



# Waste & Opportunity

U.S. Beverage Container  
Recycling Scorecard and Report, 2011

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# As You Sow

As You Sow is a nonprofit organization dedicated to increasing environmental and social corporate responsibility. Founded in 1992, As You Sow envisions a safe, just, and sustainable world in which environmental health and human rights are central to corporate decision making. Its Energy, Environmental Health, Waste, and Human Rights programs create positive, industry-wide change through corporate dialogue, shareholder advocacy, coalition building, and innovative legal strategies. [www.asyousow.org](http://www.asyousow.org)

## Acknowledgements

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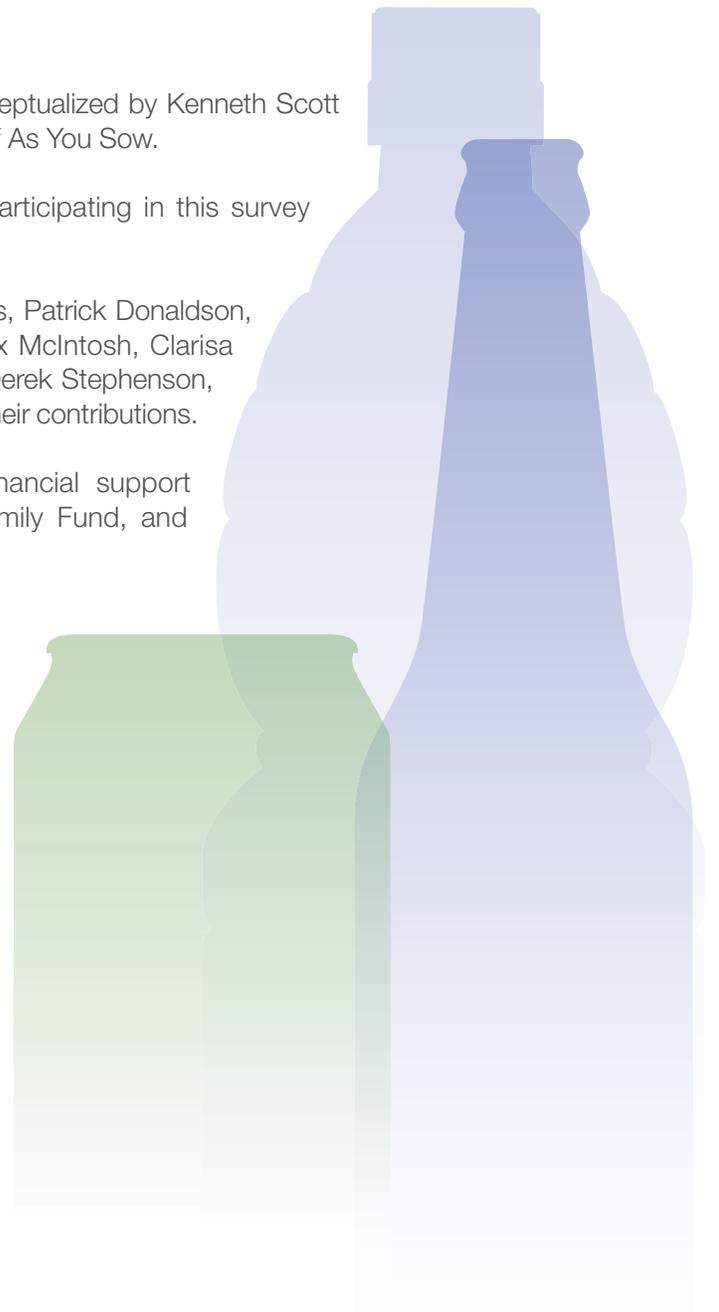
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# Contents

- Executive Summary .....1
  - Key Findings and Recommendations .....1
- Introduction .....3
- 1. General Environmental Performance .....4
- 2. Source Reduction .....6
- 3. Recycled Content .....8
- 4. Recyclability .....10
- 5. Beverage Container Recovery .....12
- 6. Findings .....18
- 7. Recommendations .....19
- Appendix A: Companies That Received the As You Sow Survey .....20
- Appendix B: Scoring Methodology .....20
- Appendix C: Sample Weighing of Selected Beverage Containers .....21
- References .....22
- Endnotes .....23



# Executive Summary

“Waste & Opportunity 2011” is As You Sow’s third U.S. Beverage Container Recycling Scorecard and Report. This report is organized into seven sections: general environmental performance, source reduction, recycled content, recyclability, container recovery, findings, and recommendations. Nestlé Waters North America received the highest score on the scorecard, followed by PepsiCo, The Coca-Cola Company, and Red Bull GMBH.

## Key Findings and Recommendations

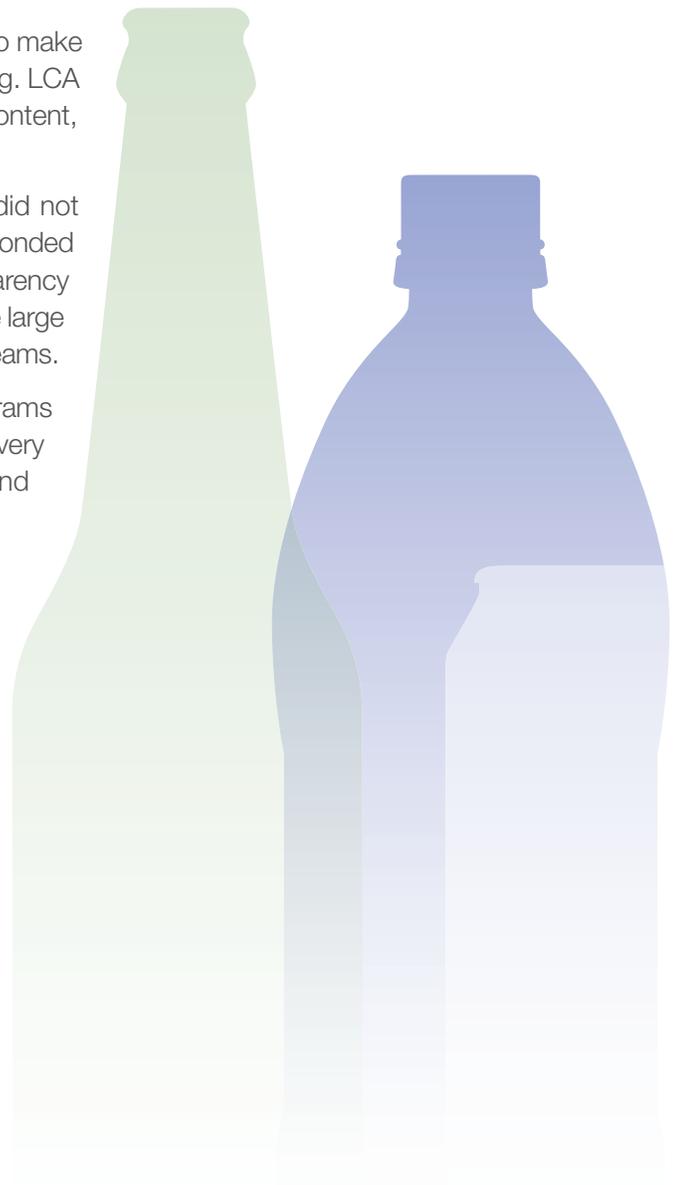
- In developing a national recycling program, survey respondents are most likely to support a program with regulatory mandates that:
  - Internalizes environmental externalities,
  - Sets fees paid by producers that are included in the price of the product, and
  - Sets fees paid by producers and administered by industry.
- Two key brands, The Coca-Cola Company and Nestlé Waters North America, have started to press publicly for state extended producer responsibility (EPR) laws for post-consumer packaging similar to those in place in Canada and Europe.
- The Coca-Cola Company, an historical opponent of container deposit legislation, indicated it is now neutral on a “voluntary” system of deposits administered by associated industries.
- Since the 2008 Waste & Opportunity report, there have not been significant increases in recycled content:
  - PepsiCo continues to have the highest use of recycled PET (rPET), 10%, across all product lines with a commitment to maintain and increase this percentage.
  - New Belgium Brewing Company currently uses 50% recycled glass, the highest reported, in its 22 oz bottles.
  - Nestlé Waters uses 50% recycled PET in its re-source™ bottles but lacks a company-wide commitment for rPET.

## U.S. Beverage Container Recycling Scorecard, 2011

Scorecard	Total Score	Total Grade
<b>Nestlé Waters North America</b>	2.88	B-
<b>PepsiCo</b>	2.83	B-
<b>The Coca-Cola Company</b>	2.73	B-
<b>Red Bull GMBH</b>	2.71	C+
<b>Starbucks Corporation</b>	2.13	C
<b>New Belgium Brewing Company</b>	1.88	C-
<b>Dr Pepper Snapple Group</b>	1.83	C-
Miller Coors	0.67	F
Fiji Water	0.56	F
Molson	0.55	F
Crystal Geyser Alpine Spring Water	0.38	F
Honest Tea	0.38	F
Niagra Bottling Company	0.38	F
Ocean Spray	0.38	F
Sunny Delight Beverages Company	0.38	F
Jones Soda	0.23	F
Polar Beverage	0.18	F
Anheuser Busch	0.06	F
El Dorado Natural Spring Water	0.06	F
National Beverage	0.00	F
Cott	0.00	F
Adirondack Beverages	0.00	F
AriZona Beverages	0.00	F
Big Red	0.00	F
Clearly Canadian Beverage Corp.	0.00	F
Hansens Beverage Companies	0.00	F
Jamba Juice	0.00	F
Re-Load Group, Inc.	0.00	F
Talking Rain Beverage Company	0.00	F
The Boston Beer Company	0.00	F
The Monarch Company, Inc.	0.00	F

Companies in **Bold** responded to survey. Other scores are based on publicly available information.

- Companies whose primary business is not beverages are making commitments to increase recycled content:
  - Whole Foods Market has a goal of 35% recycled content in its 20 oz PET and 12 oz HDPE bottles by 2011 with a future goal of 75%.
- Beverage companies can increase the recycled content in their cans by more than 50% simply by selecting aluminum and aluminum can suppliers that use higher recycled content in their products.
- Companies continue to make commitments to container recovery:
  - Nestlé Waters, PepsiCo, and Red Bull have industry-wide container recovery goals.
  - Red Bull and The Coca-Cola Company have company-wide container recovery goals.
  - Nestlé Waters announced plans for a new PET bottle-to-bottle recycling facility.
- In order to have strong buy-in for producer responsibility packaging legislation, the beverage industry needs to increase engagement and integration with stakeholders and other industries such as consumer packaged goods and retailers who produce private labels.
- Companies should put resources in to designing packaging for recycling in a manner that includes full consideration of the end-of-life aspect of packaging and, where possible, promotes a full-scale closed-loop system.
- Companies should use life cycle assessment (LCA) data to make decisions to reduce the environmental impact of packaging. LCA data can influence source reduction, the use of recycled content, design, and materials decisions.
- Anheuser Busch and MillerCoors, two leading brewers did not participate in this report although Anheuser Busch has responded to prior surveys. These companies should increase transparency to stakeholders through participation in surveys, as they are large contributors to beverage container waste and recycling streams.
- Companies should apply the lessons from successful programs in U.S. states and other countries with high container recovery rates in order to improve U.S. container recovery and recycling rates.



# Introduction

“Waste & Opportunity 2011” is As You Sow’s third U.S. Beverage Container Recycling Scorecard and Report. The report continues to track and rank companies’ efforts to reduce source materials, create product packaging that is recyclable, and increase container recovery. “Waste & Opportunity 2011” takes a deeper look into the environmental issues raised by beverage packaging and recommends corporate actions that can reduce resource depletion and solid waste, and improve the quality of post-consumer content.

The 2011 U.S. Beverage Container Recycling Scorecard and Report is based on responses to As You Sow’s Beverage Container Recycling Survey, which was sent to 45 companies. This year, in addition to beverage companies, the survey was sent to grocery manufacturers with private label beverage brands, fast food restaurant chains that serve drinks in paper and plastic cups, and packaged food companies that own beverage brands, to get an ever broader picture of the practices related to packaging among

companies that profit from the sale of products in single-use containers. Although grocers and fast food restaurants historically have not put resources comparable to traditional beverage companies into addressing beverage packaging, current attention to materials, cost, and environmental issues related to packaging indicate that all

	Nestlé Waters North America Inc.	PepsiCo	The Coca-Cola Company	Red Bull GMBH	Starbucks Corporation	New Belgium Brewing Company	Dr Pepper Snapple Group
General Environmental	A	A	B	B+	C+	A	F
Source Reduction	A	A	A	A	A	D+	A
Recycled Content	D	C	C-	C	D	C	D
Recyclability	A	B	A	A	A	B	A
Recovery	C-	C+	D+	D-	F	F	F
<b>Total Score</b>	<b>2.88</b>	<b>2.83</b>	<b>2.73</b>	<b>2.71</b>	<b>2.13</b>	<b>1.88</b>	<b>1.83</b>
<b>Total Grade</b>	<b>B-</b>	<b>B-</b>	<b>B-</b>	<b>B-</b>	<b>C</b>	<b>C-</b>	<b>C-</b>

producers of containers, regardless of the percentage of business derived from their sale, need to participate in container recovery programs. Due to the nascent participation among grocers and fast food companies, their responses to the survey were not scored.

A complete list of companies who received, participated, and did not participate in the survey is found in Appendix A. The grading methodology is described in Appendix B.

# Chapter 1: General Environmental Performance

As companies increasingly appreciate the importance of competing on the environmental benefits as well as costs of their products and packaging, they have begun to implement different tools to quantify these impacts. Investors are increasingly attending to environmental risks factors, and consumers want to know if the products that they are purchasing are “eco-friendly.” A company’s efforts in environmental stewardship, not only about current products, but also about future goals and strategies for attaining them, are becoming critical points for competition within industries.

General Environmental	Nestlé Waters North America	New Belgium Brewing Company	PepsiCo	Red Bull GMBH	The Coca-Cola Company	Starbucks Corporation	Dr Pepper Snapple Group
Does your company have environmental information relating to packaging on your website?	A	A	A	A	A	A	A
Have you conducted a Life Cycle Assessment for the packaging of any product line?	A	A	A	A	A	A	F
Did LCA measure full impact through product lifecycle?	A	A	A	A	A	F	F
Was the LCA independently reviewed?	A	A	A	A	A	A	F
Are the LCA findings public?	A	A	A	F	F	F	F
Do you calculate CO <sub>2</sub> -equivalent per unit of packaging?							
Primary	A	A	A	A	A	A	F
Secondary	A	A	A	A	F	F	F
Do you calculate CO <sub>2</sub> -e generated per unit of product?	A	A	A	A	A	F	F
<b>Score</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>3.60</b>	<b>3.20</b>	<b>2.40</b>	<b>0.40</b>
<b>Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>B+</b>	<b>B</b>	<b>C+</b>	<b>F</b>

Each of the beverage companies that responded to this report has environmental information about its packaging publicly available on its website. Over the past five years, this has become a common practice. Increasingly, companies whose primary products are not beverages — such as Campbell Soup Company, The Hain Celestial Group, and McDonald’s Corporation — are also providing information on their packaging.

One benchmark for understanding the environmental footprint of a product is a Life Cycle Assessment (LCA). An LCA is “a method for characterizing impacts associated with the sourcing, manufacture, distribution, use, and disposal of a product or product system.”<sup>1</sup> LCAs can serve a pivotal role in understanding a beverage’s environmental impact, and the importance of addressing beverage containers as companies have reported that packaging accounts for the largest percentage of a product’s carbon footprint.<sup>2</sup> The Coca-Cola Company noted its packaging accounts for 30-70% of its carbon footprint, while Nestlé Waters calculated that its PET accounted for 55% of the company’s greenhouse gas emissions. Packaging and non-consumable items for New Belgium Brewing Company’s Fat Tire Amber Ale accounts for 27% of its carbon footprint.

It is important to note that the results of LCAs cannot be compared without careful analysis. LCAs can differ widely based on the boundaries that companies use (e.g.: if they only quantify the production of the product versus the consumer's use of the product), their assumptions for end-of-life, and the units used.

## Packaging accounts for the largest percentage of a product's carbon footprint.

Critical boundaries for LCAs are if the LCA measured the full impact of the packaging throughout the product's life cycle. Each of the beverage companies that responded to the survey, except for Dr Pepper Snapple Group, has conducted an LCA for at least one packaging line and all of the LCAs were independently reviewed. Some of the brands for which LCAs were complete include Fat Tire, Tropicana Pure Premium Orange Juice, some Naked Juice flavors, and Red Bull Energy Drink. The LCAs for all of the beverage companies measured the full impact of the product lifecycle, and all except for Coca-Cola, Red Bull, and Starbucks are publicly available.<sup>3</sup>

The companies reported that the boundaries used for the LCAs for their packaging were from raw material to end-of-life. For several of those companies, including Starbucks, end-of-life assumption for packaging was a landfill. Starbucks assumed end-of-life for its cold cups to be a landfill but also explored composting for the possibility of using the bioplastic polylactic acid (PLA). The Coca-Cola Company examined both closed- and open-loop recycling as end-of-life possibilities for its packaging and Red Bull reported that it also calculated LCA based on cradle-to-cradle, meaning that the packaging would be reused into another product or package.

Another important indicator for environmental impact is carbon dioxide equivalents (CO<sub>2</sub>-e). CO<sub>2</sub>-e is the amount of global warming gases that a product or package produces, normalized to carbon dioxide. The "equivalent" is important because different gases have more or less of an impact on global warming than carbon dioxide. For example, methane has 25 times higher global warming potential than carbon dioxide, while sulfur hexafluoride has 22,800 times higher global warming potential. For this reason, the gases need to be normalized to a single unit — carbon dioxide — in order to aggregate the global warming potential for a product or packaging.

Except for Dr Pepper Snapple Group, all of the beverage companies who responded to this survey, as well as McDonald's, have calculated the CO<sub>2</sub>-e for the primary packaging of at least one of their beverages. Nestlé Waters North America, New Belgium Brewery, PepsiCo, and Red Bull have also calculated CO<sub>2</sub>-e for secondary packaging and Nestlé Waters, New Belgium Brewing Company, PepsiCo, Red Bull, Coca-Cola, and Campbell Soup have calculated CO<sub>2</sub>-e generated per unit of product.

Life Cycle Assessments and determining CO<sub>2</sub>-e take effort on the part of companies, but they are not an end in themselves. Once the analysis is complete, companies need to use the information to reduce their environmental footprint. Some ways in which these analyses are used include creating reduction targets, evaluating design decisions, and changing designs and/or materials.<sup>4</sup>



## Chapter 2:

# Source Reduction

Reducing packaging materials has a dramatic effect on the energy use and carbon footprint of beverage companies. Source reduction has both economic and environmental benefits, as using less material both costs less and requires less energy to create packaging from raw materials. The combination of reduced-weight packaging and recycled content has significant environmental benefits and, as seen by the responses to this survey, is within the reach of all of the major beverage companies. Yet the weight of packaging per ounce of beverage varies significantly. For example, in an independent test conducted on behalf of As You Sow, Nestlé Waters North America's 16.9 oz PET Poland Spring bottle was found to deliver the most beverage per gram of PET: .651 grams of packaging for each ounce of water, whereas The Coca Cola Company's 20 oz Dasani uses 1.14 grams of packaging for each ounce of water.<sup>5</sup> The results of the sample weighing can be found in Appendix C.

Source Reduction	Dr Pepper Snapple Group	Nestlé Waters North America	PepsiCo	Red Bull GMBH	Starbucks Corporation	The Coca-Cola Company	New Belgium Brewing Company
Source reduction goals	A	A	A	A	A	A	F
Historical source reduction	A	A	A	A	A	A	A
<b>Score</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>1.60</b>
<b>Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>C-</b>

All of the companies that responded to the survey except for Hain Celestial have reduced the weight of their packaging. For example, since introduction, The Coca-Cola Company reports that it has reduced its 8 oz glass bottles by 57%, 12 oz aluminum cans by 33%, and its 20 oz PET bottles by 25%. Some companies claim to have been so successful through historical lightweighting that they can no longer reduce the weight of their packaging. Nestlé Waters North America believes that its "1/2 liter retail pack is very close to its lightest possible weight," yet the company plans to continue to find ways to reduce resource use such as energy in the making of its packaging.

Companies note the amount of savings that reductions in the weight of packaging can create. For example, PepsiCo's Eco-Fina Bottle of Aquafina water weighs 50% less than a bottle of Aquafina in 2002, a reduction which saves the company 75 million pounds of PET annually.

Source reduction goals with strategic plans to implement them can have significant effects on a company's double bottom line of financial and environmental returns. While many companies have already made significant reductions to the weight of their packaging, they continue to look for ways to reduce weight. For example, in 2010 Dr Pepper Snapple Group reduced the "weight of the bottle neck (finish) by 25%" and in 2011 set a goal to redesign its "1 liter and 2 liter bottles, saving between 0.3 and 2.9 grams, and to convert the finishes of all 20 oz. Snapple containers from 43mm to 38 mm."

Coca-Cola has a goal of "reducing packaging by 7% overall by 2015 based on a 2008 baseline" and "may set more aggressive targets in individual markets," and Hain Celestial has a goal of "reducing packaging by 5% by 2013." Nestlé Waters North America is meeting its goal of 15% reduction to its half-liter bottles by reducing its Eco-Shape bottle, a reduction that "saved the company 80 million pounds of plastic resin annually" and "is 60% lighter than the bottle was when originally introduced." The company has set a goal of combined weight average reduction of 22.9% for all PET plastic bottles by 2012.

Some companies have set future goals that are less specific. For example, Campbell Soup Company, which makes V8®, has a goal to reduce packaging by "100 million pounds by 2020."

# Chapter 3: Recycled Content

The energy savings from using recycled materials in beverage containers is significant. Making cans of recycled aluminum instead of virgin ore requires “95% less energy and 95% less greenhouse gas emissions than creating a can from new metal” and a recycled can could be back on the shelf of a store in 60 days.<sup>6</sup> Plastic bottles made from recycled PET use 30% less energy and save 11 barrels of oil per ton of plastic.<sup>7</sup> Recycled glass products use 35% less energy to manufacture than does making glass from raw materials.<sup>8</sup>

Recycled Content		PepsiCo	New Belgium Brewing Company	Red Bull GMBH	The Coca-Cola Company	Dr Pepper Snapple Group	Starbucks Corporation	Nestlé Waters North America
Percentage post-consumer recycled content		B	A-	C	C+	C	C	D
Goals for post-consumer recycled content		D	F	C	D	F	F	D
<b>Score</b>		<b>2.10</b>	<b>2.04</b>	<b>2.00</b>	<b>1.72</b>	<b>1.10</b>	<b>1.10</b>	<b>1.00</b>
<b>Grade</b>		<b>C</b>	<b>C</b>	<b>C</b>	<b>C-</b>	<b>D</b>	<b>D</b>	<b>D</b>

Aluminum currently has the highest recycling rate and recycled content of all beverage containers. There are approximately 100 billion aluminum cans sold in the U.S. annually and in 2009 the recycling rate for aluminum cans was 50.7%.<sup>9</sup> Unlike glass and plastic, the percentage of recycled aluminum in an aluminum can is not determined by company, but instead by the aluminum manufacturer. Alcoa provides its customers with cans that have 68% recycled content, while Ball’s customers, such as Starbucks, are receiving cans with 44% recycled content.<sup>10</sup> Beverage companies can increase the recycled content in their cans by more than 50% simply by selecting aluminum and aluminum can suppliers that use higher recycled content in their products, significantly reducing the packaging’s environmental footprint.

In December 2008, members of the Glass Packaging Institute set a goal to utilize 50% recycled content in glass bottles by 2013.<sup>11</sup> New Belgium Brewing Company is currently using 50% recycled content in its 22 oz bottles. The Coca-Cola Company is using 35%, Starbucks 30%, and PepsiCo 29%. These numbers are orders of magnitude higher than Dr Pepper Snapple Group (7%).

PepsiCo is the only major beverage company that has maintained a consistent, if modest (10%), amount of recycled PET content for at least five years. Coca-Cola, like Pepsi, initially met a 10% goal at the end of 2005 but Coca-Cola has not maintained that percentage of recycled content. No other major brand has the consistently high levels of rPET use that Pepsi does, and the company is using 100% rPET in its smaller Naked Juice brand.

Many of the companies that make products with PET commented in their responses to the survey that there is a dearth of post-consumer PET on the market from which they can make bottles with higher recycled content. Yet in 2009, 1.44 billion pounds of PET bottles were collected in the U.S. via recycling, while only 641.8 million pounds were purchased by U.S. reclaimers. The rest was exported to markets willing to pay higher prices than the U.S. beverage companies.<sup>12</sup> Thus, on top of a low nation-wide recovery rate for PET,

less than half of the recovered bottles remain in the U.S. to be made into not only bottles, but also other products containing rPET.

As markets for post-consumer materials continue to expand, we hope to see beverage companies and bottlers that bottle for smaller brands begin to offer the same percentages of recycled content that they utilize in their branded products. Yet even larger companies note the challenge of obtaining post-consumer materials for their bottles. Dr Pepper Snapple Group noted that it wants to increase the percentage of recycled content in its products, “however, the viability of these initiatives will depend on the quality and availability of material in what can be a highly volatile and price-sensitive marketplace.”

PepsiCo, the current leader in percentage of rPET in its bottles does not own a bottle-to-bottle recycling plant and sources rPET in the open market. Yet other companies with significant brand portfolios sold in PET bottles state that in response to the above and other rPET market factors, they are opening up their own facilities. Nestlé Waters noted that it has plans to open an rPET plant in 2011, and in 2009 Coca-Cola opened the largest plastic bottle-to-bottle recycling plant in the U.S. In its first year in operation, the plant recycled more than 500 million PET bottles but did not meet its goals. Plastics News reported that only one million pounds of recycled PET went into bottles, which is only a fraction of the plant’s 56 million pound capacity.<sup>13</sup>

Most of the companies that responded to this survey first set goals for recycled content in their packaging in the first decade of the 21st century. Yet two, Coca-Cola and Red Bull, were exploring this issue earlier. Coca-Cola “began [its] research for inclusion of recycled content in PET in the 1970s and goals were set in the early 1990s” and first introduced “food grade PET in a packaging in 1991 with 25% rPET in our two liter package.” Red Bull was another early adopter of goals for recycled content, first setting goals in the late 1990s.

Many companies have set goals for recycled content. The Coca-Cola Company responded that it wants to have a minimum of 25% recycled PET in all of its brands by 2015, which is the level it had initially achieved in 1991 and then abandoned shortly thereafter yet, at present, the company has also not been able to maintain its commitment to use 10% rPET.<sup>14</sup> Whole Foods Market has some of the most ambitious goals for its private label brand – at least 35% recycled PET in its 20 oz PET bottle in 2011 with a goal of 75% rPET going forward. Nestlé Waters North America met its 2012 goal for using 50% rPET in its re-source™ brand in 2011 and set a goal for 50% rPET in its Deer Park brand. While this percentage of recycled content sets a high bar, it is only across two U.S. products whereas other companies’ goals apply to all product lines.



# Chapter 4: Recyclability

Beverage containers can become contaminated both through the collection and sorting of post-consumer materials as well as by elements in the containers themselves. In the collection and sorting processes — particularly in single-stream curbside recovery systems — materials are mixed together and cannot always be separated. Glass of different colors also cannot always be sorted. In addition, there are labels, glues, dyes, and caps which, although recyclable in and of themselves, may not be recyclable with the bottles and thus, too, need to be separated out or contaminate the stream.

Recyclability	Dr Pepper Snapple Group	Nestlé Waters North America	Starbucks Corporation	The Coca-Cola Company	Red Bull GMBH	New Belgium Brewing Company	PepsiCo
Potential contaminants to the recycling process	A	A	A	A	A	A	B
Are the caps 100% recyclable?	A	A	A	A	A	A	A
If no, are you engaged in R&D to develop 100% recyclable caps?	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Score</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>3.25</b>	<b>3.25</b>
<b>Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>B</b>

Different elements can be contaminants for different packaging materials and pose varying degrees of threat to the viability of the post-consumer material's potential for reuse. Companies mentioned promotional labels that are not water-soluble, color tinting for primary and secondary packaging, barrier coatings on cans and plastic packaging, as well as the beverage itself.

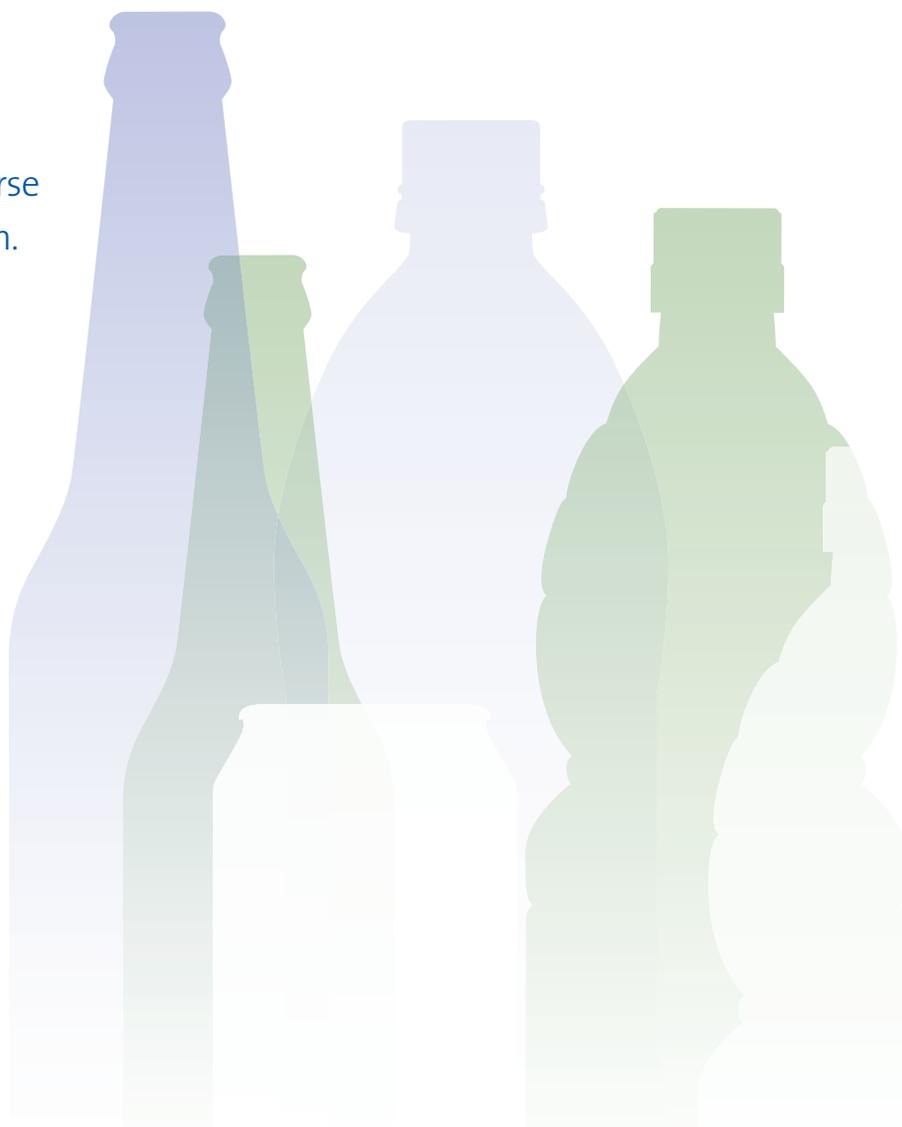
There are also additives that can be added to packaging, plastics in particular, that keep out sunlight and preserve the products. These additives, too, have an impact on the recyclability of the plastic.

In recent years, the post-consumer plastic stream has faced a challenge from another type of plastic: bioplastics. Unlike PET, which is derived from petroleum, bioplastics are derived from plant-based substances. PLA, or polylactic acid, is a bioplastic used for cold beverage cups, linings for hot beverage cups, and food containers such as clamshells. In the U.S., it is made from corn starch, but in other countries tapioca and sugarcane are also used. PLA introduces several challenges to recyclability. Consumers put PLA in with PET for recycling, and PLA is not recyclable. It is technically compostable, but in large amounts it acidifies the compost and does not compost in home composting systems.<sup>15</sup> PLA does not mix with PET, and needs to be sorted from PET bales using near infrared technology by recycling facilities at additional cost — not only to collect the PLA, but to protect the PET and enable it to be used again in products.<sup>16</sup>

Both The Coca-Cola Company and PepsiCo, instead of using bioplastics such as PLA, are making a bio-based PET. The Coca-Cola Company's plantbottle™ is a plastic bottle, 30% of which is sourced from plants and not petrochemicals. Both companies state that their bottle is chemically and physically the same as PET.<sup>17</sup> Coca-Cola's studies concluded that there is "no technical adverse impact on PET recycling stream."<sup>18</sup> PepsiCo will pilot its "green" bottle made from 100% bio-based materials in 2012 and use waste from its food production as feedstock.<sup>19</sup>

Both the Coca-Cola Company and PepsiCo, instead of using bioplastics such as PLA, are making a bio-based PET. The Coca-Cola Company's plantbottle™ is a plastic bottle, 30% of which is sourced from plants and not petrochemicals. Both companies state that their bottle is chemically and physically the same as PET. Coca-Cola's studies concluded that there is no technical adverse impact on PET recycling stream. PepsiCo will pilot its "green" bottle made from 100% bio-based materials in 2012 and use waste from its food production as feedstock.

Paper cups are also a challenge for recycling. Although paper is among the most recycled materials — the U.S. Environmental Protection Agency (EPA) calculated that 74.2% of office-type papers were recycled in 2009 — paper cups are not readily recycled.<sup>20</sup> Starbucks has been working with recyclers and paper mills running tests that have determined that its paper hot cups can be successfully recycled in paper mills. In 2011 the company is beginning to run a pilot to close the loop. Its suppliers are making small amounts of both its cups and napkins from post-consumer cups and it remains to be seen how the pilot will scale to all of its company-owned stores.



# Chapter 5: Beverage Container Recovery

Historically, beverage containers in the U.S. such as milk, beer, and soda bottles were refillable. A deposit was made on the bottle when it was delivered or purchased, and redeemed when the bottle was returned to be refilled. In the 1930s steel beverage cans were introduced to the U.S. market, and the age of single-use began. By 1970, approximately 60% of the beer sold in the U.S. was packaged in cans and no-return bottles and single-use containers captured 47% of the soft drink market.<sup>21</sup> And that percentage continues to increase. This shift is marked and not the norm in other countries such as Germany where 85% of its beer, 37% of its mineral water, and 34% of its soft drinks are sold in refillable bottles, and in Ontario, Canada where 72% of its beer is sold in refillable bottles.<sup>22</sup>

With the proliferation of single-use containers, the need to recover and recycle the containers becomes paramount. The impact of single-use beverage containers is seen in the municipal waste stream where 5.6% of all packaging waste by weight is attributed to beverage containers.<sup>23</sup> Several kinds of container recovery systems have been tested in different parts of the U.S. and the world with different levels of success.

As noted in our previous reports, container deposit legislation is the most effective proven method for bottle and can recovery in the U.S. The overall recycling rate for beverage containers is only 29% by weight in the U.S. where only 10 of 50 states have container deposit legislation for container recovery.<sup>24</sup> In the 10 states with container deposit legislation, the average recycling rate ranges from 66-96%, whereas for the 40 states without such legislation the overall rate is 24%.<sup>25</sup>

Recovery	Nestlé Waters North America	PepsiCo	The Coca-Cola Company	Red Bull GMBH	Dr Pepper Snapple Group	New Belgium Brewing Company	Starbucks Corporation
Do you have an industry-wide container recovery goal?	A	A	F	A	F	F	F
Tactical strategy for attaining recovery goals	B-	C	F	F	F	F	F
Do you have a company-wide container recovery goal?	F	F	A	F	F	F	F
Tactical strategy for attaining recovery goals	F	F	C	F	F	F	F
<b>Score</b>	<b>1.8</b>	<b>1.6</b>	<b>1.3</b>	<b>0.9</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>Grade</b>	<b>C-</b>	<b>D+</b>	<b>D+</b>	<b>D-</b>	<b>F</b>	<b>F</b>	<b>F</b>

In the absence of nationwide recovery and recycling mandates in the U.S., NGOs and investors have pressed beverage companies to take the lead to increase recovery rates. In response to these actions and corporate dialogues, companies have made public recovery goals. These are significant, because the companies can be held accountable to these goals by a variety of stakeholders. Nestlé Waters North America, PepsiCo, Red Bull, and The Coca-Cola Company have declared recovery goals. The following

chart indicates the goal and the year they hope to attain it.

Company	Industry-wide goal and year	Company-wide goal and year
<b>PepsiCo</b>	50% by 2018	
<b>The Coca-Cola Company</b>		50% by 2015
<b>Nestlé Waters, North America</b>	60% by 2018	
<b>Red Bull GMBH</b>	100% no date	100% no date

Although some companies state that they have a recovery goal, they do not disclose the goal. A public commitment and tactical strategy for achieving higher container recovery rates is a first step to attaining any such goal. Some of the strategies put forth by the companies to increase recycling rates in the U.S. include:

- Working in partnerships
- Growing the market for post-consumer materials so that demand will drive increased recycling rates
- Consumer education
- Policy initiatives

Unfortunately, companies did not provide strong tactical plans for these broad strategies nor provide activities and milestones that will continually move the needle toward increased container recovery.

However, there has been a significant move since our last report by Nestlé Waters North America and The Coca-Cola Company to press publicly for state extended producer responsibility laws for post-consumer packaging similar to those in place in Canada and Europe. In December 2010, Kim Jeffery, CEO of Nestlé Waters North America, publicly called for a version of producer responsibility in which “the industry takes sole responsibility for its packaging and, in partnership with its consumers and governments, operates an industry-led, nonprofit organization across a given state.”<sup>26</sup> In Nestlé’s model, the consumer would pay a small fee embedded in the price of a packaged good, and the funds would be used to build “municipal curbside recycling, public spaces and commercial recycling, and public education programs.”<sup>27</sup> In its response to our survey Coca-Cola said, “We have seen successful results in most of the OECD countries around the world through Extended Producer Responsibility models and have been supporting this approach in the US using our experience in other parts of the world to help inform a preferred approach in the US.”

While Coca-Cola and Nestlé Waters’ statements provide a hopeful sign that companies will support laws to increase container recovery, there is not yet evidence of a level of committed engagement by the entire industry that would be needed to meet the industry-wide goals cited above. Previous efforts, including industry working together through groups like Beverage Packaging Environment Council (BPEC) and educational initiatives and campaigns, have not provided a coherent strategy that would led to higher recycling rates. The American Beverage Association and all of the companies except for New Belgium Brewing Company and Nestlé Waters North America currently oppose container deposit legislation, the only policy initiative in the U.S. prior to 2010 proven to recover high levels of post-consumer beverage containers with recycling rates in Michigan of 97%, Maine 90%, and Iowa 86%.<sup>28</sup>

In lieu of a clear blueprint to achieve their stated goals for container recovery, survey respondents are participating in industry partnerships that, by their own admission, are not the solution to the challenge but are only supporting steps. Two industry partnerships currently most popular among beverage companies are RecycleBank and Greenopolis.

RecycleBank offers an incentive-based system for increasing recycling at home.<sup>29</sup> Residential curbside participation is metered and residents receive points that can be used to purchase products from partner companies or donated to others. RecycleBank covers approximately 2 million U.S. households since it began in 2005, but significantly the company does not provide information regarding the impact its program

actually has on recycling rates. The collected materials are processed and recycled by municipal waste collectors and processors; it is their actions that determine how much of collected materials are actually recycled. One study concluded that RecycleBank has less impact on recycling and is from 6 to 300 times more expensive per ton than traditional “Pay-As-You-Throw” programs.<sup>30</sup>

Greenopolis provides recycling kiosks where customers can return containers and get receipts for rewards with partner companies.<sup>31</sup> Greenopolis has not had an impact on overall recycling rates in any region in which it operates yet its branded kiosks do get used. For example, its co-branded program with Nestlé Waters and Whole Foods has placed 100 kiosks in 50 stores (out of more than 300 Whole Foods Markets locations) and has collected 400 tons of material in three years.<sup>32</sup>

PepsiCo and Waste Management have also put forth a reverse vending machine program. In 2010 they committed to placing 3,000 machines in high-traffic areas in the hopes of boosting the national recycling rate. For recycling, individuals can either earn rewards points or donate to charities.<sup>33</sup> It collected 4 million bottles in six months, far more than the Nestlé/Whole Foods partnership after three years.<sup>34</sup> The Coca-Cola Company rolled out a pilot program of Reimagine reverse vending machines that takes entire bags of containers, sorts the packaging, gives consumers coupons or credits, and delivers the containers directly to Coca-Cola Recycling.<sup>35</sup>

Although these partnerships are popular, at present they are having no substantive impact on overall recovery rates in the U.S. where, in one year, 224 billion beverage containers weighing 14 million tons are generated.<sup>36</sup>

Beverage companies participate in a variety of consumer-facing recovery programs such as recycling at stadium and sporting events, take-back at college campuses and retail stores, point-of-sale non-deposit take-back programs, and reverse vending machines. Yet none of the companies indicated that these programs recover significant percentages of containers sold. Companies that responded to the survey also participate in recycling programs such as Keep America Beautiful, and recycletogether.com.

States with container deposit legislation have two to three times higher recovery of glass and PET and higher rates for aluminum cans, yet all of the companies with recovery goals, except for Nestlé Waters North America, have, historically, opposed container deposit legislation.

When asked, companies reported the following as the key obstacles to increasing the recovery rate in the U.S.:

- Lack of infrastructure for collection – both at-home and away-from-home
- Lack of infrastructure for sorting, preparing post-consumer materials
- Lack of leadership outside of the beverage industry
- Lack of incentives for consumers (for example, container deposits)
- Lack of government commitment
- Lack of a market to support capital and operating costs of collecting materials
- Cost of waste not properly set
- Packaging is increasingly complex and not designed for end-of-life
- Material diversity
- Lack of consumer education on recycling and what is recyclable

In order to attain higher recovery goals, companies not only need to overcome the obstacles they identified, but also to work together and with state and local governments to improve systems for container recovery.

In the U.S., neither industry nor government has taken a strategic, leading role and the impact of that vacuum is seen in markedly and comparatively lower recycling rates in the U.S. than in Europe and Canada. The EPA reported that in 2009, the recovery rates for aluminum cans was 50.7%, 31.1% for glass containers, and 28% for PET bottles and jars.<sup>37</sup> States with container deposit legislation have two to three times higher recovery of glass and PET and higher rates for aluminum cans, yet all of the companies with recovery goals, except for Nestlé Waters North America, have, historically, opposed container deposit legislation.<sup>38</sup>

Most of the beverage companies that responded to this survey operate internationally, and thus participate in mandated container recovery and recycling systems in Canada, Japan, and Europe. These systems are examples of extended producer responsibility (EPR) programs that shift post-consumer product management from taxpayers and government to producers. For packaging, both curbside and container deposit systems are elements of EPR programs.

The term “extended producer responsibility” was coined by Swedish professor Thomas Lindhqvist in 1992 as “an environmental protection strategy to reach an environmental objective of a decreased total environmental impact from a product, by making the manufacturer of the product responsible for the entire life-cycle of the product and especially for the take-back, recycling and final disposal of the product.”<sup>39</sup>

In December 1994, the European Parliament and Council Directive on packaging and packaging waste was put into effect and is now in force in 27 E.U. member states. The Directive “covers all packaging placed on the market in the Community and all packaging waste, whether it is used or released at industrial, commercial, office, shop, service, household or any other level, regardless of the material used.”<sup>40</sup> The goals of the program were to prevent packaging waste and develop packaging reuse systems that minimized environmental impact.

The initial targets set were:

- Recycle 25% to 45% of packaging materials by June 2001;
- Recycle 55% to 80% of packaging materials by December 2008; and
- Reach the following individual materials targets by the end of 2008:
  - 60% for glass, paper, and board;
  - 50% for metals;
  - 22.5% for plastics; and
  - 15% for wood.<sup>41</sup>

Of the original 12 nations that signed on to the directive, France met and all others exceeded the 2008 packaging materials 55% target.

Each country implemented slightly different packaging recovery programs.<sup>42</sup> The predominant common feature is partial or total financial responsibility by industry. Fifteen E.U. countries mandate 100% producer financing for these programs, 10 have shared costs, two have tradable credits, and two others utilize a packaging tax.<sup>43</sup>

Some of the highest performing programs in recent years are Belgium with a recycling rate of 78.9%, The Netherlands with 72.4%, Germany 70.5%, and Austria 69.9%.<sup>44</sup>

In 2011, The European Organization for Packaging and the Environment (EUROPEN) announced that the European Directive on Packaging and Packaging Waste has also served to reduce waste during periods of economic growth. EUROPEN calculated that between 1998 and 2008, packaging waste that was disposed of declined by 43% while packaging on the market increased by 10%.<sup>45</sup>

In Canada, provincial packaging EPR programs are currently funded by producers, consumers, and municipalities and consist of combinations of refillable bottles, curbside, away-from-home, and deposit systems. For example, the province of Ontario has a refillable program for beer; deposits for wine, imported beer, and spirits; and curbside pick-up for specific materials that include beverage containers, household packaging, and printed papers. In Ontario, municipalities fund 55% and producers or first importers fund 45% of the costs associated with curbside programs with plans for 100% industry funding in the future.<sup>46</sup> Costs, fees, and payments to municipalities for the curbside program are managed by Stewardship Ontario.<sup>47</sup> Beer, wine, and spirits, managed under a deposit-return program, have a 91% recovery rate, while beverage containers and printed papers recovered via curbside programs have 40% and 80% recovery rates, respectively.<sup>48</sup>

As implemented outside of the U.S., EPR for packaging expands the scope of recovery and recycling beyond beverage containers to a much broader swath of consumer packaging and thus engages not only beverage companies, but also consumer packaged goods companies, retailers, and grocers. A successful packaging EPR program in the U.S. should address all container types and include the following elements:

- Financed and managed by producers
- Aggressive recovery targets with penalties set by government for failure to meet goals
- Participation by all industries that produce waste streams with each producer contributing its equitable share to the program
- Transparent cost allocation
- Applies to commercial, industrial, and residential packaging
- Industry-funded away-from-home collection as well as curbside programs
- Sophisticated educational/promotional programs to ensure consumer participation
- Mechanisms to work synergistically with existing container deposit programs
- A focus on materials management

As You Sow asked companies to indicate which components of recovery programs they would be most likely to support or oppose, and to which they remained neutral. The following chart provides an indication of the types of programs on which companies would be willing to work together.<sup>50</sup> Some companies noted the importance of “localized impacts” and “local implementations” due to regional differences across the U.S. as critical to their ultimate support or opposition to a program component.

Due to the historical opposition (and continued opposition noted above) of the beverage industry to container

deposit legislation which has thwarted the program’s growth in the U.S. and is a significant contributor to low national recycling rates, it is expedient to have buy-in of the beverage industry on fundamental components of any government packaging recovery and recycling system.

American Institute for Packaging and the Environment (AMERIPEN) is a packaging trade organization representing raw material producers, packaging manufacturers, packaging users and fillers, retailers, and material recovery organizations that was formed in March 2011. Its mission is to engage on public policies that affect the packaging value chain on topics related to packaging and the environment however its environmental mandate may not include packaging legislation. On the question of increasing the supply of post-consumer plastics, AMERIPEN’s president, Joan Pierce, vice president of packaging sustainability at Colgate-Palmolive Co., stated: “I do not feel legislation is necessary to resolve this issue. We certainly do have a problem, but if you have every stakeholder sitting at a table with an open mind, you will get a solution. We have the technology, the desire and we will achieve the results. We don’t need a legislator to tell us what to do.”<sup>49</sup>

Component of Recovery System	Support	Oppose	Neutral
Regulatory mandates that seek to internalize environmental externalities	NewBelg, KO, NESN	DPS	PEP**
A consumer fee paid forward to recycling and waste management	NWNA	DPS	NewBelg, PEP**, KO
A fee paid by producers and embedded in the price of the product	NewBelg, KO, NESN	DPS	PEP**
Consumer deposits managed by government		DPS, PEP, KO, NESN	NewBelg
Consumer deposits administered by the associated industries	NESN	DPS	NewBelg, PEP**, KO
Consumer deposits administered by an independent third party	NewBelg	KO, PEP, NESN	DPS
Producer fees managed by government		DPS, PEP, NESN	NewBelg, KO
Producer fees administered by the associated industries	NewBelg*, KO, NESN	DPS	PEP**, NewBelg*
Producer fees administered by an independent third party	NewBelg, KO	DPS	PEP**
Consumer deposit system with unredeemed deposits and revenues allocated to container recovery	NewBelg, NESN	DPS, PEP, KO	
Consumer deposit system with unredeemed deposits and revenues placed in a general fund		NewBelg*, PEP, KO, NESN	NBBC*
<p>* New Belgium Brewing Company put two responses as noted  ** PepsiCo is open to supporting these components depending on the details</p>			
<p><b>Key:</b>  DPS = Dr Pepper Snapple Group      NewBelg = New Belgium Brewing Company      PEP = PepsiCo  KO = The Coca-Cola Company      NESN = Nestlé Waters North America</p>			

As the chart indicates, Nestlé Waters North America, New Belgium Brewing Company, and The Coca-Cola Company are most likely to support a program that internalizes environmental externalities, while PepsiCo is neutral on this yet supportive depending on the details. Ways to incorporate environmental externalities include: carbon tax, carbon cap-and-trade, extended producer responsibility, and fees and penalties for waste production.

Nestlé Waters North America, New Belgium Brewing Company, and The Coca-Cola Company supported a fee paid by producers that is embedded in the price of the product, and producer fees administered by associated industries. Pepsi responded neutral on each of these options and stated it was open to exploring options but that support would depend on more detailed specific proposals. Assuming Pepsi could sign on to one of these, the options above represent approval by a significant percentage of the U.S. beverage market, and thus suggest actions that the industry might get behind in order to significantly increase container recovery. Still, as Pepsi states, actual approval by any of the companies would likely hinge on a range of detailed provisions in specific proposals.

Nestlé Waters North America was supportive of the broadest range of tactics for increasing container recovery. Like Nestlé Waters, New Belgium Brewery also supports deposits where unredeemed revenue is allocated only to container recovery programs. Perhaps the biggest surprise was a softening by Coca-Cola of its previous opposition to deposits in any form — the company said it is neutral on a “voluntary” system of deposits administered by associated industries.

The hardest line taken was by Dr Pepper Snapple which opposed every suggested component of a recovery system listed except for one where it had no response.

## Chapter 6:

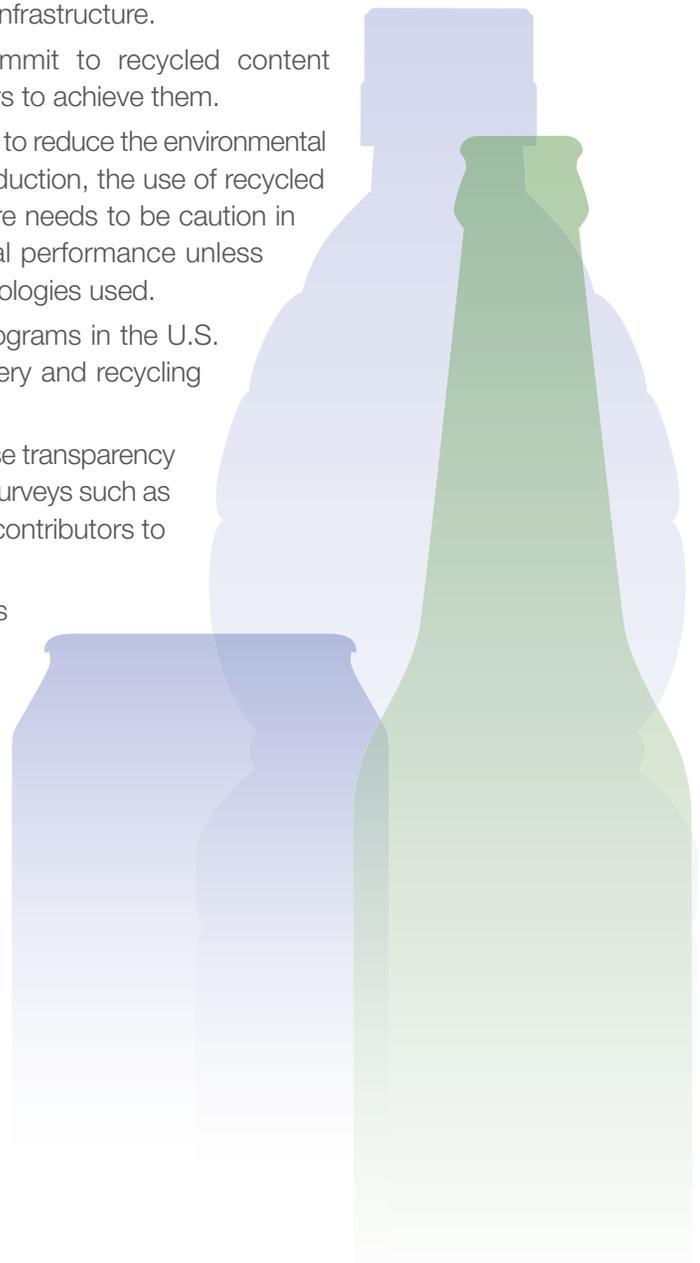
# Findings

- In developing a national recycling program, survey participants are most likely to support a program that has regulatory mandates to internalize environmental externalities, fees paid by producers that are included in the price of the product, and fees administered by industry.
- Two key brands, The Coca-Cola Company and Nestlé Waters North America, have started to press publicly for state extended producer responsibility (EPR) laws for post-consumer packaging similar to those in place in Canada and Europe.
- The Coca-Cola Company, an historical opponent of container deposit legislation, indicated it is now neutral on a “voluntary” container deposit system administered by associated industries.
- Source reduction continues to be a way by which companies address the double bottom line of environmental and financial performance. Companies have taken action in this area of environmental stewardship.
- Since “Waste & Opportunity 2008,” there have been no significant increases in recycled content.
  - PepsiCo continues to have the highest use of recycled PET (rPET), 10%, across all product lines with a commitment to maintain and increase this percentage.
  - New Belgium Brewing Company currently uses 50% recycled glass, the highest reported, in its 22 oz bottles.
  - Nestlé Waters uses 50% recycled PET in its re-source™ bottles but lacks a company-wide commitment for rPET.
- Companies whose primary business is not beverage are making commitments to increase recycled content.
  - Whole Foods Market has a goal of 35% recycled content in its 20 oz PET and 12 oz HDPE bottles by 2011 with a future goal of 75%.
- Beverage companies can increase the recycled content in their cans by more than 50% simply by selecting aluminum and aluminum can suppliers that use higher recycled content in their products. Alcoa customers purchase cans that have 68% recycled content, while Ball’s customers are sourcing cans with 44% recycled content.
- Companies continue to make commitments to container recovery.
  - Nestlé Waters North America, PepsiCo, and Red Bull have industry-wide container recovery goals.
  - Red Bull and The Coca-Cola Company have company-wide container recovery goals.
  - Nestlé Waters North America announced plans for a new PET bottle-to-bottle recycling facility.
- Companies claimed the lack of infrastructure for collection, sorting, and preparing post-consumer materials, lack of leadership outside of the beverage industry, lack of incentives for consumers, lack of government commitment, and a lack of a market to support the costs of collecting materials to be the main obstacles to increasing the recovery rate in the U.S.
- Companies are increasingly performing Life Cycle Assessments to quantify the environmental impact of their products. This is a significant step that shows a commitment to understanding where opportunities are for reducing impact.

## Chapter 7:

# Recommendations

- In order to have strong buy-in for producer responsibility packaging legislation, the beverage industry needs to increase engagement and integration with stakeholders and other industries such as consumer packaged goods and retailers who produce private labels. As a new cross-industry group, we hope AMERIPEN will endorse packaging legislation and embrace an opportunity to be part of a solution that has seen substantial success in Europe, Canada, and Asia.
- Companies should put resources in to designing packaging for recycling in a manner that includes full consideration of the end-of-life aspect of packaging and, where possible, promotes a full-scale closed-loop system.
- Companies need to develop a coordinated, tactical effort to increase the supply of recycled content by improving recycling policies and infrastructure.
- More companies and retailers need to publicly commit to recycled content and container recovery goals and work with stakeholders to achieve them.
- Companies should use Life Cycle Assessment (LCA) data to reduce the environmental impact of packaging. LCA data can influence source reduction, the use of recycled content, design, and materials decisions. However, there needs to be caution in using LCAs as evidence of leadership in environmental performance unless companies provide full disclosure of results and methodologies used.
- Companies should use the lessons from successful programs in the U.S. and in other countries to improve U.S. container recovery and recycling rates.
- The major players in the U.S. beer industry should increase transparency to shareholders and consumers through participation in surveys such as the one on which this report is based, as they are large contributors to beverage container waste and recycling streams.
- Consumer packaged goods and retail food companies should prepare to respond in a more comprehensive manner to calls from investors and consumers to set recycled content and container recovery goals.



# Appendix A: Companies That Received the As You Sow Survey

Company Name	Responded to Survey	Company Name	Responded to Survey
Adirondack Beverages		National Beverage Corp	
Anheuser Busch		<b>Nestlé Waters North America</b>	•
AriZona Beverages		New Belgium Brewing Company	
Big Red		Niagra Bottling, LLC.	
<b>Campbell Soup Company</b>	•	Ocean Spray	
Clearly Canadian Beverage Corp		<b>PepsiCo</b>	•
<b>The Coca-Cola Company</b>	•	Polar Beverages	
Cott Corporation		<b>Red Bull GMBH</b>	•
Crystal Geyser Alpine Spring Water		Re-Load Group, Inc.	
Dole Foods		Royal Ahold (Stop & Shop)	
<b>Dr Pepper Snapple Group</b>	•	RW Knudsen	
El Dorado Natural Spring Water		Safeway	
Fiji		<b>Starbucks Corporation</b>	•
<b>Hain Celestial</b>	•	Sunny Delight Beverages Company	
Hansens Beverage Companies		Supervalu	
Honest Tea		Talking Rain Beverage Company	
Jamba Juice		The Boston Beer Company	
Jones Soda		The Monarch Company, Inc.	
Kraft Foods		Unilever	
Kroger		Wal-Mart Stores	
<b>McDonald's Corporation</b>	•	<b>Whole Foods Market</b>	•
MillerCoors		Yum! Brands	
Molson			

# Appendix B: Scoring Methodology

<b>GENERAL</b>	<b>0.15</b>	<b>RECYCLED CONTENT</b>	<b>0.15</b>
Does your company have environmental information relating to packaging on your website?	0.1	Percentage post-consumer recycled content	0.55
Have you conducted a Life Cycle Assessment for the packaging of any product line?	0.2	Goals for post-consumer recycled content	0.45
Did LCA measure full impact through product lifecycle?	0.1	<b>RECYCLABILITY</b>	<b>0.20</b>
Was the LCA independently reviewed?	0.1	Potential contaminants to the recycling process	0.75
Are the LCA findings public?	0.1	Are the caps 100% recyclable?	0.25
Do you calculate CO <sub>2</sub> -equivalent per unit of packaging?		If no, are you engaged in R&D to develop 100% recyclable caps?	0.15
Primary	0.2	<b>RECOVERY</b>	<b>0.30</b>
Secondary	0.1	Do you have an industry-wide container recovery goal?	0.225
Do you calculate CO <sub>2</sub> -e generated per unit of product?	0.1	Tactical strategy for attaining recovery goals	0.325
<b>SOURCE REDUCTION</b>	<b>0.20</b>	Do you have a company-wide container recovery goal?	0.2
Source reduction goals?	0.6	Tactical strategy for attaining recovery goals	0.25
Historical source reduction?	0.4		

# Appendix C: Sample Weighing of Selected Beverage Containers

Company Name	Beverage	Container Size (ounces)	Container Weight (grams)	Material Intensity (grams/ounce)
<b>Aluminum</b>				
National Beverage Corp	Diet Shasta	16	15.3	0.956
Pepsi-Cola Company (PepsiCo sub.)	AMP Energy Drink	16	15.9	0.994
Fuze	Full Throttle Energy Drink	16	16	1.000
Hansens Beverage	Monster	16	16.4	1.025
Rock Star Inc. (dist. by PepsiCo)	Rock Star Energy Drink	16	16.6	1.038
The Coca-Cola Company	Diet Coke	12	12.9	1.075
AriZona Beverages	Green Tea with Ginseng	23	24.9	1.083
Pepsi-Cola Company (PepsiCo sub.)	Diet Pepsi	12	13.3	1.108
Starbucks Corporation	Doubleshot Energy & Coffee	15	16.8	1.120
Red Bull North America, Inc.	Energy Drink	16	18.5	1.156
Red Bull North America, Inc.	Energy Drink	8.4	11.9	1.417
<b>Glass</b>				
Dr Pepper Snapple Group	Diet Snapple Lemon Tea	16	232.8	14.550
Izze	Sparkling Juice	12	187.7	15.642
Dr Pepper Snapple Group	Canada Dry Ginger Ale	10	188.4	18.840
Jones Soda	Root Beer	12	229.3	19.108
<b>HDPE</b>				
Danone / Dannon	DanActiv Probiotic Dairy Drink	3.1	6.5	2.097
Lifeway	Probiotic Dairy Drink	3.5	12.9	3.686
<b>PET – 1/2 Litre or More</b>				
Nestlé Waters North America	Poland Spring Water	128	65.3	0.510
Nestlé Waters North America	Poland Spring Water	320	177.3	0.554
Pepsi-Cola Company (PepsiCo sub.)	Diet Pepsi	67.6	49.3	0.729
Dr Pepper Snapple Group	7Up	67.6	49.7	0.735
Polar Beverages	Seltzer with Lime	67.6	49.8	0.737
The Coca-Cola Company	Seagram's Diet Ginger Ale	67.6	49.8	0.737
The Coca-Cola Company	Diet Coke	67.6	51.1	0.756
Dr Pepper Snapple	Canada Dry Ginger Ale	67.6	51.3	0.759
<b>PET – Water</b>				
Nestlé Waters North America	Poland Spring Water	16.9	11	0.651
Pepsi-Cola Company (PepsiCo sub.)	Aquafina	20	20	1.000
Nestlé Waters North America	Poland Spring Water	23.7	24	1.013
The Coca-Cola Company	Dasani Water, <30% Plant-PET	20	22.5	1.125
The Coca-Cola Company	Dasani Water	20	22.9	1.145
Nestlé Waters North America	S. Pellegrino	33.8	42	1.243
Fiji	Natural Artesian Water	33.8	48	1.420
Fiji	Natural Artesian Water	16.9	25.4	1.503
The Coca-Cola Company	Glacéau smartwater	20	30.8	1.540
O Water	O Water Lemon & Lime	20	31.6	1.580
<b>PET – Carbonated Soft Drinks</b>				
Dr Pepper Snapple Group	Schweppes Ginger Ale	33.8	33.3	0.985
Polar Beverages	Seltzer	33.8	35.8	1.059
Pepsi-Cola Company (PepsiCo sub.)	Diet Pepsi	20	24.9	1.245
Dr Pepper Snapple Group	Diet Dr. Pepper	20	25.7	1.285
The Coca-Cola Company	Diet Coke	20	26.3	1.315
Pepsi-Cola Company (PepsiCo sub.)	Diet Mountain Dew	20	27.1	1.355
Mash	Ginger Root Water Drink	8	34.7	4.338
<b>PET – Non-Carbonated</b>				
Pepsi-Cola Company (PepsiCo sub.)	G2	20	36.2	1.810
Pepsi-Cola Company (PepsiCo sub.)	Naked Juice - 100% rPET	15.2	29.5	1.941
The Coca-Cola Company	Glacéau vitaminwater	20	41.3	2.065
Honest Tea	Half & Half Tea Lemonade	16.9	35	2.071
Fuze	slenderize Strawberry Melon	18.5	44.3	2.395
Pepsi-Cola Company (PepsiCo sub.)	Tropicana Orange Juice	12	30.6	2.550
Ocean Spray	Cranberry Juice Cocktail	15.2	40.7	2.678
Campbell Soup	V8	12	35.5	2.958

# References

- Canadian Council of Ministers, "A Canada-Wide Strategy for Sustainable Packaging," 29 October 2009, available at: [http://www.ccme.ca/assets/pdf/sp\\_strategy.pdf](http://www.ccme.ca/assets/pdf/sp_strategy.pdf).
- Container Recycling Institute, "CRI Comments on Natural Logic's White Paper on EPR for Packaging," March 2011, available at: <http://www.container-recycling.org/assets/pdfs/2011-CRIResponseToNLOnEPR.pdf>.
- Fishbein, Bette, John Ehrenfeld, and John Young, "Extended Producer Responsibility: A Materials Policy for the 21st Century," *INFORM*, June 2000, available at: <http://www.informinc.org/eprpolicy.php>.
- Future 500, "EPR Principles," available at: <http://www.future500.org/programs/recycling/>.
- General Assembly of the State of Vermont, H. 218, "An act relating to producer responsibility for solid waste," 2011, available at: <http://www.leg.state.vt.us/docs/2012/bills/Intro/H-218.pdf>.
- Morawski, Clarissa, "Recovery Questions: What is being picked up where, for how much, and by whom? Could the success of beverage container recovery in Canada point the way to a national program in the U.S.? These questions, and more, are answered," *Resource Recycling*, February 2011, available at: [http://www.cmconsultinginc.com/wp-content/uploads/2011/03/Bev\\_RecoveryQuestion-Feb20111.pdf](http://www.cmconsultinginc.com/wp-content/uploads/2011/03/Bev_RecoveryQuestion-Feb20111.pdf).
- Morawski, Clarissa, "Who Pays What? An Analysis of Beverage Container Recovery and Costs in Canada," *CM Consulting*, 2010, available at: [http://www.cmconsultinginc.com/wp-content/uploads/2011/03/WhoPaysWhat2010\\_2008-20091.pdf](http://www.cmconsultinginc.com/wp-content/uploads/2011/03/WhoPaysWhat2010_2008-20091.pdf).
- Morawski, Clarissa, R3 Consulting Group, Inc, Heidi Sanborn, Bill Sheehan, "Evaluating End-of-Life Beverage Container Management Systems for California," 15 May 2009, available at: <http://www.r3cgi.com/DOC/FINAL%20REPORT.pdf>.
- Natural Logic, "Product Stewardship & Extended Producer Responsibility: Towards a Comprehensive Packaging Recycling Strategy for the US," 25 October 2010, available at: <http://www.natlogic.com/resources/publications/white-papers/epr/>.
- Product Policy Institute, "EPR/ Product Stewardship Q& A," available at: <http://www.productpolicy.org/content/eprproduct-stewardship-q>.
- Product Policy Institute, "Evolution of the Ontario Blue Box Program: Transitioning from Government to Producer Responsibility," 15 July 2010, available at: <http://www.productpolicy.org/ppi/attachments/OntarioBlueBoxEvolution-rev.pdf>.
- Product Stewardship Institute, "Extended Producer Responsibility State Laws," available at: <http://www.productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=280>.
- Packaging Recovery Organisation Europe, "Producer Responsibility in Action," 2010, available at: [http://www.pro-e.org/files/PRO\\_EUROPE\\_brochure-20101008.pdf](http://www.pro-e.org/files/PRO_EUROPE_brochure-20101008.pdf).
- Quoden, Joachim, Packaging Recovery Organisation Europe, "EPR for Packaging: What Can We Learn from Successes in Europe and Canada," *Product Stewardship and Packaging Networking Conference Call Series*, 20 January 2011.
- Sheehan, Bill and Helen Spiegelman, "Climate Change, Peak Oil, and the End of Waste," *The Post Carbon Reader Series: Waste*, 2010, available at: <http://www.postcarbon.org/Reader/PCReader-Sheehan-Waste.pdf>.
- Stephenson, Derek, Steward Edge, "Implementing EPR for Packaging," SPC presentation, 14 September 2010.
- Stolaroff, Joshua, "Products, Packaging and US Greenhouse Gas Emissions," *Product Policy Institute*, September 2009, available at: [http://www.productpolicy.org/ppi/attachments/PPI\\_Climate\\_Change\\_and\\_Products\\_White\\_Paper\\_September\\_2009.pdf](http://www.productpolicy.org/ppi/attachments/PPI_Climate_Change_and_Products_White_Paper_September_2009.pdf).
- United States Environmental Protection Agency, "Municipal Solid Wastes in the United States, 2009 Facts and Figures," December 2010, available at: <http://www.epa.gov/epawaste/nonhaz/municipal/pubs/msw2009rpt.pdf>.
- United States Environmental Protection Agency Office of Solid Waste and Emergency Response, "Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices," September 2009, available at: [http://www.epa.gov/oswer/docs/ghg\\_land\\_and\\_materials\\_management.pdf](http://www.epa.gov/oswer/docs/ghg_land_and_materials_management.pdf).

# Endnotes

- 1 Stevenson, Martha, "Life Cycle Assessment" *National Recycling Coalition*, slide 4, 25 March 2010.
- 2 Coca-Cola Great Britain, "Coca-Cola announces the carbon footprint of some of its best loved brands," 9 March 2009, available at: [http://www.coca-cola.co.uk/press-centre/2009/march/coca\\_cola\\_announces\\_the\\_carbon\\_footprints\\_of\\_some\\_of\\_its\\_best\\_loved\\_brands.html](http://www.coca-cola.co.uk/press-centre/2009/march/coca_cola_announces_the_carbon_footprints_of_some_of_its_best_loved_brands.html); Nestlé Waters North America, "Reducing Our Manufacturing and Logistics Footprint," page 30, available at: <http://www.nestle-watersna.com/pdf/reducing-mfg-logistics-footprint.pdf>; The Climate Conservancy, "The Carbon Footprint of Fat Tire Amber Ale," page 5, available at: <http://www.newbelgium.com/Files/the-carbon-footprint-of-fat-tire-amber-ale-2008-public-dist-rfs.pdf>.
- 3 The Climate Conservancy, "The Carbon Footprint of Fat Tire Amber Ale," page 5, available at: <http://www.newbelgium.com/Files/the-carbon-footprint-of-fat-tire-amber-ale-2008-public-dist-rfs.pdf>; Tropicana, "Our Environment," available at: [http://tropicana.com/?jr=1#/trop\\_environment/environment.swf](http://tropicana.com/?jr=1#/trop_environment/environment.swf); Martin, Andrew, "How Green Is My Orange?," *The New York Times*, 21 January 2009, available at: [http://www.nytimes.com/2009/01/22/business/22pepsi.html?\\_r=2](http://www.nytimes.com/2009/01/22/business/22pepsi.html?_r=2); Nestlé Waters North America, "Environmental Life Cycle Assessment," available at: <http://www.beveragecafootprint.com>.
- 4 Only two companies disclosed CO<sub>2</sub>-e data, and they were not comparable in methodology.
- 5 The grams of packaging/unit of beverage drops significantly for the larger (2+ litre) containers. Nestlé Waters North America's 1 gallon (3.78 litres) Poland Spring water uses .51 grams of packaging per ounce of water, the lowest ratio in this sample.
- 6 Alcoa, "U.S. Aluminum Can Recycling Reached 57.4 percent in 2009," 14 September 14 2010, available at: [http://www.alcoa.com/recycling/en/news/releases/2010\\_recycling\\_rate.asp](http://www.alcoa.com/recycling/en/news/releases/2010_recycling_rate.asp).
- 7 Taylor, Brian, "An Energized Outlook: a global energy squeeze may continue to make secondary commodities valuable ones," *Recycling Today*, 1 August 2006, available at: [http://findarticles.com/p/articles/mi\\_m0KWH/is\\_/\\_ai\\_n16702145](http://findarticles.com/p/articles/mi_m0KWH/is_/_ai_n16702145); Truini, Joe, "Bottle bill proponent, opponent present case," *Waste News*, 26 May 2008, available at: <http://wastenews.texterity.com/wastenews/20080526/?fm=2>.
- 8 Truini, Joe, "Recycling Energy Savings," 26 May 2008, available at: <http://www.greenlivingtips.com/articles/182/1/Recycling-energy-savings.html>
- 9 United States Environmental Protection Agency, "Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2009," December 2010, available at: <http://www.epa.gov/osw/nonhaz/municipal/pubs/msw2009-fs.pdf>.
- 10 The recycled content in aluminum cans can be higher than the percentage of aluminum cans recycled because the post-consumer aluminum is recovered from all sources, not just beverage containers. Alcoa, "U.S. Aluminum Can Recycling Reached 57.4 percent in 2009," 14 September 14 2010, available at: [http://www.alcoa.com/recycling/en/news/releases/2010\\_recycling\\_rate.asp](http://www.alcoa.com/recycling/en/news/releases/2010_recycling_rate.asp); Ball, "Aluminum Cans," available at: <http://www.ballcorporate.com/page.jsp?page=239>.
- 11 Glass Packaging Institute, "Recycle Glass," available at: <http://www.gpi.org/recycle-glass/fifty-percent-recycled-content.html>.
- 12 National Association for PET Container Resources and The Association of Postconsumer Plastic Recyclers, "2009 Report on Post Consumer PET Container Recycling Activity," page 3, available at: [http://www.napcor.com/pdf/2009\\_Report.pdf](http://www.napcor.com/pdf/2009_Report.pdf).
- 13 Verespej, Mike, "Coke recycling venture shuts down food-grade PET recycling plant," 18 April 2011, available at: <http://plasticsnews.com/headlines2.html?id=21734&q=spartanburg>.
- 14 As of April 2011, Coca-Cola's website states its commitment to be to "source 25% of our polyethylene terephthalate (PET) plastic from recycled or renewable material" which obfuscates its quantitative target for rPET content. The Coca-Cola Company, "Sustainable Packaging," available at: <http://www.thecoca-colacompany.com/citizenship/packaging.html>.
- 15 Royte, Elizabeth, "Corn Plastic to the Rescue," *Smithsonian*, 26 August 2006, available at: <http://www.smithsonianmag.com/science-nature/plastic.html?c=y&page=2>.
- 16 The California Integrated Waste Management Board, Publication #IWMB-2009-001, January 2009, page 2.
- 17 The Coca-Cola Company, "Plantbottle™: A Green Evolution. The Introduction of Plant-Based PET Plastic Bottles," 6 January 2009, Slide 10.
- 18 The Coca-Cola Company, "Plantbottle™: A Green Evolution. The Introduction of Plant-Based PET Plastic Bottles," 6 January 2009, Slide 20; PepsiCo, "PepsiCo Develops World's First 100 Percent Plant-Based, Renewably Sourced PET Bottle," 15 March 2011, available at: <http://www.PepsiCo.com/PressRelease/PepsiCo-Develops-Worlds-First-100-Percent-Plant-Based-Renewably-Sourced-PET-Bott03152011.html>.
- 19 PepsiCo, "PepsiCo Develops World's First 100 Percent Plant-Based, Renewably Sourced PET Bottle," 15 March 2011, available at: <http://www.PepsiCo.com/PressRelease/PepsiCo-Develops-Worlds-First-100-Percent-Plant-Based-Renewably-Sourced-PET-Bott03152011.html>.
- 20 United States Environmental Protection Agency, "Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2009," page 3, available at: <http://www.epa.gov/osw/nonhaz/municipal/pubs/msw2009-fs.pdf>.
- 21 Bottle Bill, "What is a bottle bill?," available at: <http://www.bottlebill.org/about/whatis.htm>.
- 22 Morawski, Clarissa, "A Case for Refillables?," *Solid Waste & Recycling*, 1 August 2008, available at: <http://www.solidwastemag.com/issues/story.aspx?aid=1000225461&type=Print%20Archives>; Bottle Bill, "Recycling Legislation in Canada: Ontario," available at: <http://www.bottlebill.org/legislation/canada/ontario.htm>.
- 23 Container Recycling Institute, "CRI Comments on Natural Logic's White Paper on EPR for Packaging," March 2011, page 3, available at: <http://www.container-recycling.org/assets/pdfs/2011-CRIResponseToNLOnEPR.pdf>.
- 24 Container Recycling Institute, "CRI Comments on Natural Logic's White Paper on EPR for Packaging," March 2011, page 3, available at: <http://www.container-recycling.org/assets/pdfs/2011-CRIResponseToNLOnEPR.pdf>.
- 25 Container Recycling Institute, "CRI Comments on Natural Logic's White Paper on EPR for Packaging," March 2011, page 3, available at: <http://www.container-recycling.org/assets/pdfs/2011-CRIResponseToNLOnEPR.pdf>.

- 26 Jeffery, Kim, "Why It's Time to Rethink Recycling in the US," GreenBiz.com, 22 December 2010, available at: <http://www.greenbiz.com/blog/2010/12/22/its-time-rethink-recycling?page=0%2C0>.
- 27 Jeffery, Kim, "Why It's Time to Rethink Recycling in the US," GreenBiz.com, 22 December 2010, available at: <http://www.greenbiz.com/blog/2010/12/22/its-time-rethink-recycling?page=0%2C0>.
- 28 Recycling rates over 80% in other states with container deposit legislation include: Vermont 85%, Oregon 84%, California 82%. Although Nestlé Waters reported to As You Sow that the company is no longer opposed to bottle bills, the company is a member of the American Beverage Association which actively opposes such legislation. Bottle Bill, "Bottle Bills in the USA: All US Bottle Bills," available at: <http://www.bottlebill.org/legislation/usa/allstates.htm>.
- 29 RecycleBank, available at: <http://www.recyclebank.com/>.
- 30 "Pay-As-You-Throw" programs provide variable pricing for collection of municipal solid waste based on either the size of the bag or container, or by the actual weight of the waste. Skumatz, Lisa, David Juri Freeman, Dana D'Souza, and Dawn Bement, "Recycling Incentives: Part 1," Resource Recycling, February 2011, page 17, available at: <http://resource-recycling.com/node/1011>; Skumatz, Lisa, David Juri Freeman, Dana D'Souza, and Dawn Bement, "Recycling Incentives: Part 2," Resource Recycling, March 2011, pages 17 & 19, available at: <http://resource-recycling.com/node/1076>; United States Environmental Protection Agency, "Spring 2009 Bulletin: Get \*SMART\* with Pay-As-You-Throw," available at: <http://www.epa.gov/osw/conserves/tools/payt/tools/bulletin/spring09.pdf>.
- 31 Greenopolis, "About Greenopolis," available at: <http://greenopolis.com/about>.
- 32 Whole Foods Market, "About Whole Foods Market," available at: <http://www.wholefoodsmarket.com/company/index.php>; unpublished Greenopolis case study provided to the author.
- 33 GreenBiz staff, "Pepsi's Dream Machine Aims to Make Recycling a Slam Dunk," GreenBiz.com, 4 May 2010, available at: <http://www.greenbiz.com/news/2010/05/04/pepsi-dream-machine-recycling-slam-dunk>.
- 34 "Greenopolis, PepsiCo collect 4 million bottles, cans," Waste & Recycling News, 23 September 2010, available at: <http://www.wasterecyclingnews.com/headlines2.html?id=1285252419>.
- 35 Reimagine Beverage Containers, available at: [www.reimaginerecycling.com](http://www.reimaginerecycling.com).
- 36 Container Recycling Institute, "2006 Beverage Market Data Analysis," available at: <http://www.container-recycling.org/bmda/index.htm>.
- 37 United States Environmental Protection Agency, "Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2009," December 2010, available at: <http://www.epa.gov/osw/nonhaz/municipal/pubs/msw2009-fs.pdf>.
- 38 Container Recycling Institute, "Bottle Bills," available at: <http://www.container-recycling.org/issues/bottlebills.htm>.
- 39 Lundhqvist, Thomas, "Extended Producer Responsibility in Cleaner Production: Policy Principle to Promote Environmental Improvements of Product Systems," page 8, available at: <http://www.lub.lu.se/luft/diss/tec355.pdf>.
- 40 Europa, "Packaging and Packaging Waste," available at: [http://europa.eu/legislation\\_summaries/environment/waste\\_management/l21207\\_en.htm](http://europa.eu/legislation_summaries/environment/waste_management/l21207_en.htm).
- 41 Europa, "Packaging and Packaging Waste," available at: [http://europa.eu/legislation\\_summaries/environment/waste\\_management/l21207\\_en.htm](http://europa.eu/legislation_summaries/environment/waste_management/l21207_en.htm).
- 42 Notable differences among programs include: Denmark: tax plus deposit for beverage containers, no collection system for household packaging; Finland: deposit for one-way beverage containers, no collection system for household packaging; Sweden: initially had a deposit system that was supplemented with a collection system for all other household packaging; Germany: supplemented its collection system for all household packaging with a deposit system; the Netherlands have a deposit for large bottles that will be phased out by the government as the industry collection system reaches a certain recycling target for all plastic packaging. The other nations of the original 12 each have household collection systems for all packaging. Quoden, Joachim, Packaging Recovery Organisation Europe, "EPR for Packaging: What Can We Learn from Successes in Europe and Canada," Product Stewardship and Packaging Networking Conference Call Series, 20 January 2011, slide 14.
- 43 Stephenson, Derek, Steward Edge, "Implementing EPR for Packaging," SPC presentation, 14 September 2010.
- 44 EuroStat, available at: [http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search\\_database](http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database) accessed 17 June 2011.
- 45 European Organization for Packaging and the Environment (EUROPEN) calculated that between 1998 and 2008, packaging waste that was disposed of declined by 43% while packaging on the market increased by 10%. Yet the organization also concedes that this could be due to lightweighting and not improved recovery and recycling for packaging. European Organization for Packaging and the Environment, "Packaging Waste Declining Rapidly – EU Data Shows," 21 June 2011, available at: <http://www.europen.be/index.php?action=onderdeel&onderdeel=5&titel=News+Room&categorie=1&item=115>; and Carroll, Julian Carroll Managing Director, EUROPEN, communication with author 11 July 2011.
- 46 Morawski, Clarissa, "Who Pays What? An Analysis of Beverage Container Recovery and Costs in Canada," CM Consulting, 2010, page 50, available at: [http://www.cmconsultinginc.com/wp-content/uploads/2011/03/WhoPaysWhat2010\\_2008-20091.pdf](http://www.cmconsultinginc.com/wp-content/uploads/2011/03/WhoPaysWhat2010_2008-20091.pdf).
- 47 Morawski, Clarissa, R3 Consulting Group, Inc, Heidi Sanborn, Bill Sheehan, "Evaluating End-of-Life Beverage Container Management Systems for California," 15 May 2009, available at: <http://www.r3cgi.com/DOC/FINAL%20REPORT.pdf>.
- 48 Morawski, Clarissa, "Who Pays What? An Analysis of Beverage Container Recovery and Costs in Canada," CM Consulting, 2010, page 50, available at: [http://www.cmconsultinginc.com/wp-content/uploads/2011/03/WhoPaysWhat2010\\_2008-20091.pdf](http://www.cmconsultinginc.com/wp-content/uploads/2011/03/WhoPaysWhat2010_2008-20091.pdf); Product Policy Institute, "What is the way forward for product packaging EPR?," 15 July 2010, page 1, available at: [http://www.productpolicy.org/ppi/attachments/PPI\\_Way\\_Forward\\_Product\\_Packaging\\_EPR\\_16Jul2010.pdf](http://www.productpolicy.org/ppi/attachments/PPI_Way_Forward_Product_Packaging_EPR_16Jul2010.pdf).
- 49 Verespej, Mike, "PET recycling can't solve supply quandary," Plastics News, 6 April 2011, available at: <http://plasticsnews.com/headlines2.html?id=21629&q=ameripen>.
- 50 List constructed from conversations with Clarissa Morawski, CM Consulting, Inc. and Susan Collins, Container Recycling Institute.



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