comments

Please provide your comments and responses to the information provided in this stakeholder workshop in the space provided below:

I would like to know what typical californians think of this system. Also canadians, Germans, etc... Positive and negative comments from public, Industry, stakeholders would be interesting. Just complying does not imply satisfaction w/ status quo.

I am intrigued by potential use of bar codes and 'RFID' technology in sorting - and program evaluation. How do existing and future technological innovations play into policy development,

Should you prefer to submit your comments at a later date, please do so by no later than May 4th, 2009. Please address comments to:

Carrie Baxter, R3 Consulting Group
4811 Chippendale Drive, Suite 708
Sacramento, CA 95841
PHONE: (916) 576-0306
E-MAIL: info@r3cgi.com

R3

Stakeholder Workshop on End-of-Life Beverage Container Management Systems for California

Funding provided, in whole or in part, through a grant awarded by the California Department of Conservation

Stakeholder Comment Form

Stakeholder Information			
Name:	SCOTT MILLER	Date:	4/24/09
Company:	MENDOCINO DOT-SOLIDWASTE DIV	Title:	DOT Deputy Director
Phone:	707-463-4342	Email:	MILLERS@CO.MENDOCINO.CA.US

Comment Review Guidelines

All comments will be summarized in the final report presented to the California Department of Conservation.

Comments

Please provide your comments and responses to the information provided in this stakeholder workshop in the space provided below:

EASILY UNDERSTOOD & SCIENCE BASED PRESENTATION

AUTHORITATIVE SPEAKERS

UNBIASED & JUDICIAL STUDY APPROACH

Should you prefer to submit your comments at a later date, please do so by no later than May 4th, 2009. Please address comments to:

Carrie Baxter, R3 Consulting Group
4811 Chippendale Drive, Suite 708
Sacramento, CA 95841
PHONE: (916) 576-0306
E-MAIL: info@r3cgi.com

R3

Stakeholder Workshop on End-of-Life Beverage Container Management Systems for California

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Stakeholder Comment Form

Stakeholder Information			
Name:	NANCY MACY	Date:	4-24-07
Company:	Valley Women's Club (SLV Redemption/Recycling Centers)	Title:	Director of Recycling
Phone:	831-338-1728	Email:	nmacy@cruzio.com

Comment Review Guidelines

All comments will be summarized in the final report presented to the California Department of Conservation.

Comments

Please provide your comments and responses to the information provided in this stakeholder workshop in the space provided below:

Excellent research & valuable information!

Some concerns—

- Huge variability of size of containers, especially plastics, means consumers do not get "made whole" when they use smaller containers & redeem by weight. Makes it hard for "front-line" workers dealing with the public. So far it hasn't motivated consumers to stop buying those containers, just makes them angry.
- Fees & deposits should influence consumer decisions to purchase environmentally superior products/containers. Refillables (Germany) is good example.
- Has to be easy, convenient & feel good, especially in stressful urban living. (So much time commuting, no time to recycle.)
- Insight on the unserved zones & running a CRV center is very hard — large responsibility, heavy work, complex accounting, threat of theft or other confrontation — but low pay & little oversight by large companies like NexCycle.
- Strongly support CRV for liquor/wine & return to refillables in certain areas.

Should you prefer to submit your comments at a later date, please do so by no later than May 4th, 2009. Please address comments to:

Carrie Baxter, R3 Consulting Group
4811 Chippendale Drive, Suite 708
Sacramento, CA 95841
PHONE: (916) 576-0306
E-MAIL: info@r3cgi.com

Carrie Baxter

From: Nancy Macy [nbbm@cruzio.com]
Sent: Friday, May 01, 2009 11:18 AM
To: Carrie Baxter
Subject: Re: Comments due May 4th on Evaluating End-of-Life Beverage Container Management Systems for California
Follow Up Flag: Follow up
Flag Status: Red

Hi Carrie — very worthwhile workshop…really fascinating seeing how other countries are handling things, and at what level the government vs the "fillers" are responsible (in control) of the process. I turned in my comments at the end of the meeting. I'll be interested to see the final report.

Thank you,

Nancy B. Macy, Director
SLV Redemption/Recycling Centers
A Project of ***The Valley Women's Club*** *Association*
of the San Lorenzo Valley www.vwcweb.org
15485 Bear Creek Rd., Boulder Creek, CA 95006
831/338-1728 Fax: 831/338-7107 Cell: 831/345-1555

Check out EcoCruz ~ The Environmental Guide for Santa Cruz County
Visit http://www.EcoCruz.org to find environmental information, organizations and events in Santa Cruz County.

"It's just one big garden we should all be tending."
Andrew Macy

From: Carrie Baxter <cbaxter@r3cgi.com>
Date: Fri, 1 May 2009 11:03:39 -0700
To: Susan Collins <scollins@r3cgi.com>
Subject: Comments due May 4th on Evaluating End-of-Life Beverage Container Management Systems for California

This is just a friendly reminder requesting that stakeholder comments on the Draft Report and stakeholder workshop on "Evaluating End-of-Life Beverage Container Management Systems for California" be returned on the attached form. Please provide your comments and responses to the information provided in the Draft Report and stakeholder workshop on this form no later than **Monday,**

May 4, 2009.
Please address comments to:
Carrie Baxter, R3 Consulting Group, Inc.
4811 Chippendale Drive, Suite 708
Sacramento, CA 95841
PHONE: (916) 576-0306
E-MAIL: info@r3cgi.com

Carrie Baxter
R3 Consulting Group, Inc
4811 Chippendale Drive, Ste. 708
Sacramento, CA 95841
(916) 576-0306

Carrie Baxter

From: Joachim Quoden [quoden@t-online.de]

Sent: Saturday, May 02, 2009 1:28 PM

To: Carrie Baxter

Cc: 'Heidi Sanborn'; 'GISLAIS Pascal'; Derek Stephenson; 'Neil Hastie'

Subject: AW: Comments due May 4th on Evaluating End-of-Life Beverage Container Management Systems for California

Attachments: German Deposit System_Budapest_Feb 24, 2009_final.pdf; 3-Pres-Budapest_v9_090224.pdf; Factsheet on bioplastics_230309.doc; Position Paper Mandatory Deposit version June 2008.doc

Dear Carrie,

As I am with my laptop not able to open the PDF file to write directly into it and have here no printer to print it out and scan it later, I take the liberty to write you my comments directly. I hope that this is ok.

Regarding the German “dual” system:

- all prevention initiatives that the former monopolist DSD has run, have been stopped. As the 9 service provider are profit – oriented they have an interest to have more packaging in the system and not less
- the collection and recycling figures are going down since competition has started as the service provider are interested just to collect to required minimum quotas but not a single ton more. So, Germany has lost the status of best performing country in Europe. Much more plastics are used as energy instead of material recycling as in earlier times.
- More material have been sent to Asia than in monopoly times
- The 5th Amendment of the Packaging Ordinance has not led to less free riders, so the discussions about a 6th amendment have started; more and more stakeholders, especially the local authorities, are fighting for a complete change of the system and to introduce the Belgium model where local authorities are responsible for the collection and industry has to finance these costs and is responsible for the sorting and the recycling
- Because of the financial crisis the revenue for the recycled material decreased dramatically and some of the service providers who have calculated to sharp are in big financial trouble; it is expected that the first service provider will go bankrupt within the next weeks.
- There is no transparency any more; all prices for obliged companies are a business secret so it is very difficult to benchmark.

Regarding the German deposit system:

- As the German deposit system is organised in a competitive way, all data are a business secret. Therefore no cost information is officially available, also no official return figure is published. Therefore the figure used by Jürgen Resch of 95 – 98 % is just a guess and not supported by any verified report.
- So, the handling fees that the fillers have to pay to the retailers and to the service providers are not public available as well; in private discussions with fillers you hear figures up to 8 €-Cents per bottle
- 50 times refilling is the optimum figure; especially as in beer and water sector more and more fillers change from the standard to a special bottle, these figures are going down. Moreover a new 0,33 l beer refillable glass bottle has been introduced with big success into the market; the bottle is very thin so that the return figure is less than 10 times.
- As for water and softdrinks the refillable quota did not increase because of the mandatory deposit for one-way beverage containers (as promoted especially by the German Environment Aid) but decreased dramatically to less than 30%, the German Environment Aid and the local water fillers are asking for an immediate amendment of the Packaging Ordinance to introduce in addition to the deposit a 0,20 € tax to punish one-way (what is very difficult from a legal point of view with regard to European legislation).
- In deposit systems you have no incentive to optimise the bottles as you do not pay a fee with regard to the weight.

- About 700 million € have to be paid yearly to keep the deposit system running
- Infrastructure costs up to 2 billion €,
- Most of the collected PET bottles have been sold to China and not recycled in Europe and especially not recycled via bottle-to-bottle because Chinese recyclers paid more money to the retailers

With regard to the Workshop, I would like to add the following comments:

- no deposit system in Europe is self-funding. All systems have to ask the fillers to pay handling fees which are in general 3 times higher than comparable costs of a kerbside collection system.
- In Austria bottle-to-bottle recycling is taking place with bottles collected by kerbside collection; Austrian industry has agreed a CO2 reduction as answer to a deposit discussion, as it is useful to agree on the environmental benefit and not on the way to reach this goal.
- In many European countries like Germany, Belgium and Austria glass packging is collected via container stations and results are the same or even higher as with a deposit.

I enclose for your further use 1 presentation from Roland Berger consultancy about the German deposit system; one presentation from the former CEO of the German deposit company DPG, the position paper of PRO EUROPE on mandatory deposit systems and the biodegradable fact sheet of PRO EUROPE.

If you have further questions or need clarification for some of the topics, please do not hesitate to contact me.

Best regards

Joachim

Joachim Quoden
General Manager
PRO EUROPE S.p.r.l.
Rue Martin V, 40
1200 Brussels
Belgium
+49 171 201 70 55
www.pro-europe.info
info@pro-europe.info

Von: Carrie Baxter [mailto:cbaxter@r3cgi.com]
Gesendet: Freitag, 1. Mai 2009 20:04
An: Susan Collins
Betreff: Comments due May 4th on Evaluating End-of-Life Beverage Container Management Systems for California

This is just a friendly reminder requesting that stakeholder comments on the Draft Report and stakeholder workshop on “Evaluating End-of-Life Beverage Container Management Systems for California” be returned on the attached form. Please provide your comments and responses to the information provided in the Draft Report and stakeholder workshop on this form no later than **Monday, May 4, 2009**.
Please address comments to:
Carrie Baxter, R3 Consulting Group, Inc.
4811 Chippendale Drive, Suite 708

Sacramento, CA 95841
PHONE: (916) 576-0306
E-MAIL: info@r3cgi.com

Carrie Baxter
R3 Consulting Group, Inc
4811 Chippendale Drive, Ste. 708
Sacramento, CA 95841
(916) 576-0306

Additional documents provided by Joachim Quoden can be found by following these links.

Position Paper Mandatory Deposit
http://www.pro-europe.info/files/08-11_Position_Paper_Mandatory_Deposit_RBV01.pdf

Fact Sheet on Bioplastics
http://www.pro-europe.info/files/Factsheet_on_bioplastics_230309.pdf

R3
Stakeholder Workshop on End-of-Life Beverage Container Management Systems for California

Funding provided, in whole or in part, through a grant awarded by the California Department of Conservation

Stakeholder Comment Form

Stakeholder Information

Name: Tom Padia Date: May 4, 2009

Company: StopWaste.Org (the Alameda County Waste Management Authority and Recycling Board)

Title: Recycling Director

Phone: 510-891-6500 Email: tpadia@stopwaste.org

Comment Review Guidelines

All comments will be summarized in the final report presented to the California Department of Conservation.

Comments

Please provide your comments and responses to the information provided in this stakeholder workshop in the space provided below:

StopWaste.Org is in support of adding wine and liquor containers to the CRV system. Please see attached resolution of the Alameda County Waste Management Authority Board, and copy of letter that was sent to the Alameda County legislative delegation, among others.

Should you prefer to submit your comments at a later date, please do so by no later than May 4th, 2009. Please address comments to:

Carrie Baxter, R3 Consulting Group
4811 Chippendale Drive, Suite 708
Sacramento, CA 95841
PHONE: (916) 576-0306
E-MAIL: info@r3cgi.com

ALAMEDA COUNTY WASTE MANAGEMENT AUTHORITY BOARD

RESOLUTION #WMA 2009-2

MOVED: Green

SECONDED: Santos

AT THE MEETING HELD MARCH 25, 2009

RESOLUTION URGING THE CALIFORNIA STATE LEGISLATURE TO INTRODUCE AND SUPPORT LEGISLATION TO INCLUDE WINE AND LIQUOR BOTTLES IN THE BEVERAGE CONTAINER RECYCLING AND LITTER REDUCTION ACT

WHEREAS, California's Bottle Bill incentivizes the recycling of containers by putting a redemption value ("CRV") on containers that is redeemed by consumers when recycled; and,

WHEREAS, nearly 500,000 tons of non-CRV wine and liquor containers are distributed annually in the state; and,

WHEREAS, Less than 30% of non-CRV glass containers are recycled, while almost 80% of CRV glass containers are recycled; and,

WHEREAS, Adding wine and liquor bottles to the CRV Program would increase total glass recycling in California by up to 200,000 tons annually; and,

WHEREAS, Increasing the recycling of glass will reduce energy consumption, save natural resources and decrease the amount of material deposited in landfills; and,

WHEREAS, Wine and liquor bottles are a significant and dangerous component of urban litter; and,

WHEREAS, Including wine and liquor bottles in the CRV program will significantly reduce their littering and help to create jobs;

NOW, THEREFORE BE IT RESOLVED, that the Alameda County Waste Management Authority hereby urges its State Assembly Members and Senators, by letter and receipt of this resolution, to introduce and support legislation adding wine and liquor containers to the Beverage Container Recycling and Litter Reduction Act.

ADOPTED BY THE FOLLOWING VOTE:
AYES: Carson, Wile, Waespi, Bukowski, Natarajan, Henson, Leider, Freitas, Quan, Sullivan, Landis, Santos, Johnson, Wozniak, Green

NOES: None

ABSENT: Biddle, Keating

ABSTAINED: None

Gary Wolff, Executive Director

1537 Webster Street
Oakland, CA 94612

Ph: 510-891-6500
Fax: 510-893-2308

STOPWASTE.ORG
Reducing the Waste Stream for Alameda County

April 10, 2009

This is a copy of the letter that was sent to all of the Alameda County Assembly and Senate Members, and the Senate and Assembly Leadership.

The Alameda County Waste Management Authority supports the addition of wine and liquor bottles to the Beverage Container Recycling and Litter Reduction Act, and urges your support for the introduction and passage of such legislation. The Authority represents the County of Alameda, each of the fourteen cities within the county and two sanitary districts that also provide refuse and recycling services. StopWaste.Org is dedicated to achieving the most environmentally sound solid waste management and resource conservation program for the people of Alameda County. Within this context, the Agency is committed to achieving a 75% and beyond diversion goal and promoting sustainable consumption and disposal patterns.

Including wine and liquor containers in the California Refund Value (CRV) system will help StopWaste.Org achieve our diversion and sustainability goals and will help our member agencies improve the effectiveness and fiscal health of their recycling programs, while helping to reduce the physical, financial and aesthetic blight of litter and storm drain pollution. Increased glass recycling will assist in AB 32 implementation as the use of recycled cullet reduces energy demand in the making of new bottles. Increased glass recycling will also have a positive economic impact in Alameda County as two major glass processors and a major bottle plant are located here. Inclusion of these containers in the CRV system will be a win for local governments, a win for the environment and a win for the economy.

The Authority Board approved the attached resolution at their March 25, 2009 meeting. We look forward to working with you to implement this beneficial, common sense measure.

Sincerely

Gary Wolff
Executive Director

Attachment
cc: Bridgett Luther
Mark Leary, and members of CIWMB
Mark Murray
Richard Valle
Mark Green

ALAMEDA COUNTY WASTE MANAGEMENT AUTHORITY BOARD

RESOLUTION #WMA 2009-2

MOVED: Green

SECONDED: Santos

AT THE MEETING HELD MARCH 25, 2009

RESOLUTION URGING THE CALIFORNIA STATE LEGISLATURE TO INTRODUCE AND SUPPORT LEGISLATION TO INCLUDE WINE AND LIQUOR BOTTLES IN THE BEVERAGE CONTAINER RECYCLING AND LITTER REDUCTION ACT

WHEREAS, California's Bottle Bill incentivizes the recycling of containers by putting a redemption value ("CRV") on containers that is redeemed by consumers when recycled; and,

WHEREAS, nearly 500,000 tons of non-CRV wine and liquor containers are distributed annually in the state; and,

WHEREAS, Less than 30% of non-CRV glass containers are recycled, while almost 80% of CRV glass containers are recycled; and,

WHEREAS, Adding wine and liquor bottles to the CRV Program would increase total glass recycling in California by up to 200,000 tons annually; and,

WHEREAS, Increasing the recycling of glass will reduce energy consumption, save natural resources and decrease the amount of material deposited in landfills; and,

WHEREAS, Wine and liquor bottles are a significant and dangerous component of urban litter; and,

WHEREAS, Including wine and liquor bottles in the CRV program will significantly reduce their littering and help to create jobs;

NOW, THEREFORE BE IT RESOLVED, that the Alameda County Waste Management Authority hereby urges its State Assembly Members and Senators, by letter and receipt of this resolution, to introduce and support legislation adding wine and liquor containers to the Beverage Container Recycling and Litter Reduction Act.

ADOPTED BY THE FOLLOWING VOTE:
AYES: Carson, Wile, Waespi, Bukowski, Natarajan, Henson, Leider, Freitas, Quan, Sullivan, Landis, Santos, Johnson, Wozniak, Green

NOES: None

ABSENT: Biddle, Keating

ABSTAINED: None

Gary Wolff, Executive Director

Submit by Email | Print Form

Stakeholder Workshop on End-of-Life Beverage Container Management Systems for California

Funding provided, in whole or in part, through a grant awarded by the California Department of Conservation

Stakeholder Comment Form

Stakeholder Information			
Name:	Martha Stevenson	Date:	May 4, 2009
Company:	Green Blue Institute	Title:	Senior Project Manager
Phone:	434-817-1424 x311	Email:	martha@greenblue.org

Comment Review Guidelines

All comments will be summarized in the final report presented to the California Department of Conservation.

Comments

Please provide your comments and responses to the information provided in this stakeholder workshop in the space provided below:

Congratulations on a wonderful report and stakeholder event. I learned so much, so thank you again for the invitation for Liz and I to attend.

The only comments I have are regarding the “green redesign” references throughout the document. The majority of the times “green redesign” is mentioned it is linked with design for refill, design for recycling, source reduction and using recycled content. I found one mention of designing out toxic chemicals.

I think the report would benefit from some clarity of exactly what “green redesign” is considered with regard to packaging because it is such a complex question. “Green design” from the perspective of the life cycle impacts of materials vs. “green design” from the compatibility of the materials within the recycling system today yield different results. Factor in toxics, composting, product loss, packaging machinery design, etc. and the complexity elevates. I think that both the SPC Definition of Sustainable Packaging and the Design Guidelines for Sustainable Packaging give a good overview of the majority of “green design” issues for packaging (I understand this is a biased perspective).

But for the purposes of this report because it is so focused on the recycling rate of beverage containers, you may want to focus it on design for recycling and using recycled content (the ‘push’ and the ‘pull’) and define it very clearly, rather than address the breadth of what could be considered “green design” which could arguably include the addition of new materials to the market that our recycling systems cannot yet accommodate, using multi-laminates that do not require refrigeration, or using heaver materials that are chemical inert. It is a constant challenge to balance all of these considerations and I think it’s better to clearly state what you are covering and what you are not.

With regard to CD systems that address design for recycling, I would also recommend further investigation into the South Australia container deposit program. The system appears to be set up in such a way that if a bottle design is placed on the market that the “super recyclers” sorting system cannot accommodate, then the super recycler can contact the company manufacturing the bottle and explain to them why is doesn’t work and ask that the design be changed. This direct line of communications between ends of the supply chain seems to be a crucial missing piece to most of these systems.

Our last recommendation is to study a place that has a high container recovery rate (if there is one) without a container deposit law. It may yield some useful information.

Should you prefer to submit your comments at a later date, please do so by no later than May 4th, 2009. Please address comments to:

Carrie Baxter, R3 Consulting Group
4811 Chippendale Drive, Suite 708
Sacramento, CA 95841
PHONE: (916) 576-0306
E-MAIL: info@r3cgi.com

R3

Stakeholder Workshop on End-of-Life Beverage Container Management Systems for California

Funding provided, in whole or in part, through a grant awarded by the California Department of Conservation

Stakeholder Comment Form

Stakeholder Information			
Name:	Donna Thurman	Date:	5/4/09
Company:	City of San Jose	Title:	Environmental Specialist
Phone:	(408) 975-2534	Email:	donna.thurman@sanjoseca.gov

Comment Review Guidelines

All comments will be summarized in the final report presented to the California Department of Conservation.

Comments

Please provide your comments and responses to the information provided in this stakeholder workshop in the space provided below:

Amend SB 55 to include wine and liquor, resulting in increased unredeemed deposit balance. Also amend SB55 to eliminate the $15 M in Curbside funding, since curbside will get much more than that from the increased value of hundreds of millions of glass and plastic containers they already handle.

Processing fee offsets, especially for plastic, are contrary to the original intent of the legislation and do not aid in achieving the original goals to reduce litter and increase recycling.

Should you prefer to submit your comments at a later date, please do so by no later than May 4th, 2009. Please address comments to:

Carrie Baxter, R3 Consulting Group
4811 Chippendale Drive, Suite 708
Sacramento, CA 95841
PHONE: (916) 576-0306
E-MAIL: info@r3cgi.com

R3

Stakeholder Workshop on End-of-Life Beverage Container Management Systems for California

Funding provided, in whole or in part, through a grant awarded by the California Department of Conservation

Stakeholder Comment Form

Stakeholder Information			
Name:	Thomas Mabie	Date:	5-4-09
Company:	GPI	Title:	Regional Director
Phone:	213-612-7762	Email:	TMMabie@aol.com

Comment Review Guidelines

All comments will be summarized in the final report presented to the California Department of Conservation.

Comments

Please provide your comments and responses to the information provided in this stakeholder workshop in the space provided below:

(See attached.)

Should you prefer to submit your comments at a later date, please do so by no later than May 4th, 2009. Please address comments to:

Carrie Baxter, R3 Consulting Group
4811 Chippendale Drive, Suite 708
Sacramento, CA 95841
PHONE: (916) 576-0306
E-MAIL: info@r3cgi.com

Glass Packaging Institute Comments: R3 Stakeholder Workshop on End-of-Life Beverage Container Management Systems

GPI submits the following comments concerning the recent Stakeholder Workshop. The comments are divided into two sections: process and substance.

1. Process Comments -- Stakeholders have not been given sufficient time to review, analyze, and consider the R3 Report, or the presentations delivered at the April 24 Workshop. The 148 page (plus appendices) report was circulated barely one week before the workshop. The Report lacked any findings and conclusions, but stated that the "Findings" section would be completed "after" the Stakeholder Workshop. This statement implied that the Stakeholders would have some input into the process. Instead, at the end of the Workshop, but before any input from the Stakeholders was solicited, we were presented with over 30 pages of findings. What was the purpose of holding back the findings? At the end of the Workshop, Stakeholders were invited to submit comments on or before May 4, 2009, only six business days after the Workshop. This short comment window combined with the short time provided to preview the Report and the delayed release of the Findings appears structured to discourage thoughtful Stakeholder input. GPI would have appreciated more time to consider the Report and its Findings.

2. Substantive Comments:

A. The Report's premise assumes its conclusion. Specifically, the Report presupposes that the best means to achieve recycling goals is through greater reliance on Extended Producer Responsibility (EPR). Thus, while the first listed "purpose" of the study was to identify systems that lead to the highest recycling rates and achieve green product design, the "approach" was to research and support greater emphasis on EPR. Only systems with significant EPR components were studied. Given this construct, many of the "Findings" were pre-ordained.

B. At the Workshop, the Finding concerning the Department of Conservation having less control over its budget than is optimal was characterized as the "most important" issue. Budget control was not discussed in any of the case studies presented during the Workshop, so it is difficult to understand what relationship this "Finding" has with the Report. It seems to be a non sequitur. GPI is not clear what is meant by the promotion of the DOC having greater control over the CBCRF. Exactly what expenditures would be open to increase or reduction? What would be the process for making such determinations? However, if the point of the Finding is that funds in the CBCRF should not be "borrowed" for non-recycling program related purposes, GPI heartily endorses that position.

C. California's recycling program appears more cost effective than the alternative case studies in the R3 Report. During the Findings presentation, a series of slides

compared California's recycling system with several other jurisdictions. Other jurisdiction have more than double California's per capita spending on public education. California serves four to fifteen times more people per redemption location. California has among the lowest deposit fees, often 200% or 300% lower than the compared jurisdictions. At the same time, California's recycling rate was as high or higher than most of the compared systems. (It is important to note that many of the rates reported for other systems were merely "redemption" rates, not true recycling rates.) While the Report lacks any such specific analysis, there is no question that California would rank highest on a measurement of units of recycling per dollar when compared to the alternatives in the Report. While GPI agrees that the California system could be made more cost effective and more efficient, the Findings seemed to endorse greater spending without calculating the incremental costs of achieving a higher recycling rate.

D. The conclusion that container sales are not affected by increased deposits was not proven. The proffered evidence for this conclusion was charts from two jurisdictions that had increased deposits, yet did not show a material decline in sales. This is interesting information, but does not reveal what sales would have been but for the deposit increases.

E. The apparent conclusion that wine and spirits containers should be added to the California program was unrelated to and unsubstantiated by the rest of the Report. Indeed, less than one-half of the alternative systems in the Report (as listed on page 21 of the Findings) include wine or spirits as part of their program. Wine and spirits containers are regularly recycled already in California through curbside programs. Wine and spirits make up a minute percentage of container sales compared to soft drinks, water and beer, so the claimed benefits of adding these containers to the California program are highly dubious. This Finding was another non sequitur that had nothing to do with the stated goal of identifying means to achieve a higher recycling rate. Historically, expanding to new products has lowered the recycling rate.

F. The Findings endorsing refillable containers were unrelated to and unsubstantiated by the Report. The jurisdictions cited in the Report that emphasize refillable containers either mandate these containers through regulation or financially penalize any alternative. The Report lacks a comparison of the costs, environmental and economic, of switching to refillable versus the current container mix. More fundamentally, the Report lacks an evaluation of the potential for incorporating refillable containers into California's existing system. Yet, this evaluation was the second stated "purpose" of the study. In the case of glass containers, the Findings related to refillables are particularly doubtful. Over the past 15 years, glass beverage containers have been repeatedly light-weighted, rendering the old GHG comparisons out of date. The light-weighting would have to be reversed because refillable containers must be designed to withstand much greater stress. Reliance on refillable containers means a return to brand sorting, which would add a significant cost to the process. Switching to refillables would mean an increase in minimum wage sorting jobs and a decrease in well paid union jobs, with real benefits, in the container manufacturing industry. Given the high post-consumer cullet content of glass containers manufactured in California, those

manufacturing jobs are unquestionably "green jobs." Switching to refillable containers is neither advantageous nor realistic.

G. The Findings related to California's processing fees are inaccurate and draw the wrong conclusion. The Findings state that California manufacturers have little or no control over the recycling rates of the container types. If this were so, why did California's environmental lobby push to have the processing fee inversely related to a container type's recycling rate? Obviously a manufacturer may choose to use more or less post-consumer material in the manufacturing process, and this decision leads directly to the recycling rate. The next processing fee related Finding states that processing fees do not lead to green product redesign, but may encourage [a product manufacturer] to switch to another, less environmentally friendly packaging type. Glass containers, which are 100% recyclable, and have been engineered to be as light as is safe, need no redesign. But if the point is that all container types should be subject to California's container recycling statute, GPI agrees. Currently, only glass, aluminum, metal and plastic containers are subject to CRV and potential processing fee costs. All other container types are given what amounts to a regulatory subsidy. Often the excuse given is that other container types are not recyclable. This stands public policy on its head. We are placing regulatory burdens on the environmentally preferable containers and encouraging products to switch to exempt containers to avoid the system. This result is antithetical to the purpose of the California program, which should not exempt any container type.

Plastic
Recycling
Corp. of
California

May 5, 2009

Re: End-of-Life Beverage Container Management Systems for CA: Stakeholder Comments
Name: Patty Moore, Executive Director
Company: Plastic Recycling Corporation of California
Phone: 707-935-3390 X14
Email: Patty@MooreRecycling.com

Comments re slide #:
Existing California System: You note that we are not yet achieving the goal of 80% recycling. Yet you also note that we are close, if not at, 75% in 2008. Reports from Certified Recycling Centers indicate redemption of containers is increasing—as sales are flat or decreasing—because of the slowing economy. It is quite possible that it will take no additional effort to see the rate climb to 80%.
In addition, I must be emphasize that the so-called "goal of 80% recycling rate" is merely a nonbinding objective in the preamble to the statute, not a binding mandate.
Department has Less control than Other Programs: Your conclusion is that the Dept. needs to set its own spending and program priorities. I might agree with this statement if there was a mechanism for direct input into the program by businesses that make and sell beverages. Other programs may have more discretion on their priorities and how they spend money, but other programs have representatives of the beverage industry making those decisions.
As a practical matter, the Department of Conservation (DOC) employs in excess of 220 employees who participate in the implementation and management of the California beverage statute. There is no legal mechanism to separate this function from legislative policymaking activity.
No Impact on Sales from New Fee: You show one example, yet there are many more examples that show that sales do decrease with an increased fee. In addition, your example is inherently flawed because it refers to a $.20 deposit on a high-cost commodity of wine and spirits—a $0.20 deposit on a $10-$20 item is significantly different from a $.20 deposit on a one dollar item. This is not a true measure of price elasticity and impact on product sales. In fact, in one of your case studies (Germany) there was a dramatic drop in sales when a deposit was placed on beer.
Advantages of Increasing CRV: I strongly disagree that an increased CRV will cause improved overall quality of material for recycling and do not know of any data to back up this claim. You also note that it will increase recovery rates, yet your chart on the prior page does not bear this out, nor does your regression analysis.
Disadvantages of Increasing CRV: You fail to mention that increasing the CRV will put an additional regressive financial burden on California consumers that are already suffering under financial strain
2.b. Advantages of Using Refillables: A study by IFEU (Heidelberg) shows without doubt that one-way PET bottles are as “ecologically favorable” as refillable glass. And I note that you do not include disadvantages of a Refillable system. What about the critical lack of a water analysis? What about the cost to implement and manage refillable programs?
2.c. Processing Fee Calculations: While manufacturers do not have direct control over recycling rates (no one does, it is up to consumers whim), they certainly have the ability and the responsibility to increase the rates and, through PRCC, do so. PRCC increased recycling of PET by working with Recyclers and MRFs so they understand which bottles are recyclable and which are not. PRCC staff make

Plastic
Recycling
Corp. of
California

presentations at events throughout the State to encourage consumers and communities to recycle PET bottles. PRCC provides direct technical assistance to consumers, educators and recyclers throughout the State.

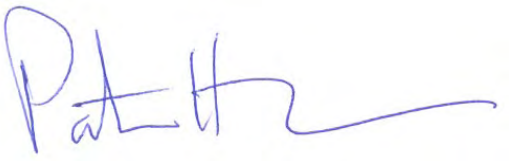
2.c.: (continued) Processing fees encourage green product redesign in several ways. The PF calculation rewards light weighting; it rewards using products that have a higher recycling rate; it rewards using products that have a higher scrap value; and it rewards using products that can be easily and efficiently collected for recycling. Unfortunately, it also does encourage switching to a package that is not covered under the law (aseptic, foil pouches).

2.e. Material Tracking to Assure Recycling: Although I am not opposed to tracking, it can be quite expensive and difficult to achieve. I'd suggest that rather than spending what little money we have tracking recycled materials, we should continue to encourage the use of materials here in California.

2.f. Recycled-content Requirements for Containers: FDA approves the use of recycled content in some plastic food containers (e.g., PET) but not others (e.g., HDPE).

Let me know if you have any questions regarding my comments.

Sincerely,



Patricia H. Moore
Executive Director

• P.O. Box 1327 • Sonoma, CA 95476-1327 • (707) 935-1997 • FAX (707) 935-1998

Dear Susan – thank you for hosting the stakeholder meeting and providing us a review of your near complete report. Already I see the value it will serve both as a reference for our management team – and as a starting-point for stakeholder discussions around improving the program.

Below, please find some comments from our perspective regarding what the report and what it doesn't consider. Please feel free to follow-up with me if you require clarification.

Thank you – Chuck Riegle

Demystifying deposit-return models

- In the section titled: "Elements of Success" you find that when boiled down, these programs have common absolutes that ensure their success in recovering high volumes of UBCs. Your list includes:
    - Deposit level
    - Public Education
    - Consumer Access to Redemption Points

  Based on my company's experience providing services in over 60 markets and many different system models, we have found that there are more core similarities than most think. The real differences are in execution – sometimes defined by politics.

  To your list I would consider:
    - Mandated recovery goal. This is not required in all of the programs found in the report, but such a goal pulls together other parts of the model. For example – the need for a significant incentive (deposit or other); the need for convenience; and the need to use a number of return systems versus supporting ineffective collection schemes. If you have a goal – all components are considered for their affect.
    - Producer or Consumer Fees that cover, when needed, the cost differential of collecting and processing packaging.
    - Convenient community-wide infrastructure (Return-to-Retail)

- In each case, yes there are differences, but those are simply nuances that are mostly the result of politics and local habits. When we recognize that these differences are indeed not significant, we will have more clarity to innovate for improvement.

More consideration required (from a recycler's perspective)

- Consider a more thorough analysis on the challenges and risks of the California model under certain circumstances – like the local budget crisis and the global economic downturn.
    - Please consider the April 21, 2009 letter from Californian's Against Waste regarding the Implications of 2008 record recycling rate on fund status and

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PHONE: (203) 449-8393

expenditures.

- The report points out the practice of 'loaning' moneys to general government expenses, and suggests that the money be spent on new initiatives. We would like there to be some consideration that the program cannot afford to continuously fund 'non-essential' or ineffective programs in times when the fund balance is in jeopardy.
- Discuss the flaw in the California model - its reliance on high Aluminum commodity prices. The report fails to point out the model's failure to consider and react in a reasonable time frame to a flux in commodity pricing – specifically PET and Aluminum.

Finding 1a: Public Education

- Last time significant money was spent for this item there was an opportunity for public comment – but there was no plan to review. Most stakeholders are not public relations professionals - this initiative might receive better stakeholder support if stakeholders were allowed to comment on a marketing plan as opposed to simply being asked for our input.
- Unless cuts to non-essential programs are made or borrowed monies are returned to the fund – there isn't enough money available to pay for 80% redemption rate.

Finding 1b: Access to Redemption

- We need to better understand the reasons why there are UZs – and shape efforts to address them. Our experience tells us that the following would help:
  1. Assistance with local planning and zoning to understand the value and best practices in RC operations.
  2. A limit to the size of beverage containers currently covered by the law would allow for some flexibility and innovations that serve over 90% of the containers covered by the law – at a greatly reduced footprint and cost.
  3. Review of the impact of commodity market swings and cuts to hours of operation and investment in operating new sites.
  4. Enforcement.

Finding 1c: CRV Value

- $ is the great incentivizer and educator in the case of recycling.
- There is approximately a 60-day lag between a recycler paying CRV and being reimbursed by the State. RCs front these funds – to do so they must borrow the money. Raising the CRV too high might pose a fiscal challenge for RCs. If the CRV is indeed raised, or new larger containers are added to the program – I suggest that the same CRV for small and large containers be considered.

Finding 2a: Expansion to other juices, Wine & Spirits

- New equipment and storage methods will be required as the proportion of larger sized containers rises.
- Consider limiting the inclusion of all beverage containers by size to allow for more innovative practices and cost reduction opportunities.
- Ensure new beverage packaging being considered that isn't recyclable take action to develop a recycling market or pay more fees to cover additional recycling costs.

Finding 2b: Refillables

- We have 35 years experience redeeming refillable containers for reuse – we can help understand the design and economics of such return systems.

Finding 2c: Processing Fee Calculations

- We all value the aluminum can for its positive impact on California's recycling model, but we must consider a safety-net like the ones for glass and plastics when markets drop as much as they have.

Finding 2d: Market Development Grants

- Does not include monies for the collection infrastructure. Operators use processing and handling fees to cover operational costs. A grants program would provide for a needed facelift and innovations; and help improve access to consumers for redemption.
- The program should consider funding or working with another state agency's Economic Development Manager – someone empowered to advise investors on the incentive programs offered by the DOC and other agencies - and bring together for them the various parties they must work with to build the sought after recycling plants.

Finding 2f: Recycled Content

- If a content rate is considered, it should consider what is available for use based on the type of collection system from which it came. Quality control is key.

Appendix B

Flow of Payments under the Beverage Container Recycling Program (California)

The California Beverage Container Recycling and Litter Reduction Act

Flow of Payments under the Beverage Container Recycling Program

RECYCLING

Beverage Manufacturer

- Buys beverage containers from container manufacturer
- Fills and sells beverage containers to distributor
- Pays processing fees to the Department of Conservation

Consumer

- Buys beverage containers from retailer and pays redemption value
- Returns empty beverage containers to recycler
- Receives refund value

Retailer

- Buys beverage containers from distibutor and pays redemption value
- Sells beverage containers to consumer and charges redemption value
- Redeems beverage containers when a convenience zone is unserved

Distributor

- Sells beverage containers to retailer and charges redemption value
- Pays redemption value to the Department of Conservation

Recycler

- Receives empty beverage containers from consumer
- Pays refund value to consumer
- Receives CRV and processing payment from processor
- Sells empty beverage containers to processor

Processor

- Receives empty beverage containers from recycler
- Pays refund value, processing payments, and applicable scrap value to recycler
- Receives refund value and processing payment from the Department of Conservation
- Cancels used beverage containers
- Sells empty beverage containers to container manufacturer or other end user

Department of Conservation

- Receives processing fees from beverage manufacturers
- Receives redemption payment from distributors
- Pays refund value and processing payment to processors
- Pays participants various other program payments
- Funds program administration

- ✲ California Redemption/ Refund Value (CRV)
- ✲✲ Processing Fee
- Processing Payment
- Other Program Payments

Departmental Administration | **Handling Fees** | **Public Education and Information Campaign** | **Grants** | **Quality Incentive Payments** | **Payments to Cities and Counties** | **Market Development Payments** | **Curbside Supplemental Payments** | **Incentive Payments to Recyclers**

NOTES: ✲ California Redemption Value is paid when a beverage container is purchased. California Refund Value is received when a beverage container is returned for recycling. CRV is used to reference both terms.

✲✲ Processing payments are paid to recyclers equaling the difference between the average cost to recycle and the average scrap value received. Processing fees are equal to a percentage of processing payments ranging from 10 to 65 percent.

5/07

The California Beverage Container Recycling and Litter Reduction Act

Flow of Payments under the Beverage Container Recycling Program (with Container Flow)

RECYCLING

- Containers
- ✲ California Redemption/ Refund Value (CRV)
- ✲✲ Processing Fee
- Processing Payment
- Other Program Payments

Beverage Manufacturer

- Buys beverage containers from container manufacturer
- Fills and sells beverage containers to distributor
- Pays processing fees to the Department of Conservation

Other End User

- Manufactures non beverage container products (e.g., fiberglass and carpets)

Container Manufacturer

- Manufactures new beverage containers

Consumer

- Buys beverage containers from retailer and pays redemption value
- Returns empty beverage containers to recycler
- Receives refund value

Retailer

- Buys beverage containers from distibutor and pays redemption value
- Sells beverage containers to consumer and charges redemption value
- Redeems beverage containers when a convenience zone is unserved

Recycler

- Receives empty beverage containers from consumer
- Pays refund value to consumer
- Receives CRV and processing payment from processor
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Distributor

- Sells beverage containers to retailer and charges redemption value
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Processor

- Receives empty beverage containers from recycler
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- Receives refund value and processing payment from the Department of Conservation
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Department of Conservation

- Receives processing fees from beverage manufacturers
- Receives redemption payment from distributors
- Pays refund value and processing payment to processors
- Pays participants various other program payments
- Funds program administration

- Departmental Administration
- Handling Fees
- Public Education and Information Campaign
- Grants
- Quality Incentive Payments
- Payments to Cities and Counties
- Market Development Payments
- Curbside Supplemental Payments
- Incentive Payments to Recyclers

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5/07

Appendix C

Bibliography

Appendix C

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