

**2013 Interim Status Report
on the
Integrated Solid Waste Management Plan (2008)**

**Prepared and submitted by:
Department of Environmental Services
City and County of Honolulu
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Purpose

The Hawaii Revised Statutes (HRS) Section 342G-24, subsection (a) requires each county to submit a revised integrated solid waste management plan (ISWMP) “once every ten years, provided that an interim status report on the implementation of a revised plan be submitted five years after every submission of a revised plan.” Further, the Revised Ordinances of Honolulu (ROH) Section 9-1.3 requires that an ISWMP and interim status report which meets the requirements of the HRS be submitted to the City Council as well.

The purpose of the ISWMP is to provide a road map for managing the island’s waste by employing strategies that reduce landfilled waste through recycling, waste-to-energy and other technologies, and plan for future needs.

The City and County of Honolulu (City) submits this progress report on the implementation of its ISWMP dated October 2008. The report is organized according to the Plan’s components/tasks as presented in Section 13, “Plan Implementation,” and Section 13.1 “Summary of Implementation Schedule,” and presents recycling, waste-to-energy and landfill diversion data for the five year period from 2008-2012.

Background/Information:

In accordance with the HRS, the City Department of Environmental Services (ENV) (formerly Department of Public Works) prepared and submitted the first Integrated Solid Waste Management Plan in 1991 and subsequent revised plans every five (5) years. The HRS was amended in 2010 to change the reporting requirements for the revised plans to every 10 years with an interim status report submitted five years after every submission of a revised plan.

The City prepared and submitted the most recent ISWMP in December 2008, and received a letter from the State of Hawaii, Department of Health (DOH) indicating acceptance of the plan in January 2010 (letter attached). The full 2008 ISWMP is posted online at www.opala.org in the Resource Library, Technical Studies.

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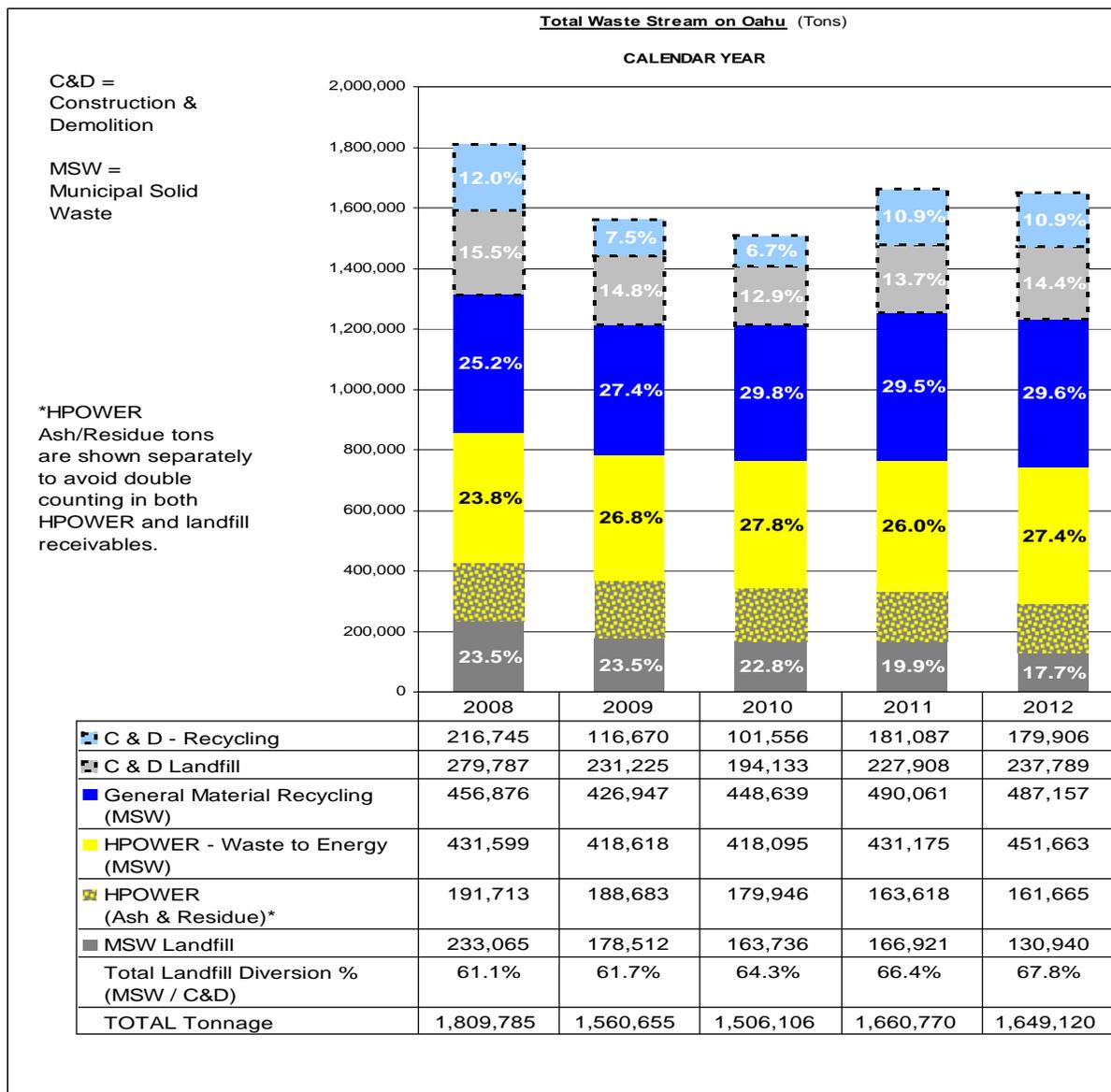
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Recycling, Waste-to-Energy and Landfill Diversion 2008-2012

To present a complete waste flow picture, the most recent available data is for calendar year 2012. Although waste tracking to landfill and H-POWER is managed every month by ENV, recycling data is provided by commercial recycling companies which are surveyed annually. Recycling data for 2013 will be gathered and compiled during the first quarter of 2014, and an updated chart and analysis will be posted online at www.opala.org mid year.

Table 1: Total Waste Stream

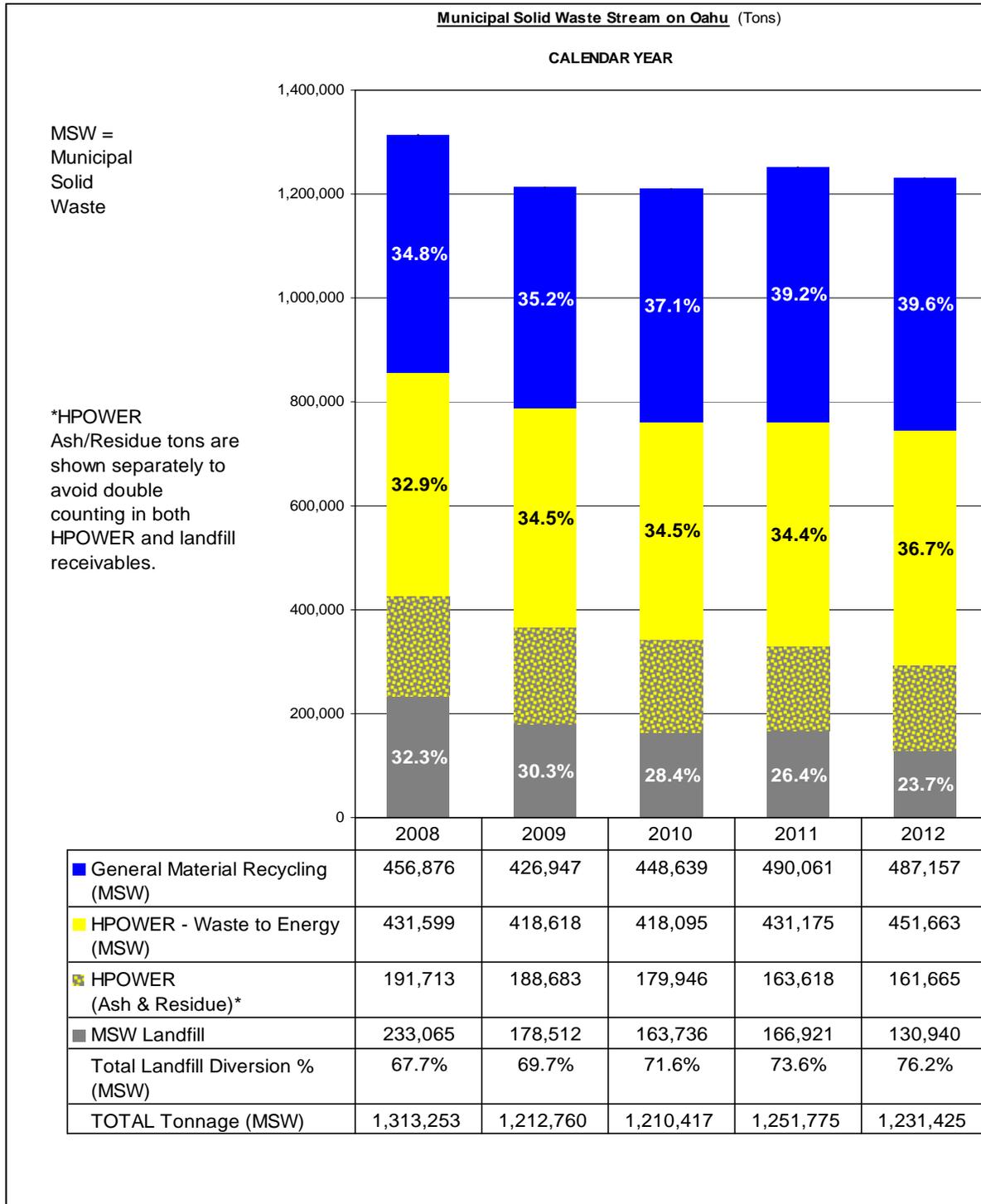


The data in the chart above presents the annual quantity of waste (in tons) that is processed through recycling, waste-to-energy or landfilling for the most recent five (5) calendar years (2008–2012).

Brief analysis: The data shows how Oahu's waste has been diverted from landfill through recycling and waste-to-energy. The general trend shows annual increases in recycling and waste-to-energy, and decreases in landfill disposal. Note that overall waste generation has decreased significantly since 2008, most likely due to the downturn in the economy. Total waste generation dropped from 1.8 million tons in 2008 to 1.5 million tons in 2010. A slight increase was noted in 2011, with waste generation rates leveling off in 2012. The general material recycling rate (shown in the darker blue) increased from 25 percent (2008) to 27 percent (2009) and to more than 29 percent (2010, 2011 and 2012). The total landfill diversion rate continued to increase from more than 61 percent (2008/2009) to 64 percent (2010) to 66 percent (2011) and to nearly 68 percent (2012), with continued reductions in waste disposed at the landfill.

Total waste includes all waste of all types disposed/recycled on Oahu, including construction and demolition (C&D) waste. There are two landfills on Oahu: the City's Waimanalo Gulch Sanitary Landfill (WGSL or landfill), which is designated for municipal solid waste (MSW), and the private PVT Landfill, which is permitted for C&D waste only. When analyzing MSW only and landfill diversion specific to the WGSL, the landfill diversion rate achieved through recycling and waste-to-energy is over 76% and the general material recycling rate is 39%. See Table 2 for a fuller comparison of diversion rates for WGSL over the most recent five (5) years.

Table 2: Municipal Solid Waste Stream



Note that the general material recycling rate (shown in the darker blue) increased from nearly 35 percent (2008) to almost 40 percent (2012).

Recycling data: The tables below provide detail of what was recycled by material type. The City has gathered annual recycling data since 1988 (except for 1989, 1990 and 1992). Note the upward trend of general material recycling from approximately 75,000 tons in 1988 to well over 400,000 tons today. Recycling of C&D materials, such as concrete, rock and asphalt, has added between 100,000 to 200,000 tons to the recycling rates. These C&D recycling rates tend to fluctuate based on the volume and type of construction projects undertaken from year to year.

Table 3: Yearly Recycling Rates

Yearly Recycling Rates (1988 – 2012)			
Year	General Material Recycling	C&D Recycling	Total Recycled
2012	487,197	179,906	667,065
2011	490,061	181,087	671,148
2010	448,639	101,556	550,195
2009	426,947	116,670	543,617
2008	456,876	216,745	673,621
2007	453,282	148,952	602,234
2006	421,072	121,675	542,747
2005	417,669	193,829	611,498
2004	386,338	173,916	560,254
2003	366,639	106,773	473,412
2002	352,699	139,055	491,754
2001	367,300	114,070	481,370
2000	327,710	165,000	492,710
1999	314,075	225,200	539,275
1998	318,690	148,800	467,490
1997	313,394	204,400	517,794
1996	299,574	95,300	394,874
1995	294,340	44,400	338,740
1994	290,412	35,700	326,112
1993	241,600	30,000	271,600
1991	167,152	0	167,152
1988	73,992	0	73,992

Table 4: 2012 Recycling

Oahu Recycling 2012	
Material Type	Amount in tons
PAPER	
Corrugated Cardboard	51,382
Newspaper	13,600
Office Paper	11,177
Other Paper	3,537
METALS	
Ferrous (includes autos)	189,722
Non-Ferrous (includes aluminum)	14,679
GLASS	22,616
PLASTIC	6,264
TIRES	13,106
AUTO BATTERIES	7,503
ELECTRONIC SCRAP	2,356
GREEN WASTE (yard trimmings)	97,807
WOOD WASTE/PALLETS	10,145
CONSTRUCTION & DEMOLITION (rock, concrete, asphalt)	179,906
FOOD WASTE	25,845
SEWAGE SLUDGE (Tonnage data being researched)	-
OTHER REUSE (Goodwill, Salvation Army)	17,420
TOTAL	667,065

Table 5: 2011 Recycling

Oahu Recycling 2011	
Material Type	Amount in tons
PAPER	
Corrugated Cardboard	45,984
Newspaper	10,251
Office Paper	12,689
Other Paper	3,755
METALS	
Ferrous (includes autos)	182,393
Non-Ferrous (includes aluminum)	24,372
GLASS	24,140
PLASTIC	6,161
TIRES	13,504
AUTO BATTERIES	7,959
ELECTRONIC SCRAP	2,414
GREEN WASTE (yard trimmings)	103,666
WOOD WASTE/PALLETS	10,271
CONSTRUCTION & DEMOLITION (rock, concrete, asphalt)	181,087
FOOD WASTE	25,228
SEWAGE SLUDGE (Tonnage data being researched)	-
OTHER REUSE (Goodwill, Salvation Army)	17,274
TOTAL	671,148

Table 6: 2010 Recycling

Oahu Recycling 2010	
Material Type	Amount in tons
PAPER	
Corrugated Cardboard	41,805
Newspaper	12,596
Office Paper	11,177
Other Paper	6,944
METALS	
Ferrous (includes autos)	163,166
Non-Ferrous (includes aluminum)	18,247
GLASS	22,833
PLASTIC	5,385
TIRES	9,518
AUTO BATTERIES	5,383
ELECTRONIC SCRAP	1,375
GREEN WASTE (yard trimmings)	91,413
WOOD WASTE/PALLETS	15,514
CONSTRUCTION & DEMOLITION (rock, concrete, asphalt)	101,556
FOOD WASTE	26,677
SEWAGE SLUDGE (Tonnage data being researched)	-
OTHER REUSE (Goodwill, Salvation Army)	16,607
TOTAL	550,196

Table 7: 2009 Recycling

Oahu Recycling 2009	
Material Type	Amount in tons
PAPER	
Corrugated Cardboard	41,945
Newspaper	15,053
Office Paper	14,224
Other Paper	1,043
METALS	
Ferrous (includes autos)	152,377
Non-Ferrous (includes aluminum)	13,626
GLASS	21,306
PLASTIC	4,876
TIRES	10,277
AUTO BATTERIES	5,929
ELECTRONIC SCRAP	664
GREEN WASTE (yard trimmings)	87,907
WOOD WASTE/PALLETS	16,185
CONSTRUCTION & DEMOLITION (rock, concrete, asphalt)	116,670
FOOD WASTE	25,736
SEWAGE SLUDGE (Tonnage data being researched)	-
OTHER REUSE (Goodwill, Salvation Army)	15,777
TOTAL	543,617

Table 8: 2008 Recycling

Oahu Recycling 2008	
Material Type	Amount in tons
APER	
Corrugated Cardboard	34,249
Newspaper	13,905
Office Paper	13,301
Other Paper	1,124
METALS	
Ferrous (includes autos)	165,943
Non-Ferrous (includes aluminum)	23,656
GLASS	25,050
PLASTIC	4,704
TIRES	10,200
AUTO BATTERIES	6,327
ELECTRONIC SCRAP	1,123
GREEN WASTE (yard trimmings)	95,941
WOOD WASTE/PALLETS	13,526
CONSTRUCTION & DEMOLITION (rock, concrete, asphalt)	216,745
FOOD WASTE	29,933
SEWAGE SLUDGE (Tonnage data being researched)	-
OTHER REUSE (Goodwill, Salvation Army)	15,831
TOTAL	673,621

1. Municipal Solid Waste (MSW) Collection

1.1 Conduct pilot programs of weekly MSW collection, with and without optional second day pick-up available for a fee.

The City conducted pilot programs in Mililani and Hawaii Kai from November 2007 through April 2008. In addition to once a week refuse and once a week recycling collection, approximately 11,200 homes in the Mililani pilot were offered a second weekly refuse pick-up for a \$10 fee per month. Roughly 7,300 Hawaii Kai homes were asked to work within a system of one collection day for refuse and one collection day for recyclables each week.

1.2 Evaluate the results of the pilot programs to determine whether the preferred approach is once a week pick-up of MSW or 2nd day pick-up of MSW for a fee.

Based on the results the evaluation the City recommended that the curbside recycling program be expanded using the Hawaii Kai model with no option for additional paid refuse service. The City found that setout and recovery rates were significantly higher in the Hawaii Kai pilot. Additionally, less than 5% of Mililani residents opted to pay for additional refuse service. Moreover, of those who did pay for additional refuse service, more than half were not using their recycling bins. The City's pilot evaluation report is available online at www.opala.org in the Resource Library, Technical Studies, and is attached to this report as Exhibit A.

1.3 Implement a new MSW collection system island-wide based on the results of the pilot program.

In November 2008 the City began expanding the curbside recycling program islandwide. Households were allotted three color-coded carts for refuse (gray), green waste (green) and mixed recyclables (blue), and provided twice a week collection service with one day for refuse and the other dedicated to recycling, alternating weekly between the blue and green carts. Islandwide expansion to 160,000 households with automated cart collection service was completed in May 2010. The City conducted an evaluation of the program after the first year; the evaluation report is available online at www.opala.org in the Resource Library, Technical Studies, and is attached to this report as Exhibit B. Curbside recycling has yet to be included for the remaining 20,000 single-family homes with manual refuse collection service, in areas where automated collection is not feasible. Plans are underway to develop a manual collection system for recycling to be provided to these pockets of neighborhoods around Oahu.

2. Source Reduction

2.1 Continue to promote source reduction and reuse through the City's website, www.opala.org, and other educational avenues.

The City continues to promote the importance of source reduction and reuse on www.opala.org by providing a comprehensive listing of charitable organizations that accept donations of household items, furniture, appliances and electronics for reuse. The City also developed a food waste reduction guide entitled "Food: Too Good To Waste, *Cookbook and Smart Food Tips*" (FTGTW) which is distributed through participating local restaurants. The FTGTW book is a guide and cookbook offering helpful tips and tools on how to minimize food waste at home through smart shopping, storage and food preparation. Local chefs provide recipes for using common leftovers. The FTGTW book is available in print and online at www.opala.org in the Media Library, linked on the Food Waste Prevention webpage and attached to this report as Exhibit C.

2.2 Continue to encourage *grasscycling* and backyard composting through workshops with Hawaiian Earth Products, www.opala.org, and other avenues.

The City continues to encourage and promote grasscycling online at Opala.org and in its educational print material as an intelligent method for reducing green waste and enriching lawns. The term grasscycling refers to leaving grass clippings on the lawn as you mow, which provides a nutrient-rich addition to lawn soil equivalent to one fertilizer application. Backyard composting guidelines are available online in the Resource Library at www.opala.org. The City no longer offers workshops in collaboration with Hawaiian Earth Products, but the composting facility is included in the annual Tour de Trash, allowing the public to visit the site and learn more about the composting process and mulch/compost products.

2.3 Continue to distribute the business Waste Prevention Guide and to promote companies that have successfully prevented waste.

The City continues to promote the benefits of reuse and waste prevention online in the Waste Prevention section of www.opala.org. The guide provides helpful tips to businesses on how to produce less waste and how to effectively manage excess waste. The City's website promotes companies that have established successful recycling programs and that advocate materials for reuse. The City has also profiled businesses that are actively engaged in recycling and waste prevention on The Green Channel. Further, the City's annual Tour de Trash tour series gives participants a behind-the-scenes look at some of Oahu's top leaders in business recycling and resource management.

2.4 Increase the emphasis on source reduction and reuse in the City's procurement policies.

The City has yet to develop formal procurement policy that specifically promotes source reduction and reuse. The City Department of Budget and Fiscal Services encourages the reuse of surplus City furniture and equipment by posting

available items on a City intranet site (<http://cityfyi/fin/surpl.xls>). Materials of value are offered through public auction. All large capacity copy machines include features for double-sided copying to reduce paper use.

2.5 Join with counties in the State to advocate for manufacturer responsibility for product waste.

The City worked collaboratively with other counties and the state to establish the successful HI-5 deposit beverage container program, advance disposal fee for non-deposit glass, and take-back legislation for used tires and auto batteries, and has continued this collaboration to develop extended manufacturer responsibility legislation for electronic waste (e-waste). The 2008 Hawaii Electronic Waste and Television Recycling and Recovery Act took effect in 2010 for computers and expanded to TVs in 2011. The state and counties continue to work on measures to improve the law's effectiveness.

2.6 Expand the City's canvas bag give-away program, encourage residents to sign reuse and recycling pledges and tracking number distributed.

The City passed Ordinance 12-8 banning the use of non-biodegradable bags on Oahu, and encouraging the use of reusable bags. The ordinance takes effect July 1, 2015. The City is currently working to establish implementation guidelines for affected businesses. The City distributes reusable canvas bags at special events and to schools.

3. Recycling

3.1 Expand energy recycling through increased renewable energy production.

The H-POWER Expansion Project, accepted by the City on August 4, 2012, provides for an additional 900 tons-per-day MSW capacity and includes a new 33.6 MW Siemens Turbine/Generator, increasing H-POWER's capacity to process waste and produce renewable energy sold to Hawaiian Electric Company (HECO). The waste-to-energy plant now operates with three boilers and two turbines, increasing the plant's total waste capacity to 900,000 tons per year, and enabling the City to divert bulky wastes and special wastes from the landfill to H-POWER's new mass burn unit. By 2014 year end, pending the completion of construction of a new receiving facility, the City plans to divert sewage sludge from the landfill to H-POWER as well. Additionally, H-POWER is assessing the plant's ability to process tires to further generate local power. Currently, much of Oahu's recovered used tires are shipped outside of Hawaii to be used as tire derived fuel.

3.2 Provide islandwide, every-other-week curbside collection of residential mixed recyclable materials.

The City completed the islandwide implementation of its curbside recycling program in May 2010. Curbside recycling is now provided to the 160,000 single-family homes that are serviced by the City using automated collection carts. Each home is provided three carts, one each for refuse (gray), green waste (green) and mixed recyclables (blue), and receive twice-per-week collection with

one day for refuse and the other dedicated to recycling, alternating weekly between the blue and green bins. The City collects approximately 22,000 tons of mixed recyclables in the blue carts and 55,000 tons of green waste in the green carts annually.

3.3 Provide financial assistance to condominiums for recycling programs.

The City offers reimbursement (up to \$2,000) to multi-family dwelling associations or residential building owners for expenditures associated with the start-up of recycling programs for their residential facilities. Additionally, the City provides recycling carts for use on the properties, tenant education materials, and assistance in designing the program and finding a recycling/collection company. Program information and request forms are online at www.opala.org on the Condo Recycling webpage.

3.4 Modify community drop-off bin and HI-5 fundraiser programs once impact of City-wide curbside recycling is evaluated.

The City closed the community recycling drop-off bin program in June 2012. Public use of the bins had decreased by 70% with the expansion of islandwide curbside recycling, and as a result the cost to maintain the program became excessive. The City is refocusing resources to develop more convenient recycling options for residents, including further expansion of curbside recycling and support for condo recycling. In addition, with the closure of the drop-off bins, HI-5 redemption centers have expanded the types of recyclable materials accepted to include non-HI-5 containers (plastics, glass and metals) and paper. Schools continue to raise funds through HI-5 collection events supported by private recycling companies, and the City continues to offer promotional banners and collection containers to support these events.

3.5 Work with DOH to develop regulations to recycle residual and ash from H-POWER and additional waste-to-energy capacity.

Requests for Proposals (RFP's) for recycling H-POWER process residue, bottom ash, and fly ash were advertised in 2010, but no acceptable bids were received. The City and Covanta Energy continue to meet with interested parties to discuss ash recycling initiatives, including beneficial use determination (BUD), but to date no suitable commercial-scale technologies or processes have been identified.

3.6 Increase the number of recycling containers in public areas.

The City has placed HI-5 recycling containers of various types at City facilities, including City administration buildings, district parks, City golf courses, Blaisdell Center, Fort Street Mall, along Kalakaua/Kuhio Avenues in Waikiki and the Honolulu Zoo, and is continuing efforts to place additional bins to increase the convenience of recycling in public spaces through a DIY (Do-It-Yourself) project for community and youth groups. The DIY HI-5 Recycling Program assists groups in placing "self servicing" recycling baskets which can be attached to existing trash containers at beaches, parks, bus stops and along sidewalks. People can deposit or withdraw HI-5 containers freely – with a HI-5 recycling sign

that reads “Take, Leave, Whatever.” The City provides the materials and signage, and provides workshops to train interested groups on how to make the bins and place in their community. The concept for these do-it-yourself baskets was developed by a grass roots collective and has proven to be a simple, inexpensive and efficient system.

3.7 Enhance enforcement of commercial recycling ordinance and material bans.

Regulations for business recycling were established via City Ordinance in 1996. Recycling of targeted materials is required by law for most businesses and government agencies. Although the City encourages the recycling of as many materials as possible, it requires that the regulated materials be recycled or composted and thereby diverted from City disposal sites. The commercial sector has the greatest potential to significantly increase recycling on Oahu. Businesses that generate large volumes of recyclable materials may also have an opportunity to reduce waste disposal costs when recycling is integrated into their waste management system.

Almost every large business on Oahu -- restaurants, bars, hotels, office buildings, shopping centers, retail stores, grocery stores, hospitals, food courts, food manufacturers and processors, golf courses, parks, tree trimmers, auto shops, appliance dealers -- is affected, either directly or indirectly, by the City's recycling requirements. Some of the requirements specifically identify the types of businesses that are required to set up recycling systems for targeted materials. Bars and restaurants are required to recycle glass containers; commercial office buildings, including government buildings, are required to recycle paper; and businesses that generate large amounts of food waste, including hotels, restaurants, grocery stores, manufacturers and hospitals, are required to recycle that waste.

Other businesses are affected indirectly by the bans and restrictions of materials at City disposal sites. Although refuse haulers are responsible for recycling/disposal compliance, the businesses that generate the waste need to insure that their refuse is within allowable disposal limits. Large generators of cardboard, including retail operations, shopping centers, grocery stores and hospitals, are affected by the restriction on cardboard; and large generators of green waste, including golf courses, hotels, condominiums and parks, are affected by the restriction on green waste.

Below is a summary of the mandatory recycling related City ordinances.

- **Bars and restaurants** serving alcoholic beverages are required to recycle glass containers, effective July 1, 1996. Local recycling companies and collectors pickup at no charge, and some pay for HI-5 deposit glass. (ROH, Section 9-3.1)

- **Office buildings** with 20,000 square feet or more of office space are required to recycle office paper, newspaper and cardboard, effective July 1, 1996. Local recycling companies pick up for fees. (ROH, Section 9-3.1)
- **Hotels, restaurants, grocery stores, food courts, food manufacturers/processors and hospitals** meeting specific size criteria defined by ordinance are required to recycle food waste, effective January 1, 1997. Collection service offered by local hog farmers and collectors for a fee. (ROH, Section 9-3.5)
- **City agencies are required to recycle** newspaper, cardboard, office paper, aluminum, glass, and plastics through the government mandatory recycling program established in 1990 for all City agencies. (ROH, Section 9-1.11)
- **The City is required to purchase recycled paper products** to support the recycled paper market. Everything from toilet tissue and paper towels to copier and computer paper is purchased with recycled content. (ROH, Section 1-12.3)

Pursuant to Section ROH 9-1.7 the City has exercised its authority to control the flow of waste in the public interest by restricting certain wastes as follows. State and EPA laws are additionally noted where applicable.

- **Green waste** (yard trimmings) from commercial and government generators is RESTRICTED/ BANNED from disposal. Commercial and government trucks are limited to a maximum of 10% green waste per load at H-POWER and Refuse Transfer Stations, and green waste is completely banned from disposal at the landfill. Local composting facilities accept this material for a fee and process it into soil amendment products. Generators are also encouraged to consider small-scale, do-it-yourself mulching and composting. Restrictions began in 1994; the ban became effective January 2003.
- **Cardboard** from commercial and government generators is RESTRICTED from disposal. Commercial and government trucks are limited to a maximum of 10% cardboard per load. Local paper recyclers pay for cardboard. Restrictions began in 1994.
- **Tires, auto batteries, white goods and scrap metals** are BANNED from all City disposal sites, effective 1994. State law bans auto batteries and whole tires, and requires dealers to take back old tires and auto batteries and recycle them. City-collected residential tires and batteries are delivered to a recycler. EPA bans the disposal of white goods that contain freon.
- **Electronic waste** is BANNED from disposal, effective July 2006. Commercial and government e-waste must be processed through e-waste recycling companies. State law requiring manufacturer take-back became effective January 2010.

City staff continually monitors compliance with these laws and enforces restrictions at City disposal facilities. Affected businesses are mailed an annual compliance form and City staff follow-up throughout the year with site inspections. In 2013, business compliance was approximately 81% for glass recycling, 79% for office paper recycling and 86% for food waste recycling,

representing a moderate increase from the previous year. The Report on Implementation of Mandatory Business Recycling (July 2013) is attached as Exhibit D. The Report on City Agency Mandatory Recycling (July 2012) is attached as Exhibit E. Both reports are available online at www.opala.org in the Resource Library, Technical Studies.

4. Bioconversion

4.1 Provide comprehensive green waste and food waste composting services.

In 2012, the most recent surveyed year, more than 97,000 tons of green waste and 25,000 tons of food waste was recycled on Oahu. The green waste was mulched and composted at an on-island composting facility. Most food waste on Oahu is delivered to hog farmers; some is processed through co-composting with green waste.

The expansion of curbside recycling enabled the City to increase recovery of residential green waste. The City recovers approximately 70,000 tons of green waste per year, with 54,000 tons now collected through curbside collection, 10,000 tons collected through the City's Convenience Centers and 6,000 tons self-delivered by homeowners and pre-approved non-profits. The green waste capture rate in the curbside green carts is relatively high at 77%, reflecting a participation rate of over 90%. Green waste from commercial generators is banned from disposal, effectively diverting this material to composting operations. Additionally, ROH Section 9-3.5 requires recycling for commercial food waste.

4.2 Increase the customers that use green waste carts rather than setting out green waste in bags or bundles.

The City completed the transition from bags/bundles to carts in 2010 with the implementation of the 3-cart curbside recycling system. Curbside recycling is now provided to 160,000 single-family homes serviced by the City using automated collection carts. Each home is provided three carts, one each for refuse (gray), green waste (green) and mixed recyclables (blue), and receive twice-per-week collection with one day for refuse and the other dedicated to recycling, alternating weekly between the blue and green carts. Green waste is collected curbside in carts only; bagged or bundled green waste is no longer an option. Curbside collection of green waste has increased to over 50,000 tons per year, more than double the recovery rate prior to the expansion of the cart collection system. The City conducted an evaluation of the program following the first full year of operation. The report is attached as Exhibit B and available online at www.opala.org in the Resource Library, Technical Studies.

4.3 Continue restricting the disposal of green waste from commercial and governmental generators at the transfer stations, waste-to-energy facilities and the landfill.

The City's green waste disposal ban remains in effect at all City disposal facilities. Commercial and government generators are limited to no more than 10% green waste per truckload.

4.4 Target landscapers and gardeners for educational messages on separating green waste from garbage.

Disposal bans and residential collection systems provide a structure for clear messaging on the need to separate green waste from garbage. Commercial landscapers, gardeners and tree trimmers are banned from delivering green waste to City disposal facilities, where such deliveries are diverted to composting facilities. Some tree trimmers run green waste through a shredder at the work site, and provide the material directly to landscaping and agriculture sites for use as mulch. Landscaping companies providing residential service may leave green waste material at the residential property for disposal, in which case the resident sets out the green waste in green carts provided for curbside collection.

5. Special Waste

5.1 Continue to ban Construction and Demolition (C&D) waste from the Waimanalo Gulch Landfill.

The City continues to ban C&D waste from WGSL, and to direct the haulers to the privately-operated PVT C&D landfill in Nanakuli. The ban is enforced with signage at the WGSL, via monitoring at the scale located at the entrance to the landfill, and as the trucks unload within the landfill.

5.2 Continue to promote the reuse of asphalt and concrete.

The City promotes the reuse of asphalt and concrete by banning these materials from City disposal sites, including HPOWER and WGSL. This ban effectively encourages generators to pursue reuse options for asphalt and concrete. Recycled asphalt pavement (RAP) is used in the base course for new road construction. Concrete is crushed and reused in aggregate for construction. In 2012, 110,000 tons of asphalt and 70,000 tons of concrete were recycled. Over the past five years, the combined reuse rate for asphalt and concrete has continued to increase, rising from 100,000 tons in 2010 to about 180,000 tons in 2012.

5.3 Continue to encourage the reuse and recovery of C&D debris.

The City encourages the reuse and recovery of C&D debris by banning C&D waste from WGSL. Generators are required to separate C&D debris from MSW prior to disposal. This ban effectively encourages generators to pursue alternative uses and/or recycling options for C&D debris. Still, approximately 250,000 tons of mixed C&D is delivered to the privately-operated PVT landfill each year. With the expansion of H-POWER to include the new mass burn unit, the City is further assessing the composition of this waste stream and the feasibility of processing the combustible portion of the C&D material as waste-to-energy.

5.4 Work with DOH to develop local markets for other components of construction and demolition debris.

As the City further assesses the feasibility of incorporating combustible C&D materials into H-POWER, it will work closely with the state DOH to ensure compliance with all regulations and permits.

5.5 Expand contracted services to convert sewage sludge to fertilizer and evaluate additional alternatives for diversion of remaining sludge. Work with DOH to receive approval for use of fertilizer pellets.

The City is currently expanding the Synagro bio-solids facility at Sand Island Waste Water Treatment Plant (WWTP) to add an additional digester for the processing of sewage sludge to fertilizer pellets. The additional digester will provide increased sewage sludge processing capacity at the Sand Island WWTP, and provide added flexibility by allowing for maintenance to be performed on the existing digester without having to suspend operations.

The City is also expanding the H-POWER facility to process sewage sludge in lieu of contracting separately for sewage sludge composting. The processing of sewage sludge at H-POWER allows the City more flexibility as H-POWER is capable of receiving sewage sludge from all treatment plants on the island. H-POWER was also found to be a more cost-effective option to divert sewage sludge from the landfill when compared to providing for a separate sewage sludge composting project. DOH has approved the required permits to allow for the processing of sewage sludge at H-POWER.

6. Household Hazardous Waste and Electronics

6.1 Continue to monitor quantities collected and per ton costs associated with quarterly household hazardous waste collection program.

The City expanded the household hazardous waste collection program by increasing the frequency of the drop-off events from quarterly to once every two months to provide greater convenience to the public. The City's coordination of these events includes contracting a hazardous waste company to receive and process the materials, promoting the events and educating the public through newspaper advertisements and online at www.opala.org, and tracking the types and quantities of material received at each event. Approximately 125 residents call for reservations to participate in each event, dropping off pre-approved quantities of household hazardous waste at the contractor's facility. Each event costs an average of \$18,000, including advertising, staffing and material handling and processing. In fiscal year 2013, the City collected a total of 5,225 gallons of household hazardous waste for a total cost of \$110,000.

6.2 Evaluate and implement options to recycle electronics from residential generators.

Options for residential recycling of electronics are provided through extended producer responsibility legislation. Hawaii state law which requires electronics manufacturers to take back their used products for recycling.

6.3 Continue to promote producer responsibility and take-back recycling programs for electronics.

E-waste from commercial and government generators was banned from disposal on Oahu effective July 2006. Commercial and government e-waste must be processed through an e-waste recycling company. Residential generators are exempt from the ban in accordance with EPA guidelines. The 2008 Hawaii Electronic Waste and Television Recycling and Recovery Act requires manufacturers of “covered” electronic devices (i.e. computers and televisions) sold in the State of Hawaii to provide recycling options for these devices. The City also encourages all types of generators, residential and commercial alike, to pursue reuse and recycling options in its communications to the public and through its website at Opala.org. The City maintains a comprehensive list of retailers, organizations and drop-off events on Opala.org that will accept used electronics for either reuse or recycling.

7. Public Education

7.1 Continue maintaining, updating, and promoting the City’s website, www.opala.org.

The Opala.org website is the cornerstone of the City’s public education and outreach on recycling and waste management. The City maintains Opala.org with the most recent information on collection, disposal, policy/legislation, and recycling and disposal rates. The website offers educational resources, including video, PowerPoint presentations, books and instructional guides in the Media Library section, and a vast array of waste and recycling data in the Resource Library. The website also enables users to find resources for condo recycling, business recycling, and school recycling projects. Users can click and type in an address to check collection schedules for refuse, recycling, and bulky pickup, and can view collection schedule calendars. The City continues to promote Opala.org as a central resource for all things waste management-related. The words “Learn more at opala.org” are prominently featured in all of the City’s refuse and recycling educational materials, and Opala.org is imprinted into all of the newly distributed recycling carts. The bi-monthly e-newsletter, WasteLine, provides regular updates about programs, services and events, and links readers back to Opala.org for more information.

7.2 Continue supporting Partnership for the Environment to encourage and promote business source reduction and recycling.

The City continues to promote the Partnership for the Environment program through Opala.org. Through this program, more than a dozen businesses with established recycling and source reduction programs are available to serve as “peer consultants” to assist businesses interested in recycling and reducing waste. The Partnership businesses are featured stops on the City’s annual Tour de Trash, further enabling them to showcase their programs and share their expertise. City recycling staff is available to provide technical assistance to businesses interested in starting or improving recycling programs. Almost every

large commercial entity on Oahu is subject to mandatory recycling laws. A summary of the laws and Report on the Implementation of Mandatory Business Recycling is attached as Exhibit D and is available online at www.opala.org in the Resource Library, Technical Studies.

7.3 Continue to educate students on source reduction, recycling and solid waste management through Recycle Hawaii Teacher Kits, Recycling Teacher Partners, the Learning Center at www.opala.org, and by siting community recycling bins at schools.

Educating our youth about waste management, conservation and the importance of recycling is critical to the success of a sustainable waste management system. Today's kids are tomorrow's leaders, and today's kids can be instrumental in helping their families engage in recycling at home. For these reasons, the City continues to invest in educational resources which target students.

The Learning Center section of www.opala.org presents all of the City's programs and resources to assist teachers, schools and students, including the annual Discover Recycling event for teachers, student activity books, school recycling projects, field trips and school recycling education shows. Additionally, teachers can now more easily access resources online that were previously provided in teacher kits, including weblinks to classroom lesson plans, project ideas, graphics, PowerPoint presentations, and video. The Green Channel video can be used as a teaching tool in classrooms, easily streaming from the Opala.org website.

In 2010 the City began a partnership with the Honolulu Theatre for Youth (HTY) to provide recycling education to schools, which included the development and production of shows presented in their Tenney Theatre, traveling in-school recycling workshops/performances, and activity books based on the performance stories. This partnership has reached more than 20,000 students, teachers and families each year. The following is a listing of the successful products of the partnership:

- "Where Do Things Go?" performed during HTY's 2010-2011 Season of Science, included a story about Kevin who learned about recycling and how to sort it out from animated blue, green and gray carts, and contributed to the creation of the first coloring/activity book.
- "The Spirits of Recycling", performed during HTY's 2012-2013 Season of the Classics, Kevin learned about the importance of helping his family recycle and sort it out in an adaption of "A Christmas Carol" in which Kevin is visited by the ghosts of recycling past, present and future. The coloring/activity book of the same name was distributed to the more than 10,000 students, teachers and family in the audience, and at Christmas displays at both Honolulu and Kapolei Hales.
- The "Sort It Out" recycling workshop/performance is a one-hour interactive show which tours Oahu's schools, and is presented to the entire school assembly to educate students about recycling and encourage them to help

their families recycle at home. The show tours to 20 schools each year, and provides teachers with activity books for classroom follow-up lessons and take-home.

The City closed the community recycling drop-off bin program in June 2012, following a 70% decrease in public use due to the expansion of curbside recycling. With the closure of the drop-off bins, HI-5 redemptions centers have expanded the types of recyclable materials accepted to include non-HI-5 plastics, glass and metals, and paper. Schools continue to raise funds through HI-5 collection events supported by private recycling companies, and the City continues to offer promotional banners and collection containers to support these events. The state Department of Education is determining the feasibility of incorporating recycling collection services into refuse hauling service contracts for public schools.

7.4 Continue developing, producing, and distributing collateral materials to encourage proper solid waste management.

The City continues to develop new educational materials and strategies to encourage recycling and proper waste management on Oahu. All collateral materials can be viewed online at www.opala.org in the Media Library, including The Green Channel videos and print publications.

The Green Channel includes an archive of dozens of entertaining vignettes about recycling and intelligent waste management. Most recent videos include a creative series of recycling tips for the blue bin. View Green Channel videos on Oceanic 332 and online at Opala.org.

The “Recycling and Disposal Guide for Oahu” is an 8-page booklet providing an overview of City programs and services. Attached as Exhibit F and online at www.opala.org in the Media Library.

School activity books include two coloring/activity books geared for K-3, “Where Do Things Go?” and “The Spirits of Recycling”, and “The Opala IQ Book” for 5th grade and up. Attached as Exhibits G, H and I, and online at www.opala.org in the Media Library.

“Food: Too Good To Waste, *Cookbook and Smart Food Tips*” offers recipes for remaking leftovers and tips for smart shopping, smart storage and smart food preparation to help reduce food waste at home. Attached as Exhibit C and online at www.opala.org in the Media Library.

A new in-store education program was launched in partnership with Costco, and includes shelf signs advising shoppers about which products go in the blue bin and a large display where shoppers can pick up a handy recycling list (sticker), “What’s in Your Blue Bin”, and the “Recycling and Disposal Guide for Oahu”. Sticker attached as Exhibit J and online at www.opala.org in the Media Library.

7.5 Continue operating Environmental Concern Line.

The City continues to operate its Environmental Concern Line (768-3300), through which the public can report illegal dumping as well as other environmental concerns, and access information on proper disposal and recycling methods. Additionally, the Refuse/Recycling Public Information Line (768-3200) provides the public with information and direct connections to all refuse/recycling services and programs.

7.6 Continue planning and participating in special events to promote source reduction, recycling, and sound solid waste management.

The City continues to coordinate two major recycling education events annually, Tour de Trash and Discover Recycling. The City's Tour de Trash free bus tour series, now in its 15th year, offers an up-close look at how Oahu's waste is managed, and includes visits to recycling and waste processing operations, and takes participants behind the scenes at businesses with model recycling programs. The annual Discover Recycling Event, now in its 8th year, invites teachers and students to learn more about recycling, access resources for the classroom, and encourages sustainable recycling projects on Oahu school campuses. The event offers educators an opportunity to tour several recycling and waste processing facilities on Oahu, as well as "green" schools that have comprehensive recycling programs.

7.7 Continue to offer the public opportunities to provide input into recycling and solid waste management programs through public meetings, surveys, and other avenues.

The City receives ongoing public input on its programs through the Public Information Line at 768-3200, the Environmental Concern Line at 768-3300 and via email through the Opala.org website. Additionally, public surveys were conducted to evaluate the curbside recycling program and to assess the effectiveness of the Costco in-store education program. The results of the curbside recycling survey are included in the evaluation report, attached as Exhibit B and available online at www.opala.org in the Resource Library, Technical Studies.

7.8 Inform residents of changes to the solid waste management system through www.opala.org website, press releases, public service announcements, printed materials, and WasteLine newsletter.

The City's ongoing public outreach continues to include all of the above. The Opala.org website is the cornerstone of public education and information about all programs and services. All other collateral materials are designed to brand the website as the go-to source for questions and information about recycling/waste management on Oahu. The Green Channel provides interactive, on-demand video on Oceanic 332 and online at www.opala.org. New vignettes are produced regularly with an archive of dozens of feature videos. The WasteLine e-newsletter is distributed bi-monthly and posted/archived on the WasteLine blog

site. Print materials, including the general guide to refuse and recycling, the handy recycling list sticker, the food waste prevention guide, and the school activity books, are distributed through in-store displays, City displays, school recycling shows, and events.

8. Transfer Stations

8.1 Improve Keehi Station operations including modifying operations, conducting cost benefit analysis, and assessing night shift to improve traffic.

Planning is underway to improve operations by converting the Keehi Transfer Station to an open-top trailer load-out system. The plan includes construction of two open top-trailer load-out bays plus a knuckleboom crane and full length truck scale. The first load-out bay is planned for FY15 with the second bay to be constructed in FY16 to complete the conversion. The improvements will provide a more efficient trailer loading system that will increase productivity and minimize transfer trailer leaks. Repairs to the transfer station tipping floor are scheduled for calendar year 2014. A cost benefit analysis and assessment of a night shift operation are being considered, however, no action has been taken to date.

8.2 Update structure and equipment at Kapaa Station.

Notwithstanding on-going periodic maintenance to the transfer station, no major modifications have been made to the structure. Currently, repairs to the transfer station canopy, the tipping pit floor louvers and access road are in progress and are scheduled to be completed in 2014. Future repairs will include replacing the metal lining on the tipping pit floor push wall, improvements to the drainage system and repairing the pit floor. Transfer station equipment has undergone routine repair/maintenance and replacement.

8.3 Expand capacity and upgrade handling of refuse and recyclables at Kawaihoa Station.

The plan to modify the Kawaihoa Transfer Station by adding a new green waste load-out bay and administrative office building has been delayed due a reassessment of the current operations at Kawaihoa Transfer Station which may allow for all greenwaste from the Northshore area to be delivered directly to a future greenwaste facility in nearby Waialua.

9. Waste to Energy

9.1 Improve air pollution control system at H-POWER.

In April 2009, to comply with the Clean Air Act Section 129 and newly promulgated air emissions standards for Large Municipal Waste Combustors, H-POWER completed an upgrade from the existing electrostatic precipitators to reverse air fabric filter baghouses. The new baghouses were chosen as the Maximum Achievable Control Technology (MACT) to meet the new emissions guidelines and they have been performing as expected allowing the facility to meet the new standards.

9.2 Purchase H-POWER facility.

H-POWER was repurchased in 2008 and is now wholly City-owned.

9.3 Add 300,000 tons of waste-to-energy capacity.

The H-POWER Expansion Project was accepted by the City on August 4, 2012, and increases capacity by 900 tons per day or 300,000 tons per year. The project also includes a new shear shredder which allows for the acceptance of bulky waste.

10. Landfill Disposal

10.1 Continue to dispose of MSW not recycled or converted to energy at H-POWER at the landfill.

Wastewater sludge, medical waste and auto shredder residue will be diverted to H-POWER once necessary systems are installed and regulatory requirements are satisfied.

10.2 Extend operating permit for the landfill.

The existing permit is due to expire June 3, 2015. A permit renewal application is scheduled to be submitted to DOH in March 2014.

10.3 Expand the landfill.

The landfill expansion was approved in June 2010. No further expansion is planned for WGSL.

10.4 Initiate siting process for new landfill.

The City's siting process for a new landfill, to supplement and/or replace WGSL beyond its remaining capacity, began in November 2010 with the formation of the Mayor's Advisory Committee on Landfill Site Selection. The first meeting of the committee was held on January 20, 2011. The committee conducted a total of 10 meetings over a 16-month period and a final report was submitted to then Mayor Carlisle in September 2012. During its meetings, the committee felt it important to investigate all areas of the island regardless of past recommendations (such as sites above the Underground Injection Control Line, areas west of Makakilio, sites of smaller acreage and military sites.) to allow more sites to be considered. The City is currently reviewing the 11 sites selected in the report and preparing to conduct further feasibility and engineering evaluations. A copy of the committee's final report, "The Report of the Mayor's Advisory Committee on Landfill Site Selection (MACLSS), September 2012", is attached as Exhibit K and is available online at www.opala.org in the Resource Library, Technical Studies.

10.5 Issue IFB for trans-shipment of 100,000 tons of MSW per year.

In January 2008, the City issued an Invitation-For-Bid (IFB) to provide the receiving, baling, shipping, offloading, transportation and disposal of MSW to a mainland landfill facility for a thirty-six (36) month period with the guarantee of delivering 100,000 tons per year to the contractor.

10.6 If proposals received to trans-ship 100,000 tons of MSW per year are cost-effective, trans-ship materials incompatible with landfill disposal.

In September 2009, the City and County of Honolulu and Hawaiian Waste System, LLC (HWS) entered into Master Agreement MA-ENV-1000015 for the trans-shipment of waste.

By June 2012, the City and County of Honolulu amended MA-ENV-1000015 because HWS failed to obtain the proper permits to ship baled MSW through the Columbia River destined for the Roosevelt Landfill, Klickitat County, Washington. The revised contract removed the interim waste shipping component and provided for the local processing and disposal of the 20,000 tons of MSW that had already been provided to and stored by HWS.

11. Market Development

11.1 Work with other Hawaii Counties to advocate for State initiatives to extend producer responsibility.

The City worked collaboratively with other counties and the state to establish the successful HI-5 deposit beverage container program, advance disposal fee for non-deposit glass, and take-back legislation for tires and auto batteries, and has continued this collaboration to develop extended manufacturer responsibility legislation for electronic waste (e-waste). The Hawaii Electronic Waste and Television Recycling and Recovery Act took effect in 2010 for computers and expanded to TVs in 2011. The state and counties continue to work on measures to improve the law's effectiveness.

11.2 Enhance City procurement policies to purchase more products with recycled content.

The City has established procurement policy by Ordinance to support purchase of recycled content paper and recycled content in asphalt.

- The City is required to purchase recycled paper products to support the recycled paper market. Everything from toilet tissue and paper towels to copier and computer paper is purchased with recycled content. (ROH, Section 1-12.3)
- The City is required to use glasphalt, if available, in city road construction and paving projects. Glasphalt is defined as asphaltic concrete made from crushed glass as a partial substitute for aggregate in the mix. (ROH, Section 9-8.2)

All of the Refuse Division's educational material is printed on 100% post-consumer recycled content paper. Additionally, all of the educational materials to promote recycling, including pens, pencils, tote bags and books, are made from recycled content materials, specifically those materials recovered in local recycling programs. The City complies with the State Procurement Code, which gives preference to the purchase of products made from recycled materials (HRS Sections 342G-41 & 103D-1005).

11.3 Work with large retailers to encourage the backhauling of recyclables such as plastic film and corrugated cardboard.

Many of the large retailers on Oahu continue to backhaul their recyclables to the mainland for processing. The City has seen this trend increase in recent years, and monitors activity when collecting data through the annual recycling survey.

11.4 Work with local concrete paving companies to increase the use of recovered concrete as aggregate in a new Portland cement concrete, or as aggregate in road sub base.

Local concrete paving companies continue to reuse recovered concrete. The City tracks the reuse of concrete and asphalt in new road construction projects and has observed significant increases in recent years. In 2012, local concrete and paving companies reused a total of approximately 70,000 tons of concrete as aggregate in road repair and new road construction, up from 32,000 tons in 2009.

Exhibits

- Exhibit A: Curbside Recycling Pilot Program Evaluation (June 2008)
- Exhibit B: Curbside Recycling Program Evaluation and Strategic Planning (November 2011)
- Exhibit C: Food: Too Good to Waste Cookbook and Guide
- Exhibit D: Report on Implementation of Mandatory Business Recycling (July 2013)
- Exhibit E: Report on City Agency Mandatory Recycling (July 2012)
- Exhibit F: Recycling and Disposal Guide for Oahu
- Exhibit G: Where Do Things Go?
- Exhibit H: The Spirits of Recycling
- Exhibit I: The Opala IQ Book
- Exhibit J: What's In Your Blue Bin?
- Exhibit K: The Report of the Mayor's Advisory Committee on Landfill Site Selection (MACLSS), September 2012

Note: Exhibits C, F, G, H, I and J are placed in the pocket insert at the end of this report. If you are reviewing this report in electronic format, these exhibits are available online at www.opala.org in the Media Library.

Exhibit A

Curbside Recycling Pilot Program Evaluation (June 2008)

The City's pilot evaluation report is attached and available online at www.opala.org in the Resource Library, Technical Studies.

Exhibit B

Curbside Recycling Program Evaluation and Strategic Planning (November 2011)

The Curbside Recycling Program Evaluation and Strategic Planning report is attached and available online at www.opala.org in the Resource Library, Technical Studies.

Exhibit C

“Food: Too Good to Waste” Cookbook and Guide

The “Food Too Good To Waste” book is placed in the pocket insert and is available in print and online at www.opala.org in the Media Library, linked on the Food Waste Prevention webpage.

Exhibit D

Report on Implementation of Mandatory Business Recycling (July 2013)

The Report on Implementation of Mandatory Business Recycling is attached and available online at www.opala.org in the Resource Library, Technical Studies.

Exhibit E

Report on City Agency Mandatory Recycling (July 2012)

The Report on City Agency Mandatory Recycling is attached and available online at www.opala.org in the Resource Library, Technical Studies.

Exhibit F

Recycling and Disposal Guide for Oahu

The Recycling and Disposal Guide for Oahu is placed in the pocket insert of the report and available online at www.opala.org in the Media Library.

Exhibit G

Where Do Things Go?

The “Where Do Things Go?” activity coloring book is placed in the pocket insert of the report and available online at www.opala.org in the Media Library.

Exhibit H:

The Spirits of Recycling

The “Spirits of Recycling” activity coloring book is placed in the pocket insert of the report and available online at www.opala.org in the Media Library.

Exhibit I:

The Opala IQ Book

The “The Opala IQ Book” activity book is placed in the pocket insert of the report and available online at www.opala.org in the Media Library.

Exhibit J:

What's In Your Blue Bin?

The “What's In Your Blue Bin?” sticker is placed in the pocket insert of the report and available online at www.opala.org in the Media Library.

Exhibit K:

The Report of the Mayor's Advisory Committee on Landfill Site Selection (MACLSS), September 2012

The Report of the Mayor's Advisory Committee on Landfill Site Selection (MACLSS) is attached and available online at www.opala.org in the Resource Library, Technical Studies.

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- City and County of Honolulu, Integrated Solid Waste Management Plan, October 2008