

**AMERIPEN Analysis of Strategies and Financial Platforms
to Increase the Recovery of Used Packaging**

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American Institute for Packaging and the Environment

Disclaimer:

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Executive Summary

Public and private stakeholders across the United States are struggling to create a self-supporting waste management strategy that results in higher rates of material recovery. According to the U.S. Environmental Protection Agency, 51 percent of packaging is recycled¹ -- the second highest rate of all product categories measured. Yet, packaging still makes up an estimated 23% of disposed municipal solid waste, providing significant opportunity to increase recovery.

As a result, the reduction of packaging waste has been at the forefront of the dialogue on financing and increasing recovery of discards in the U.S. Ongoing debates regarding how to balance these financing issues and increase material recovery have resulted in the promotion of, and advocacy for, specific strategies adopted elsewhere across the globe. Yet, when counterparts in Europe, Canada, and Australia are examined, these strategies depend upon the utilization of a multiple-system or “toolbox” approach. No single strategy operates independently of others. Each serves to create a mutually reinforcing system of recovery that addresses multiple priorities.

This paper seeks to identify strategies and financing mechanisms used across the globe that are the most effective and efficient in recovering packaging waste and addressing financing challenges of collection, sorting, and transportation. In order to do so, this paper:

- Identifies the range of strategies applied to packaging waste reduction and overall solid waste reduction amongst a variety of developed nations;
- Describes the relative effectiveness of the strategies for their impact on recovery and behavior change potential, strengths and challenges, and financial stability;
- Identifies best practices, or combinations thereof, that demonstrate efficiency and effectiveness in recovery of packaging waste.

The initial intent in undertaking this research was to identify a defined set of financial metrics that would help examine and analyze strategies for direct comparison on overall recovery and financing success. However, it was quickly learned that the underlying cultural, geographic, and political landscapes within the countries studied, and in some cases within states or provinces within a country, make these types of comparisons problematic. Additionally, drawing lines between strategies was difficult, as all operate within a specific cultural, geographic, and political system and do not act independently. We now believe any assessment of strategies for adoption within the U.S. requires a comprehensive understanding of specific waste management systems, an understanding of the interplay and interrelationships of these various approaches, and an assessment of their application against our unique challenges and opportunities.

¹ U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery, *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2011 & Tables and Figures for 2011*, May 2013; Accessed July 2013: <http://www.epa.gov/osw/nonhaz/municipal/msw99.htm>

In undertaking this study, AMERIPEN engaged a range of stakeholders involved in packaging waste concerns across the globe. These included industry peers, non-profit organizations, recycling and waste vendors, local and state officials, and packaging waste recovery experts. The goal was an objective and unbiased report based upon facts and provable findings.

Thanks to this effort, it appears that there is significant opportunity to expand certain best practices that are currently under-utilized and highly fragmented. The strategies that hold the most promise for adoption in the U.S. include unit-based pricing/pay as you throw (PAYT) initiatives, disposal bans, and recycling mandates that can collectively help shift consumer practices away from waste disposal and towards recycling and other recovery strategies.

As the report demonstrates, these are effective tools with proven results that -- when implemented together -- can better utilize our existing infrastructure. Additionally, voluntary financing mechanisms designed to grow recycling infrastructure should be explored as a way to drive infrastructure support and innovation. These include industry-funded project grants, similar to those utilized in Australia and Ontario, Canada.

1. Introduction

Stakeholders across the packaging value chain and government are working toward improving packaging recovery and optimizing recovery efforts. The challenge lies in balancing the need for sustainable funding of packaging waste recovery with the need to improve the efficiency of the system in order to increase material recovery.

The United States is often cited as the only country in the industrialized world without a regulatory program for financing the recovery of used packaging. Europe, Canada, Australia, and Japan all have programs in place that require manufacturers or brand owners to fund, at least in part, end-of-life management of their packaging.

Waste management policy in the United States is a complex web of state regulations and local government ordinances implemented in most cases with little federal direction. States are responsible for setting their own goals, plans, strategies, timelines, and program elements. As a result, there is a broad range of approaches applied, with programs varying both state-by-state and municipality-by-municipality. In Europe, Canada, and Australia, where federal authorities play a stronger role in setting direction for waste management, there is a multiple-system or “toolbox” approach in addition to industry-funded financing mechanisms.

In these countries, the motivation for making brand owners responsible for packaging end-of-life varies widely. Therefore, an assessment of existing and new programs or policies for the U.S. requires an understanding of the interplay and interrelationships of these various approaches.

Some advocates for creating a state or national financing mechanism in the U.S. argue that it will solve many of the packaging waste related issues. These include increasing recycling rates, reducing government spending, and use of private sector efficiencies to reduce the overall cost of recycling.² Other advocates contend that such programs will provide incentives to producers to incorporate environmental considerations into the design of their products and packaging.³

The purpose of this paper is not to examine whether either of these contentions is right or wrong; rather it is to explore the strategies and financing mechanisms that are the most effective and efficient in recovering packaging waste.

The objectives of this report are to:

- Explore the set of strategies used for packaging waste reduction and overall solid waste reduction amongst a variety of developed nations;
- Describe the relative effectiveness of the strategies against a defined set of criteria;
- Use the results of the second objective to identify those best practices, or combination thereof, that most efficiently and effectively recover packaging waste.

² Recycling Reinvented, Website: <http://recycling-reinvented.org/about/>

³ Product Stewardship Institute, Website: <http://www.productstewardship.us/>

The report does not explore the environmental impacts of the different strategies studied nor provide financial comparisons across strategies or geographies. Differences in definitions, material categories, scope of materials covered, regulatory requirements, and other critical data points make this virtually impossible. Even within the U.S., a comparison of recycling rates across states would be incorrect, as the states have different definitions of municipal solid waste.

For example, a comparison of the publicly reported numbers (Table 1-1) for recovery and recycling between the U.S. and European Union (EU) may lead to different conclusions if the cultural, economic and regulatory strategies that differ by geographies are not considered.^{4 5} What should be considered is the implication that directionally there is room for improvement in recovery within the U.S. when compared to the EU.

Table 1-1: Recovery and Recycling Rates in the U.S. and EU		
MSW	EU (2011)	US (2011)
Recovery	61%	46%
Recycling	39%	35%
Packaging	EU (2010)	US (2011)
Recovery	76%	60%
Recycling	63%	51%
Glass	69%	34%
Plastics	33%	13%
Paper	83%	75%
Metal	72%	57%

⁴ U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery, *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2011 & Tables and Figures for 2011*, May 2013; Accessed July 2013: <http://www.epa.gov/osw/nonhaz/municipal/msw99.htm>

⁵ European Union, Eurostat Statistics Portal Website, accessed July 2013: http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

2. Research Parameters

This paper was developed by utilizing publicly available research; research commissioned by AMERIPEN and completed by students at Arizona State University and Virginia Commonwealth University; and the internal research conducted by AMERIPEN's Value of Packaging and Packaging Recovery Teams. A global team representing industry, government, nonprofit organizations, and expert consultants has reviewed the finding of this report. It is AMERIPEN's belief that this collaborative approach has helped ensure that the findings are technically correct and without bias, in line with its core objective of providing fact-based data regarding issues related to packaging and the environment within North America.

3. Definitions

In order to minimize confusion relating to the various ways of calculating waste reduction or diversion amongst the countries studied, this report uses the definition appropriate to the country being discussed. For the U.S., "recovery" means material and organic recycling (composting); it does not include energy recovery. For Europe, Canada, and Australia, recovery includes material recycling, organics recycling, and energy recovery.

There are many producer responsibility programs in existence that cover products, such as electronics, paint, or durable goods. Within the context of this report, extended producer responsibility (EPR) will refer exclusively to programs directed at used packaging and, where appropriate, printed paper.

4. Assessment

To understand the interplay of waste management strategies that target financing and recovery objectives, strategies across North America, Europe, and Australia were reviewed.

Key findings included:

- Multiple strategies are used in every country, and sometimes, at the provincial or state level;
- No industry-funded financial mechanism for used packaging recovery exists without a legislated requirement, whether as a backstop or an underpinning;
- While they all have a similar goal to reduce packaging's impact on the environment, the strategic approach for each country differs;
- The Australian, European, and Canadian programs are rooted in regulatory measures with broad goals, but allow for flexibility in implementation at the state/country/provincial level;
- Australia, the European Union, and Canada all had programs outside of their regulatory framework for packaging waste. These included sustainable packaging guidelines, landfill diversion requirements, toxics reductions, and others.

Drawing from the assessment, specific regulatory strategies were identified as common across all geographies. These strategies are used around the world to manage all municipal wastes, not simply

packaging. They may be voluntary or mandatory, depending on the jurisdiction enacting them. Table 4-1 lists the key programs so identified.

Table 4-1: Commonly Used Regulatory Strategies
Disposal Bans
Mandatory Recycling
Unit-based pricing/Pay As You Throw
Advance Recycling/Disposal Fees
Container Deposits
Landfill Surcharges
Extended Producer Responsibility for Packaging

Each strategy is discussed in detail below, with programs from the U.S., Canada, the European Union, and Australia used as examples. Best practices are identified based on a relative evaluation of the strength, challenge, financial stability, behavioral change potential, and packaging recovery potential of each strategy. Each strategy was also assessed in terms of the strengths and challenges from both an implementation and overall effectiveness perspective.

4. A. Disposal Bans

Disposal bans are measures to restrict or even prevent the disposal (landfill or incineration) of certain types of municipal waste. They can be implemented as outright exclusion mandates or requirements for pre-sorting/pre-treatment. Disposal bans can be implemented on material types (e.g., yard wastes, aluminum cans), as pre-sorting requirements prior to disposal (e.g., minimization of biodegradable materials), or from a generation source (commercial, residential, etc.). In North America, most bans center on material types, whereas Europeans tend to use a mixture of material bans and pre-sorting requirements.⁶ Disposal bans for packaging are found in various countries across Europe, and at the provincial or state levels in Australia, Canada and the U.S. Currently, a combination of 90 states and/or municipalities in the U.S. has disposal bans in place for some or all aspects of packaging.

⁶ Australia, Department of Sustainability, Environment, Water, Population, and Communities; Hyder Consulting, *Landfill Ban Investigation*, August 2010: www.environment.gov.au/wastepolicy/publications/pubs/landfill-ban.pdf

Table 4-2: U.S. States with Consumer Disposal Bans for Packaging Materials		
States	Banned Packaging Materials	Ban Applies to
Kentucky	Plastic Containers, Recyclable Paper	Bans disposal by consumer
Massachusetts	Glass, Metal, and Plastic Containers, Paper (anything accepted in municipal collection)	Bans disposal by consumer and at landfill
North Carolina	Aluminum, Glass, and Plastic Containers	Bans disposal by consumer and at landfill
Pennsylvania	Aluminum, Glass, and Plastic Containers	Bans disposal by consumer and at landfill
South Dakota	Aluminum, Glass, and Plastic Containers	Bans disposal by consumer and at landfill
Tennessee (newly enacted)	Aluminum Cans, Plastic Bottles	Bans disposal by consumer; effective January 1, 2015
Vermont	Metal	Bans disposal by consumer and at landfill
West Virginia	Aluminum	Bans disposal by consumer and at landfill
Wisconsin	Aluminum, Glass, Metal, and Plastic Containers	Bans disposal by consumer at landfill in communities where no recycling program exists (currently all communities have recycling programs)

Nova Scotia has the only province-wide disposal ban in Canada. Beverage containers, glass containers, metal cans, plastic containers, polyethylene bags and packaging, and cardboard and newsprint are banned from landfills. The ban was passed in 1996 and implemented in phases through 2008. Nova Scotia also has complementary measures in place including curbside recycling, container deposits for beverage containers, and a paint recycling program. From 1990 to 2010, the provincial disposal rate decreased from 743 kg/person/year to 401 kg/person/year.⁷

South Australia is the only state in Australia with a disposal ban on packaging materials. Starting in 2010 with a phased implementation geographically starting with the metropolitan area of Adelaide, bans will be in effect for cardboard, glass, metals, and PET and HDPE packaging. South Australia also has complementary measures in place, such as a landfill levy, waste and recycling targets, waste

⁷ Nova Scotia, Province of, *Our Path Forward: Building on the Success of Nova Scotia's Solid Waste Resource Management Strategy*, Halifax, Nova Scotia, 2011: <http://www.gov.ns.ca/nse/waste/docs/Solid.Waste.Strategy-Our.Path.Forward.2011.pdf>

management planning, and product stewardship for beverage containers.⁸ It is too early to gauge success.

Drivers for disposal bans include environmental concerns and landfill capacity. They are designed to facilitate increased material capture for material and energy recovery. Bans may be based on waste source, waste type, waste properties, or any combination thereof. In the EU, the motivation for bans is largely due to capacity issues, as land is scarcer than in other parts of the world.

North Carolina's law banning the landfill disposal of plastic bottles was passed in 2005 and took effect in 2009. Plastic bottle recovery from local government recycling programs increased 100% between 2008 and 2011 as the ban was implemented – growing from 18,000 tons to 36,000 tons collected annually.⁹

Banning the disposal of waste is rarely a measure taken alone. It is usually implemented with a measure designed to assure that the banned material has the infrastructure in place to be properly recycled. In the U.S., the National Solid Waste Management Association, the Solid Waste Association of North America, and the National Recycling Coalition joined together to promote a platform calling for “no ban without a plan.” These groups were concerned that landfill bans on electronics would be implemented without the necessary collection and processing infrastructure.¹⁰

Proper planning, clear goals, a robust collection infrastructure that is designed to address increases in recovered materials, and the political will to enforce the ban are all necessary for disposal bans to succeed.

Packaging Recovery Potential: The data on the amount of waste going to landfills after landfill bans were enacted in Europe show a definitive reduction in the percent of waste going to landfills (see Table 4-3 below). The Packaging and Packaging Waste Directive, enacted in 1994, and revised in 2004, set targets for recycling and recovery of used packaging, as well as creating an environment for the emergence of extended producer responsibility programs for packaging.

However, it was the passage of Directive 1999/31/EC on the landfill disposal of waste that required member countries to reduce biodegradable waste (e.g., lawn clippings, food scraps, and paper) going to landfill and drove legislation enacting disposal bans. Table 4-3 provides information for five European countries and the U.S. state of Massachusetts that were selected for a UK government study.¹¹ These programs varied by material and waste stream. As noted above, because most locations with bans or restrictions already have other complementary measures in place, it is not possible to say definitively that strong diversion rates result singularly from the enactment of disposal bans. However, the addition

⁸ Australia, Department of Sustainability, Environment, Water, Population, and Communities; Hyder Consulting, *Landfill Ban Investigation*, August 2010: www.environment.gov.au/wastepolicy/publications/pubs/landfill-ban.pdf

⁹ Resource Recycling Systems, AMERIPEN Packaging Recovery Best Practices Profiles and 100 Cities Survey Analysis

¹⁰ National Solid Waste Management Association, Joint Policy on E-Scrap: <http://www.environmentalistseveryday.org/docs/joint-policy-e-scrap.pdf>

¹¹ Hislop, H. and Begin, A-E., *Waste 2010: The Role of Bans and Restrictions on Landfill in UK Waste Policy – A Green Alliance Project for DEFRA*, Waste 2010 Conference, 28 and 29 September 2010, Stratford-Upon-Avon: <http://warr.org/746/>

of landfill bans in the late 1990s and early 2000s to the combination of other strategies clearly resulted in strong overall increases in waste diversion.¹²

Country	% Waste before ban	% Waste after ban	Years between
Austria	29%	4%	7 (1999-2006)
Belgium – Flanders	25%	3%	10 (1997-2007)
Germany	27%	1%	6 (2000-2006)
Netherlands	35%	10%	1 (2005-2006)
Sweden	23%	4%	6 (2001-2007)
Massachusetts (U.S.)	26%	22%	2 (2004-2006)

Behavioral Change Potential: Behavior change potential will be dependent on the resources put behind communicating the ban to the public and affected industries, as well as clearly defining enforcement activities. It is theorized that a large portion of the population will respond to positive communication and will comply with the ban when informed that it exists, but that a much smaller percentage might need to be subject to enforcement actions for compliance. An essential part of effecting the change is having the alternative collection sorting system available, and ensuring that the necessary infrastructure and financing are also available to support the change.

Financial Stability: Bans that prohibit consumers from disposing of certain materials are a relatively low-cost way to increase recycling. Where local government provides or contracts for both waste hauling and recycling, net market value for the increased amount of recyclables and avoided landfill fees should provide financial support for the program and its administration. However, key to financial stability is the existence of infrastructure support and market demands to ensure that the additional collected recyclables are utilized. Additional funding solutions are necessary to support education and enforcement.

Strengths: Disposal bans across the U.S. have proven performance in reaching diversion goals. AMERIPEN’s 100 largest city survey showed that target cities in states with packaging disposal bans that also combined some kind of local mandate or recycling ordinance had 6% higher recovery levels than target cities in states without disposal bans.¹³ This is the type of low-cost policy intervention that could cost-effectively lift the national diversion rate, currently at 46%.¹⁴ Additional research uncovered by

¹² Hislop, H. and Begin, A-E., *Waste 2010: The Role of Bans and Restrictions on Landfill in UK Waste Policy – A Green Alliance Project for DEFRA*, Waste 2010 Conference, 28 and 29 September 2010, Stratford-Upon-Avon: <http://warr.org/746/>

¹³ Resource Recycling Systems, AMERIPEN Packaging Recovery Best Practices Profiles and 100 Cities Survey Analysis

¹⁴ U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery, *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2011 & Tables and Figures for 2011*, May 2013; Accessed July 2013: <http://www.epa.gov/osw/nonhaz/municipal/msw99.htm>

AMERIPEN supports this finding that when landfill bans are paired with recycling mandates, the two can be highly effective at increasing recycling rates.¹⁵ This is consistent with the data from Europe in Table 4-3.

Challenges: Disposal bans alone are limited in their ability to keep all of the targeted material out of the disposal stream. It is essential to have programs in place to manage (collect/process/market) the material that is being banned. Additionally, enforcement and education of any disposal ban are key elements to its success. Because noncompliance with disposal bans for packaging materials alone is hard to identify and enforce, any ban would need to address a broader waste stream in order to make compliance and monitoring more efficient. Other risks include poor anticipation of, and funding for, the necessary infrastructure to support diversion from landfill into recovery or other forms of end-of-life management, as well as risks of interstate transportation, illegal dumping, or overseas shipping to avoid bans altogether.

Key Findings:

- Disposal bans, used in concert with other strategies like recovery targets or mandates, can be effective at diverting used packaging from landfill;
- Recovery processes must be identified and be ready to operate prior to the implementation of a ban. However, a related challenge may involve the financing and industry support for recovery and ban;
- Long lead times are required prior to implementation to ensure success in building consumer and industry support, and setting up enforcement mechanisms and recovery systems.

4. B. Mandatory Recycling

Mandatory recycling laws are passed at the country, state, and local levels. They can require that residential and/or commercial entities participate in recycling programs. These laws could also require local governments or haulers to provide recycling services to a certain class of community (e.g., communities larger than 5,000 in population). The two main motivators for enacting mandatory recycling programs are landfill diversion and increasing material supply.

Researchers have argued that mandates in combination with disposal bans are highly effective at increasing recycling rates. They help secure guaranteed material flow with high volumes and drive market development. Mandated recycling programs have proven track records in helping reach diversion and recycling goals and allow flexibility to expand to additional markets and/or materials.¹⁶

¹⁵ Resource Recycling Systems, AMERIPEN Packaging Recovery Best Practices Profiles and 100 Cities Survey Analysis

¹⁶ Skumatz, Lisa A., Ph.D., *Recycling Update Workshop*, Presentation to Northern California Recycling Coalition, March 27, 2012

The methods for implementing mandatory recycling programs vary by jurisdiction, but may include:

- Setting mandated recycling rates (with or without compliance dates);
- Mandated recycling services/convenience;
- Mandated recycling of specific materials/commodities;
 - Mandated sectors (i.e., residential, commercial, industrial);
 - Mandated enforcement at the curb or at the landfill;
 - Mandated planning.

Under the European Waste Framework Directive 2008/98/EC, there must be separate collection of paper, metals, plastics, and glass in all Member States by 2015. By 2020, 50% of the waste paper, metals, plastics, and glass from households shall be recycled or prepared for re-use.¹⁷ This, in combination with the Packaging Directive, effectively makes recycling mandatory throughout the European Union. The Canadian province of Ontario has a service requirement in place for all municipalities over 5,000 people.

In the U.S., 11 states and the District of Columbia have mandatory recycling requirements. Additionally, thousands of municipalities across the U.S. have mandatory recycling ordinances in place. They vary in scope, size, and geographic spread across the country. In some cases, these are mandated by state laws identified in Table 4-4 or reflect local community environmental ethics and values.

Table 4-4: States with Mandatory Recycling Regulations Affecting Packaging Materials ¹⁸			
States with	Packaging Materials Covered	Applies to	State Recycling Rate

¹⁷ European Commission, *Waste Framework Directive “Directive 2008/98/EC on Waste”* (2008):

<http://ec.europa.eu/environment/waste/framework/index.htm>

¹⁸ Northeast Recycling Council, Inc., *Disposal Bans & Mandatory Recycling in the United States*, June 24, 2011:

http://www.nerc.org/documents/disposal_bans_mandatory_recycling_united_states.pdf

Mandatory Recycling Laws			(as defined by each state; includes composting)¹⁹
California	Aluminum and steel cans, HDPE, PET, and glass containers	Certified recycling centers and processor businesses for covered beverage containers	65% (2012); includes diversion
Connecticut	Aluminum and steel cans, cardboard, and glass containers	Municipalities, residents, businesses, haulers, government agencies, and retailers	25% (2010)
District of Columbia	Aluminum and steel cans, cardboard, glass containers, other recyclable paper, and plastics	Municipalities, residents, businesses, haulers, government agencies, and retailers	10% residential; 15% commercial (2012) ²⁰
Maine	Cardboard and glass containers	State government and businesses with more than 15 employees at one location collect OCC; universities collect OCC and glass	39% (2010)
Maryland	Containers and packaging collected in curbside collection programs	Applies to municipalities over a certain size or population density (requires programs be implemented)	49% (2011); includes diversion
New Jersey	Each county government must develop a recycling plan that includes a minimum of three designated recyclables, which include: aluminum and tin cans, corrugated cardboard, glass containers, high-grade office paper, newspaper, mixed paper, HDPE and PET, scrap metal, and white goods	Residential, commercial, and institutional settings	61% (2010)
New York	Materials with economic markets	Local governments must require source separation of those materials with economic markets – no list of materials is specified	22% (2008)
Oregon	Containers and packaging collected in curbside collection programs	Applies to municipalities over a certain size or population density (requires services be provided)	52% (2011)

¹⁹ State recycling rates obtained from state websites or state reports.

²⁰ *Waste & Recycling News*, "Municipal Recycling Survey," February 18, 2013:

<http://www.wasterecyclingnews.com/>

Pennsylvania	Aluminum and steel cans, cardboard, glass containers, and plastics	Residential, commercial and institutional settings	39% (2011)
Rhode Island	Aluminum and steel cans, foil and pie plates, empty aerosol and paint cans, glass containers, milk, juice and aseptic drink cartons and boxes, HDPE and PET, cardboard and paperboard	Municipalities and single-family residences – commercial facilities and multifamily residences are required to recycle a similar set of materials	32% (2012)
Vermont	Beginning July 15, 2015: Aluminum and steel cans, aluminum foil and aluminum pie plates, glass bottles and jars from foods and beverages, PET and HDPE plastic bottles or jugs, cardboard, boxboard, and paper bags	Residential curbside and public building or land, starting July 1, 2015	Program begins in 2015
Wisconsin	Food and beverage containers and cardboard	Municipalities, residents, businesses, haulers, government agencies, and retailers	37% (2011)

Packaging Recovery Potential: Mandated recycling programs have proven track records in reaching recycling goals and allowing flexibility to expand to additional markets and/or materials.²¹ Like disposal bans, mandatory recycling programs at the state and local level can be effective in increasing recovery of targeted materials. In a recent survey by *Waste & Recycling News* of the top 30 cities in North America, 12 have mandatory residential recycling programs and reported an average 47.8% residential recovery, while the others who responded reported an average residential recovery rate of 23.4%. Most of the communities include organics recovery.²² Nonetheless, the numbers show that mandatory recycling is a powerful strategy to drive material recovery.

A key aspect in developing plans for mandatory recycling is successful collaboration with industry in order to understand market demand for materials and appropriate infrastructure to ensure success. Increasing supply without ensuring sufficient demand and market pricing for the material generated can lead to stockpiling and eventual disposal (e.g., early tire collection programs).

Behavioral Change Potential: Behavior change potential is dependent on the extent to which the requirement is both communicated to the public and affected industries, and enforced.

Financial Stability: Where local government provides or contracts for both waste hauling and recycling, net market value for the increased amount of recyclables and avoided landfill fees should provide financial support for the program and its administration. However, key to financial stability is the existence of infrastructure support and market demand to ensure that the additional collected material

²¹ Resource Recycling Systems, AMERIPEN Packaging Recovery Best Practices Profiles and 100 Cities Survey Analysis

²² *Waste & Recycling News*, "Municipal Recycling Survey," February 18, 2013: <http://www.wasterecyclingnews.com/>

is utilized. While fines for failure to comply with the mandate may help subsidize some of the cost, revenues from this source should be minimal and not critical to the core financing of the program.

Strengths: At the local level, the impact of mandatory recycling can be very strong when communicated and enforced. Enforcement takes political will and can happen at different levels: the curb or the landfill, with or without monetary fines.

Challenges: These include correct selection of materials to be mandated, political will for proper enforcement, program stagnation, the right balance of oversight, inclusion of key sectors, and lack of sufficient funding.

Key Findings:

- Mandatory recycling, combined with disposal bans, can result in strong diversion rates if the infrastructure exists to use the collected material;
- Selection of the right materials to be mandated is critical to success;
- Even if there is no imbedded financing mechanism, communication and enforcement mechanisms need to be addressed.

4. C. Unit-Based Pricing or Pay As You Throw (PAYT)

Unit-Based Pricing, more commonly known as “pay as you throw” (PAYT), is a local policy mechanism utilized to effectively raise recycling rates of MSW. The program charges participants for the collection of municipal waste based on the amount of material that is discarded. In contrast, to the consumer, recycling often has no visible fees or is priced below that for MSW collection to incentivize recycling.

According to leading PAYT expert Lisa Skumatz of Skumatz Economic Research Associates, the key components to implementing a sustainable PAYT program include:

- Incorporating the cost of recycling in the trash collection fee;
- Developing recycling programs with convenience equal to that of disposal;
- Shrinking the trash container so that it is no larger than 32 gallons, with increasing multiples (the PAYT part);
- Including the ability to inspect hauler records and conduct outreach.

A recent study for the European Union found that 17 Member States use PAYT systems for managing municipal waste in some or all municipalities. Of those, three Member States (Austria, Finland, and

Ireland) have PAYT programs in all municipalities.²³ In 2005, more than 200 communities in Canada used variable fees for solid waste collection.²⁴

In 2006, approximately 25 percent of the U.S. population lived in communities with PAYT programs. Thirty percent of the nation's largest cities operate PAYT programs, and the number of programs continues to grow in communities across the U.S. It is mandated in Minnesota, Washington, and Oregon; Iowa requires PAYT when recycling rates fall below 25 percent.²⁵

Packaging Recovery Potential: Research has shown that unit-based pricing is one of the most cost-effective actions when trying to increase recycling and diversion rates in communities.²⁶ Research suggests that implementing a PAYT program reduces MSW disposal tonnage by approximately 17 percent: 5 to 6 percent is attributed to recycling; 4 to 5 percent is attributed to yard waste diversion/composting; and the remaining 6 percent is due to source-reduction efforts (PAYT affects consumer purchasing decisions and promotes purchasing fewer over-packaged items). Communities implementing PAYT alongside comprehensive recycling and organics collection programs see residential diversion rates over 60 percent.²⁷

Behavioral Change Potential: PAYT surveys indicate that approximately 90% of residents approve of the system after a program is put in place.²⁸ Through the financial incentive to reduce the amount of MSW disposed at the household level, PAYT programs have the best chance of changing not only recycling behavior but purchasing decisions as well; as a result, widespread PAYT may affect package design.

Financial Stability: PAYT is locally self-funded and financed. Participants pay to support the system through increased waste fees or the direct purchase of disposal bags. The rates charged should be sufficient to cover the system costs including education, collection, disposal, administration and enforcement, organic waste processing, and recycling.

Strengths: PAYT programs have been proven to drive increased recovery. Once adopted, few communities surveyed discontinue the program.²⁹ PAYT may also influence packaging design by incentivizing consumers to consider packaging types when making purchases.

²³ European Commission, *Use of Economic Instruments and Waste Management Performance*, Paris, France, April 2012: http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf

²⁴ C. D. Howe Institute Commentary: *The Urban Papers: Taking Out the Trash: How to Allocate the Costs Fairly*, July 2005: http://www.cdhowe.org/pdf/commentary_213.pdf

²⁵ Skumatz, Lisa A., Ph.D. and David J. Freeman, *Pay as you Throw (PAYT) in the U.S.: 2006 Update and Analyses*, prepared for U.S. EPA and SERA, by Skumatz Economic Research Associates, Superior, CO, December 2006

²⁶ Pay As You Throw website: <http://paytnow.org>

²⁷ Skumatz, Lisa A., Ph.D. and David J. Freeman, *Pay as you Throw (PAYT) in the U.S.: 2006 Update and Analyses*

²⁸ Skumatz, Lisa A., David J. Freeman, Dana D'Souza and Dawn Bement, *Resource Recycling, Recycling Incentives: Part 2*, March 2011

²⁹ Ibid

Case Study: WasteZero, an Enterprise Model for PAYT

WasteZero is a private enterprise that has developed the management and support of PAYT programs into a successful business model with a proven track record of decreasing municipal landfill fees and increasing recycling revenues. It currently works with more than 800 municipalities across 42 states. In 20 years of operations, WasteZero has a 98 percent success rate in maintaining operations with the municipalities with which it works.

WasteZero reports that its system cuts the amounts of waste disposed of annually across the municipalities it works in by an estimated 44-46 percent.

In a typical WasteZero program:

- WasteZero manufactures, prints, and distributes PAYT bags.
- Consumers pay up front for the purchase of the municipally approved bags; fees (estimated at \$1-3 per bag) cover bag manufacture as well as local waste and recycling services. Garbage fees are either removed or reduced significantly.
- WasteZero works with local municipalities to develop an extensive stakeholder outreach program more than 90 days in advance of program launch.
- The local municipality continues its existing collection and disposal programs for solid waste and recycling. Only approved municipal waste bags are accepted for solid waste collection; unlimited recycling efforts are supported.
- WasteZero continues to provide ongoing support with program supplies (bags, etc.) and stakeholder outreach.

Table CS-1: Program Results

Municipality	Solid Waste Disposal Rate	Recycling Rate
Ashland, MA	-38%	+98%
Dartmouth, MA	-57%	+50%
Decatur, GA	-42%	+79%
Duxbury, MA	-43%	+20%
Malden, MA	-49%	+74%
Sandwich, MA	-42%	+74%
Tiverton, RI	-50%	+100%
Wells, ME	-59%	+47%

WasteZero reports that its success in implementing PAYT programs requires a comprehensive stakeholder engagement process. Early upfront dialogue, strong education, and ongoing communications on the program's results helped inform taxpayers and municipalities of the program goals, true costs, and eventual outcomes. By including stakeholder engagement as part of its service model, WasteZero is able to leverage its expertise in working with numerous municipalities, anticipate concerns, and build from national contacts.

President Mark Dancy notes: "The concern about possible public opposition to a PAYT program is often a barrier to program adoption. In our experience, however, stakeholder feedback is often more positive than policymakers think it will be."

For more information on WasteZero, go to www.wastezero.com.

Challenges: Effective PAYT systems require some level of enforcement to ensure residents don't avoid waste disposal costs by throwing trash in the recycling bin.³⁰ PAYT systems that incorporate recycling programs have worked well in commercial and single-family settings. However, the system does not work in large (over six units) multi-family buildings where residents generally pay for their utilities in their monthly rent. Stakeholders resistant to PAYT adoption include local governments concerned about illegal dumping; citizens worried that their disposal costs will increase or that PAYT will create economic hardships for lower-income residents and/or large families; recyclers concerned over contamination; and haulers worried about stranded assets and capital investments.³¹

Key Findings:

- PAYT may have the greatest success of all programs studied in influencing consumer behavior where customers can control their costs by recycling more and disposing of less material;
- Strong education and consumer awareness is needed to avoid perception of increased taxes and/or illegal dumping programs;
- Consideration should be given to developing an enforcement mechanism to ensure that waste is not disposed of within recycling bins in order to avoid PAYT fees.

4. D. Advance Recycling/Disposal Fees

Advance Recycling/Disposal Fees (AR/DFs) are usually paid by the consumer at the time a product is purchased. They can be either a flat fee per unit or a variable fee. Both are designed to cover all or some of the cost of managing end-of-life activity of the product or package on which the fee is assessed. AR/DFs differ from container deposit laws in that the fee is not returned to the consumer. In general, these fees are typically applied to hard-to-manage products such as electronic waste, tires, carpet, and paint. For example, 27 U.S. states impose a fee on the purchase of new tires to pay for responsible tire disposal programs. They are typically not assessed on packaging, though some variations on this approach exist.

In 1993, the State of Florida enacted a 1-cent ADF on all containers made of glass, plastic, plastic-coated paper, steel, and aluminum that were not recycled at a 50% recycling rate or did not contain specified levels of recycled content. Though originally enacted to increase recycling rates and markets for

³⁰ GreenBlue, *Closing the Loop: Road Map for Effective Material Value Recovery*, Charlottesville, Virginia, January 2012: <http://www.greenblue.org/publications/road-map-for-effective-material-value-recovery/>

³¹ Skumatz, Lisa A., David J. Freeman, Dana D'Souza and Dawn Bement, *Resource Recycling*, Recycling Incentives: Part 2, March 2011

recovered materials, after two years only 10% of the \$64 million collected went to recycling related activities. The fee was allowed to sunset in 1995.³²

Packaging Recovery Potential: Because there is no consumer incentive to recycle, an advance recycling/disposal fee alone is unlikely to directly encourage waste reduction or recovery of packaging material unless coupled with other complementary measures and approaches.

Behavioral Change Potential: Advance recycling/disposal fees on products typically are not expected to influence product design. However, Florida's packaging ADF provided fee exemptions for specific recovery or recycled content rates. As the collected dollars fell 75% over the three years of its existence, it could be assumed that these producer incentives worked. However, there was only a 1-3% change in Florida's overall recovery rate while the ADF was in effect, providing context to the belief that when the fee is applied at the point of sale, there is no incentive or mandate to change behavior by end users.³³

Strengths and Financial Stability: Since advance recycling/disposal fees are charged at the point of sale (like a sales tax), they can provide a steady funding source to pay for recovery programs of specific products. However, attention needs to be paid to how these fees are collected and distributed. As with Florida, fees can be directed to other uses.

Challenges: Consumers may view the fee as an additional tax and be slow to embrace it. Ontario, Canada, recently rescinded an ARF as a result of consumer pushback. There is some belief, despite the amount of investment made into stakeholder awareness, that the campaign focused too much on how to recycle rather than the purpose of the fee.³⁴ A review of the situation suggested that AR/DF fees are best assigned to hard-to-recycle, visibly hazardous materials, as consumers understand the rationale for subsidizing these services. They have a harder time accepting fees on materials already accepted through curbside collections.³⁵

Key Findings:

- Advance Recycling/Disposal Fees are best directed toward difficult-to-recover products, such as paint, carpet, electronics, etc.;
- AR/DFs are not a proven strategy for used packaging recovery;
- If utilized, a comprehensive communication strategy to communicate the need for and use of the fee is required to gain stakeholder support.

³² Florida, State Department of Environmental Protection, *Florida's Recycling and Litter Programs: Current Status and Potential Future Directions*, 2001:

http://www.dep.state.fl.us/waste/quick_topics/publications/shw/recycling/hb9.pdf

³³ Ibid

³⁴ Global Product Stewardship Council, *Preliminary Analysis: Visibility of Eco-Fees in Producer Responsibility*, May 2011: http://www.globalpsc.net/downloads/GPSC_Eco_fee_Vis_Prelim_Analysis_0511.pdf

³⁵ Ibid

4. E. Container Deposits/Bottle Bills

In a deposit system, consumers pay a deposit upon purchase of a covered container. The deposit is refunded when containers are returned for recycling to either a grocery store or a redemption center. The difference in the amount of containers sold and the amount of containers returned for recycling results in what are termed “unclaimed deposits.” Unclaimed deposits are used differently depending upon the program. In some countries or states, they are kept for environmental purposes or general revenue, and in others the beverage dealers keep the deposits to fund the recycling system.

In the U.S., 10 states and Guam currently have container deposits in place that vary in scope of containers and beverages covered. Most Canadian provinces and two Australian states have some type of deposit on beverage containers. A recently released report by the European Union identified eight member states as having deposit/refund programs for a variety of beverage containers: Austria, Denmark, Germany, Estonia, Latvia, Netherlands, Finland, and Sweden.^{36 37}

Packaging Recovery Potential: Container deposits have proven successful for capturing beverage containers for recycling. In a 2012 report, CM Consulting estimates that 84% of deposit-bearing containers were collected in 2010 vs. 52% for the same containers in non-deposit areas.³⁸

In the U.S., states with container deposits consistently have the highest beverage container recycling rates and the highest quality of recyclables.

Behavioral Change Potential: Receiving their deposit back acts as an incentive for consumers to return their containers for recycling. In Ontario, adoption of a common beer bottle design facilitates a steady stream of bottles for re-use across the beer industry.

Financial Stability: While a deposit law is generally self-sustaining, directing funds back into subsidizing administrative or collection and recycling costs can be dependent on the unclaimed deposits. While there will be some economies of scale in terms of decreased costs due to a higher return rate on bottles, this type of program does not necessarily address long-term financing needs.

Strengths: Container deposit programs generate consistently high beverage container recycling rates and high quality recyclables.

Challenges: Container deposit legislation targets only a small portion of the total packaging and printed materials generated. There are also concerns regarding administrative costs of the system as well as the impact on removing financially valuable material from curbside recycling programs, further reducing

³⁶ European Commission, *Use of Economic Instruments and Waste Management Performance*, Paris, France, April 2012: http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf

³⁷ Bottle Bill Resource Guide, *Beverage Container Deposit Laws Worldwide*:
<http://www.bottlebill.org/legislation/world.htm>

³⁸ CM Consulting, *Who Pays What – An Analysis of Beverage Container Collection and Costs in Canada*, Peterborough, Ontario, August 2012:
<http://www.cmconsultinginc.com/wp-content/uploads/2012/09/WPW2012-final-report.pdf>

revenue opportunities for local municipalities. Where unclaimed deposits are used to fund education or other related activities, high recovery rates may financially disadvantage the program. For example, in Germany, container bills have resulted in a return greater than 85%. Their system is subsidized at the equivalent of more than \$900 million per year, as there are simply not enough unclaimed deposits to cover costs.³⁹

Key Findings:

- Significantly higher beverage container recovery and quality rates are attached to container deposit systems;
- The more utilized the system, the less reliant the funding mechanism;
Beverage container deposits only address a small portion of the used packaging stream.

4. F. Landfill Taxes/Surcharges

Landfill taxes/surcharges are part of many government packaging reduction and waste management strategies.⁴⁰ In Europe, the aim of landfill taxes is clear: promote diversion of waste by making the cost of landfilling high enough that it incentivizes reuse and recycling. Landfill taxes are significantly higher in Europe than within North America or Australia. In the U.S., 24 states levy statewide landfill surcharges in addition to tipping fees. According to the National Solid Waste Management Association, most state landfill surcharges in the U.S. are between \$1 and \$2 per ton, with a few outliers being as high as \$13 per ton.

Most jurisdictions in Australia now have some form of levy for waste disposed in landfills. Levies vary across the country: some are based on the source of waste and/or geographic area where the waste was generated. Tipping fees are highest in South Australia to encourage diversion.⁴¹ South Australia also has the second-highest recycling level, based on kilograms per capita.⁴²

Packaging Recovery Potential: The European Union study on Economic Instruments and Waste Management Performance concluded there is a correlation between the total landfill charges and

³⁹ Pingten, Felix, *Experience with the Introduction of a Mandatory Deposit System in Germany*. Powerpoint Presentation, ProEurope Deposit Workshop, Slide 19, Budapest, Feb 22, 2008:

<http://www.apeal.org/uploads/Library/08-02%20Roland%20Berger.pdf>

⁴⁰ Landfill taxes are paid on top of, or in addition to, the gate rate or tipping fee. The aim of the surcharge is usually either to: (1) Promote diversion of waste by making the cost of landfilling more costly; and/or (2) raise revenue for governmental services.

⁴¹ GreenBlue, *Closing the Loop: Road Map for Effective Material Value Recovery*, Charlottesville, Virginia, January 2012: <http://www.greenblue.org/publications/road-map-for-effective-material-value-recovery/>

⁴² Australia, Department of Sustainability, Environment, Water, Population, and Communities; Hyder Consulting, *Waste and Recycling in Australia 2011*, August 2012:

<http://www.environment.gov.au/wastepolicy/publications/pubs/waste-recycling2011.pdf>

percent of waste recycled and composted.⁴³ Member states that have higher combined landfill charges (taxes and gate rates) have a greater percentage of waste diversion. The report also states that other policies that promote recycling, including landfill bans and PAYT, influence diversion rates, but concluded that as disposal costs reach €100 per tonne (\$122.45/ton) there is a greater likelihood of reaching a 50% recycling rate.

Chart 4-1: Typical Landfill Charge vs. Percentage of MSW Landfilled, EU 2009 Materials⁴⁴

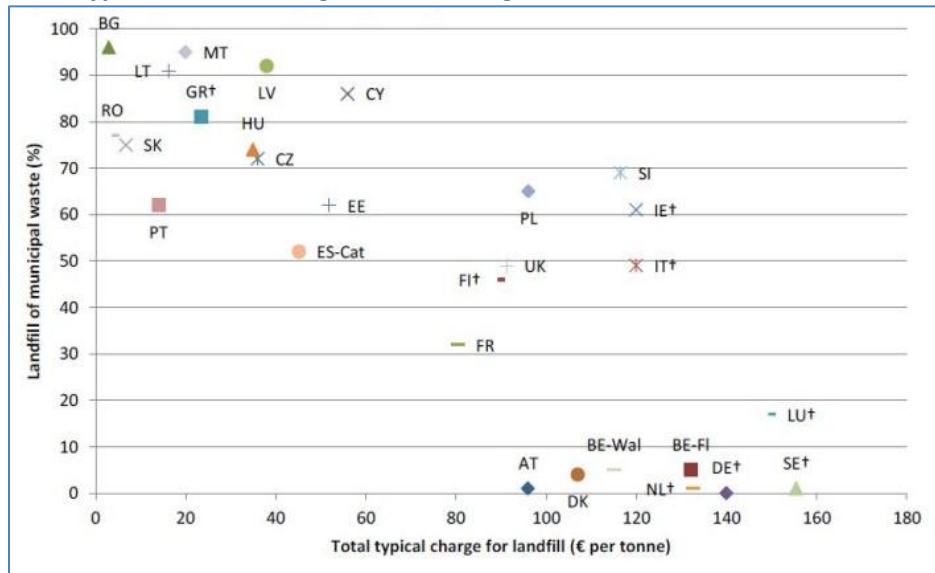
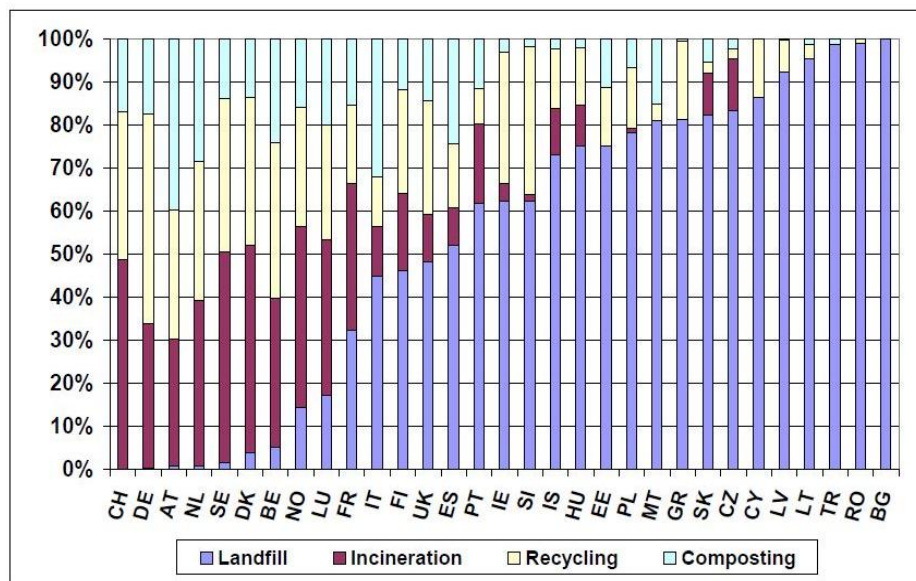


Chart 4-2: EU-27 Municipal Waste Management (Eurostate, waste data centre 2010)⁴⁵

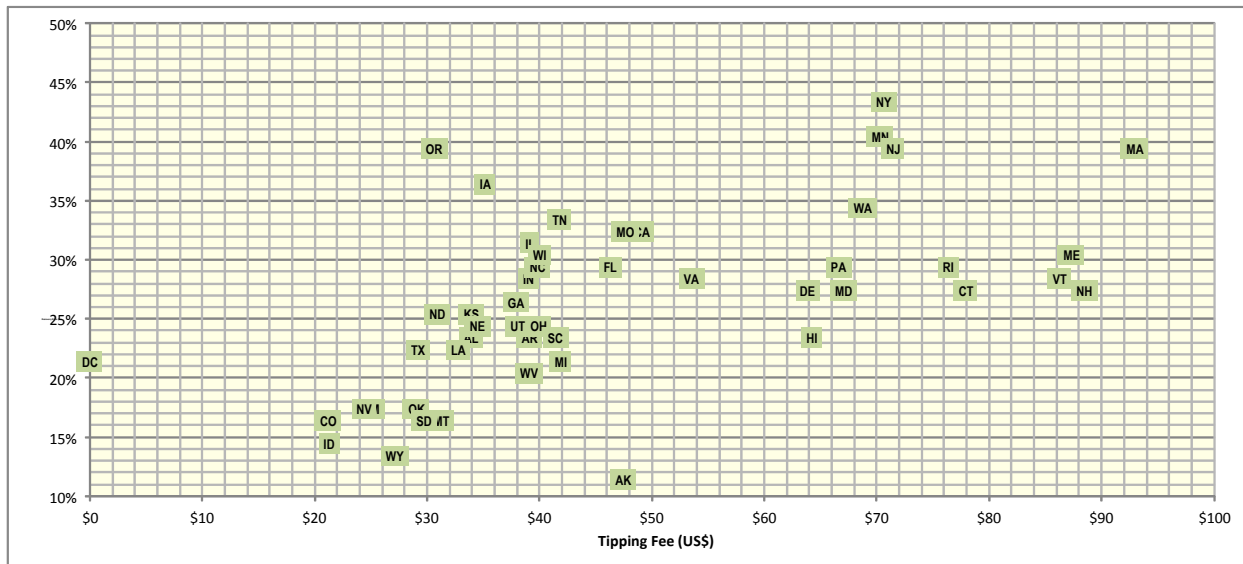


⁴³ European Commission, *Use of Economic Instruments and Waste Management Performance*, Paris, France, April 2012: http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf

⁴⁴ Ibid

⁴⁵ Ibid

Chart 4-3: U.S. State Recovery Rate vs. Tipping Fee⁴⁶



Behavioral Change Potential: As constituted today, most landfill surcharges in the U.S. are not high enough to affect behavioral change. The surcharge would have to increase to levels approaching those in Europe before any such change would occur.

Financial Stability: Revenue from a surcharge is dependent on the amount of waste being disposed. As discussed earlier in the container deposit segment, success is contradictory. In this case, as higher taxes/surcharges divert material away from landfill, programs receiving funding from the surcharge must find supplemental revenue from other sources.

Strengths: Funds generated from these fees usually go to cover state costs for administering solid waste management regulatory activities/programs and to fund local government recycling initiatives. This is accomplished mostly through grant programs that encourage recycling.

Challenges: With current U.S. surcharges significantly lower than those in Europe and not expected to rise significantly, they are less likely to affect recycling and disposal habits. In order to ensure full participation, risk of illegal dumping or cross state/country transportation are other concerns that should be considered within program design.

Key Findings:

- Landfill taxes can have a significant impact on diversion rates as they make the cost of disposal uneconomical;
- There is little chance that the U.S. will increase landfill taxes or rates to the level needed to have impact upon recycling and disposal habits.

⁴⁶ Waste Business Journal, 2009 Industry Report

Case Study: The Carton Council – One example of a voluntary industry-led producer responsibility program

Along with self-realization, feedback from consumers, brand owners, NGOs, and retailers caused Tetra Pak, a major producer of aseptic and gable-topped beverage containers, to examine the end-of-life options for cartons in North America. Most of the world was already recycling cartons, yet the recovery rate in the U.S. was basically non-existent. In fact, carton recyclability ranked low in public perception and even lower among recycling professionals because they believed markets did not exist for post-consumer cartons.

In April 2009, Tetra Pak convened their peer carton manufacturers towards forming a new organization designed to overcome barriers to greater carton recycling. They sought input and advice from a diverse group of industry experts to answer key technical questions about how cartons would flow through the recycling process and what would be needed to divert them from the waste stream. In addition, the Council hired a third-party advisor to develop and execute the strategy, which amounts to an approach similar to a public affairs campaign.

Barrier Type	Status in U.S.
Legislation	None (FTC)
Volume and Values	Low
End Markets	Limited
Perception	Poor
Industry Alignment	None

Table CS-2 highlights the barriers that were identified by the consultations with key stakeholders. A strategy was developed that focused on three main points:

- Develop sustainable recycling infrastructure;
- Improve perceptions of the package among key stakeholders;
- Build consumer awareness and grow the recycling rate through behavioral change.

To create the demand for valuable fibers in the waste stream, the Council adopted a market “pull” strategy. By creating demand in the marketplace, the Council hopes to achieve:

- High levels of household recycling access to meet the Federal Trade Commission recyclability claim guidelines;
- Building the recycling infrastructure from collection to processing to markets;
- Increased carton market share in the food and beverage packaging sector.

Two key efforts were addressed to improve the perceptions of carton recycling – credibility among recycling professionals and building sustainability market value for cartons. Partnerships

were developed with MRF operators, solid waste/recycling collectors, non-governmental organizations (NGOs), and government agencies.

While the Council continues to receive feedback on its strategy and has adjusted where required, accomplishments to date are:

- The number of U.S. households with carton recycling access more than doubled, from 18 percent in 2008 to 41 percent as of November, 2012.
- Expanded the number of mills accepting post-consumer polycoated cartons to nine – up from one – in less than two years, with more facilities expected online in the next 18 months.
- Increased the number of material recovery facilities (MRFs) to 37, which are either finalizing or under contract to accept and sort cartons for marketing as a distinct grade.
- Secured communities in 43 states that now include cartons in recycling programs.

For more information on the Carton Council, go to www.recyclecartons.com.

4. G. Extended Producer Responsibility (EPR) for Packaging

EPR systems are designed to make brand owner/manufacturers responsible for the recovery of packaging they place in the marketplace. Product/brand manufacturers typically have two options for compliance with packaging EPR systems: (1) Creation of a system for taking back their own packaging; or, (2) financially supporting a third-party organization through payment of fees imposed on their packaging. In most situations, the later approach is taken. The practical implementation of these programs is to shift the cost of recovery programs away from taxpayers and governments towards consumers and manufacturers.

EPR programs for packaging differ from country to country and were designed to address different drivers unique to a country or region. For example, in Europe, the driver was implementation of the 1994 Packaging and Packaging Waste Directive. It required member states to ensure that systems were set up to meet legislated recovery and recycling targets, yet left the approach up to the individual member state. Today, each of the 27 member states in the EU has some type of packaging producer program in place. While most (24) use producer fees, some use tradable credits or a combination of producer fees and other approaches like packaging taxes or container deposits.

The EU has the oldest EPR systems in existence and is seeing challenges to program organization, governance, and structure. Eleven producer responsibility organizations have created a manifesto requesting:

- That EPR organizations should be owned by the obligated companies and run as a not-for-profit;
- Strong governmental support/monitoring;

- Monopoly vs. competitive programs;
- Organized in a way that provides sustainable financing; and
- Continued focus on packaging optimization and waste prevention.⁴⁷

The system in Ontario, Canada, emerged for financial reasons. In 1990, a small group of brand owners agreed to provide financial support for recovery of packaging to avoid mandatory container deposit legislation. Their intent was for all brand owners to eventually join the scheme to minimize costs. This did not happen, and EPR was introduced in 2009 to provide a legislative backstop against the non-participants. EPR programs have since emerged in Quebec and Manitoba. Other provinces are developing their own programs, with British Columbia's program set to go into effect in 2014. Each of these programs differs in the scope of obligated packaging, fee setting requirements, and organization. When implemented, the planned British Columbia system will be the most diverse.

In Canada, the Canadian Stewardship Services Alliance (CSSA) has been formed to work toward a more unified system.⁴⁸ Key drivers behind CSSA are:

- Several stand-alone provincial stewardship agencies mean costly duplication;
- Different reporting methodologies and systems;
- Little or no control over municipal supply chains;
- Lack of consistency in materials captured, thus limiting economies of scale;
- Reverse supply chain logistics that prevent consolidation of materials and contracts;
- Lack of coordination and sharing of best practices across provincial agencies.

CSSA proposes a shared administrative and customer service infrastructure to producers/stewards of EPR packaging and printed paper programs and provincial producer responsibility organizations in Canada. It is looking to advance administrative harmonization of EPR programs and advocates for a national approach to EPR policy and regulations.

The Australian Packaging Covenant emerged as a voluntary effort (also with legislative backstops) to avoid national container deposit legislation. As opposed to Europe's legislated approach, both Canada and Australia began with industry players voluntarily submitting to EPR programs. Both included legislative backstops. Australia's system also differs from those in Canada and Europe in that funding is based on total brand owner sales, not packaging substrates or weights. Additionally, the fees are used as matching funds for specific projects to advance recovery, not as a reimbursement system for recovery costs.

⁴⁷ Global Product Stewardship Council, *11 European Producer Responsibility Organizations Release Manifesto on EPR Principles for Packaging*, January 19, 2013: <http://www.globalpsc.net/11-european-producer-responsibility-organizations-release-manifesto-on-epr-principles-for-packaging/>

⁴⁸ Blake, Alan: Presentation to the PackNEXT Conference on Packaging Optimization in Toronto, Canada, May 15, 2013

Almost all countries with EPR systems in place today utilize one or more of the strategies discussed in this report to increase used packaging recovery.

Packaging Recovery Potential: Because EPR systems operate within jurisdictions that leverage other policies and programs, direct correlations related to success or improvements are difficult. Jurisdictions that include EPR have demonstrated increased recovery and recycling rates for certain material substrates. However, AMERIPEN's research did not uncover any studies that could conclusively correlate EPR alone with increased recovery rates.

Behavioral Change Potential: EPR in itself does not promote behavior change, as most consumers are unaware of the role industry plays in financing recovery. However, it can be asserted that EPR promotes behavior change by expanding consumer access to recycling and other recovery options. Unlike disposal bans, mandated recycling, container deposits, or PAYT, there is rarely a specific positive or negative incentive for consumers to participate. However, as with any successful financing system, EPR programs generally direct funding to consumer education in order to increase recycling and recovery rates.

Financial Stability: EPR is a self-funding program that provides funding to support recovery and, in some instances, education programs. In most countries, brand owner fees are set annually and are based on different criteria in each. Though most programs are financially stable, the emergence of competitive Producer Responsibility Organizations (PROs) in Europe has reportedly led to fragmented recovery that affects fees and revenues.

Strengths: EPR systems can effectively generate funding from a broad array of brand owners to provide, among other things, financial support to recycling. Grant monies for specific projects, as found in Canada and Australia, are able to provide research and development monies to address difficult-to-recover materials, packaging formats, or unique community collection problems. Australia's approach, specifically, bears closer scrutiny, as the country has relatively equivalent-to-superior recovery and diversion rates to Ontario, Canada (a similar geography and demographic to Australia), at significantly less program cost. Other strengths are the ability to unify the value chain into a common approach or language, and the ability to bring a business approach to used packaging recovery.

Challenges: Program variability and changing regulations across regions or countries result in increased administrative costs and uncertainty for brand owners. This is reflected in the creation of the CSSA and, to a degree, the manifesto for change in the EU approach. If the EPR system is primarily a funding or reimbursement system, issues relating to program optimization and efficiencies remain. A recent report on Economic Instruments by the European Union suggests that EPR fees cover the full cost of recovery activities to local municipalities in only three Member States (Austria, Belgium, and Germany).⁴⁹

From a package design perspective, the fees vary from year to year and are paid on packaging already in the marketplace. This makes it difficult for brand owners to anticipate the financial impact of changing

⁴⁹ European Commission, *Use of Economic Instruments and Waste Management Performance*, Paris, France, April 2012: http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf

substrates or formats. There are some design signals to brand owners in the form of consistently higher fees on PVC and other "non-desirable" substrates or combinations thereof. These fees are generally based on difficult-to-recycle packaging and substrates with low market value as a recycled material. The emergence of disruptor designations (Canada and France) and associated fees (France) is expected to further affect design.

Key Findings:

- EPR systems can effectively generate funding for recovery from a broad array of brand owners;
- Most EPR systems place the cost of funding the program on brand owners through the use of packaging fees, though the UK and Ireland take a shared funding approach across the supply chain;
- The EU and Canada have significantly different programs across their member states/provinces; this presents challenges in harmonization for brand owners and package designers;
- The array of administering organizations has led to high administrative costs and regulatory uncertainty for brand owners;
- Currently, calls for program change are occurring in both the EU and Canada;
- Australia's program appears to have much more flexibility and more industry involvement than most of the programs studied. Through the use of publicly reported industry action plans that demonstrate continuous improvement, it builds design targets and strategies into the program itself rather than the passive approach other systems use through fee-setting mechanisms.

5. Packaging Waste Strategies & Financial Platforms Summarized

Table 5-1: Waste Reduction Strategies Summarized -- Strengths, Challenges, Behavioral Change Potential, Waste Reduction Potential, and Recycling/Recovery Potential					
Strategy	Strength	Challenge	Behavioral Change Potential	Financial Stability Potential	Packaging Recovery Potential
Landfill Bans	Proven landfill diversion	Enforcement of ban; sufficient infrastructure; political feasibility	Dependent on education/enforcement	No revenue component	Secure material flow, drives recovery and market development
Mandatory Recycling	Proven generator of material	Enforcement/funding; correct mix of materials to be collected; political feasibility	Dependent on education/enforcement	No revenue component	Secure material flow, drives recovery and market development
PAYT	Proven generator of material supply and diversion; stand-alone program	Enforcement of program to minimize contamination; political feasibility; difficult for multi-family housing	Excellent opportunity to affect diversion	Programs are locally self-funded	Secure material flows and increased material recovery
ADF/ARF	Easy implementation	Could be seen as a tax; diversion of revenue to other needs	No incentive for consumer behavior change; may affect design	Can provide steady source of funds	No consumer incentive to recover materials
Container Deposits	Proven generator of material supply	Narrow coverage and opposed by many stakeholders	Provides incentives for recycling	Depending on unclaimed deposits could be risky	Powerful tool for recovery of beverage containers
Landfill Surcharges	Easy implementation	Opposition from stakeholders	Surcharge would have to be significant to have impact; high diversion rates would negatively affect revenue	Steady stream of revenue to support infrastructure development	If surcharge is sufficiently high, could redirect materials to recovery efforts
Extended Producer Responsibility	Shifts costs from government; proven generator of material supply	Program variability; infrastructure inefficiencies not addressed; fees don't always cover cost of program	Not itself a behavioral change agent; design signals inconsistent	Primarily a self-funding program	Proven increases in material recovery

6. Key Findings - Conclusion

Based on the thorough analysis above, AMERIPEN finds that recovery of packaging is best accomplished through a comprehensive suite, or toolbox, of approaches. AMERIPEN recommends a combination of three legislated approaches within the U.S.:

- ***Unit-Based Pricing or Pay As You Throw*** -- Despite the complexities of local solid waste management decisions, implementing PAYT collection systems can have significant impact on driving increased recovery and waste reduction. These programs are self-sustaining in that the costs of programs implementation are borne by the rate payers.
- ***Mandatory Recycling*** – This strategy has shown proven increases in material recovery, despite the challenges of enforcement. Redeployment of avoided landfill tipping fees and increased income from material recovery streams can provide financing to support infrastructure needs.
- ***Disposal Bans*** – Bans have shown proven waste diversion and material recovery, despite the challenges of enforcement. Redeployment of avoided landfill tipping fees and increased income from material recovery streams can provide financing to support infrastructure needs.

In the execution of these strategies, the following approaches should be taken:

- Decisions should provide a clear policy direction for the foreseeable future, particularly those tied to financing and recycling targets that involve industry. Fragmented systems as found in the EU and Canada should be avoided, and a harmonized approach to optimizing program efficiencies and effectiveness should be created. Doing so enables governments and the solid waste/recycling industry to operate in a way that allows for rational investment and infrastructure optimization.
- In order to measure program effectiveness and efficiency, harmonized reporting mechanisms on recycling and waste management should be adopted across the states.
- Goal-setting, incentives for participation, solid waste management planning, and local tactics that drive recovery through education and outreach are elements that should be considered as part of a successful program.
- States and municipalities should not consider recovery strategies in isolation. Instead, they must first move to utilize approaches with proven success, and then explore mechanisms to fund any gaps that may occur.

- To move forward on this strategy, industry should play a role in developing policy approaches, identifying opportunities, and building support within states and municipalities.

These conclusions are based on data from countries/regions with established programs, and strategies or combinations of strategies that have a proven record of increasing packaging recovery. Programs that can be, and have been, translated into state and local policy were also considered.

Through the work of the AMERIPEN Recovery Team, it is expected that sustainable financing for these programs can be realized through reduced waste collection and disposal costs and net income from the increased collection and sale of recovered materials. This approach may not address funding needs for research and development into recovery of hard-to-recycle materials, innovation in machinery and materials recovery technology, and serving rural and multi-family communities. Further exploration of industry investments related to technology development and data collection is needed. Based on noted successes, voluntary grant programs should feature prominently within future explorations.

AMERIPEN looks forward to building on these conclusions through continued multi-stakeholder discussions and outreach to public policy makers.

APPENDIX A

Stakeholders

A1 – AMERIPEN

AMERIPEN works to improve and promote the economic, environmental, and social sustainability of packaging. It does this by working to increase material recovery rates, improve packaging design and materials selection, and building public awareness. To facilitate relevant research and identify key data and standards to advance the organization’s mission, the organization engages with thought leaders throughout the packaging industry, including representatives of trade associations, academic institutions, non-governmental organizations (NGOs), and government agencies.

AMERIPEN’s efforts are based upon a philosophy of sound science. Its members and associates support an operating philosophy that consists of a collaborative trade and industry organization, active and cooperative issue resolution, and material and packaging system neutrality.

AMERIPEN carries out its activity through focused committees and projects. Members along with affiliates and Technical Advisory Group (TAG) members may participate in committee meetings, participate in project work, and participate in project team meetings.

Principally, the AMERIPEN work is currently divided into three project areas:

- Value of Packaging – This team helps consumers understand the role of packaging in their daily life by protecting the goods consumed during manufacturing and consumption. This group produced a brochure entitled “Discover the Hidden Value of Packaging,” which concluded that “packaging protects the economic, environmental, and social value of the products it contains. In fact, effective packaging actually helps prevent waste.”
- Packaging Recovery – The Recovery Team is tasked with examining research and information surrounding packaging generation and recovery, and then using the information gathered to develop potential action opportunities for AMERIPEN. It has developed a number of tools, including the Product Recovery Knowledge Map (PRKM).
- Financial Platforms – This team researches and finds a balanced approach between volunteer and regulatory efforts to support a sustainable packaging recovery infrastructure. This group is responsible for this report.

In many ways, the work of AMERIPEN picks up where the EPA Sustainable Financing Dialogue, highlighted below, leaves off.

A2 – USEPA Dialogue on Sustainable Municipal Financing

In 2009, the success surrounding product stewardship programs for electronic waste caused the states of North Carolina, New York, and Iowa to petition the Administrator of the U.S. Environmental Protection Agency (USEPA) to address the critical need for an alternative method of financing community recycling programs. Relating mostly to packaging and printed paper, the requests stressed the need to alleviate “the burden on local governments that currently serve as the backbone of sustainable materials management...”⁵⁰

The requests further state that if these local recycling programs continue to rely on local funding sources, they will fall short of their potential to deliver on such benefits as job creation, conservation of resources and energy, and greenhouse gas reduction. The states specifically asked the Administrator to convene a multi-stakeholder dialogue to explore “sustainable financing strategies for recycling at the municipal level.”

EPA convened the requested dialogue sessions beginning in September 2010. The dialogue focused on curbside recycling programs, which mostly focus on packaging and paper. Long-term goals were identified as:

- Optimization of existing components of the recycling system;
- Identification of mechanisms to address shortfalls in the current recycling system, including the need for long-term financing and opportunities for fully utilizing the existing value chain;
- Maximization of the source reduction, collection, reuse, and recycling of packaging and printed materials.

The multi-stakeholder group consisted of state and local government officials, consumer packaged goods companies, and non-governmental environmental groups. In addition to long-term goals, participants discussed the characteristics and objectives of an effective recycling system for packaging and printed material, and also developed criteria for evaluating financing strategies. Potential optimization projects were identified that, if implemented, could meaningfully improve current recycling systems and increase recycling rates. Unfortunately, EPA was only able to commit resources to the dialogue sessions, not to implementing any of the recommendations that would result.

The dialogue resulted in a new and far-reaching discussion on packaging recovery. It changed the arc of history on packaging recovery, and recovery in general in the U.S. No longer will the status quo be acceptable. The discussion is now about sustainable material management and keeping materials, especially packaging, out of the landfill and having them available for the economic benefit of industry. States are re-engaging on solid waste and recycling. They see not only the softer environmental benefits, but the more direct jobs and economic development benefits to increased recycling as well.

⁵⁰ U.S. Environmental Protection Agency, *Final Report of the Dialogue on Sustainable Financing of Recycling of Packaging at the Municipal Level*, February 2012:

<http://www.epa.gov/epawaste/consERVE/smm/sfmr/packagingreport.htm>

A3 – Other Stakeholders

Besides AMERIPEN, there are multiple stakeholders engaged in problem-solving around both optimizing and funding an improved packaging material recovery infrastructure. They span individual corporate efforts, non-governmental organizations, and industry trade associations. Table AA-1 summarizes several organizations and their public positions/initiatives with regard to packaging waste.

Table AA-1: Stakeholder Review		
Organization	Initiative	Summary of Position Documents/Reports or goals for improvement
As You Sow	Founded in 1992 and dedicated to increasing environmental and social corporate responsibility.	In 2012, published “Unfinished Business: The Case for Extended Producer Responsibility for Post-Consumer Packaging.” This report focuses on the packaging material not recycled and estimates the market value to be \$11.4 billion in 2010. The report claims the locally controlled and funded method of recycling management is ill-equipped to recover and invest in the needed infrastructure to get at the not-recycled materials. The report makes four recommendations: 1) Those that put packaging into the marketplace should be responsible for its end-of-life management; 2) EPR systems should be prioritized and aggressive timelines and goals (75%+) implemented; 3) EPR systems should address all packaging types, be financed and managed by manufacturers, and should phase out all non-recyclable packaging; and 4) Such systems would allow companies to utilize greater amounts of post-consumer materials. ⁵¹
Curbside Value Partnership	Focuses on increasing the recovery of all materials through curbside collection.	No public stance on EPR, but works to optimize collection programs through increased household participation and material yield per household.
Future 500	Hosted EPR dialogues “Transitioning to Action on EPR for Packaging;” Recycling Reinvented was an outgrowth of those dialogues.	Recovery rates in the U.S. are too low, and a number of stakeholders believe EPR is the best tool to improve recovery. Its goal is to develop state legislation. Closed group – invitation only – started small and added people as it went along. Dialogue process started in March 2011 and met four times face-to-face between then and June 2012 with multiple conference calls in between. Core principles: 1) Internalize costs; 2) Brand owner financing; and 3) Brand owner management. Policy goals must meet following benchmarks: 1) Meet three core principles; 2) Address PPP; 3) Achieve high rates and quality; and Boost domestic economy. Effort dovetailed into Recycling-Reinvented. ⁵²

⁵¹ As You Sow, *Unfinished Business: The Case for Extended Producer Responsibility for Post-Consumer Packaging*, June 2012

⁵² Future 500, *Extended Producer Responsibility*, presented to Dialogue IV Meeting, San Francisco, California, June 2012

GreenBlue – Sustainable Packaging Coalition	Focus on packaging design and material recovery.	In January 2012, GreenBlue released the Road Map for Effective Material Value Recovery, commissioned by the State of California. The document provides a detailed systems analysis of packaging recovery systems from an international perspective. It focused on material recovery in several EU nations, as well as Australia, Ontario, Canada, and rural recycling systems. It also identifies potential best practices that could be adopted within the U.S. ⁵³ They have not adopted a public stance for or against EPR.
Grocery Manufacturers Association	Focuses on packaging initiatives, including food waste recovery.	In September 2012, GMA released the Evaluation of Extended Producer Responsibility for Consumer Packaging report. The report concluded that costs would be passed through to consumers under an EPR system and that EPR does not influence package design. ⁵⁴
Keep America Beautiful	Expansion of litter programs; recycling programs; public space and event recycling; community support. Change behavior with actionable public education programs.	Waste reduction and recycling through integrated programs consistent with the solid waste hierarchy. No public stance on EPR.
Product Stewardship Institute and Product Policy Institute	Various initiatives, including hosting dialogues, blogs, webinars on packaging and financing approaches.	Both organizations support a comprehensive approach spanning regulatory (including EPR) and voluntary solutions to reduce waste, increase recycling, reduce overall costs and specific costs on taxpayers, and create recycling jobs. Includes producer responsibility as a central element of this approach.
Recycling Reinvented	Nonprofit focused on increasing packaging and printed material recovery rates in the U.S. through an EPR model. Primary sponsor is Nestle Waters North America.	Supports EPR for packaging and printed paper, and is actively working to get EPR legislation passed in the U.S. on a state-by-state basis. Recycling Reinvented has developed a full EPR model that would require: 1) Brand owners to assume the cost of collecting/sorting recyclables; 2) Creation of one or more product stewardship organizations to manage the process; and 3) Brand owners to internalize the costs of the system by incorporating them into the price of new products. ⁵⁵

⁵³ GreenBlue, *Closing the Loop: Road Map for Effective Material Value Recovery*, Charlottesville, Virginia, January 2012: <http://www.greenblue.org/publications/road-map-for-effective-material-value-recovery/>

⁵⁴ Grocery Manufacturers Association, *Evaluation of Extended Producer Responsibility for Consumer Packaging*, September 2012: http://www.gmaonline.org/file-manager/Sustainability/GMA_SAIC_EPR_Report_091112.pdf

⁵⁵ Recycling Reinvented, *Proposal for Extended Producer Responsibility (EPR) for Packaging & Printed Paper*, July 23, 2012: www.recycling-reinvented.org

APPENDIX B

Country Profiles

Understanding the history and motivations behind policy tools in each country is important to assessing current and future situations and trends. Much can be learned from the history of how each country implemented its programs. This section examines packaging waste reduction regulations in place among the 27 Member States⁵⁶ of the European Union (Europe), Canada, Australia, and the United States.

B1 – Europe

Packaging Directive

European Union countries are united in valuing the common social benefit of packaging and waste reduction, and have implemented a variety of legislative tools and financial arrangements to manage their programs. The main driver is the European Union Parliament and Council Directive 94/62/EC on Packaging and Packaging Waste.

This directive replaced 85/339/EEC, which was aimed only at beverage containers. According to a recent report by the industry-funded European Organization for Packaging and the Environment (EUROPEN), the main objectives of this policy are to safeguard the free circulation of packaged goods across Europe and promote high level of environmental protection.⁵⁷ The Directive was first adopted on December 20, 1994 and amended several times. The Directive:

- Provides for Member States to form national programs to encourage packaging reuse to prevent the formation of waste;
- Reduces the content of heavy metals in packaging;
- Requires that Member States introduce systems to collect and return used packaging;
- Establishes overall packaging recovery targets, material-specific recycling goals, and processes to adjust them;
- Requires Member States to promote recycling information campaigns to all stakeholders and the general public;

⁵⁶ Member States: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK. Candidate countries: Croatia, Iceland, Macedonia, Montenegro, Serbia, Turkey.

⁵⁷ EUROPEN, *European and National Legislation on Packaging and the Environment*, March 2012: <http://www.europen.be/index.php?action=onderdeel&onderdeel=6&titel=EUROPEN+Publications&categorie=0&item=43&back=%3Faction%3Donderdeel%26onderdeel%3D6%26titel%3DEUROPEN%2BPublications>

- Requires Member States to develop a combined reporting system and databases on packaging and waste in order to monitor the implementation of the directive.⁵⁸

The packaging directive was amended in 2004 and 2005 with language to clarify the scope of packaging, and to push back timetables to reach recovery and recycling targets. It also extended timelines for certain EU Member States.

Economic Instruments

The directive allows Member States to adopt economic instruments. However, they are not obliged to do so.⁵⁹ Member States are free to implement their own economic instruments, as long as they are consistent with “the principles governing European Community environmental policy.” The key directive is to maintain the principle of proportionality, which states that “major distortions of competition for minor environmental benefits are not acceptable.”

A report entitled “Use of Economic Instruments and Waste Management Performances” was released in April 2012 by the EU. The study examined the relationships between waste management performance and Member States’ use of economic instruments. The objective was to move the EU to a common approach on the use of economic instruments. The major economic instruments used fall into three categories and were the subject of the report:

- Charges for waste disposal (landfill and incineration taxes and fees);
- Pay-as-you-throw;
- Producer responsibility fees for specific waste streams including packaging.⁶⁰

Twenty-four of the 27 Member States have producer fees for packaging. A majority of them are EPR programs in which brand owners support, to varying degrees, the collection and recycling of packaging waste. No two of these programs are alike. The United Kingdom has a system of tradable credits for packaging recycling, while Denmark, Hungary, and the Netherlands have either a taxation system and/or deposit-refund system. (The main type of packaging programs used in each Member state is identified in Table AB-1.)

⁵⁸ U.S. Environmental Protection Agency, Recycling and Reuse: Packaging Material: European Union Directive: <http://www.epa.gov/oswer/international/factsheets/200610-packaging-directives.htm>

⁵⁹ EUROPEN, *European and National Legislation on Packaging and the Environment*, March 2012: <http://www.europen.be/index.php?action=onderdeel&onderdeel=6&titel=EUROPEN+Publications&categorie=0&item=43&back=%3Faction%3Donderdeel%26onderdeel%3D6%26titel%3DEUROPEN%2BPublications>

⁶⁰ European Commission, *Use of Economic Instruments and Waste Management Performance*, Paris, France, April 2012: http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf

Member State	Main type of scheme	Member State	Main type of scheme
Austria	Producer fee scheme (some deposit-refund schemes)	Latvia	Producer fee scheme
Belgium	Producer fee scheme (some deposit-refund schemes)	Lithuania	Producer fee scheme
Bulgaria	Producer fee scheme	Luxembourg	Producer fee scheme
Cyprus	Producer fee scheme	Malta	Producer fee scheme
Czech Republic	Producer fee scheme	Netherlands	Producer fee scheme (deposit-refund schemes exist but are set to expire in 2015)
Denmark	Tax and deposit-refund schemes	Poland	Producer fee scheme
Estonia	Producer fee scheme/deposit-refund schemes	Portugal	Producer fee scheme
Finland	Producer fee scheme/deposit-refund schemes	Romania	Producer fee scheme
France	Producer fee scheme	Slovakia	Producer fee scheme/deposit-refund schemes
Germany	Producer fee scheme/deposit-refund schemes	Slovenia	Producer fee scheme
Greece	Producer fee scheme	Spain	Producer fee scheme
Hungry	Tax	Sweden	Producer fee scheme
Ireland	Producer fee scheme	United Kingdom	Producer fee scheme (tradable credits)
Italy	Producer fee scheme		

A new economic instrument used to incentivize companies to meet their recovery targets is a packaging tax designed as a penalty for not meeting recovery/recycling targets. It is to be paid on the difference between targeted and actual performance. This type of incentive is used in some electronic waste programs in the U.S., most notably Minnesota.

The Essential Requirements

As part of the Directive and Independent of packaging waste targets and requirements, the EU also established “The Essential Requirements and The CEN Standards” for packaging. The Essential Requirements define the results to be achieved and the associated risks, but delegates the job of finding technical solutions to the European Committee for Standardization (CEN). The Essential Packaging Requirements have the following requirements:

- Minimize packaging volume and weight;
- Design and use that permits reuse and recovery;
- Limited use of heavy metals in packaging materials.

⁶¹ European Commission, *Use of Economic Instruments and Waste Management Performance*, Paris, France, April 2012: http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf

Recently released International Standards Organization (ISO) standards on Packaging and the Environment (ISO 18601:2013 through ISO 18606:2013) cover topics such as reuse, material recycling, organic recycling, energy recovery, system optimization, and general requirements. Because they relate to international commerce, these standards are very new and may take on greater importance over time for packaging companies.

Country-by-Country Implementation

The Waste Directive adopted in 1994 by the EU was a framework and the agenda for each Member State with regard to packaging waste. Article 7, Article 22, as amended, requires Member States to pass necessary laws to ensure that systems are set up for the return, collection, reuse or recovery of used packaging to meet the objectives of the Directive. This means that while the Directive and its subsequent amendments gave firm objectives, implementation specifics are still subject to the individual country's interpretations.

Differences between the Member States' approaches to implementation include wide differences in how recovery organizations operate, and add to compliance costs for obligated companies. Table AB-2 is based on the work done for AMERIPEN by Arizona State University and Virginia Commonwealth University students and highlights basic program elements of selected Member States' producer responsibility programs.

Table AB-2: Elements of Selected European Packaging Waste Reduction Programs					
	Austria	Belgium	France	Germany	Sweden
Type of System	EPR	EPR – full & Bottle Bill	EPR	EPR	EPR & Bottle Bill
Monopoly or Competitive Systems	Competitive	Monopoly	Monopoly	Competitive	Monopolies (3 non-profits)
Recovery Rate for Packaging (2010 - EuroStat) ⁶²	92%	96%	70%	96%	77%
Recycling by Material (2010 - EuroStat) ⁶³	Packaging - 67% Glass - 83% Plastic - 34% Paper - 85% Metal - 61%	Packaging - 80% Glass - 100% Plastic - 42% Paper - 90% Metal - 95%	Packaging - 61% Glass - 70% Plastics - 24% Paper - 92% Metals - 75%	Packaging - 73% Glass - 86% Plastic - 49% Paper - 90% Metal - 93%	Packaging - 77% Glass – 93% Plastics – 34% Paper - 70% Metal 76%
Funding – Income Sources	Predominately brand owners -- small % is household fee.	100% industry fees applied to producers, private label retailers, and importers.	Goal: Brands and importers to cover 80% of costs by 2012 through EPR fees. EPR fees in 2010 covered estimated 57% of costs. Local governments rely on the sale of sorted material and taxes to fill the gap.	Predominately brand owners -- small % is household fee	Municipally owned waste companies charge fees to households. Fees serve as incentives. Producer organizations pay EPR fees for producer responsibility.
Scope of Collection	Household & Industrial	Household (Fost Plus) Industrial Val-I-Pac	Households only	Households & Industrial	Household & Industrial
Cost Controls	Any revenues are directed towards reducing fees the following year.	After reserve fund, if there are extra revenues they are directed towards reducing industry fees the following year.	Up to 8% of payments are dedicated to 9 sustainable development criteria including cost controls.		Competition for the collection and disposal of waste; 4 material companies manage plastics, glass, metal, paper.
Industry Incentives for Sustainable Packaging		VAL-I-PAC: Recycled plastic: \$46 per tonne of plastic sent for recycling; recycled wood: \$13 per tonne of wood sent for recycling; \$26-145 per year for installing collection containers.	New Green Dot tariff for 2012 that includes additional bonuses and penalties to incentivize businesses, households, communities to recycle and sort more efficiently.		Producer is responsible for collection and disposal at EOL. They fund Materials Companies in their sector and pay EPR fees. Efficiency is incentivized.

⁶² European Union, Eurostat Statistics Portal Website, accessed July 2013:
http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

⁶³ Ibid

B2 – Canada

In May 1989, the Canadian Council of Resource and Environment Ministers, later renamed the Canadian Council of Ministers of the Environment (CCME), created a National Task Force on Packaging. The purpose was to develop national policies for management of packaging. Disposal options and their effect on packaging design were not included in the scope of the work. The result of the Task Force's work was "The National Packaging Protocol" (NAPP).

NAPP included timelines and targets that called for reduction of packaging waste sent to landfills:

- By December 31, 1992, packaging sent for disposal shall be no more than 80% compared to a 1988 baseline;
- By December 31, 2000, packaging sent for disposal shall be no more than 50% compared to the 1988 baseline.

Further, the report left the appropriate funding mechanism up to the CCME.⁶⁴

CCME's creation of the Extended Producer Responsibility Task Group in 2005 was the next step in the evolution of sustainable packaging regulations in Canada. The group was tasked with providing guidance on EPR program development, and the group determined that packaging should be its first priority. The results of the Task Group's work were two reports published in October 2009 and summarized below:

"Canada-wide Action Plan for Extended Producer Responsibility" -- In the hopes of a harmonized approach for a number of commodity types, this report provides guidance to provinces and territories as they develop EPR programs. These include batteries, packaging, mercury lamps, electronics, automotive products, and packaging in Phase I of a two-phase approach.

Phase II commodities include construction and demolition materials, furniture, textiles/carpet, and appliances. Timelines in the report call for operational EPR programs within six years of adoption of the Action Plan for Phase I materials and eight years for Phase II materials. Given the unique characteristics of the Territories, they were given special dispensation for alternatives. The report points out that EPR "may not be an appropriate instrument for all products or product categories."⁶⁵

"A Canada-wide Strategy for Sustainable Packaging" – As with the Action Plan for Extended Producer Responsibility, the Strategy for Sustainable Packaging report aims to establish a more consistent countrywide approach to EPR for packaging. While the report makes the case for EPR, it also acknowledges that EPR alone may not be enough to drive producers to meet the packaging sustainability goals. It lays out nine additional supporting measures that would

⁶⁴ Canadian Council of Ministers of the Environment, National Packaging Protocol, 1990

⁶⁵ Canadian Council of Ministers of the Environment, *Canada-wide Action Plan for Extended Producer Responsibility*, October 2009: http://www.ccme.ca/assets/pdf/epr_cap.pdf

increase awareness of sustainable packaging options, providing incentives for packaging actors to make sustainable choices, and supporting the development of better systems to optimally recovery packaging materials.⁶⁶ The nine additional supporting measures are:

- Establishment of an industry-government working group to provide a forum for greater dialogue and to facilitate implementation of the other supporting measures included in the Strategy;
- Negotiated industry agreements with interested industry sectors to reduce packaging and improve its sustainability;
- Development of a Canada-wide standard and certification program for compostable packaging;
- Exploration with industry of the potential development of a Canada-wide labeling system for recyclable packaging;
- Exploration with industry of opportunities for implementation and expansion of reuse systems;
- Adoption of Canada-wide sustainability indicators and metrics that can be used to assess the sustainability of packaging over its entire life cycle;
- Development and implementation of industry-led educational initiatives, best practices and industry recognition programs that promote sustainable packaging design;
- Exploration with stakeholders of the establishment of a packaging ombudsman to address consumer complaints regarding excessive packaging;
- Exploration with industry of the potential development of an index used to measure packaging sustainability across Canada.

These are presented in their entirety, to convey the understanding that the CCME defined EPR as end-of-life management of packaging. The nine measures are considered supporting measures to achieve the broader goal of more sustainable packaging.⁶⁷

Province-by-Province Implementation

While the federal government sets overall policy and directions, it is up to the provinces and local governments to implement policy. Provinces are free to individualize the national policy for their own purposes. This could mean a lack of harmony on implementation. However, four basic criteria are used for all packaging and waste diversion programs:

- Waste diversion is a program focus;
- Programs operate in the public domain;
- Programs are funded in whole or in part by industry and consumers;
- Programs operate in close association with government.

⁶⁶ Canadian Council of Ministers of the Environment, *A Canada-Wide Strategy for Sustainable Packaging*, October 2009: http://www.ccme.ca/assets/pdf/sp_strategy.pdf

⁶⁷ Ibid

Table AB-3 provides an overview of the four provinces with packaging waste producer responsibility programs in place or planned.

Table AB-3: Selected Elements of Canadian Packaging EPR Programs				
	Manitoba ⁶⁸	Ontario ⁶⁹	Quebec ⁷⁰	British Columbia
Packaging Recovery	37.2% (2011)	49.9% (2011)	64.8% (2010); includes printed paper	n/a – to begin in 2014
Industry Funding	80% industry reimbursement	50% industry reimbursement	Industry reimbursement on a sliding scale up to 100% in 2013; 90% reimbursement in 2012	100% industry funded and managed
Steward Fees 2012	CA\$12.7 million	CA\$104.6 million	CA\$134.7 million	n/a – to begin in 2014

B3 – Australia^{71 72}

The legislative and policy framework for packaging recovery in Australia is the Used Packaging Materials National Environmental Protection Measure (NEPM) passed in 1996. In 1999, the voluntary Australian Packaging Covenant (APC) was created. It is an overarching agreement between packaging stewards (defined as brand owners), the Commonwealth, local governments, NGOs, and packaging supply chain companies. Signatories of the APC avoid the harsh regulations under the NEPM. The NEPM also addresses the issues of “free-riders” and requires take-back measures be implemented by brand owners if they are not part of the APC. They would be required to achieve material recovery targets that are greater than those if they were part of the APC, and report periodically. In addition to the APC, those who sign are also required to adopt the Environmental Code of Practice for Packaging (ECOPP), which promotes minimal environmental impact while preserving product integrity.

All signatories to the APC are required to develop an action plan and report annually on performance against key performance indicators and measurable targets that put a higher priority on minimizing waste, reuse, recycling, recovery, and final disposal. In addition, Sustainable Packaging Guidelines provide a simple methodology to analyze and document packaging decisions.

⁶⁸ Multi-Material Stewardship Manitoba, 2012 Annual Report:
<http://stewardshipmanitoba.org/mmsm/files/annual-report-2012.pdf>

⁶⁹ Stewardship Ontario Annual Report, 2012:
http://www.stewardshipontario.ca/wp-content/uploads/2013/06/SO_2012AR_WEB.pdf

⁷⁰ EEQ Annual Report 2012:
http://www.ecoentreprises.qc.ca/documents/pdf/AGA/2013/rapportannuel2012_eeq_engl_simple.pdf

⁷¹ GreenBlue, *Closing the Loop: Road Map for Effective Material Value Recovery*, Charlottesville, Virginia, January 2012: <http://www.greenblue.org/publications/road-map-for-effective-material-value-recovery/>

⁷² Northwest Product Stewardship Council, *Analyzing Product Stewardship Policies for Packaging & Printed Paper in Washington State*, March 2011:
<http://productstewardship.net/sites/default/files/PDFs/productsPackagingNWPSCReport2011.pdf>

Under the APC, packaging is defined as retail consumer product packaging and associated distribution packaging. This voluntary approach is unique. It provides a national framework whereby industry and government collaborate, encompassing all packaging, for any use. It covers household, business, and away-from-home uses and includes guidelines for sustainable design. It makes Australia the first country studied that doesn't specifically identify materials covered, and instead focuses on responsible parties and overall objectives. These objectives are identified as: better product design; increase reduction, recycling, and reuse; limit the amount going to landfilling; and reduce littering.

The APC is not responsible for fully funding recovery programs for packaging, but instead provides grants to municipalities for specific targeted needs. Over a five-year term about \$32M (U.S.) or \$30M (A) is raised and distributed in the form of grants. Industry contributes, based on a formula related to annual packaging related turnover, defined as "total sales of ALL packaged finished goods sold into the consumer market in Australia, including industrial applications and sales for public events (e.g., for sporting events)."⁷³ No one company is required to contribute more than \$302,000 (U.S.) annually.

In its 2011 Annual Report, the APC reported project funding of \$5.5 M (U.S.) for 23 projects. Total project value, including funding from jurisdictions and applicants, is estimated at \$10.1 M (U.S.).⁷⁴

This "co-regulatory" framework was renewed in 2010 for another five-year term. It includes new provisions that allow the APC Council to identify "free-riders" and turn over enforcement to state governments.

State-by-State Implementation

Within Australia's federal form of government, each state and territory is free to make its own laws. The NEPM was passed at the federal level, but since states are responsible for enforcement, it had to be adopted by each state and territory. In 2009, the Commonwealth adopted The National Waste Policy: Less Waste, More Resources and all state and territory governments agreed to adopt it as well.

Waste management is delegated to state and local governments. Local governments determine collection services (frequency, bin, etc.), though occupational health and safety standards have moved solid waste/recycling collection to larger, rolling carts with automated collection systems. Curbside collection for recycling is mostly single-stream.

⁷³ Australian Packaging Covenant, Signatory Commitment Form:

http://www.packagingcovenant.org.au/data/Forms/APC_Compmitment_Form_2012_Brand_Owners_autofill.pdf

⁷⁴ Australian Packaging Covenant, 2011 Annual Report:

http://www.packagingcovenant.org.au/data/Publications/APC_ANNUAL_REPORT_2010-2011_FINAL.pdf

B4 – United States

The Resource Conservation and Recovery Act (RCRA) was passed in 1976. It banned all open dumping of wastes, encouraged source reduction and recycling, and promoted safe municipal solid waste (MSW) disposal. It amended the Solid Waste Disposal Act of 1965 and set national goals for:

- Protecting the environment from potential hazards of waste disposal;
- Conserving energy and natural resources;
- Reducing the amount of waste generated;
- Managing wastes in an environmentally sound manner.

Three separate, yet interrelated, programs were created by RCRA. The one related to solid waste was commonly referred to as Subtitle D. It encouraged states to develop comprehensive solid waste plans, set criteria for landfills and other disposal facilities, and prohibited open dumping of MSW. It also required states to complete and submit solid waste plans to manage solid waste within their borders. This meant that state and local governments are responsible for setting their own guidelines, goals, and laws.

Many states completed plans in the required timelines. However, in fiscal year 1980-81, federal funding for MSW programs was withdrawn as the federal emphasis and funding shifted to hazardous waste management. With the passage of the Federal Hazardous and Solid Waste Amendments (HSWA), RCRA was amended by Congress in 1984. These had little to do with municipal solid waste, but instead strengthened hazardous waste land disposal regulations and underground storage tank rules. The law did increase enforcement authority for EPA, in order to better monitor and safeguard communities.

RCRA has been amended twice since then, in 1992 and 1996. Neither change had a big impact on MSW management, but instead focused on enforcement of RCRA at federal facilities and provided some flexibility in disposal practices for certain wastes.⁷⁵

In 2002, the Resource Conservation Challenge (RCC)⁷⁶ was launched. The RCC is a national effort to conserve natural resources and energy by more efficient use of resources and better management of materials. Two of the four national priorities focused on recycling: 1) Creating a 35% recycling goal, 2) Increased industrial recycling. The RCC set out to:

- Prevent pollution and promote reuse and recycling;
- Reduce priority and toxic chemicals in the economy;
- Conserve natural resources especially energy and materials.

As part of the RCC, EPA developed its materials management philosophy and published its visioning report, entitled “Beyond RCRA: Waste and Materials Management in the Year 2020.” Its key finding was the need to shift society away from “waste management” toward “materials management.” It was the

⁷⁵ U.S. Environmental Protection Agency, History of RCRA: <http://www.epa.gov/waste/laws-regs/rcrahistory.htm>

⁷⁶ U.S. Environmental Protection Agency, Resource Conservation Challenge (Now Sustainable Materials Management): www.epa.gov/waste/rcc/index.htm

basis for the implementation report entitled “Sustainable Materials Management: The Road Ahead in 2009,” which will guide the Agency’s thinking for years to come.⁷⁷

EPA’s initial efforts will concentrate on four areas -- electronics, food management, federal green challenge, and materials measurement. Food management will concentrate on source reduction, reuse, and recycling with efforts targeting grocery stores and college campuses. The materials measurement approach will focus on developing better and more complete data on waste, including packaging waste generated, recycled, reused, and prevented.⁷⁸

State-by-State Implementation

According to the EPA, “There are not federal mandates for product responsibility comparable to the existing or proposed take-back and recycling mandates for packaging, electronics, and other products in Europe.”⁷⁹ RCRA gives EPA the specific authority and obligation to develop regulations governing “open dumps” and hazardous waste facilities. Its ability to regulate anything else falls under Subtitle D – State or Regional Solid Waste Plans. The objectives of this section are clear in the preamble – “The objectives of the subtitle are to assist in developing and encouraging methods for the disposal of solid waste which are environmentally sound and which maximize the utilization of valuable resources including energy and materials which are recoverable from solid waste and to encourage resource conservation.”⁸⁰

However, EPA began studying product stewardship and EPR as far back as 1996, when the President’s Council on Sustainable Development released a report that said extended producer responsibility could lead to better resource conservation and pollution prevention at lower costs.⁸¹

⁷⁷ U.S. Environmental Protection Agency, Sustainable Materials Management: The Road Ahead

<http://www.epa.gov/smm/vision.htm#beyond>

⁷⁸ Vance, Ron: Presentation at Waste Expo, May 2012, Las Vegas, NV

⁷⁹ U.S. Environmental Protection Agency, Conservation Tools: What is Product Stewardship?:

<http://www.epa.gov/epawaste/conserves/tools/stewardship/basic.htm#feds>

⁸⁰ U.S. Senate, Solid Waste Disposal Act, Subtitle D Section 4001, December 2002: <http://epw.senate.gov/rcra.pdf>

⁸¹ U.S. Environmental Protection Agency, Extended Product Responsibility, December 1998:

<http://www.epa.gov/epawaste/conserves/tools/stewardship/docs/eprbrochure.pdf>

Broader Policy Discussion for the U.S.

A number of broader policy issues and their impacts on packaging are discussed in this section.

Sustainable Materials Management (SMM) – SMM is a systematic approach to the materials in the waste stream. It seeks to reduce the environmental impacts over the life of the material; starting at the extraction point of natural resources, to supply chain activities, product design, delivery to consumers, and ultimately to end-of-life decisions. Decisions will be made about packaging and product design, material usage, transportation systems, refrigeration systems, recycling options, etc. An SMM approach seeks to:

- Use materials in the most productive way with an emphasis on using less;
- Reduce toxic chemicals and environmental impacts throughout the material life cycle;
- Assure we have sufficient resources to meet today's needs and those of the future.⁸²

There is a major movement in the U.S. toward SMM. States are now revising their Solid Waste Master Plans, which have not changed in decades. States see the opportunities within their borders from not only rethinking waste, but using it as an economic driver to grow new jobs and retain current ones. The basis of that thinking is that economic opportunity exists when materials are treated as resources rather than as waste.

Landfill reduction versus recycling/recovery – States are beginning to set goals based on reducing the amount of material going to landfills, not on the amount of material to be recycled. States are seeing landfill reduction as a simpler, more direct, and more effective metric for evaluation of program performance (including reduction, recycling, composting, and other diversion methods). This also could potentially save money related to tracking annual recycling volumes and providing the opportunity for a more harmonized measurement system.

Landfill diversion has been the priority in Europe, Canada, and Australia for long time. Implications for taxation issues are not far behind. As the amount of materials going to landfills could potentially decrease at increasing rates, states that support their solid waste and recycling programs based on tipping fee surcharges will have to rethink that methodology.

Recycling as a Greenhouse Gas Reduction Strategy – As states update their solid waste management plans, they are shifting from championing the indirect advantages of recycling to championing recycling specifically as a way to combat global warming and reduce greenhouse gas emissions. While this benefit has been recognized for a long time, awareness of challenges relating to global warming is increasing awareness of it.

⁸² U.S. Environmental Protection Agency, Sustainable Materials Management:
<http://www.epa.gov/epawaste/conserva/smm/basic.htm#EL>

Federal Guiding Policy in the Harmonization of State/Country Policy with Freedom for Application – One of the key considerations for any national policy is the freedom or flexibility it gives to subordinate jurisdictions to implement the policies enacted. What should be obvious from this report is that while there may be broad packaging reduction and waste reduction goals in place, there is no harmonization of the programs implemented at the country/province/state level. This is necessary to allow for local customs, ethics, and values to be reflected in individual programs. However, it will continue to challenge packaging manufacturers.

The Impact of Jobs from Increased Recycling – Recycling has not only energy and environmental benefits, but also economic benefits. It has been shown to be one of the best methods to reduce greenhouse gas emissions by avoiding extraction of limited natural resources, and it saves energy and reduces wastes going to landfills. This section examines the many studies that have been published around the economic impact of increased recycling, specifically those related to job creation and retention. In examining the studies, it is interesting to note that almost none of them takes into account the job losses in the other sectors: They only focus on the job gains in the recycling collection, processing, and manufacturing sector.

In 2012, the Tellus Institute, along with Sound Resource Management, released a report entitled “More Jobs, Less Pollution: Growing the Recycling Economy in the U.S.” The report assessed the impact on jobs if the U.S. were to reach a 75% national recycling rate by 2030. The report contrasted the status quo of continued reliance on disposal against a more aggressive scenario that recovered 75% of municipal waste and construction and demolition debris. The report details the jobs by activity (collection, processing, manufacturing, reuse/remanufacturing, landfilling, and incineration) and by material type. The study concluded that with a 75% recovery rate 2.35 million jobs would be created – 1.5 million more than the status quo scenario.⁸³

A study commissioned by the National Recycling Coalition found that the recycling and reuse industry represented a significant force in the U.S. economy. The study tallied a direct and supported economic impact of approximately 4 million jobs created or supported, generating nearly \$130 billion in annual payroll.⁸⁴ In another example, The Institute of Scrap Recycling Industries claims in its 2012 fact sheet that the U.S. scrap recycling industry employs more than 137,000 people.⁸⁵

Minnesota’s 2011 Solid Waste Policy Report states that between 2004 and 2011, the number of estimated jobs increased from 19,260 to 36,981, based on the strength of the economic activity of Minnesota’s value-added recycling manufacturers (unadjusted for displacement). The report further

⁸³ Tellus Institute & Sound Resource Management, *More Jobs, Less Pollution: Growing the Recycling Economy in the U.S.*, 2012: http://docs.nrdc.org/globalwarming/files/glo_11111401a.pdf

⁸⁴ R.W. Beck, Inc.: *U.S. Recycling Economic Information Study*, prepared for the National Recycling Coalition, July 2001: <http://www.epa.gov/wastes/conservation/tools/rmd/rei-rw/pdf/exe-sum.pdf>

⁸⁵ Institute of Scrap Recycling Industries, *The Voice of the Recycling Industry*, 2012: <http://www.isri.org/CMDownload.aspx?ContentKey=1d7c41b3-68a6-46a6-a128-ae75323136f4&ContentItemKey=436d9e87-8b7d-45c3-bba2-a483207a2581>

states that the total gross estimated economic activity increased from \$2.98B to \$8.5B. The report also states that the recycling rate was stagnant during that same period, increasing only a percentage point or two.⁸⁶

The New Mexico Recycling Coalition released a report on job creation in the state, assuming the diversion rate was increased from both its current 16% to the national average of 34%, and also to a 75% rate.⁸⁷ The report done by ICF predicts that if the rate went to 34%, 8,397 new in-state jobs would be created and if a 75% goal were achieved, 18,900 new jobs would be created. The report uses data from previous studies on job creation, including the Institute for Local Self Reliance data highlighted in Table AB-4. The report further states that, in the collection sector, there would be net gain of approximately 1.1 new jobs in recycling collection for every lost job in waste collection.

Information is not always available on the social effects of packaging recycling and recovery on jobs creation from various reuse, recycling, and composting activities. What is known is that recycling creates more jobs than any other waste treatment option. According to the Institute for Local Self-Reliance, 10 times more jobs are created when comparing the treatment options for 10,000 tons per year of waste when using conventional MRFs versus disposal (See Table AB-4).

Table AB-4: Job Creation: Reuse & Recycling vs. Disposal	
TYPE OF OPERATION	JOBS PER 10,000 TPY
Product Reuse	
Computer Reuse	296
Textile Reclamation	85
Misc. Durables Reuse	62
Wooden Pallet Repair	28
Recycling-based Manufacturers	25
Paper Mills	18
Glass Product Manufacturers	26
Plastic Product Manufacturers	93
Conventional MRFs	10
Composting	4
Landfill and Incineration	1
Source: Institute for Local Self-Reliance, Washington, DC 1997	

⁸⁶ Minnesota, 2011 Solid Waste Policy Report:
<http://www.pca.state.mn.us/index.php/view-document.html?gid=17104>

⁸⁷ New Mexico Recycling Coalition, *Adding 5,000 Jobs to New Mexico's Economy*, January 2013:
http://www.recyclenewmexico.com/pdf/Recycling_Plan_to_Create_5000_Jobs_in_NM.pdf

A recent European report suggests that while there may be job gains in the recycling sector as a result of Packaging Directive 94/62/EC, there are associated job losses in the waste disposal areas as a result of macroeconomic effects. According to the report, “overall the employment balance is likely to be neutral to slightly positive.”⁸⁸

⁸⁸ European Commission, *Study on Coherence of Waste Legislation*, August 2011:
http://ec.europa.eu/environment/waste/studies/pdf/Coherence_waste_legislation.pdf

APPENDIX C

State Programs

Over the past few years, a significant number of states have revised their solid waste master plans; are in the process of doing so; have completed comprehensive reviews of their solid waste activities; or have reported on the status of their solid waste and recycling programs. To get a glimpse of the trends and activities at the state level, this section reviews a number of these reports. Table AC-1 is a summary of the states highlighted in this section and the type of report that was reviewed.

TABLE AC-1: State Solid Waste Reports Reviewed				
State	Report Title/Subtitle	Revised SW Master Plan	Comprehensive Review	Annual Report
Minnesota	2011 Solid Waste Policy Report			X
Washington	Solid Waste in WA State: 20 th Annual Status Report			X
New York	Beyond Waste: A Sustainable Materials Management Strategy	X		
Massachusetts	2010-2020 Solid Waste Master Plan: Pathway to Zero Waste	X		
Connecticut	Recycling 2.0: Better Economics, Better Environment		X	
California	Various Reports			X

Trends

A number of key trends were identified from the state reports:

- As states update their solid waste master plans, they are no longer championing the indirect advantages of recycling (environmental “do good”) as the prime motivator for public support of recycling. Instead, they are championing recycling specifically as a way to combat global warming, reduce the generation of greenhouse gases, and as an economic engine that can produce “green jobs” and restore economic vitality.
- Many states are embracing EPA’s call for a shift of our nation’s waste policy from waste management to materials management. This shift has its roots in:
 - Knowing and reducing life impacts of the supply chain.
 - Using reduced amounts of material inputs.
 - Reducing toxicity and using more renewable materials.

The basis of materials management is that economic opportunity exists when materials are treated as a resource rather than a waste.

- States are setting goals based on reducing the amount of material going to landfills, not on the amount of material to be recycled. States are seeing landfill reduction as a simpler, more direct and more effective metric for evaluating performance (reduction, recycling, composting, and other diversion methods).
- Overall recycling rates and tonnages are trending upward again.

Challenges

A number of key challenges were identified during the review:

- Providing necessary resources to implement the aggressive goals being set by states. As has been seen in the past with oversight of other product stewardship programs, having a source of secure funding from industry does not mean the resources will be allocated to efficiently monitor and enforce regulations.
- States have identified product stewardship as an aspirational accomplishment, yet only a few clearly defined what it means for their state or what materials would be subject to the regulatory regime.
- Lack of harmonization of programs in close proximity to each other, at both the local and state level. See Note on divergent requirements on the St. Paul and Minneapolis programs below.
- Some states, such as Minnesota and Washington, must figure out how to improve on their top recycling programs. For example, Washington claims 80% of its population has access to curbside and 100% to drop-off facilities, yet the state has a 51% overall recycling rate.
- Changing a long-standing way of counting and measuring diversion or recycling could cause short-term challenges.

Opportunities

Key opportunities were identified during the review:

- There are some “shining star” programs that should be held up as beacons for others to emulate. For example, Minnesota and Washington evince some of the highest recovery rates in the country.
- Long-term established recycling programs are looking for ways to modernize and reinvigorate themselves.

- Reframe the discussions and debate with new data and new arguments that can show direct benefits to citizens.
- There seems to be a renewed synergy around bringing government, NGOs, and the private sector together to improve recycling rates.

A Note on Divergent Requirements

State and local planners from around the country have long complained about the lack of harmonization among local recycling programs. This situation may be most pronounced in the Twin Cities Metropolitan Area in Minneapolis. Here, there are nearly 200 municipalities with nearly as many different recycling programs. Because of this, it is difficult to project a consistent message to the public, in an efficient manner, on how to recycle. As an illustration of the problem, a comparison was made between St. Paul and Minneapolis.

- St. Paul has a two-sort collection system through a contractor, made up of bottles/cans and paper/cardboard. The city is currently evaluating its program by considering the addition of low-density polyethylene (LDPE #4), polypropylene (PP #5), miscellaneous plastic (Other #7), and organics to the program. Also, single-stream collection is being considered.
- Minneapolis currently has a “multi-sort” collection system, but is moving to a single-stream system called “One-Sort,” to be operated by city crews. In the multi-sort program, residents are asked to sort recyclables into nine categories.

Table AC-2 depicts the specifics of each program, highlighting the differences between the two:

TABLE AC-2: St. Paul and Minneapolis Curbside Recycling Programs			
Material Category	St Paul⁸⁹ Two-Sort	Minneapolis – Multi-Sort^{*90}	Minneapolis – One-Sort
Bottles & Cans	Steel & Aluminum cans, foil & trays; Glass bottles & jars; Milk cartons & juice boxes; Plastic bottles with #1 or #2	1)Food and beverage aluminum cans, pie tins, or foil 2)Glass bottles & jars 3)Plastics bottles with # 1 thru #7	
Paper & Cardboard	Pizza boxes; corrugated cardboard; cereal, cracker boxes, etc.; magazines, mail, phone books & office paper; newspaper with inserts	4) Newspapers and inserts 5) Magazines and catalogs 6) Cereal , cracker and cake mix boxes, shoe boxes 7) Phone books 8) Corrugated cardboard 9) Household batteries	

⁸⁹ Eureka Recycling Website, March 2013: <http://www.eurekarecycling.org/page.cfm?ContentID=4>

⁹⁰ Minneapolis, City website, March 2013: http://www.minneapolismn.gov/solid-waste/recycling/solid-waste_recycling-separating

One-Sort		Paper – mail, office, and school papers, magazines, newspapers & inserts, phone books, cardboard, cereal & cracker boxes, shoe boxes, etc. Cartons – milk, juice, soup, broth, & wine Plastics – bottle/jugs -- water, soda, juice, milk, ketchup, salad dressing, dishwashing, detergent, shampoo, soap, lotion; cups/containers – yogurt, pudding, fruit, disposable cups & bowls, margarine, etc.; packaging – clear from toys & electronics Metals – food & beverage cans; aluminum foil & trays Glass – bottles & jars Batteries – Household.
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* Each numbered item is a separate sort category.

Summary

The in-depth review of the worldwide experience with various tools and financing mechanisms indicates that:

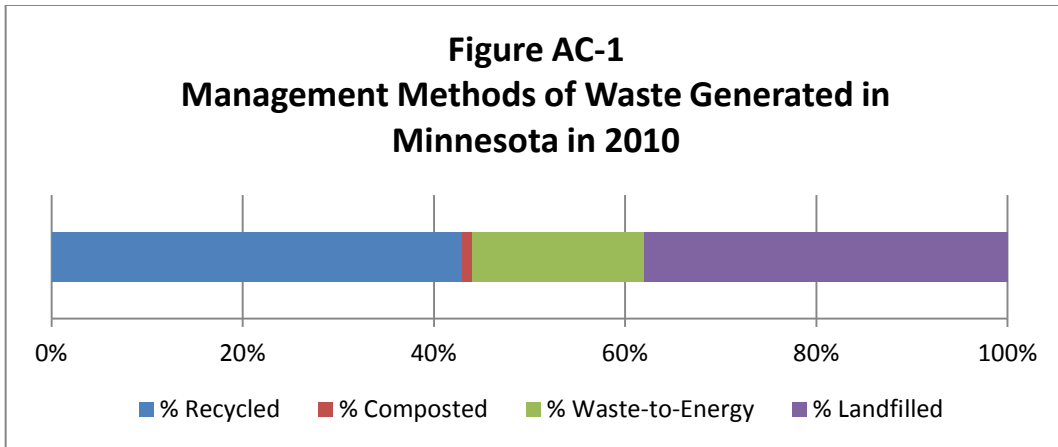
- The strategies identified are usually never used in isolation;
- Worldwide experience suggests that every tool can be associated with successful results;
- The lack of consistency in waste/recycling program specifics across countries, states, and even communities can form a barrier to progress.

C1 – MINNESOTA

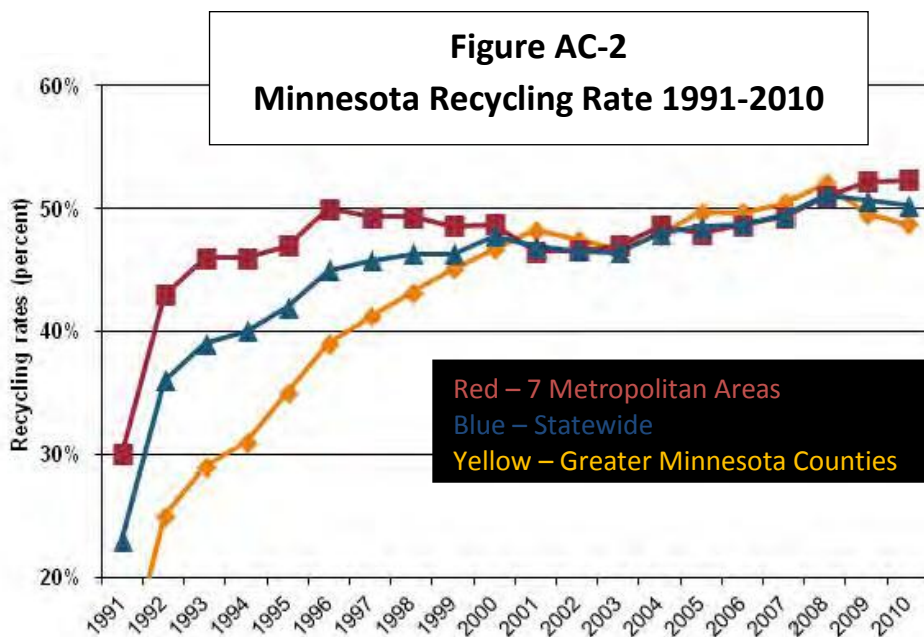
The recently released biennial State Solid Waste Policy Report in 2011 highlights key trends and challenges facing the state’s solid waste stream. It outlines developments and activities since the last report in 2009, and offers recommendations for future system developments while setting overall management goals through 2030. The major theme of the report is the shift from waste management to materials management.

The Numbers

In 2010, Minnesotans generated 5.6 million tons of municipal solid waste, a 0.4% decrease from the previous biennial report in 2009. The Twin Cities Metro Area generates a majority (57%) of the waste and therefore garners much of the discussions in the report. Figure AC-1 gives the detail on the management methods used.



While recycling is by far the most prevalent method used to manage solid waste, the recycling rate has remained fairly constant for the past 15 years (see figure AC-2). Like the rest of the nation, Minnesota had a huge increase in recycling in the 1990s but has leveled off since then. In 1995, the state reported a recycling rate of 41%, and it dipped to 40% in 2002 and 2003. It increased in 2008 and 2009 to 45% and dropped in 2010 to 43%,⁹¹ and increased again to 45.1% in 2011 according to a 2011 state recycling rate report.⁹²



⁹¹ Minnesota, 2011 Solid Waste Policy Report:
<http://www.pca.state.mn.us/index.php/view-document.html?gid=17104>

⁹² Minnesota, Report on 2011 SCORE Programs, December 2012:
<http://www.pca.state.mn.us/index.php/view-document.html?gid=18888>

Policy Discussion

The 2011 Solid Waste Policy Report focused on identifying solid waste policy goals and objectives through 2030. As stated in the plan, the goals for the metropolitan area are:

- Protect the environment, reduce greenhouse gases and conserve energy and natural resources;
- Integrated waste management system designed to minimize landfilling;
- Cost-effective waste management and internalization of future costs;
- Share responsibility and costs for environmentally sound management of waste among all those who benefit from the system.

The policy recommendations supporting the goals are designed to guide actions and decisions for the metropolitan area in the future. Metropolitan area waste management goals for 2030 are 54-60% recycling, 9-15% organics/composting, and 4-6% source reduction. Landfilling is projected to be reduced from 28% today to a maximum of 9% over the 15-20 year planning horizon.⁹³

It is interesting to note that Minnesota follows a rigid solid waste protocol for the Metropolitan Counties in the Twin Cities area. State law requires them to prepare solid waste plans consistent with the State Policy Plan, and any solid waste activity in the seven-county area must be consistent with both the state and county plan.

Product Stewardship for Packaging

While the report highlights product stewardship as an effective tool for addressing the economic challenges of recycling certain products and stagnant recycling rates for certain products, it does not make any specific recommendations related to packaging. The legislature in 2013, however, did charge the MPCA with preparing a recommendations report on a policy design to achieve an 80 percent recycling rate for beverage containers through use of a deposit.

Volume-Based Pricing

Minnesota is one of a few states that require volume-based pricing for solid waste. Minnesota Statute (§115A.9301) requires a local government to charge a variable rate based on size of container if it charges for solid waste collection directly from waste generators.⁹⁴

⁹³ Minnesota, 2011 Solid Waste Policy Report:
<http://www.pca.state.mn.us/index.php/view-document.html?gid=17104>

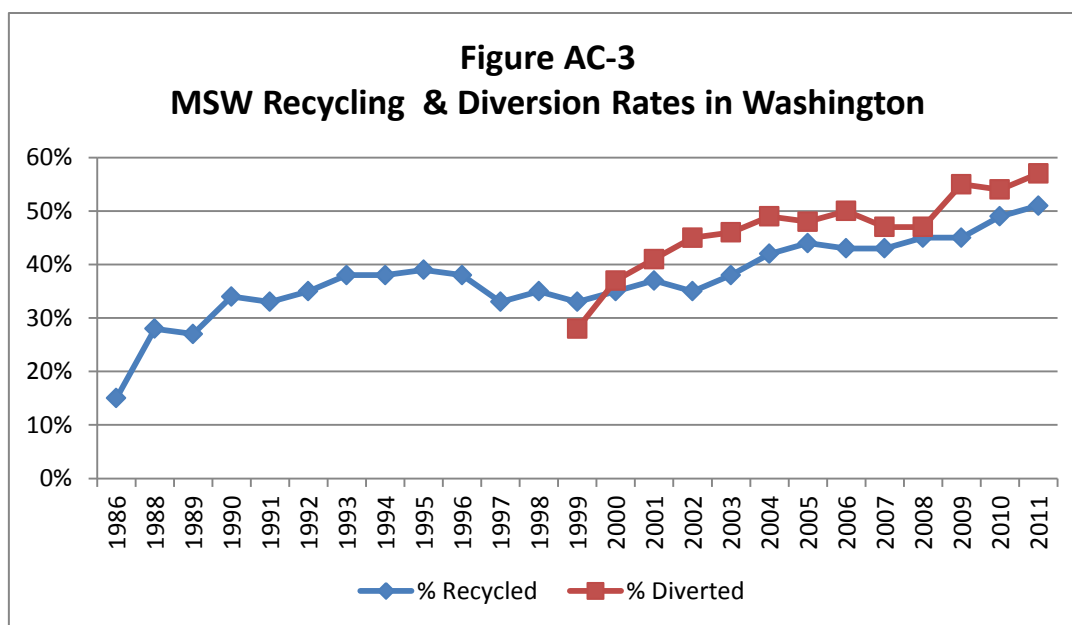
⁹⁴ Ibid

C2 – WASHINGTON STATE

At the time of this report the state had not published its annual solid waste report for 2011, though the Department of Ecology did announce new recycling and diversion rates for 2011 and for the first time it topped the goal established in 1989. The report detailing the 2011 solid waste generation, recycling, and diversion activity would be the 21st annual report. In its release the Department noted that recycling the material instead of landfilling helped avoid 3.2 million tons of greenhouse gases, equivalent to keeping 1.9 million cars off the road and saving enough energy to power 1.2 million homes for a year. The press release also highlighted the green economy benefits.

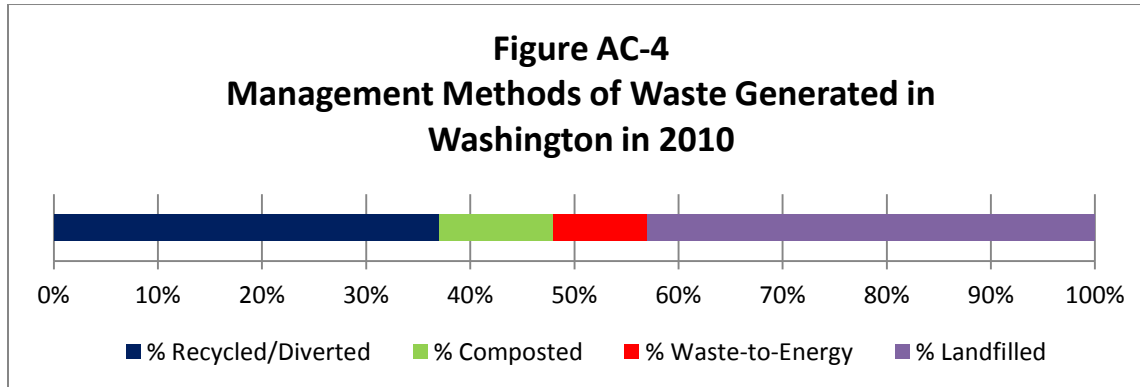
The Numbers

Washington State's Department of Ecology (WADOE) announced the State's 2011 overall recycling rate of 50.7%. The diversion rate, which includes recycling and reuse, as well as energy recovery from woody materials and tires, was also reported at 57.2%.⁹⁵ Both are increases over 2010 rates of 49% and 54%, respectively. The state's recycling numbers combine composting/yard waste with recycling, which is consistent with U.S. EPA methodology. The state has been calculating a diversion rate since 1999 to capture the non-MSW materials diverted from the waste stream. Figure AC-3 details the recycling rate since 1986 as reported by the Department. While remaining relatively flat since 2004, the rate has seen a steady increase in the last three years, from 45% in 2009 to 51% in 2011.



⁹⁵ Washington, State Department of Ecology Press Release, December 2012:
<http://www.ecy.wa.gov/news/2012/404.html>

Figure AC-4 highlights the waste management methods used in Washington to manage wastes generated in 2010.⁹⁶



According to WADOE, curbside recycling services in 2012 were available to 87.4% of the population and drop-off facilities are available to 100 percent.⁹⁷ The high access rate, combined with PAYT requirement, is one of the reasons Washington has one of the highest recycling rates in the country.

Policy Discussion

There are approximately 80 laws in Washington that address solid waste; the main one is Chapter 70.95 RCW, Solid Waste Management – Reduction and Recycling. It was originally passed in 1969 and amended 29 times since then. In 2009, the Department of Ecology set out to improve and update the law. A multi-stage process began with identifying and prioritizing problems, finding solutions, and proposing changes. Due to budget constraints, the process was paused in 2012, but not before 11 themes and 79 subthemes were identified. After additional consultation with stakeholders and a prioritization exercise, seven themes and 25 subthemes were selected for further work.

In the first phase, 10 subthemes were identified in the area of packaging and products. But in the second phase only two subthemes under packaging and products were included in the prioritized list:

- Packaging is often excessive and wasteful; and
- Lack of extended producer responsibility needed to be addressed.

Work will continue with this process as budget and time allows.⁹⁸

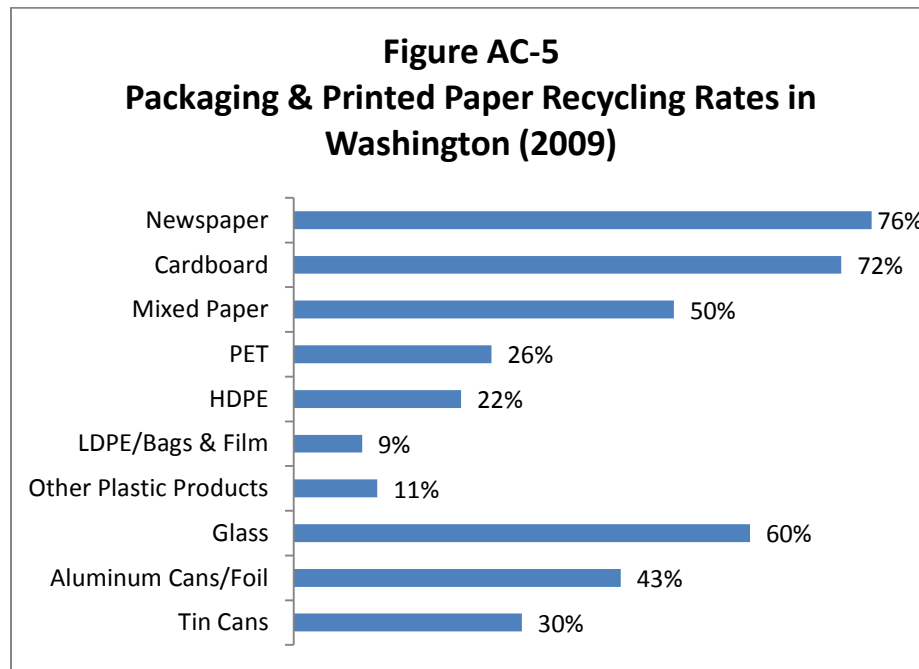
⁹⁶ Washington, State Department of Ecology, 20th Annual Solid Waste Status Report, December 2011: <https://fortress.wa.gov/ecy/publications/summarypages/1107039.html>

⁹⁷ Washington, State Department of Ecology, website: http://www.ecy.wa.gov/beyondwaste/bwprog_swCurbsideRecycling.html

⁹⁸ Ibid

Product Stewardship for Packaging

A March 2011 report from the Northwest Product Stewardship Council (Council) identified the State's packaging and printed material recycling rate at 54% in 2009. The Council used data from the Department of Ecology 2009 Waste Characterization Study. While the State's report breaks out products and packaging into separate categories based on the function of the material, the Council classifies the following as packaging for purposes of the report: newspapers, cardboard, mixed paper, PET, HDPE, LDPE, glass, aluminum cans/foil, and tin cans.⁹⁹ The recycling rate reported for each material is detailed in Figure AC-5.



Volume-based Pricing

Washington is one of the few states to have a requirement for volume-based pricing of solid waste services. Unincorporated areas of the state fall under the auspices of the Washington Utilities and Transportation Commission (WUTC), the agency that regulates solid waste hauling services, and are mandated to have variable rates in place. Many incorporated cities outside the purview of the WUTC also utilize variable rates, but there is no data to confirm that.¹⁰⁰

⁹⁹ Northwest Product Stewardship Council, *Analyzing Product Stewardship Policies for Packaging & Printed Paper in Washington State*, March 2011:

<http://productstewardship.net/sites/default/files/PDFs/productsPackagingNWPSReport2011.pdf>

¹⁰⁰ Ibid

C3 – CONNECTICUT

Connecticut is one of 10 states with a bottle bill law covering certain beverage containers.

In 2006, amendments were made to the state's Solid Waste Management Plan that essentially replaced the previous plan adopted in 1991. The plan was designed to serve as the basis for solid waste management decision-making for a 20-year planning horizon.

State law (CGS Section 22a-229) requires that any action that is governed by the plan by a person, municipality, or regional authority must be consistent with the plan.¹⁰¹ The plan covers municipal solid waste (household and commercial) and construction and demolition waste. The plan creates the long-range vision of moving from waste management to materials management.

Not satisfied with the state's progress in achieving the goals of the plan, Governor Dannel Malloy appointed a *Modernizing Recycling Working Group* in 2012 to improve the state's recycling rate and to more efficiently use waste materials. In announcing the creation of the working group, clear goals were set:

- Modernize and update state policies to better capture the value locked in the waste materials;
- Ensure the remaining waste is managed sustainably;
- Establish a stable, cost-effective way to fund sustainable materials management.¹⁰²

The Working Group released its report in December 2012. It had a number of key recommendations that can be summarized into four main areas and will be discussed in more detail later:

- Infrastructure;
- Economic development;
- Lessening municipal burdens;
- Role of the Connecticut Resource Recovery Association.

The Numbers

In fiscal year 2010 (July 2009-June 2010), The State of Connecticut recycled, diverted, or recovered for energy value 93% of the 3.18 million tons of municipal solid waste (not including C & D wastes) generated within its borders. Based on solid waste facility reports submitted to the Department of Energy and Environmental Protection (DEEP), the state recycled or composted approximately 25% of the 3.18 million tons of municipal solid waste generated. The percent recycled was actually higher since not all material recycled is captured in reports submitted to DEEP. For example, material recycled through the CT bottle deposit bill and most of the commercial scrap metals are not reported to DEEP. Approximately 68% of the municipal solid waste was incinerated for energy recovery in the state's

¹⁰¹ Connecticut, State 2006 Solid Waste Management Plan:

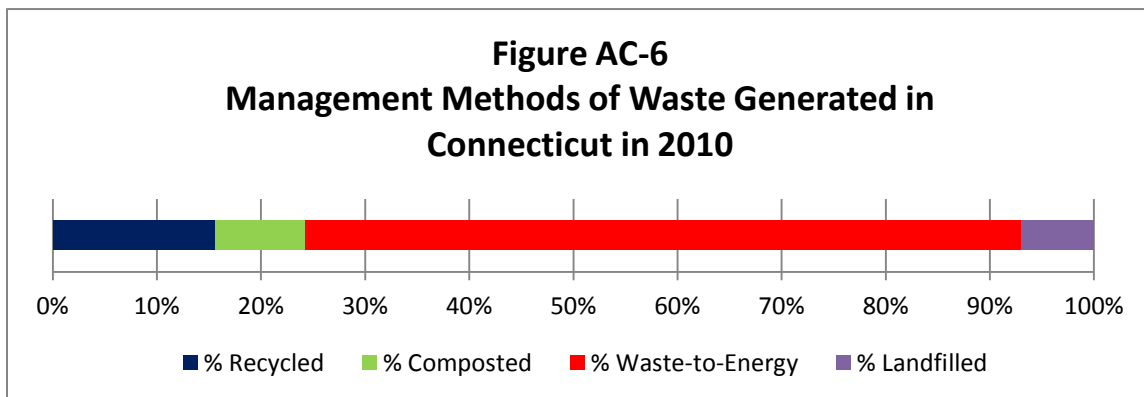
http://www.ct.gov/deep/cwp/view.asp?A=2718&Q=325482&deepNav_GID=1639

¹⁰² Connecticut, Governor's Press Release Announcing Recycling Working Group Members, April 2012:

<http://www.governor.ct.gov/malloy/cwp/view.asp?A=4010&Q=502124>

resource recovery facilities (RRFs). Most of the remaining waste was sent to out-of-state landfills (approx 6%).¹⁰³

Figure AC-6 details the waste management method used in Connecticut in 2010. Data for FY2011 reveal little change from the FY2010 figures.



Goals

The Solid Waste Management Plan of 2006 set a target of a 58% MSW diversion from disposal at landfills and waste-to-energy facilities by the year 2024, to be achieved through source reduction, recycling, and composting. At the time, the estimated recycling and composting rate was 30% (including estimates for unreported recyclables). The Governor’s Modernizing Recycling Working Group goal was to transform the Solid Waste Management Plan’s vision into action with a series of recommendations. Below is a summary:

Promote environmentally beneficial infrastructure:

- Incentivize and/or finance organics composting and/or anaerobic digestion facilities
- Expand capacity and performance of construction and demolition (C&D) recycling facilities
- Evaluate the container deposit system
- Clarify reuse and recycling opportunities for difficult waste streams (e.g., issue regulations that streamline beneficial use) as well as repurpose landfills for those materials for which reuse and recycling are not possible
- Assure the sustainability of the state’s waste-to-energy infrastructure to manage non-recyclable wastes, while continuing to prioritize source reduction, reuse, and recycling

¹⁰³ Connecticut, State Department of Energy & Environmental Protection, and Yale School of Forestry & Environmental Studies, "Unlocking the Value: Transforming the Connecticut Materials Economy," handout, March 2012:

http://www.ct.gov/deep/lib/deep/waste_management_and_disposal/solid_waste/transforming_matls_mgmt/su_mmit_1/handout_unlocking_the_value.pdf

- Create a new Infrastructure Development Bank or expand existing funding mechanisms (e.g., Clean Energy Finance and Investment Authority) to assist in financing new recovery businesses.

Foster economic development and job creation:

- Align economic development incentives with opportunities for recycling-based businesses
- Improve procurement practices to increase demand for materials, and have the state lead by example

Reduce burdens on municipalities:

- Promote Product Stewardship principles to ensure shared responsibility for products throughout their life cycles
- Develop a statewide recycling education and enforcement campaign
- Implement transparent pricing/billing for disposal through unit-based pricing to de-couple solid waste management costs from property taxes and to empower recycling with the rewards of thrifty behavior (saving money), resulting in reduced waste generation by at least 40%
- Simplify and improve data reporting requirements to reduce the reporting burden on municipalities and make clear what materials are available for reuse in the marketplace or as feedstock to make a product

Refine role of CRRA:

- Develop a transition plan with advisory input from affected towns to evaluate the functions of CRRA and manage this changed role, with consideration of the operational requirements of the recycling facilities, regional transfer stations, closed and closing landfills, and other functional roles.

In addition, the Working Group has introduced the concept of zero waste and envisions it as a goal that will encourage people to change their lifestyles and practices to more sustainable natural cycles.

Product Stewardship for Packaging

The Governor's Working Group wants to promote a system of shared responsibility for products throughout their life cycles. The Group recommended that to reduce the burdens, both economic and operationally from local governments, there needs to be a shift of responsibility for the costs of solid waste management to generators/consumers and manufacturers.

Connecticut law requires municipalities to make provision for all solid waste generated in their communities. According to the report, 50 percent of households are served with organized collection of recyclables and even less for trash; about 20 percent purchase subscription services on the open market, and the remaining 28 percent self-haul their recyclables to drop-off locations. The report also points out that 70 percent of municipalities fund solid waste management through property taxes. The report recommends implementing product stewardship policies so that municipalities will be relieved of disposal costs for the following top five priority items:

- Mattresses (enacted in 2013)
- Carpet
- Batteries
- Fertilizers and pesticides
- Packaging

Volume-based Pricing

The Governor's Working Group report includes a recommendation to implement unit-based pricing as a way to decouple solid waste management costs from property taxes and to provide greater incentives to recycle and reduce waste generation by up to 40% through behavior changes. The plan calls for mandated unit-based pricing statewide by 2017.

C4 – NEW YORK

New York managed about 18.3 million tons of municipal solid waste in 2008. This does not include another 13 million tons in C & D debris wastes, 3.5 million tons of industrial waste, and 1.8 million tons of biosolids not included in MSW. New York is one of 10 states with container deposit legislation for certain beverage containers. The *Beyond Waste* report adopted at the end of 2010 seeks to change the way materials are handled in New York by progressively reducing the amount of materials that go to disposal over the 10-year planning period and further in the 20-year planning horizon. It moves the state from waste management to materials management.¹⁰⁴ The plan sets an aggressive overall goal of reducing the amount of waste New Yorkers send to combustors for processing and landfills for disposal from 4.1 pounds per person per day to 0.6 pounds per person per day by 2030. The 85% drop is the most aggressive in the nation. The report sets out qualitative goals to minimize waste generation that look like a mix of principles and tools. The goals of the plan are:

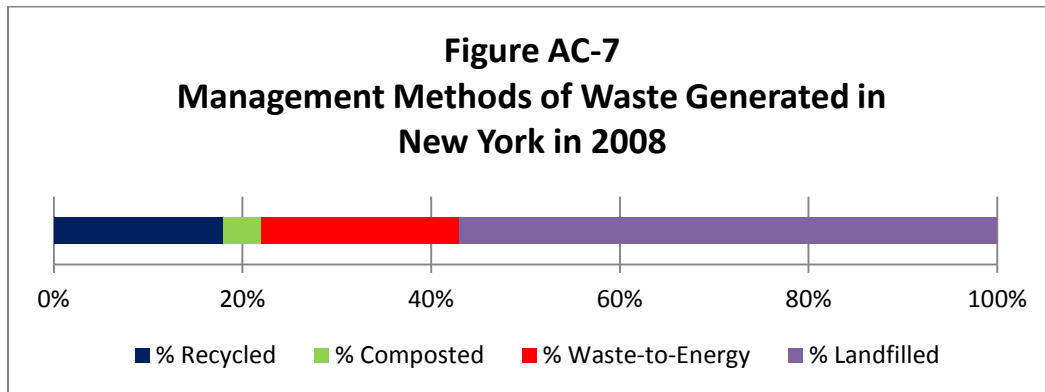
- Minimize waste generation
- Maximize reuse
- Maximize recycling
- Maximize composting and recycling
- Advance product and packaging stewardship
- Minimize waste disposal
- Create green jobs
- Maximize the energy value of materials management
- Minimize the climate impact of materials management
- Reemphasize the importance of comprehensive local materials management planning
- Minimize the need for long-range export of residual waste
- Engage all New Yorkers in sustainable materials management
- Strive for full public participation, fairness, and environmental justice

¹⁰⁴ New York, State Department of Environmental Conservation, *Beyond Waste Report*, December 2010: http://www.dec.ny.gov/docs/materials_minerals_pdf/frptbeyondwaste.pdf

- Prioritize investment in reduction, reuse, recycling, and composting over disposal
- Maximize efficiency in infrastructure development
- Foster technological innovation
- Continue to ensure SW management facilities are designed and operated in an environmentally sound manner

The Numbers

The Beyond Solid Waste report estimated that in 2008 New York State facilities managed a total of 36 million tons of materials and waste with a resulting recycling/composting rate of 36% and a combustion rate of 8% for all waste streams, including MSW, industrial, C & D debris, and biosolids. The rates for MSW alone were 20% recycling/composting and 14% combustion. Figure AC-7 details the waste management methods used in 2008 in NY for the MSW portion of the waste stream.¹⁰⁵



Product Stewardship for Packaging

Product stewardship is central to the state’s *Beyond Waste* plan. The report states that product stewardship can influence design of products and packaging to reduce material use and toxicity and improve recyclability. It will generate resources that can optimize collection and processing systems, as well as improve efficiency. The report goes on further to say that packaging is particularly appropriate for product stewardship policy implementation.

Most communities in the state utilize property taxes to fund their solid waste and recycling program according to the report. The report calls for legislative implementation of product stewardship programs to “relieve governments from the obligation to finance collection and end-of-life management of the products and packaging targeted...”

¹⁰⁵ New York, State Department of Environmental Conservation, *Beyond Waste Report*, December 2010: http://www.dec.ny.gov/docs/materials_minerals_pdf/frptbeyondwaste.pdf

Volume-based Pricing

According to the *Beyond Waste* report, more than 400 municipalities in New York currently use some form of variable rates for funding solid waste services. Communities are very familiar with these pay-as-you-throw (PAYT) programs, but the report does not call for their statewide mandatory implementation.

C5 – MASSACHUSETTS

Massachusetts is in the process of revising its Solid Waste Master Plan for the 2010 to 2020 planning horizon. Massachusetts is one of 10 states that have a bottle bill for beverage containers. The last plan changes were the 2006 revisions to the Beyond 2000 Master Plan. The state continues to report annually on progress toward the goals set forth in the Beyond 2000 and 2006 revisions. The latest draft of the 2010-2020 Solid Waste Master Plan¹⁰⁶ was published in December 2012. The plan shifts the goals from a waste reduction rate to a disposal reduction goal, using 2008 as the baseline. In the Solid Waste Plan it is noted that Massachusetts is bound by law to reduce greenhouse gas emissions 25% below 1990 levels by 2020 and 80% by 2050, and that increased recycling will help meet those goals.

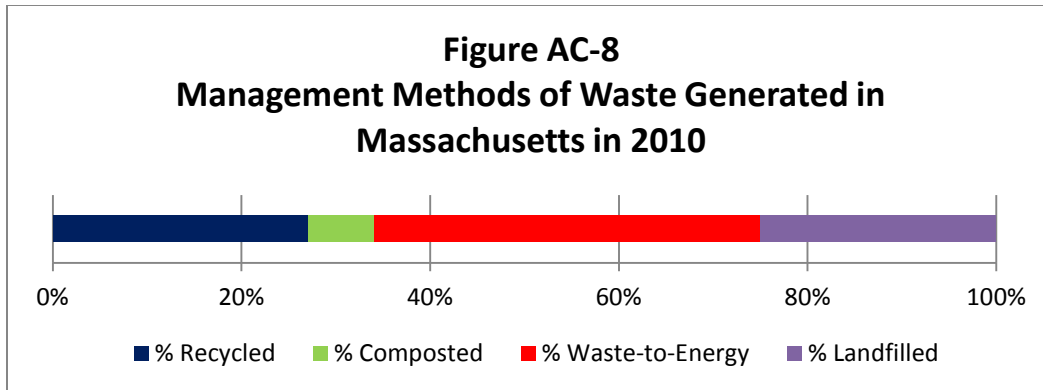
Finally, the Pathway to Zero Waste highlighted in the Plan requires a shift in thinking that will mean a focus from a state perspective on:

- Reducing the production of waste;
- Promoting more efficient use of materials;
- Increasing recycling of materials;
- Reducing the amount of waste requiring disposal;
- Reducing toxicity; and
- Improving environmental performance of solid waste management facilities.

The Numbers

The Department of Environmental Protection publishes an annual solid waste update to report on progress of the Beyond 2000 Solid Waste Master Plan. The 2010 Solid waste data update was published in November 2011. Disposal tons in Massachusetts decreased 17% from 2008, a total of 1.1 million tons less. More than five million tons of waste was prevented from disposal through recycling, composting, or other diversion methods, reducing greenhouse gas emissions by nearly 1.9 million tons of carbon equivalent, and supporting 14,000 direct jobs. Figure AC-8 highlights the waste management methods used in Massachusetts to manage the 10.55 million tons of MSW and non-MSW (C & D and other) generated in 2010. While disposal was down between 2008 and 2010, recycling and composting tonnages were up 4.9% between 2009 and 2010, with recycling of MSW making up the bulk of the increase.

¹⁰⁶ Massachusetts, *2010-2020 Solid Waste Master Plan*, December 2012:
<http://www.mass.gov/dep/recycle/solid/mprev12.pdf>



Goals

The 2010-2020 Draft Solid Waste Management Plan set out materials management goals for 2020 and 2050:

- 2020:
 - Reduce disposal by 30% from 6.55 million tons to 4.55 million tons
 - Continue efforts to divert toxics from the solid waste stream
- 2050
 - Reduce disposal by 80%
 - Virtually eliminate toxics in the waste stream

These straightforward goals are supported by three primary objectives and 17 strategies that form the framework for actions over the planning period. The objectives are to:

- Reduce waste and maximize recycling;
- Improve environmental performance of solid waste facilities;
- Develop integrated solid waste management systems.

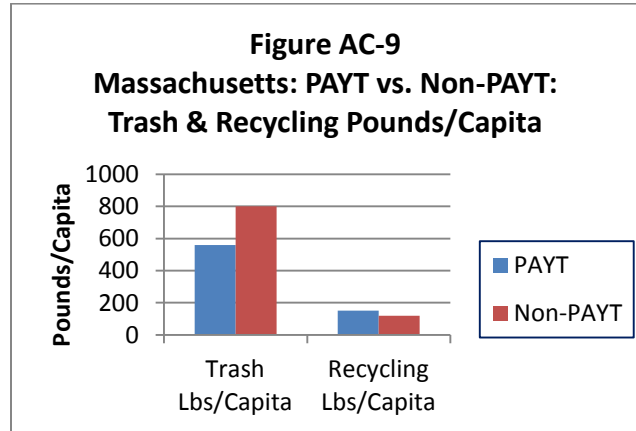
Product Stewardship for Packaging

In the *Beyond 2000* Solid Waste Master Plan, the state supported the creation of the Product Stewardship Institute. In the 2010-2020 draft plan the Department calls for:

- Product stewardship for specific product categories: electronics, beverage containers (support expanded bottle bill), carpet, plastic bags, and ceiling tile;
- Consistent regional approach to EPR systems and requirements;
- Promoting product stewardship on a national level.

Volume-based Pricing

In the 2010-2020 Draft Plan, the Department sets a goal of having 50% of the state residents utilize Pay As You Throw programs by 2020. This would more than double the current 24% utilizing such programs. State data shows that municipalities with PAYT generate more recyclables and less trash than those that don't. Figure AC-9 shows the average trash and recycling performance for PAYT vs. non-PAYT municipalities in Massachusetts in 2008. The caveat is that the recycling numbers are for paper and containers only.¹⁰⁷



C6 – CALIFORNIA

California has a long history of being out front in the environmental movement, including setting aggressive goals for material diversion and recycling. According to CalRecycle, the state's lead recycling agency, California's 37.7 million residents disposed of 29.3 million tons of solid waste in 2012. Per capita disposal is down about 30% since 2005.

In 1989, the California legislature passed the California Integrated Waste Management Act of 1989, affectionately known as AB 939. Not only did the bill create the California Integrated Waste Management Board, it mandated local jurisdictions to meet solid waste diversion rates of 25% by 1995 and 50% by 2000. In addition, each community had to create a solid waste management plan that included development of a recycling program, environmentally preferred purchase programs, and waste reduction/minimization. Local communities were free to implement a combination of waste prevention, reuse, recycling, or composting programs that best met their local needs and conditions.

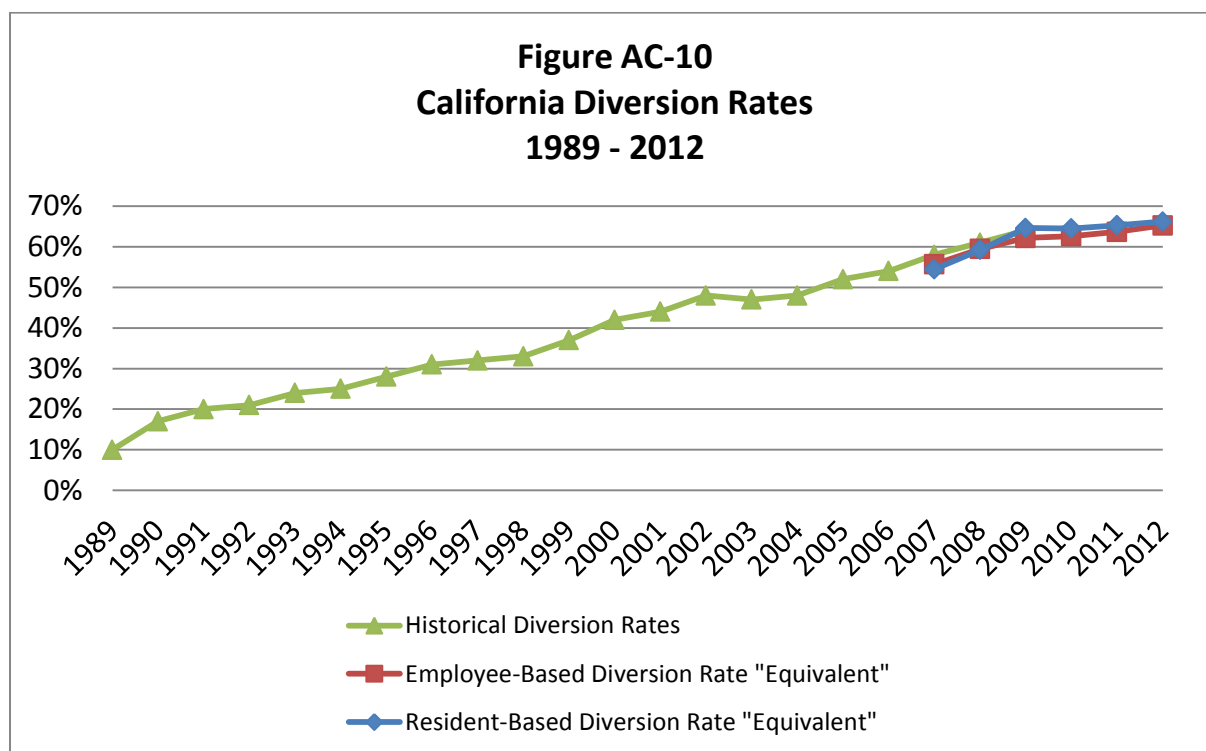
A few years earlier, the legislature had passed a new kind of beverage container recycling program called the Beverage Container Recycling and Litter Reduction Act, also known as AB 2020. This law put in place a redemption program for certain beverage containers. It requires consumers to pay a redemption fee, and then get it back when they return the container for recycling to a redemption

¹⁰⁷ Massachusetts, *2010-2020 Solid Waste Master Plan*, December 2012:
<http://www.mass.gov/dep/recycle/solid/mprev12.pdf>

center. More recently, Governor Brown signed legislation (AB 341), which establishes an ambitious recycling goal of 75% by 2020. The bill switches the way California measures success from a diversion rate to a recycling rate. In addition, the bill will require commercial establishments to implement recycling programs.¹⁰⁸

The Numbers

California has a long history of measuring progress toward its AB 939 waste diversion requirements and the beverage container recycling goals set forth in AB 2020. Since 1989 the diversion rate has seen a steady increase to reach more than 66% in 2012, though it has leveled off in the last four years. Figure AC-10 shows this graphically. Beginning in 2007, the state went to a new method of calculating

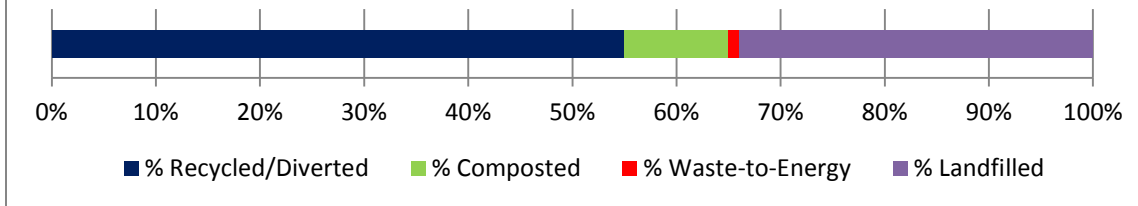


statewide diversion rate equivalents based on per-capita disposal numbers. The beverage container recycling rate is also well documented by the state and has been at 82% each year from 2009-2012.¹⁰⁹ There are three permitted transformation “waste to energy” facilities in California that accept disposal, and track what they accept. Jurisdictions can get limited credit up to a certain level (10 points out of the 50% mandate). Figure AC-11 is therefore an estimate by CalRecycle of how solid waste is managed in California.

¹⁰⁸ Californians Against Waste Website, March 2013: <http://www.cawrecycles.org/>

¹⁰⁹ California, State Department of Resource Recycling and Recovery, Beverage Container Recycling Website, December 2012: <http://www.calrecycle.ca.gov/BevContainer/Rates/BiannualRpt/12MonPeriod.htm>

**Figure AC-11
Management Methods of Waste Generated in
California in 2012**



Goals

In 2011, building on the successes of the Integrated Waste Management Act and the Beverage Container Recycling Act, the California Legislature passed AB 341 (Chapter 476, Statutes of 2011). The law establishes a goal that not less than 75% of the state’s solid waste will be source-reduced, recycled, or composted by 2020.¹¹⁰

Product Stewardship for Packaging

California also has a long history in supporting product stewardship programs for both packaging and non-packaging material types. In 2007, the California Integrated Waste Management Board (now CalRecycle) adopted a set of strategies that reflected the Board’s mission and values. Strategic Direct 5, covering producer responsibility, states that “it is a core value of the Board that producers... assume the responsibility for the safe stewardship of the materials in order to promote environmental sustainability.” Specifically, the Directive says the Board (now CalRecycle) will utilize its existing authority and will seek legislative means to implement the Directive.¹¹¹

CalRecycle is one of several agencies and programs engaged in product stewardship. SB 1723, adopted in 2008, requires any person who is the first seller of pesticide containers made from HDPE of 55 gallons or less to create a collection program or demonstrate that the containers are part of a program and are recycled.¹¹² California also has in place product stewardship programs for carpet (AB 2398), paint (AB 1343), mercury-containing thermostats (AB-2347), and auto refrigerant (part of AB 32, Global Warming Solution Act of 2006).¹¹³

¹¹⁰ California, State Department of Resource Recycling and Recovery, *California’s New Goal: 75% Recycling*, May 2012: <http://www.calrecycle.ca.gov/75percent/Plan.pdf>

¹¹¹ California Integrated Waste Management Board (now California Department of Resource Recycling and Recovery), Strategic Directive, Progress Report 2008: <http://www.calrecycle.ca.gov/Archive/IWMBPlans/2007/Progress.pdf>

¹¹² California, Senate Bill 1723, Chapter 533, 2008: http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb_1701-1750/sb_1723_bill_20080928_chaptered.html

¹¹³ California, State Department of Resource Recycling and Recovery, Product Stewardship and Extended Producer Responsibility Website, March 2013: <http://www.calrecycle.ca.gov/EPR/PolicyLaw/default.htm#World>

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