3. SOURCE REDUCTION

3.1 Introduction

Source reduction adopts practices that generate less waste. Source reduction strategies include changes in product design and packaging, reduction of consumer purchases, and the reuse of materials or goods. By decreasing the amount of waste that must be disposed of, waste reduction programs decrease the environmental issues associated with waste disposal. Reusing a grocery bag, buying materials in bulk, and reselling or donating unwanted and still usable materials or products are typical examples of waste reduction.

This chapter describes the County's source reduction activities, identifies current issues and concerns regarding current source reduction practices, and presents options for achieving further source reduction.

3.2 Background

3.2.1 Regulatory Context

As described in the Hawai'i Revised Statutes Chapter 342G (HRS 342G), each County is required to consider solid waste management practices and processing methods in the following order of priority:

1. Source reduction.
2. Recycling and bioconversion (including composting).
3. Landfilling and incineration.

HRS 342G-3 established a 25 percent waste reduction goal by 1995, and a 50 percent goal by 2000 through source reduction, recycling, and bioconversion.

Recycling and bioconversion practices were first detailed in the original Integrated Solid Waste Management Plan created in 1993 and in subsequent updated plans. In 2003, the County passed a resolution with a goal to divert 50 percent of the solid waste from landfills by 2008 and 80 percent by 2013.

3.2.2 Resolution 356-07 (Zero Waste)

In 2007, the County adopted Resolution 356-07, "A Resolution to Embrace and Adopt the Principles of Zero Waste as a Long-term Goal for Hawai'i County." The resolution embraces the zero waste philosophy of solid waste management and commits to taking the necessary steps to incorporate the zero waste philosophy into legislation, policies, and actions.

The zero waste philosophy is based on the concept that current standards of waste management are inefficient and unsustainable, and that waste can be virtually eliminated by emulating sustainable natural cycles, where all discarded materials are treated as resources that can effectively be reused. It is a whole-system approach that emphasizes a closed-loop production and consumption system by

1. Reducing the volume and toxicity of waste through product and packaging redesign strategies.

2. Reusing materials and products for alternative uses, as well as for their original intended use.

3. Recycling and composting all remaining materials for their best use.

Within the zero waste framework, materials that cannot be easily and conveniently reduced, reused, recycled, or composted are returned to the manufacturer, who is ultimately responsible for product

disposal. The zero waste approach includes aggressive education of public and private entities because consumer choices are considered to be the driving force in changing consumption and disposal patterns.

With a focus on eliminating waste at the source, one of the fundamental principles of zero waste is redesigning products and packaging, by considering the entire life cycle of a product. In contrast to the current emphasis on disposability, products and packaging within the zero waste framework are designed with an emphasis on minimal use of materials, use of recycled and benign resources, longer product lives, and maximum potential for every product to be repaired, reused, or recycled. Critical to this principle is the concept of extended producer responsibility (EPR), a policy tool in which manufacturers are held legally and financially responsible for the waste and environmental impact associated with their product and packaging, rather than passing that responsibility on to the consumer. Under EPR, manufacturers are mandated to "take back" their end-of-life products and create closed looped systems. As a result, EPR enforces design, production, and packaging strategies that consider the quantity and type of materials required for production, product lifespan, and the ability with which products can be disassembled and recycled.

In addition, zero waste emphasizes an aggressive combination of reuse, recycling, and composting. Within the zero waste framework, all organic materials, including yard trimmings and food scraps, are composted and treated as "biological nutrients" rather than being disposed of in landfills where they can potentially contribute to future environmental liabilities. Instead of using revenues generated through the tax base or other financial resources to build new landfills or incinerators, the zero waste approach advocates for investment in recycling, composting, and reuse facilities, especially those that accommodate the entire spectrum of reuse and recycling activities (for example, resource recovery parks). By supporting the reuse and recycling of discarded products and materials, the zero waste approach creates jobs and stimulates local economies. According to Eco-Cycle Solutions, recycling creates an "average of ten times more jobs than trash [landfilling], composting creates at least twice as many jobs as landfills, and reuse creates as many as 30 times more jobs than landfills" (Eco-Cycle Solutions 2018). According to the Environmental Protection Agency's (EPA's) 2016 Recycling Economic Information (REI) Report, recycling of construction and demolition waste provides the largest contribution to job, wage, and tax revenue, followed by ferrous and non-ferrous metals (EPA 2016a).

A Zero Waste Implementation Plan developed for the County in 2008 outlines suggested changes to the way that solid waste is handled within the County (Recycle Hawaii 2009). As stated in Resolution 356-07, the County recognizes "that zero waste is a long-term goal and that in the interim, programs may need to be implemented that may be counter to the zero waste philosophy and are necessary to reach the long-term goal of zero waste and that such programs should not be prohibited by the embracing and adoption of the long-term goal of zero waste." To this end, the components of the Zero Waste Implementation Plan, which can be realistically achieved during the life span of this Plan, have been incorporated.

In conclusion, the County will continue to take incremental steps toward achieving zero waste in the long term with the understanding that the ability to truly achieve zero waste is realistically challenging for an island.

3.2.3 Review of 2009 Plan

Exhibit 3-1 provides a summary of the recommendations put forth in the 2009 Integrated Resources and Solid Waste Management Plan (2009 Plan) relative to source reduction, and a description of the actions taken to achieve each recommendation.

Exhibit 3-1. Status Update of 2009 Plan Recommendations for Source Reduction

2009 Plan Recommendation	Status
Develop County policies or ordinances that mandate certain actions be taken to reduce the source of waste currently entering landfills.	2012-01-17 Ordinance 12-1 Plastic Bag Reduction Ordinance adopted; 2013-01-17 implemented. 2017-09-29 Ordinance 17-63 Polystyrene Disposable Food Service Ware Reduction Ordinance adopted, to be implemented 2019-07-01.
Develop ordinances requiring that a waste reduction plan be submitted.	Did not pass an ordinance; however, the County permit process does require commercial, industrial, and multiple structure demolition projects to develop solid waste demolition diversion plans.
Develop EPR policy statements or resolutions.	In 2007 the Solid Waste Division (SWD) drafted a resolution that would mandate recycling at County offices. This has not yet been implemented.
Implement a campaign to develop EPR for difficult-to-recycle products.	Did not implement.
Implement a County government source reduction program.	No staff available for program implementation.
Implement Pay-as-You-Throw program or other funding method.	Difficult to achieve a balanced community-supported outcome in advancing this recommendation.
Expand the current reuse program.	The County has added additional reuse centers.
Expand reuse facilities.	Added Hilo, Kealakehe, Pāhoa, and Waiʻōhinu reuse centers; closed Ka`auhuhu (Hāwī) reuse center.
Develop public-private partnerships.	The County's website, HawaiiZeroWaste.org, provides a listing of private reuse stores. The County contracted Recycle Hawaii to consult with large-scale Leadership in Energy and Environmental Design (LEED) construction sites to recommend how construction and demolition materials could be diverted from the landfill.
Expand and improve public education and awareness programs.	No dedicated public education and awareness program since summer 2014. The County maintains the HawaiiZeroWaste.org website and provides facility tours, press releases, advertisements, and presentations.
Develop a business waste audit and education program.	No staff available for audits. The County provides disposal and recycling information on the HawaiiZeroWaste.org website.
Develop a visitor industry waste reduction education program.	No staff available for developing the visitor industry waste reduction education program. The County provides disposal and recycling information on the HawaiiZeroWaste.org website.
Develop a reuse education, outreach, and public awareness campaign.	Information is available on the HawaiiZeroWaste.org website and Reuse Center vendors can promote program.

3.3 Existing Conditions

The status of source reduction efforts in the County is described below. This discussion includes a description of 1) County-operated or sponsored programs, 2) other programs conducted by private entities, and 3) County staffing levels.

3.3.1 County of Hawai'i Waste Reduction Programs

3.3.1.1 Backyard Composting

The County's Zero Waste website includes links to guidance by the U.S. Environmental Protection Agency (EPA) and other resources on backyard composting, and locations on the island where vermiculture bins, worms, and accessories can be purchased.

3.3.1.2 Reuse Centers

Reuse centers are located at eight of the County's recycling and transfer stations. The County contracts the management and operation of seven of these facilities, which include Kealakehe, Keauhou, Waimea, Wai'ōhinu, Hilo, Pāhoa, and Kea'au. Laupāhoehoe is a volunteer-based facility. Materials accepted are as follows:

Kea'au Recycling and Transfer Station: Reuse Center

- Furniture and furnishings.
- Working appliances (contingent on space availability).
- Office equipment (non-computer or electronics).
- Toys and baby items.
- Recreational items.
- Small kitchen appliances (e.g., electric coffee makers, toasters).
- Garden/farm items.
- Tools.
- Books, magazines, music and movie media (CDs, DVDs, Blu-rays, etc.).
- Crafts and craft supplies.
- School supplies.
- Clothing and fabric.
- Home construction and demolition materials (except for Kea'au, contingent on space availability).

Items are available for free or sold at a modest price, and the revenue is used to partially fund operations and education outreach programs. Reusable latex paint is collected at Hilo, Kea'au, and Waimea reuse centers. The latex paint collected at the select reuse centers and during designated household waste collection events is sorted and available for purchase at a discount over the retail price of new paint. Upon written approval from the County's Contract Manager, the reuse center contractor may be allowed to collect latex paint at additional reuse centers. No oil-based paint may be collected at any reuse centers because it requires special handling. The reuse center contractor is also required to provide an area at the Kea'au and Hilo reuse centers to collect clean and dry reusable newspaper. The containers are covered to store the newspaper, which is made into high-quality shredded material that is aesthetically pleasing (e.g., packing material for island-grown flowers shipped off-island). The Contractor must ensure that the newspaper is being reused.

Exhibit 3-2 breaks down the tonnage of material recycled at reuse centers since FY 2009–10. The peak timeframe for participation was FY 2017–18, which is likely due to the increased availability of facilities (increased from one facility to eight facilities since FY 2009–10).

Exhibit 3-2. Tonnage Diverted at Reuse Centers FY 2009–10 to FY 2016–18

Year	East Hawai'i (tons)	West Hawai'i (tons)	Total (tons)
2009–10	172.6	71.5	244.1
2010–11	206.9	148.7	355.6
2011–12	236.3	133.6	369.8
2012–13	241.0	145.3	386.3
2013–14	245.0	120.9	365.8
2014–15	275.2	69.8	345.0
2015–16	185.1	59.8	245.0
2016–17	182.2	58.6	240.8
2017–18	265.0	175.8	440.8

3.3.1.3 Reduction and Reuse Education

The County has an education program that targets waste reduction and reuse. Its main education initiatives include:

- Information and resources provided through the County's HawaiiZeroWaste.org website.
- Newspaper, radio, and television advertising.
- Brochures.
- Community outreach (e.g., promotion of zero waste event planning and reuse centers on County's HawaiiZeroWaste.org website).
- Community events.
- Sporting events.
- School programs (e.g., recycling site tours).
- Business education (e.g., HawaiiZeroWaste.org).

More information about these initiatives is provided in Chapter 5 Public Education and Information.

3.3.1.4 Solid Waste Demolition Diversion Plan

The County Department of Environmental Management (DEM) currently works with the County Department of Public Works (DPW) and County Planning Department to advise developers with large projects with alternative ways to dispose of demolition waste other than the landfill. The County DEM also routinely comments on National Environmental Policy Act (NEPA) environmental assessments (EAs) and environmental impact statements (EISs) for development projects, advising the project proponents to consult with the DEM to determine the best way to dispose of demolition waste. The DEM's comments on NEPA environmental documentation often result in projects that are committed to alternative methods of handling demolition waste in lieu of landfilling.

Common materials recycled through this program include roofing, steel posts, and gutters. Concrete rubble from foundations or other structures is usually reused as fill material and road subgrade once the rebar is removed. Asphalt, otherwise called "reclaimed asphalt pavement" is reused in asphalt pavement mixtures, road base course, or utility backfill.

3.3.1.5 Procurement Policies

Public sector procurement can help reduce waste, foster reuse of products, and stimulate markets for recyclable materials and compost. In addition, these procurement policies can serve as a model for other entities, including private sector businesses and institutions.

Pursuant to HRS 342G-41-44, the County has a policy to "give preference to vendors who utilize products with recycled content," when purchasing paper and plastic materials (for example, office paper, printed materials, plastic bags, and so forth), and has a policy to make double-sided copying standard practice at County offices.

3.3.1.6 E-Waste Producer "Take-Back" Program

As of 2010, the State of Hawai'i legislature enacted Act 13 to encourage recycling of electronics, and mandated manufacturers to establish, conduct and manage take-back recycling programs for "covered electronic devices" (CEDs). Act 13 was revised in 2011 to include "covered televisions" (CTVs) [herein referenced as e-waste]. The HDOH is responsible for implementing the program. County public awareness campaigns educate residents on e-waste programs and promote collection events. The County contracts for the collection of e-waste products, which are then shipped off island for proper disposal or treatment. See Chapter 6 Household Hazardous Waste and Electronic Waste for more information related to the e-waste take-back program.

As described in Section 3.3.1.2, seven reuse centers throughout the County allow residents to drop off unwanted and still useful non-e-waste electronics such as small kitchen appliances for purchase at a nominal fee.

3.3.1.7 Product Bans

Since the 2009 Plan, the County regulates the use of plastic bags and polystyrene foam food containers to reduce landfilling of these products and for gaining the overall environmental benefits. Hawai'i Ordinance 121, as codified in Chapter 14 of the Hawai'i County Code (HCC), bans businesses from providing plastic checkout bags to their customers and encourages use of environmentally preferable alternatives, such as reusable bags. This law went into effect in 2013.

Pursuant to HCC 20-60, the County proposes to reduce the use of polystyrene foam food containers and food service ware by restaurants, supermarkets and other vendors, eliminate the use of polystyrene foam for packaging prepared and unprepared food, and in doing so promote the use of environmentally preferable alternatives. Under this reduction plan, outside purveyors are encouraged, and not required to use alternative packaging to polystyrene foam. On July 1, 2019, all food vendors and County facility users (i.e., concession contracts with the County, renters of County facilities) using disposal food service ware are required to use recyclable or compostable products. If not exempted and found out of compliance, a fine may be imposed by the County; the amount ranges from $10 to $600 depending on the circumstances. In preparation for the ban, the County established an education program for businesses, nonprofits, and the public regarding compostable alternatives to polystyrene foam.

3.3.1.8 Private Reuse Programs

In addition to the County reuse centers, there are several for-profit and nonprofit reuse facilities. For example, Habitat for Humanity Restores, located in Kona and Waimea in West Hawai'i and in Hilo in East Hawai'i, emphasizes reusable building materials, as well as products returned to local "big box" stores, such as Wal-Mart. Home building items accepted by Habitat for Humanity include lumber (greater than 4 feet long), kitchen and bathroom fixtures, doors, windows, concrete blocks and bricks, latex paint, large appliances, and light and fan fixtures.

Re-use Hawai'i, a local nonprofit deconstruction company, salvages building materials for reuse on other construction projects. Re-use Hawai'i opened their West Hawai'i location in 2018 in Kona. Their first job involved dismantling the Kona Village Resort, which was destroyed by a tsunami in 2011. Re-use Hawai'i sells lumber and other building materials at their redistribution center at a discounted price if the materials have undergone a two-step quality control. The cost of the operation requires approximately 10 percent of its annual budget from outside sources with donations from local foundations and grants from the State. These funds supported the company's expansion from O`ahu to West Hawai'i (West Hawai'i Today 2019).

There are also a variety of other reuse businesses throughout the island – thrift shops and consignment stores, appliance stores, swap meets, and used book stores that sell used merchandise, such as furniture, rebuilt appliances, clothing, housewares, and books. Many local businesses also accept packing materials such as bubble wrap and foam peanuts.

The DEM website, HawaiiZeroWaste.org, provides a listing of for-profit and nonprofit reuse centers throughout the island with store locations, contact phone numbers, and hyperlinks to reuse websites.

3.3.2 County of Hawai'i Staffing Levels

Successful delivery of local government waste reduction programs requires devoting an appropriate amount of resources including staffing. The County has demonstrated its commitment to waste reduction by assigning the following staff to County waste reduction and recycling programs:

- One full-time recycling coordinator.
- Two full-time equivalent (FTE) recycling specialists for the HI-5 recycling program.
- Three FTE recycling specialists.

The County recycling staff conducts most education and outreach activities. The County has a contract with a consultant to help develop and enhance the education and outreach programs, as described in greater detail in Chapter 5 Public Education and Information.

3.4 Issues and Concerns

As described above, several source reduction activities are conducted in the County, including programs and initiatives by the County as well as other organizations. There is more that could be done by the County and waste generators to promote changed behaviors that would ultimately reduce the quantity of materials entering the waste stream. The need to implement additional programs and policies is further established by the County's commitment to greater diversion.

3.5 Options for Improvement

Pursuant to HRS 342G-26, an overview of various measures that could be implemented to increase source reduction is provided below. These options were developed based on successful initiatives

implemented in other jurisdictions that may be applicable and appropriate for the County. Note that the options focus on waste reduction and reuse; education, recycling, and composting programs are discussed in other chapters of this Plan update.

3.5.1 County Source Reduction Practices

The County has an opportunity to serve as a model for the entire island and demonstrate their commitment to waste diversion by implementing comprehensive source reduction policies for all County operations. The County could make a more pronounced commitment to environmentally preferable products. This effort could include an evaluation of current practices at all County offices and buildings, and identification of opportunities for increased source reduction. All County employees could be provided with documents providing information about the County's commitment to zero waste, and ideas of how each employee and department can reduce their waste.

Specific policies and activities that the County could adopt include the following:

- Implement an environmentally preferable purchasing policy and additional environmentally preferable procurement guidelines. Set environmentally preferable purchasing and recycled content as "defaults" for departments to use in departmental purchases of supplies and equipment not centrally procured.
- Establish a Zero Waste Purchasing Committee with a mandate to develop the County's purchasing policy.
- Include measurable zero waste goals in job descriptions and annual performance evaluations.
- Establish a Green Building Policy and evaluate the extent to which those policies can be encouraged or required for new private construction and major renovation projects.
- Use electronic mail, document storage, and retrieval systems to achieve a "paperless office."
- Accept electronic submittal of all applications and required submittals.
- Provide incentives for staff members who develop and implement new initiatives that reduce waste.
- Promote and encourage in-house composting programs.
- Encourage or mandate the use of reusable mugs, plates, and silverware and install dishwashers in County facilities where feasible.
- Publish major accomplishments and progress of each department on the County website.

The federal government has undertaken various initiatives to include the environment in its purchasing decisions. The County could consider EPA's Comprehensive Procurement Guideline program as a model for helping its employees purchase products that use materials recovered through recycling (EPA 2016b).

Cost Considerations. Many County actions could be accomplished at little or no cost. The initial review of purchasing policies would require staff resources throughout many departments, but it is unlikely that additional staff would be required. Green building policies will increase the cost of construction somewhat; estimates on the extent of likely increases differ, and many jurisdictions have successfully implemented such policies. Purchasing policies can increase the cost of materials; however, the higher costs could be offset by efforts to eliminate certain products from the waste stream (plastic flatware) or by reduction efforts (paperless office). The net result would probably be a small percentage increase in costs for many County activities and material purchases.

3.5.2 Business Waste Audits and Reduction Plans

The County currently provides a dedicated page to businesses on their HawaiiZeroWaste.org website. Information on the dedicated business page includes guidance for the handling of hazardous materials and promotion of a business waste reduction plan for environmental benefits as well as savings in disposal costs. The web page also includes links to information from other websites including: the City and County of Honolulu Department of Environmental Services "How to Conduct a Waste Audit" guide, Hawai'i Green Business Program at the Hawai'i State Energy Office (greenbusiness.hawaii.gov), the EPA (e.g., WasteWise Program, Procurement Guidelines), and Energy Star. The County would expand their business waste reduction program by teaming up with others (e.g., grassroots organizations such as Zero Waste Big Island and Recycle Hawaii) to conduct business waste audits, provide outreach, or develop an updated business recycling and reuse guide (the latest version is reported to have been produced by Recycle Hawaii in 2005).

As part of the County's effort to work with local businesses to reduce waste, the County could conduct outreach to local businesses to:

- Encourage retailers and their suppliers to take back products and packaging that are currently difficult to reuse, recycle, or compost. Potential take-back programs could be publicized by posting all cooperating retailers on the County's website and publishing frequent articles and/or advertisements in the local newspaper and County newsletter.
- Teach environmentally sensitive lean manufacturing practices to reduce or eliminate non-reusable packaging, transport containers, and serviceware. This effort could target both organizational processes and retail practices.
- Advertise on the County's HawaiiZeroWaste.org website opportunities for material exchanges to foster business-to-business connections to match unwanted material byproducts or commodities for reuse or recycling as feedstock.

Cost Considerations. The cost of this option would differ depending on the speed of implementation. County staffing levels would need to increase to implement and manage the program.

3.5.3 Construction and Demolition Diversion

As described in Section 3.3.1.4, the County DEM currently works with the DPW and County Planning Department to assist developers with large projects in finding alternative ways of disposing demolition waste other than the landfill, and similarly advises large development proponents through the NEPA process. The County would expand the program to emphasize building deconstruction and support local initiatives for adaptive reuse of materials generated during deconstruction projects. Initiatives could include:

- Require demolition projects to publicize in the local newspaper to solicit salvage of reusable items by deconstruction companies.
- Include a dedicated page on the HawaiiZeroWaste.org website that emphasizes construction and demolition recycling and reuse. It could include "how-to" guidance on deconstruction and a listing of available deconstruction companies on the island.
- Require contractors to separate reusable or recyclable construction and demolition debris from non-recyclable materials as a component of permit conditions.
- Separate ceramic items, such as sinks and toilets from the waste stream, and utilize the crushed material in construction.
- Construct a construction and demolition demonstration salvage yard in East Hawai'i.

Cost Considerations. The cost of this option would differ depending on the speed of implementation. At least initially, there would be some added cost to businesses to conduct audits and change existing material management methods. County staffing levels would need to increase to implement and manage the program.

Chapter 9, Sections 9.7 and 9.8, discuss the option and recommendation to develop a Construction and Demolition landfill with a sorting and reuse area.

3.5.4 Visitor Industry

Because tourism is one of the largest industries in the County, hotels, motels, and other lodging facilities contribute a significant portion of the County's waste. There are a variety of basic measures that these facilities can implement to reduce their waste stream, including:

- Replace disposable products with reusable products (utensils, dishes, cleaning supplies).
- Buy in bulk, when possible.
- Offer newspapers only upon request.
- Change linens only upon request.
- Utilize soap and shampoo dispensers rather than disposable containers.
- Utilize air hand dryers or reusable napkins in public restrooms, rather than disposable.
- Change lighting fixtures to LED (light emitting diode) bulbs.
- Practice grasscycling.
- Implement onsite composting.
- Donate or sell lightly used furniture or appliances instead of landfilling.

This program could be implemented as a sub-element of a broader business waste audit and reduction program (see Section 3.5.2), or as a stand-alone program. The County could seek partner businesses and organizations within the visitor industry to build on existing waste reduction efforts by industry. At least initially, there would be some added cost to businesses to change existing material management methods.

Cost Considerations. The cost of this option would differ depending on the speed of implementation. County staffing levels would need to increase to implement and manage the program.

3.5.5 Reuse Facilities

As described in Section 3.3 Existing Conditions, the County currently contracts seven reuse centers, and one reuse facility is managed by volunteers, which is far greater than the number of facilities in operation at the time of the 2009 Plan. All reuse centers have been successful at diverting household products and, to a lesser extent, construction (demolition and deconstruction) materials from the landfills. The County has three options:

- Expand and develop more reuse centers.
- Improve programs at existing facilities.
- Increase promotion of the many for-profit and nonprofit thrift stores throughout the County.

The Reuse Center at Laupāhoehoe is run by volunteers with assistance from the solid waste facility attendants from time to time to remove large items. The County has considered upgrading the volunteer facility at Laupāhoehoe and contracting the management; however, the amount of overall waste diverted from the landfill is relatively low and resources are better used elsewhere. Instead of

investing in new facilities, the County is working with the contractor responsible for managing the existing facilities to improve operations as follows:

- Develop and communicate to residents a list of the highest priority materials to maximize the type and quantity of materials that can be accepted.
- Be selective about merchandise, emphasizing items that are lightly used, clean, and in good condition.
- Improve signage.
- Provide more covered space.
- Improve organization and display of merchandise.

The County could also work collaboratively with the volunteer-based Laupāhoehoe site to increase participation, which has decreased since the initial enthusiasm around the program. If the acceptance of highest priority materials results in greater diversion, expanding the program to other recycling and transfer stations, or upgrading the Laupāhoehoe Reuse Center could be considered.

The County could increase their support of other thrift stores (for-profit and nonprofit) by providing an interactive map showing store locations and providing details on materials accepted on the HawaiiZeroWaste.org website or through other promotional efforts such as radio or other media. This support could focus on stores that divert construction demolition and deconstruction materials because this is a significant portion of the waste stream (estimated at 22.2 percent in 2008).

Cost Considerations. The cost of expanding facilities would depend on the number of facilities constructed, site-specific design considerations, and the resources devoted to staffing and outreach at each facility. The cost of improving the functionality of existing facilities to increase waste diversion would be nominal.

3.5.6 Establish Pay-As-You-Throw System for Residential Discards

Implementing a pay-as-you-throw (PAYT) system creates a financial incentive for residents and businesses to reduce their waste. As reported in the most recent EPA co-sponsored publication, PAYT systems, also known as variable rates programs or user pay, ask households to pay more if they put out more garbage for collection. According to the EPA, the most effective way for local governments to reduce residential solid waste, increase recycling, and decrease waste-related greenhouse gas emissions is by implementing PAYT programs (EPA 2016c). A 2017 study of 20 municipalities in the State of Maine concluded that *communities with PAYT generated, on a per capita basis, 44.8 percent less trash than those without PAYT.* In this same study it was estimated that communities with PAYT generated approximately 340 pounds of residential trash per capita of municipal solid waste (MSW) per year compared to non-PAYT communities that generated approximately 645 pounds (WasteZero 2015a). PAYT provides a powerful financial incentive for residents to reduce waste discards.

A good example of a smaller jurisdiction in the State of Hawai'i implementing a PAYT program is the County of Kaua'i. In 2014, the Kaua'i County Council passed PAYT Ordinance 975. The ordinance went into effect in July 2015. An important component of the program was the development of an implementation plan that was funded through the EPA Region 9 Solid Waste Management Assistance Grant (County of Kaua'i 2018a).

In the County, this program could be implemented in multiple ways:

- PAYT at County Recycling and Transfer Stations: Charge residents on a volume or weight basis for garbage delivered to County recycling and transfer stations while allowing drop-off of recyclable or compostable materials at no charge.

- Provide Universal Collection with PAYT Rates:
  - Implement universal collection for households in densely populated areas and charge rural residents on a volume or weight basis for garbage delivered to County recycling and transfer stations, while allowing drop-off of recyclable or compostable materials at no charge.
  - Implement universal collection for households in densely populated areas and charge a base fee to all residents (including those who opt out of universal collection or rural populations that are outside the universal collection zones), while allowing drop-off of recyclable or compostable materials at recycling and transfer stations at no charge.
  - Implement universal collection of garbage for all households in the County.

Except for the universal collection program that would charge a base fee to all residents, the above options have the additional benefit of eliminating misuse of the recycling and transfer stations by non-residential generators. To successfully implement a PAYT program, it is advisable to develop a study or implementation plan to fully understand the system that would work best for the residents of the County. A discussion of each option follows.

3.5.6.1 PAYT at County Recycling and Transfer Stations

PAYT could be implemented at County recycling and transfer stations by establishing rates either proportionally by volume or by weight, which would be charged for discarding materials at each station. Another option could be a flat rate.

Option 1: Bag or Tag Proportional Pricing System

Typical volume rates include some combination of per-bag and per-vehicle fees. Because the County would prefer to avoid security and other issues relating to collection of fees at recycling and transfer stations, this system could be implemented using pre-purchased bags or tags, eliminating the need to collect fees at the recycling and transfer stations. Residents would be provided a pre-determined number of County-approved garbage bags, or tags that can be used for disposing of larger items. Additional bags or tags could be purchased from the County or through local retail outlets.

To implement this option, all recycling and transfer stations would need to have a full-time attendant to monitor residential disposal. In addition, the program would need the following:

- Adequate bins for dropping off readily recyclable materials at, or nearby, the recycling and transfer stations.
- A small building or other structure for an attendant to use while monitoring incoming loads.
- Adequate space to allow for vehicle queuing at the recycling and transfer stations.
- An agreement with retail stores to sell pre-approved bags or tags on behalf of the County.

Option 2: Variable Rate Three-Can System

The County could consider charging residents based on the volume of cans (e.g., 12- ["micro can"], 20-, 32-, 64-, or 96-gallon) they dispose of at their local recycling and transfer station. In this option, residents may haul their rubbish, green waste, and recyclables to their nearest recycling and transfer station. The onsite attendant would visually count the number, size, and type of cans. Variable rates would be enforced for the type of waste (green waste, rubbish, or recyclables) as well as the number and size of the cans.

This option would require:

- Adequate space to allow for vehicle queuing at the recycling and transfer stations.
- A small building or other structure for an attendant to use while monitoring incoming loads.
- Collection of fees at the recycling and transfer stations.

Option 3: Variable Rate Scale System

The County could consider a PAYT system that is established by weight through the installation of scales at the County recycling and transfer stations. An inbound and outbound scale would have to be installed at the station. Because of the high initial costs of this option, scales could be installed at recycling and transfer stations that experience the highest traffic and disposal volumes. Residents would drive onto an inbound truck-mounted scale, dispose of their waste, drive onto an outbound scale, and pay the attendant for the per pound weight difference.

This option would require:

- Installation of an inbound and outbound scale.
- Installation of a recording system.
- Adequate space to allow for vehicle queuing at the recycling and transfer stations.
- Collection of fees at the recycling and transfer stations.

Option 4: Multi-tiered Pricing

According to the EPA, multi-tiered pricing generates the greatest revenue for localities (EPA 2016c). Through this system, residents are required to pay a monthly fee for baseline solid waste service. The County may require residents to pay for every bag and/or cart they fill on top of this fee, or they may include up to two or three bags/cans per week into the baseline fee (Solid Waste Association of North America [SWANA] 2007). If residents exceed this amount, they will be required to pay a second tier for additional bags or containers they fill on top of this fee. Residents must then pay a second tier to dispose of extra waste, which may be based on volume (SWANA 2007). Recyclables and green waste could then be collected at a reduced fee or for no charge.

Option 5: Automated Transfer Station Pay Station

The County could install self-service electronic fee payment mechanisms at all recycling and transfer stations that charge a flat fee. The County could also consider installing a self-operating compactor as a component of the system, which would charge customers based on weight.

Automated Rural Drop Box Pay Station in Skykomish, WA Source: King County (2018)

For example, a gated customer-operated drop box is in operation in rural Skykomish, King County, WA, allows customers to drive up to an automated gate, make payment at a self-service kiosk, and then enter the gated area to dispose of their solid waste into two top-loading drop boxes, each with two stalls. It does not have a self-operating compactor. Recycling facilities are also provided outside the gated area, allowing customers to drop off recyclables without paying a fee. The waste ultimately ends up being transported to a transfer station 50 miles away for

eventual disposal at the regional landfill. Because of its remote location, cameras are used to monitor activities, and staff make regular visits for maintenance. King County's Solid Waste Division has formed a partnership with the Road Services Division in which staff working at the adjacent road services facility regularly monitor the site.

Some of the challenges related to the Skykomish self-operating system includes illegal dumping (including in the recycling bins), little to no control of materials that require special handling (e.g., hazardous waste), exceedances of load limits, unwanted visitors (e.g., black bear, people scavenging during afterhours), loss of revenue, and maintenance of bins for proper weight distribution. However, the advantages of the Skykomish rural drop box includes rubbish collection for an underserved community, the availability of recycling, opportunities to educate customers, and the partnership with the Road Services Division.

In the County, potential complications of such a system could include:

- Upfront cost of fee payment technology and compactors at recycling and transfer stations lacking these facilities.
- Upgrades to existing compacting systems for use by the public.
- Maintenance of fee-payment systems and security cameras.
- Administrative costs (although this would be realized in varying degrees with any PAYT program).
- Potential safety issues (people operating compactors).
- Potential for illegal dumping.
- If unstaffed, issues with weight distribution in drop box.

However, the introduction of such a system would have the advantage of less reliance on the general fund, and the potential reduction in recycling and transfer station staffing.

Conclusion

It is possible that not all recycling and transfer stations would have the physical space to accommodate the infrastructure needs for a PAYT system – some stations may need to be closed, relocated, or substantially modified to implement this program. There is the potential to consolidate "wastesheds" to fewer facilities (i.e., closing some and enhancing others based on usage and/or distances from population centers to the facilities). Chapter 8, Section 8.7.6, identifies potential recycling and transfer stations for optional closure.

Implementation of these options would require an aggressive public education and information campaign to ensure that residents understand the rationale for implementing the PAYT program.

Cost Considerations. Estimating the initial infrastructure costs for this option would require conceptual designs at each of the County's 22 recycling and transfer stations. The infrastructure cost could vary considerably depending on site-specific conditions and the extent to which modifications are feasible at each station. The County would need to modify its financial systems to account for the new revenue source.

3.5.6.2 Universal Collection with PAYT Rates

While not unprecedented, the County's current system of solely providing recycling and transfer stations distributed throughout the County is a relatively uncommon way of providing garbage collection services to residents. PAYT rates could be implemented to provide universal garbage, recycling, and

perhaps organics collection services to all County residents. Elsewhere in the United States, residential collection services typically are either provided by local government or by the private sector under a contract or franchise arrangement. The Supreme Court of the State of Hawai'i "Konno decision" affirmed the rights of the United Public Workers (UPW) union to perform work that "customarily and historically" had been performed by government workers. However, subsequent to that ruling, the Hawai'i Legislature in HRS 46-36 provided for a "managed competition" process in which local government and the private sector would compete on the basis of efficiency, effectiveness, and price for new government services. Additional research would be needed to decide the best way to proceed with universal collection if this is an option the County would like to implement.

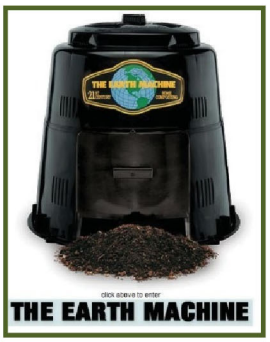
PAYT collection rates can take many forms including using a variable can, metered bag, or metered tag system. The key aspect of this system is to charge a progressive rate for each additional garbage unit collected above the basic service level (e.g., one can per week).

Like PAYT at County recycling and transfer stations, implementation of this option would require an aggressive public education and information campaign to ensure residents understand the rationale for implementing the PAYT program.

Significant upfront planning would be required. The County would need to establish billing systems and a customer service organization, and modify its financial systems to accommodate this new service. The County could elect to assess the potential for reducing property taxes as an offset to the new revenue source.

Cost Considerations. The County of Kaua`i PAYT variable rates are $10 per month for a 64-gallon cart and $18 per month for a 96-gallon cart. Service is once per week. Everyone pays a $6 base fee whether they have County-provided collection service or opt out and only use the County-operated recycling and transfer stations. They provide a 50 percent cost reduction for low-income households, both on the base fee and the rubbish collection fee.

3.5.7 Expanded Home Composting Program



Since the 2009 Plan, the County has decreased emphasis on a public campaign around home composting, which formerly entailed educational workshops and distribution of backyard composting units. The County's home composting promotion is now primarily emphasized on the HawaiiZeroWaste.org website, which includes links to EPA guidance and other resources on backyard composting, and locations on the island where worm bins, worms, and accessories can be purchased. The program could rekindle a more aggressive promotion campaign and a target penetration rate of at least 25 percent of single-family households within 5 years.

Cost Considerations. The County would have to consider the cost for purchase, storage, and delivery of each unit. Existing staff resources would need to be used to develop the plan for how best to distribute the units and to provide suitable promotion and user education.

3.5.8 Expanded Reusable Bag Program

As part of their educational outreach program, the County has conducted Bring-Your-Own Bag (BYOB) promotional events at local grocery stores and at various community events such as Earth Day, during which reusable grocery bags are given to interested residents. To expand this program, the County could significantly increase the number of reusable bags that are distributed to residents, and expand

its outreach to encourage participating grocery stores to increase the financial discount for using reusable bags.

Cost Considerations. This option would require additional staff time and funding for additional materials.

3.5.9 Expand Source Reduction Education

A key to successful reuse programs is the education of the staff (government, private for-profit, and nonprofit) who operate the facilities within the program. Once staff have been trained on program basics, they will need to develop systems to implement programs for the public. The methods for providing materials to markets include retail sales, dismantling for recycling, and ensuring materials reach markets accessible to the public.

Chapter 5 Public Education and Information includes a series of proposed enhancements to the County's education and promotion programs.

3.5.10 Establish Extended Producer Responsibility Policy

As previously described, EPR is a policy tool that extends manufacturer's responsibilities to include responsibility for life cycle costs of their products and associated packaging. This approach has been successfully implemented in various communities throughout Europe and Canada, as well as parts of the United States.

When considering the life cycle of a product, manufacturers should take into consideration the environmental footprint of a product, from its beginning to end of life. Through EPR, the responsibilities and life cycle costs of their products and packaging shift from municipalities towards manufacturers. For instance, through EPR, producers analyze the natural resource, energy, packaging, and transportation-associated costs and impacts of their products (MacKerron 2012).

In 2012, 32 states enacted greater than 70 producer responsibility laws, including products such as batteries, telephones, paint, pesticide containers, carpet, and fluorescent lamps. However, none of these programs took into consideration product packaging (MacKerron 2012). Around the globe, British Columbia mandated a fully funded EPR paper and plastic packaging program by manufacturers in 2014 (Resource Recycling Inc. 2016); after 1 year, the province reported a 77 percent recovery rate. In Europe, since the European Union's adoption of EPR in 1994, 25 member states have enacted national packaging policies and achieved a 65 percent recycling rate in 2012 (EUROPEN 2018).

Some policy statements the County may want to consider include the following:

- Express support for state and federal policies to eliminate subsidies, internalize externalities for virgin material production and wasting, and involve producers in taking physical and/or financial responsibility for their products and packaging through reuse, repair, or recycling.
- Express support for state and County agencies to support product stewardship, by creating a state/counties coalition to work towards EPR, along with other active states.
- Express support for policies designed to relieve local taxpayers from the burden of managing wastes they have no control over. This could include identifying specific product categories that have the greatest impact on local programs.
- Express support for mandatory recycled content, as well as "cradle-to-cradle" product take-back and recycling services. Insist that the cost of the programs be paid by manufacturers and internalized into the cost of their products.

EPR framework policy and legislation can be drawn from successful programs implemented in California, Oregon, Washington, and Minnesota, as well as other areas of the world including Belgium, the Netherlands, and Germany.

Cost Considerations. To implement this option, the County would need to invest some ongoing staff time and potential consulting assistance for research, policy analysis, and drafting legislation. The price of some products affected by EPR programs could increase depending on implementation.

3.5.11 Create a Zero Waste Fund

To encourage local innovation and participation, the County would fund community zero waste initiatives with fees levied on landfill disposal. The County could leverage private sector investments by adopting supportive policies and by providing technical assistance, matching funds, and letters of support for independent financing and/or grants. The more that nonprofits and private companies invest in expansion of reuse, recycling, and composting programs, the less the County needs to invest. The County could also identify and support proposals for state, federal, and foundation grants and loans for local zero waste businesses and service providers.

For example, in Boulder, Colorado, the Boulder County Resource Conservation Division distributes $50,000 annually as part of its Zero Waste Funding Program. Since 1997, they have awarded over one million dollars for education and infrastructure initiatives to businesses, residents, and governments.

Cost Considerations. The cost of this option would depend on the extent to which the County elects to fund this program. Some added staff time would be necessary to develop and administer the program.

3.5.12 Public-Private Partnerships with Community-Based Organizations

A survey of the reuse industry (e.g., Goodwill Industries, Habitat for Humanity) on the island would be beneficial. Other nonprofits or businesses may be interested in participating in reuse programs within the County. The County could convene a meeting of interested parties to determine the level of interest, evaluate what challenges such a program would face, and identify potential mechanisms to assist with initiation of the program.

Independent community-based organizations (CBOs) may see this as an opportunity. They are potentially available to take on repairing and refurbishing as well as dismantling of discarded items into recyclable commodities.

Cost Considerations. Some added staff time would be necessary to develop and administer the program.

3.6 Recommendations

Based on the analysis presented above, and discussions with the SWAC, the Plan recommends the following to improve the source reduction program:

1. **Develop County policies or ordinances that mandate certain actions be taken to reduce the source of waste currently entering landfills, including:**
    - Develop a County ordinance that requires a waste reduction plan be submitted to obtain a commercial building permit. Coordinate implementation with the County Planning Department.
    - Work with other counties to develop EPR policy statements or resolutions expressing strong support for initiatives that require manufacturers of certain products or materials to take responsibility for the life cycle costs of their products. As a component of the EPR policy,

implement a campaign to develop EPR for difficult-to-recycle products, and lobby state and federal lawmakers to advance EPR initiatives.

- Implement a County government source reduction program by implementing policies, procedures, and incentive programs that will reduce waste streams currently being generated within various County departments and agencies.

2. **Investigate a PAYT program or other funding method.** A critical element of the County waste management program is to provide incentives for the public to participate in source reduction and other programs to reduce waste going to landfills. PAYT programs have proven to be a highly successful and cost-effective method of reducing waste going to landfills in many similar communities nationwide. After considerable deliberation by the SWAC about its advantages and disadvantages, this Plan update recommends conducting a feasibility study regarding the implementation of a PAYT program or other funding method. The feasibility study of a PAYT program or other funding method would include the following components:
   - Suite of funding mechanisms and logistics for implementing programs (i.e., capital improvements, administration, self-haul versus collection, or a combination of the two).
   - Education and public outreach campaign (including retail businesses) that would be necessary for the implementation.
   - Pilot program that would be at no cost to the public to introduce the program and identify ways in which the program can be implemented most effectively.
   - Training for County staff to implement the program.
   - "Phasing-in" of the program, which would span over several years.
   - Prevention of illegal dumping.
   - Plan for monitoring and evaluation of program results and participation.

   Note: Chapter 8, Section 8.8 (Recommendation 1) discusses the continued operation and maintenance of recycling and transfer stations until a decision on the best method of collection and transfer is determined, and to also explore alternative funding mechanisms via a feasibility study. Chapter 10, Section 10.6 (Recommendation 1) discusses a Solid Waste System Financial Analysis.

3. **Improve the current reuse facility program.** One of the most popular existing waste reduction programs among County stakeholders is the operation of reuse facilities where unwanted products that are still useful can be made available to others rather than discarded. Several recommendations relating to improving the current reuse program include the following:
   - Work with contractors managing reuse centers to create a list of preferable donations to distribute to customers.
   - Work with the contractor managing the reuse centers to be more selective about merchandise, emphasizing items that are lightly used, clean, and in good condition. Improve signage, organization, and display of merchandise.
   - Provide more covered space at reuse centers.
   - Collaborate with the volunteer-based Laupāhoehoe Reuse Center to increase participation of volunteers.
   - Continue public-private partnerships with organizations such as Goodwill Industries to develop reuse centers at existing outlets within the County.
   - Consider expanding the program to other recycling and transfer stations and/or upgrade the Laupāhoehoe Reuse Center.

If improvements to the existing reuse facility program results in greater diversion, expanding the program to other recycling and transfer stations or upgrading the Laupāhoehoe Reuse Center could be considered.

4. **Expand and improve public education and awareness programs.** Stakeholders agreed that education was a key element of implementing source reduction programs within the County. The following are recommendations regarding development of educational programs:
   - Develop a business waste audit and education program to foster source reduction within the local business community.
   - Develop a visitor industry waste reduction education program.
   - Continue reuse education, outreach, and public awareness campaign to encourage public participation and use of the reuse centers.