GLOBAL GREEN USA®

Piloting Food Scrap Recovery in Los Angeles

A Case Study of the San Fernando Building

Global Green's Food Waste Recovery Series

contents

Project Summary

Global Green USA is working to build pilots and momentum around residential food scrap collection programs on both the East and West Coasts, utilizing targeted pilot projects as a means to be a "first mover" in new cities and neighborhoods, as well as using these pilots as a broader educational tool.

Landfilling or burning recoverable wastes costs cities and businesses millions of dollars each year and releases potent greenhouse gases. With the support and participation of a variety of corporate and philanthropic partners, Global Green's Coalition for Resource Recovery (CoRR) helps to develop, implement, and improve systems by which these wastes can be consistently and economically recovered, bringing valuable material back onto the market and creating a net greenhouse gas benefit. These partners have the opportunity to advance their sustainability and waste diversion performance, better serving businesses and residents seeking to lead greener lives.

To achieve the goal of reducing and diverting food scraps, Global Green USA is focusing on one of the most difficult areas for program implementation – multi-family dwellings (MFDs). MFDs pose unique challenges due to the fact that the tenants do not have a direct incentive to reduce waste generated, especially since waste collection services are managed and paid for by the property manager. Residents commonly dispose of their trash in either one of two drop-off scenarios: a trash chute room or by taking it directly to a shared dumpster. Education and outreach programs rely instead on motivation by tenants to be environmentally responsible, as well as help their building increase their waste diversion and, where applicable, reduce waste-related costs overall.

Global Green is working to build pilots and momentum around residential food scrap collection programs on both the East and West Coasts, utilizing targeted pilot projects as a means to be a "first mover" in new cities and neighborhoods, as well as using these pilots as a broader educational tool. Key groups that we seek to educate, engage, and share lessons learned are city agencies, residents, and property management companies with large portfolios that could potentially offer composting to their tenants in multiple locations and cities. In coordination with CoRR partners, Global Green has rolled out "first-mover" food scrap collection programs for large apartment complexes in Los Angeles and Albany, California.

In partnership with Athens Services, the largest waste hauler in LA County, and EcoSafe Zero Waste, a provider of diversion programs and tools including compostable bags, sorting containers, and educational outreach materials, CoRR and its partners used a pilot approach for a targeted MFD, the San Fernando building located in the Old Bank District of Los Angeles, California. In order to determine potential diversion outcomes from common tenant outreach and engagement strategies, this pilot scenario included one-on-one outreach, educational materials, and the distribution of tools such as kitchen pails, compostable plastic bags, bag dispensers, and signage.

From these strategies, we determined:

- Overall diversion rates for the building selected (the total material, by weight, being recycled or composted)
- Volume and contamination of the organics stream
- Recommendations to increase organics diversion

Based on the success of this project, Global Green USA is seeking to expand the pilot to additional buildings in Los Angeles, and evaluate the success of a wider variety of resident engagement strategies.

For more information on this pilot, please visit: www.thecorr.org.

For information regarding the waste hauler and composting facility used, please visit: www.athensservices.com.

For information regarding the utilized tools, please visit: www.ecosafezerowaste.com.

Key Findings

An Understanding of the Operational Structure of the Building Maintenance is Key

For a building such as the San Fernando Building in which the maintenance plays a significant role in implementing the program, it is crucial that the logistics are integrated into their daily operational procedures. At the San Fernando building, the maintenance duties are subcontracted and over the course of the pilot the maintenance personnel changed four times as well as the office personnel once; this sometimes resulted in an information gap due to the lack of proper training on the organics pilot. The program must be tailored to fit with the building's maintenance and existing communications systems. For tracking and accountability, program outreach emails, provided to the property management who forwards the communication to both tenants and staff, should ideally be sent as a blind carbon copy to the program representative(s) (and if necessary other members of the implementation team). Property management should also communicate with the designated program representative(s) (which could include the waste hauler and/or equipment provider) on material availability or concerns and any maintenance staff turnover.

Establish Agreed-Upon Expectations for Program

A written agreement between the building management, hauler, and equipment provider outlining the relative expectations of the program and all involved parties could prove beneficial. This agreement does not need to be contractually binding, however it is helpful to ensure there is mutual understanding of expectations and roles.

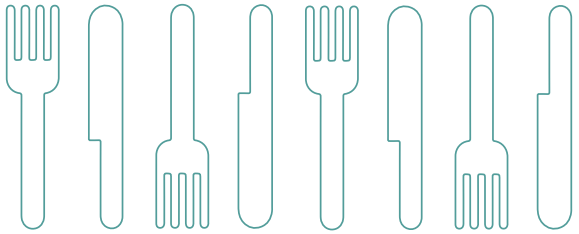
In the duration of the pilot, total diversion doubled from its 34% recovered materials before the addition of the organics recycling program to 68% diversion of recoverable materials just 18 months later.

Timing is Everything

The program should be rolled out at a time of relative stability for the building. Because outreach to tenants and training of maintenance staff is resource-intensive, these activities should take place at a point when it is expected that tenant and staff turnover will be low.

Providing the Organics Recovery System Increased Overall Diversion by 34%

This is a significant finding, given the newness of the program to not only the San Fernando Building, but also the Los Angeles area as a whole. In the duration of the pilot, total diversion doubled from its 34% recovered materials before the addition of the organics recycling program to 68% diversion of recoverable materials just 18 months later. With an average total of 219 pounds of food waste diverted per week,[1] or 3.08 pounds per week per apartment unit,[2] the increased diversion reduced the building's annual greenhouse gas emissions by an estimated 5 tons/yr.[3]



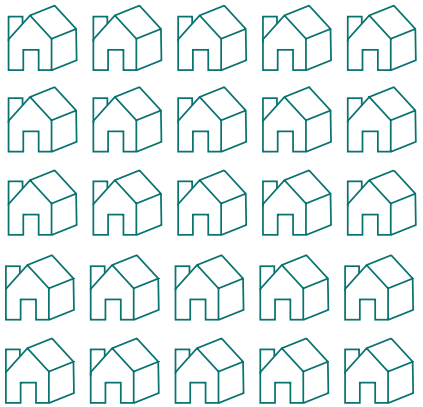
With an average total of 219 pounds of food waste diverted per week, or 3.08 pounds per week per apartment unit, the increased diversion reduced the building's annual greenhouse gas emissions by an estimated 5 tons/yr.

Resident Satisfaction with the Program and Equipment was High

Overall, tenants were very happy that the program was available; 44% (of those who responded to the survey) either had no negative comments or specifically wrote that they loved the program as is. Two tenants indicated an interest in a bigger kitchen pail or a bigger bag, and others requested additional information about the program, indicating an interest in using the system.

The Opportunity

In early 2014, the City of Los Angeles began the process of instituting a franchise zone system for waste hauling of commercial accounts, a system that will require haulers to provide food waste collection. The City released a Request for Proposal that separates the city into eleven franchise zones, and received submissions from waste haulers on October 29, 2014. The city is set to announce and award contracts by the middle of 2016 and begin the program by 2017.[4] The ultimate goal of diverting 90% of the city's trash from landfills is expected to be reached by 2025.[5] Since as much as 45.1% of the commercial waste is food waste and 25.5% of the residential waste is food waste, food scrap recovery is necessary to meet this goal.[6]



Assessing and refining successful food scrap reduction and recovery programs for MFDs is more important now than ever before. According to the US Census Bureau, over 42% of Los Angeles County's housing units are in MFDs, totaling approximately 1.45 million units of housing and over 4.3 million residents.[7] As the county's population continues to grow and demand for multi-family remains strong, it is expected that multi-family housing will make up a significant portion of future housing stock given current growth trends in multi-family housing stock.[8]

Multi-family buildings face a variety of unique challenges concerning implementation of food scrap recovery, these challenges include: 1) difficulty providing a direct financial reward to tenants for diverting waste (as a building's waste is typically paid for by the building managers and waste production typically cannot be tracked to individual households), 2) perceived inconvenience of food scrap recovery in most high-rise structures (unless floor-by-floor collection areas or chutes were provided in the original design), 3) space constraints that limit the addition of new bins, 4) concerns about pest control given the large quantities of food scraps generated and concentrated in a small physical area, and 5) issues with maintenance staff training (especially in cases where subcontracted) and high turnover rate.

An estimated 148,952 tons of organic waste were disposed of from multi-family buildings in the city of Los Angeles in 2002, which given population increases, is likely a very conservative estimate of how much was generated in 2015.

95.2% of food scraps are landfilled across the U.S. each year resulting in greenhouse emissions equivalent to 9 coal-fired poewer plants.

Reducing the levels of CO2 in the atmosphere by even 25% through source reduction and diversion would yield an emissions reduction equivalent to planting over 835,000 trees.

In order to reduce state carbon emissions, the California legislature passed AB-341, a statewide goal of 75% recycling, composting, or source reduction of solid waste by 2020.

At the same time, access to a concentrated volume of organic waste greater than that of individual family homes creates a unique opportunity to reduce landfilled waste and achieve greenhouse gas reduction goals. Increasing investment by CalRecycle and others in new composting infrastructure, as well as growing demand for soil amendments by farmers, will lead to new recovery options for valuable nutrients in unwanted food scraps, were they collected cleanly and in volume.

An estimated 148,952 tons of organic waste were disposed of from multi-family buildings in the City of Los Angeles in 2002,[9] which, given population increases, is likely a very conservative estimate of how much was generated in 2015. However, even assuming this amount remained unchanged, the disposal of this quantity of food scraps into the landfill releases the equivalent of 128,920 tons of CO2 equivalent into the atmosphere.[10] Reducing this by even 25% through source reduction and diversion would yield an emissions reduction the equivalent of planting over 835,000 trees.[11]

Resource Recovery in Los Angeles

95.2% of food scraps are landfilled across the US each year,[12] resulting in greenhouse gas emissions equivalent to 9 coal-fired power plants.[13] In order to reduce state carbon emissions, the California legislature passed AB-341, a statewide goal of 75% recycling, composting, or source reduction of solid waste by 2020.[14] This assembly bill is a statewide approach to decreasing California's reliance on landfills, meaning that all jurisdictions in the state must explore implementation of commercial and residential food scrap recovery programs to achieve this goal.

In the past several years, there has also been significant legislative activity in the State of California to reduce landfilling of organics (including food scraps) for the purposes of reducing carbon emissions. A series of bills and subsequent initiatives by the state recycling agency, CalRecycle and the California Air Resources Board have set standards and allocated resources to both limit landfilling of organics and increase investment in facilities to recover organics for digestion and/or composting. These efforts have increased the urgency surrounding the implementation of programs to recover food scraps and other organics across the state.

For many cities, the most difficult aspect of implementing these programs is working with multi-family dwellings, due in part to the lack of financial incentives for individual apartment units to participate. Because all units share one food waste bin and none of the waste is traceable to any one household, any savings from an overall increase in diversion is experienced by the building as a whole, not by individuals or households. Vigorous outreach and education are therefore required to encourage residents to divert their waste, with assistance from the property management, who stands to gain the most by reducing or diverting waste.

860,000

If fully implemented, an estimated 860,000 tons of food scraps would be diverted from Los Angeles landfills annually.

860,000

Avoiding methane generated by food waste by diverting Los Angeles' food scraps to composting facilities will reduce emissions by an estimated 860,00 tons of GHG equivalent.

34

According to the Intergovernmental Panel on Climate Change, methane has a global warming potential 34 times greater than that of carbon dioxide over 100 years.

86

In a 20-year time frame, a single molecule of methane has the global warming potential of 86 molecules of carbon dioxide.

Global Green USA is working with city agencies, property managers, and waste haulers to undertake in-depth pilots for resource recovery systems at MFDs, with a particular focus on the waste streams that continue to be sent to landfill, but could potentially be diverted using existing technologies and systems.

Global Green USA's role in these pilots is to:

- Convene the key stakeholders
- Work with them to plan the project steps and timeline
- Assist with implementation
- Document and verify environmental outcomes
- Promote the project and its success to those who could duplicate the project, thus increasing the project's impact beyond the site of the pilot itself

In Los Angeles to date, these pilots have focused on food scrap recovery and were undertaken in partnership with the waste hauler Athens Services and EcoSafe Zero Waste, a provider of diversion programs and tools including sorting bins, compostable bags, compostable bag dispensers, and educational outreach materials for residential and commercial food scrap recovery. These pilots took place at two multi-family buildings in Los Angeles, and have since been completed.

Legacy Impact of Food Waste Diversion

If fully implemented, an estimated 860,000 tons of food scraps would be diverted from Los Angeles landfills annually.[15][16][17] Since food waste generates methane when it is buried in landfills, avoiding this by diverting Los Angeles' food scraps to composting facilities instead will reduce methane emissions by an anticipated 860,000 tons of GHG equivalent.[18] According to the Intergovernmental Panel on Climate Change, methane has a global warming potential of 34 times greater than that of carbon dioxide over 100 years.[19] Therefore, methane emissions from food waste in Los Angeles will continue to have immense impacts over time unless mitigated.

Unlike carbon dioxide that can remain in the atmosphere for hundreds or thousands of years, methane has a much shorter atmospheric lifetime, but one that is significantly more impactful.[20] In a 20-year time frame, a single molecule of methane has the global warming potential of 86 molecules of carbon dioxide.[21] Methane therefore constitutes a highly concentrated and severe threat to immediate global temperatures.

Global Green USA is working with city agencies, property managers, and waste haulers to undertake in-depth pilots for resource recovery systems at MFDs.

Background

Athens Services, EcoSafe Zero Waste, and The San Fernando Building's Food Scrap Recovery System

Athens Services is the largest waste hauler in Los Angeles County and services hundreds of commercial and residential customers. Athens Services is equipped to provide a two-bin system of organics and mixed dry waste. Organics are transported to their Materials Recovery Facility (MRF) in the City of Industry to have contaminants removed. The material is then consolidated and brought to an aerobic windrow facility in Victorville, CA that is also operated by Athens. The mixed dry wastes are brought to one of their two MRFs to be sorted into commodities, baled, and sold for reprocessing.

Athens selected two of their customers, the San Fernando Building in the Old Bank District of Downtown Los Angeles and a complex on Griffin Ave in Lincoln Heights, to be the first buildings to participate in their MFD food scrap recovery pilot program. These sites were selected, because they were on existing commercial organics routes and the management had expressed enthusiasm for the program. Athens also joined Global Green USA's Coalition for Resource Recovery (CoRR) and formed a partnership with fellow CoRR member EcoSafe Zero Waste to undertake the project.

EcoSafe Zero Waste is a company that specializes in the development and implementation of patent pending organics diversion programs that include multi-family buildings, commercial food service establishments, schools, and institutions. EcoSafe manufactures certified compostable liners along with compost bag dispensers and sorting containers, which allow tenants and other users to have consistent access to compostable bags. Within EcoSafe's model, property owners, managers, waste haulers, and cities are encouraged to purchase the kitchen pails, compostable bags, and the bag dispensers, which increases participation by not requiring the tenants or other users to purchase materials independently. For this pilot, all materials, signage, bin collection, containers, and tools were provided at no cost.

Organics
Fruits and vegetables
Meat, poultry and fish
Bones
Fats and oils
Bread and grains
Flowers
Shredded paper
Cardboard egg cartons
Coffee filters
Tea bags
Paper towels and napkins
Soiled paper products
Certified composable bags

Dried Mixed Waste
All recyclables and landfill items
Exludes household hazardous waste

Household Hazardous Waste Products
Cleaning products
Indoor pesticides
Automotive products
Workshop/painting supplies
Paint
Electronics
Other flammable products
Batteries
Medication
And more (signage example included in the Appendix)

Figure 1. (left) The following chart details acceptable materials for each bin, according to Athens Services' system.

Figure 2. (above) The following chart details materials that were to be sent to the L.A. County S.A.F.E. Collection Center.

> Athens created uniform signage for all sorting rooms in order to keep materials clean from household hazardous waste, and to encourage the continued safe disposal of e-waste.

Athens provided signage indicating which materials were acceptable in each bin, and this signage was adapted throughout the pilot to better reflect what was acceptable and what was not. The following chart details acceptable materials for each bin, according to Athens Services' system.

Additionally, as the pilot progressed, Athens recognized the need for uniform signage in every sorting room. Prior to the pilot, there was random signage for cardboard box placement and three of the seven sorting rooms included old information on proper disposal of hazardous waste. Athens deployed a household hazardous waste and e-waste outreach, which included signage encouraging tenants to take their household hazardous waste to a nearby L.A. County S.A.F.E. Collection Center. Athens created uniform signage for all sorting rooms in order to keep materials clean from household hazardous waste, and to encourage the continued safe disposal of e-waste.

Through emails and signage in the trash chute rooms, residents were encouraged to take the materials in Figure 2. to L.A. County S.A.F.E. Collection Center.

Pilot Methodology

The San Fernando Building has 71 apartment units over 8 floors. Each floor is equipped with a sizeable trash chute room, as part of the pilot program these rooms are refferef to as “sorting rooms.”

Site Selection

Athens Services assessed their customer base, and chose sites based on their proximity to existing commercial organics collection routes and the management’s expressed enthusiasm for the program. The program at the first building selected, located in the Lincoln Heights area of Los Angeles, has been placed on hold for now due to unforeseen renovations and tenant turnover. This report will focus primarily on the outcomes from the San Fernando Building, located in the Old Bank District of Downtown LA.

The San Fernando Building has 71 apartment units over 8 floors. Each floor is equipped with a sizeable trash chute room, as part of the pilot program and are referred to as “sorting rooms.” Athens Services provides the building with a mixed waste processing bin and separates recycling and landfill at an offsite Materials Recovery Facility. Tenants use the sorting room chute for both their landfill and recycling. They are advised to place all cardboard to the side and not down the chute, which is then collected by maintenance. The Sorting Rooms are where the compostable bag dispenser and the green 23-gallon organics containers were placed for the organics program.

It is important to note that there were no major renovations, dramatic changes in rent or tenant turnover, or other significant confounding factors occurring at the time that we launched the program at the San Fernando Building.

Tenant Demographics

The Property Manager informed us that all the tenants speak fluent English and tenant outreach in additional languages was not necessary for this location. Downtown LA reflects the third highest rental market in LA County, behind Santa Monica and Beverly Hills, with the average one bedroom apartment renting for $2400/month. The San Fernando Building rates reflect the socioeconomic requirements of Downtown LA; on average the units rent for $2.50 per sq ft. and tenant medium income is $60,000-$80,000 per year.[22]

Initial Outreach

Global Green, Athens Services, and EcoSafe were able to advertise the approach of the program in several ways. First, flyers were placed in the mailboxes of all tenants, as well as in high-traffic areas, including the lobby, outside the elevator, and in the mailroom. Second, an email was sent to all tenants informing them of the program and inviting their questions. Management informed us there were several responses to this email from tenants, all of whom indicated that they were pleased they would be able to compost.

Program Launch

The program materials consisted of equipment for tenants and instructions. In addition to the central organics dumpster (which was labeled and painted green), the equipment provided included:

- Tenants received a small kitchen pail, called a kitchen “caddy,” and a few starter compostable plastic bags for use in each apartment to contain food scraps. Each caddy included an acceptable materials sticker on the lid and Athens contact information label.
- A compostable plastic bag dispenser with a roll of 325 bags was placed in the sorting room on each floor.
- A 23-gallon green organics container was placed in each sorting room, into which tenants could empty their kitchen caddy compost bags.
- Signage was placed above the organics container and trash/recycle chute.
- Informational materials about how to use the program effectively was included with the caddies and emailed to tenants.

Athens provided the building with a central organics, 3-yard dumpster in the alleyway to be used solely by the maintenance and property management. The container was painted green, and “Organics Only” signage was attached (eventually a lock was added to the bin to protect against contamination and

misuse). The program was designed to be a wet/dry collection system. The mixed waste processing container was to include only the dry materials from recycling and landfill. The organics dumpster and containers were used to capture the wet putrescible materials like plant matter, food scraps, and soiled paper.

On Saturday October 4, 2014 from 11:00am to 3:00pm Global Green, Athens Services, and EcoSafe Zero Waste kicked off the program by setting up and manning a table to educate the tenants on the new program. The outreach table was positioned in the front entranceway in order to effectively reach as many tenants as possible. Residents were given their kitchen caddy, along with a starter compostable liner and program instructions. Tenants were directed to deposit their full compost bag of food scraps into a central green container located in each Sorting Room of the building. One green, 23-gallon organics container was placed in each Sorting Room (total of 7 rooms), along with a compostable bag dispenser for the tenants.

Shortly before the kickoff event, Athens Services and EcoSafe staff hosted a training event for the maintenance crew at the building, during which they showed them how the bag dispensers and organics containers would be utilized, how to operate the system, and where the central 3-yard organics bin was placed for pickup by Athens Services' organics trucks.

Following the initial event, Athens Services and EcoSafe staff conducted two more tabling sessions on Monday and Tuesday of the same week (from 11am-3pm).

Site Visits

To monitor diversion, monthly site visits were undertaken by EcoSafe and Athens Services staff over the course of the project. To determine program success, consistent monthly site checks were conducted and recorded for the first six months and continued periodically throughout the pilot. A checklist was created and utilized to assess the overall trends of the program. These site visits illustrated the current state of the pilot, which helped give guidance to continuous program improvements.

Each Sorting Room was evaluated on the following aspects:

- Proper signage
- Containers in-place
- Dispenser in-place
- Compost bags in the dispenser
- Odors (1-10, 10 being the worst)
- Contamination (1-10, 10 being worst)
- Overall cleanliness (1-10, 10 being the worst)

Figure 3. (left) Organics and mixed waste dumpters at San Fernando Building

Figure 4. (left) Outreach table set up in San Fernando Building entranceway

Figure 5. (left) Athens performing training with maintenance staff

Figure 6. (left) Example of a sorting room set-up in the San Fernando Building

- Miscellaneous notes

The EcoSafe and Athens Services staff undertook the site visits, going into each Sorting Room to assess the above evaluation aspects; during some of these visits, they also met with the maintenance personnel to review the program and conduct training when necessary.

Baseline Conditions

In order to assess the success of the food scrap recovery program, a baseline waste composition must be established to compare with the composition measured after implementation. A pre-implementation waste audit was not performed, but is

	November 2014	December 2014	February 2015	March 2015	April 2015
Contamination Rate	< 5%	< 5%	< 1%	< 1%	< 1%
Contaminants	Few poly bags used for food waste	1 poly bag used for food waste	3 poly bags used for food waste	1 poly bag used for food waste, 1 aluminum can	1 poly bag used for food waste, 1 aluminum can
Large, Unnecessary Items	None	None	None	None	None
Odor Level (1 to 10)	1 to 6	1 to 4	1 to 2	1 to 3	1
Recommendations	Clear signage needed in all refuse rooms; Use smaller bins for food waste due to low volume	Clear signage needed in all refuse rooms; Use smaller bins for food waste due to low volume	Clear signage needed in all refuse rooms	–	–
Other Notes	Floor 5 dispenser was out of bags	New employee was placing organics bags into landfill dumpster. Floor 5 dispenser was out of bags	Placed two extra EcoCaddies for possible surplus food waste	Extra EcoCaddies were full due to high participation; May need larger containers	–

Figure 7. Recorded site visits from November 2014 to April 2015, excluding January 2015. Each floor was evaluated separately; in the table below the findings are combined per month.

assumed based on the total amount of waste calculated from the first audit and information provided by Athens regarding their recovery process. The baseline condition uses a single stream scenario in which all waste is sent in one bin to Athens' Mixed Waste, Materials Recovery Facility. The City of Los Angeles certified thar the diversion rate for this facility was 25.17% in 2014, 26.42% in 2015, and 27.17% in 2016,[23] which is calculated from the aggregate of both the recyclables and landfill materials received. Under this scenario, 0% of the food waste and other organic material was recovered for this account; only recyclables were separated at the MRF under the baseline. Only after implementation of the food scrap recovery program was organic material recovered from this account.

Site Visits: Contamination Rates and Obervations

In Figure 7 above, we can see the contamination rate and odor level decreased with time as residents adopted the food waste collection procedures, and according to property management, participation rates steadily increased as well. Very few polyethylene plastic bags (or "poly" as referenced above) were used for food scrap collection and found in the 32-gallon containers.

Several key findings came from these site visits that allowed the program to improve during the pilot period:

- The maintenance crew determined that the 23-gallon organics containers needed bags and lids, as well as more frequent emptying, to help alleviate odors. Lids were provided and the organics containers were emptied at least twice a week.
- Due to lower-than-expected volumes of organic waste, the 23-gallon organics containers were replaced on two floors with 6-gallon EcoSafe EcoCaddies as an experiment.
- Residents notified the office when the organics containers were not inside the sorting room during the maintenance cleaning process. This highlighted that residents want the program and are concerned when any of the program components are not in place.
- The Sorting Room on the 5th floor was at one point vandalized – the bag dispenser was emptied, the organics container was overturned, a kitchen caddy was in the room, and all the signage had been removed. In response, the management sent an email to all residents of the 5th floor indicating the importance of the program and how much the management values their participation. The room was not vandalized again after the email was distributed. Soon after the email, an unidentified tenant placed a stuffed toy bear on top of the compost bag dispenser; we took this as positive feedback and a notion of program appreciation.
- The maintenance crew changed out the bags in the organics containers at different rates, which is a reflection of varying participation rates on each floor.
- Contamination of the organics containers was consistently low and decreased over time.
- Monthly site visits showed there were no large, unnecessary items placed within the organics bin.
- The property manager stated that several new tenants cited the added amenity of a food scrap composting program as a reason they chose to move into the Old Bank Building.
- The San Fernando Building contracts out to a maintenance company and the assigned maintenance

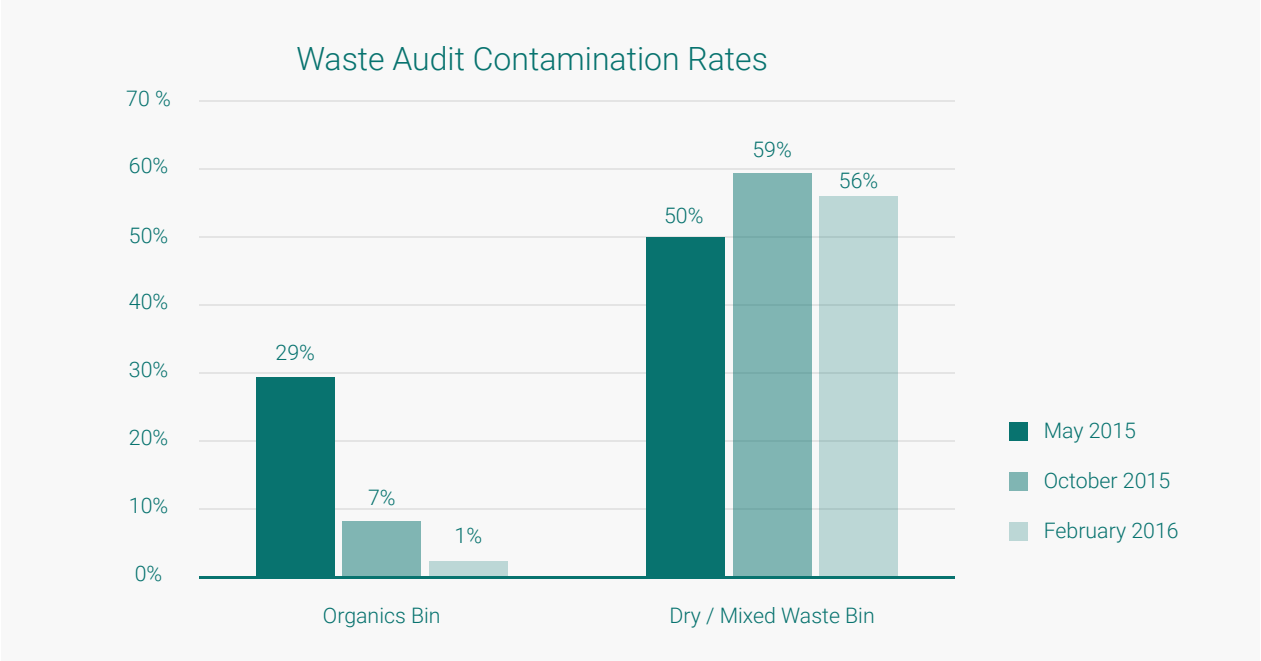


Figure 8. Recorded site visits from November 2014 to April 2015, excluding January 2015. Each floor was evaluated separately; in the table below the findings are combined per month.

personnel changed several times over the course of the program, including soon after the original, on-site training was conducted. It was discovered that the building management did not personally train the maintenance staff, but instead the assigned company provided all training based off a checklist of duties completed by the building manager. Initially, Athens Services was not made aware of each maintenance turnover and would conduct on-site maintenance training after the fact. It was also found that information about the program was not included in the checklist of duties provided to maintenance personnel, including the lock combination for the 3-yard bin. For example, following the first waste audit it was determined that the two restaurants on the first floor of the building were using the MFD organics bin; a lock was added and a key was provided to management. Soon after, there was a change in maintenance personnel and the new staff did not have access to the key. This was remedied, but a few weeks later it was concluded that the original bin key had been misplaced and switched with another key, as it no longer worked (Athens uses a universal key for all of their locks). To avoid any further issues, Athens changed the lock to a combination. During site visits, Athens and EcoSafe checked in with the maintenance crew to assess their situation and retrain when necessary; during a visit it was ascertained that when new maintenance personnel joined the effort, they were in some cases not provided the combination code. As a result, it was suggested to the building manager that the combination be added to the checklist of duties. These lock issues resulted in organics material being wrongly placed in the mixed materials bins, but the EcoSafe and Athens teams were able to rectify these issues after discovering them during the site visits.

It should be noted that most of the program difficulties were the result of the maintenance staff not having all necessary information, training, and tools. Residential contamination was relatively low, which is one of the measures of success typically monitored in residential composting programs.

Waste Audit Contamination Rates: May 2015, October 2015, and February 2016

The contamination rate decreased for the organics bin, likely a result of targeted tenant outreach to known contaminators, maintenance training, and restricting the use of the organics dumpster from the first floor restaurants. However, the contamination rate for the mixed waste went up in the October audit– an estimated 25.8% of material destined for landfill in the mixed bin was food waste, meaning that participation in the organics program was decreasing and in need of tenant and maintenance outreach. Also, contributing to an increased contamination rate in October was the over 55 lbs of cement and contaminated construction material placed in the dry/mixed waste bins; these heavy materials reflected over 43% of the contamination found in the dry/mixed waste bins.[24]

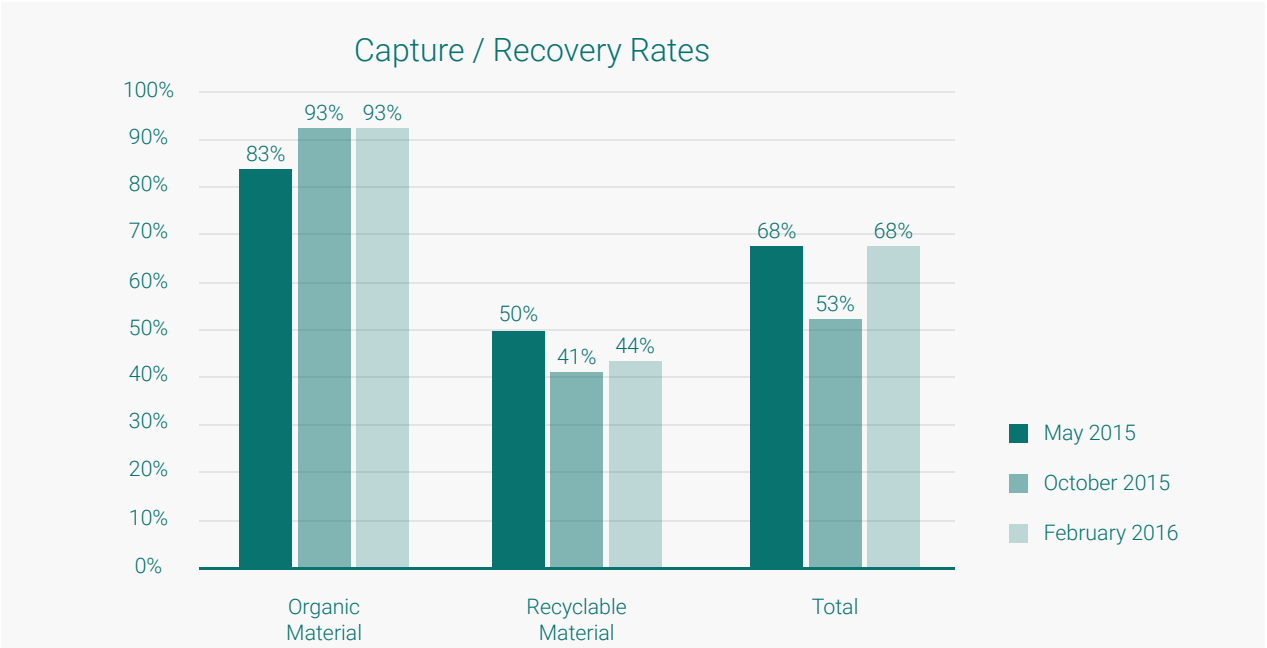


Figure 9. Recorded site visits from November 2014 to April 2015, excluding January 2015. Each floor was evaluated separately; in the table below the findings are combined per month.

Capture/ Recovery Rates of Waste Audits: May 2015, October 2015, and February 2016

Over the span of the pilot, it seemed as if overall diversion dropped significantly halfway through, and rebounded to the same rate at the close of the program. It is important here to note diversion for all streams reflect lower percentages for the October waste audit due to heavily-weighted contaminants. As previously mentioned in this report, heavy items such as cements, construction wastes, and food scraps were counted as miscellaneous items to be landfilled during the October 2015 audit, notably lowering the total recovery rate.

After six months of implementation of the organic waste diversion program, only 3.6% of organics were landfilled.[25] Then, five months later in October, the amount of organics landfilled increased to 40.7%.[26] Finally, showing significant improvement since October, only 5.4% of organics were landfilled the following February.[27]

Although the amount of organics recovered significantly decreased halfway through the program, the organics recovery rate in the final February 2016 audit succeeded that in the first audit in May 2015. In contrast to the decrease in organics recovery in the October 2015 audit is the increased recyclable material capture. This is consistent with the findings from the above graph indicating more organics capture could improve overall diversion rates. These results are a positive indicator that organic waste diversion in MFDs is possible with proper implementation, maintenance, and outreach.

In order to facilitate increased diversion and recovery rates, tenant outreach was conducted.

Follow-Up & Tenant Surveys

Ongoing education and outreach was conducted mainly through emails. The communications were created and reviewed by the pilot program team and then sent to tenants by the San Fernando Building's management. The types of outreach emails included:

- A follow-up email after program implementation to tell residents who missed the kickoff event where to get supplies
- Reminder emails informing residents of the program and how to get their caddy from management
- Reminder emails of what can and can't be composted
- A request to participate in a survey to assess the program
- Two email reminders to complete the survey
- A review of the survey results, announcement of the winner, and reminders of who to participate

The San Fernando Building's management had suggested that we consider a quarterly tenant email communication to encourage participation, appropriate behavior, and give recycling tips. Management was also interested in doing another tabling session on the building grounds to answer questions and promote the program.

In March 2015, residents received email notification asking them to participate in a tenant survey as a way to access the program and provide feedback. As an incentive, respondents had a chance to win a $50 gift certificate and approximately 20% of residents responded to the survey.

Overall, tenants are in favor of the program and pleased with the equipment provided, but some offered helpful comments and ideas for improvements. The following section is a summary of the survey responses.

Tenant Responses When Questioned About The Food Scrap Diversion System

Figure 10

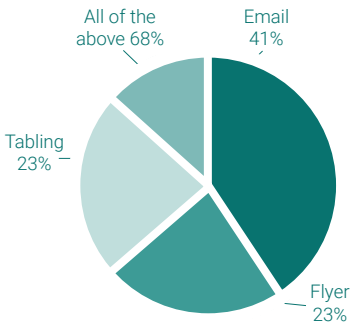


Figure 11

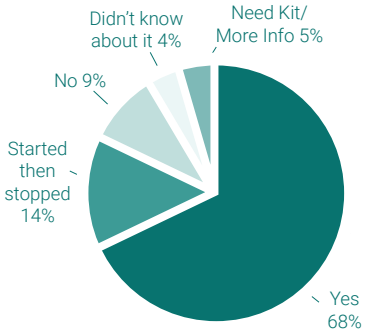


Figure 12

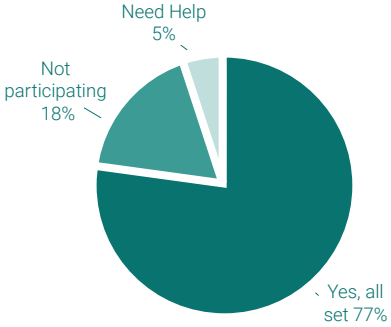


Figure 10. (left) Tenant's responses when questioned about how they heard about the building's new food scrap diversion system

Figure 11. (middle) Tenant's responses when questioned about diverting their food scraps

Figure 12. (right) Tenant's responses when questioned if they knew how to successfully divert their food scraps using the tools provided by the program

Question 1

How many people live in your household?

It was found that 1-2 people on avergae live in each household in the San Fernando Building.

Question 2

How long have you lived in the building?

It was found that the average time that tenants live in the San Fernando building is 4.2 years.

Question 3

How did you hear about the building's new food scrap diversion system?

The above results in Figure 10 indicate that the email had the biggest impact of all the outreach strategies employed, but that the others were also successful at reaching significant proportions of respondents.

Question 4

Have you been diverting your food scraps since the bins and bags became available?

From the findings in Figure 11 we can see that a large proportion of the respondents are participating in the program, which indicates that the program's components are an effective means of gaining high participation rates. A few residents expressed that they needed additional information or assistance before they could participate.

Question 5

Do you feel that you understand how to successfully divert your food scraps using the tools provided?

As seen in Figure 12, the vast majority of residents (77%) indicated that they understood the program's mechanics with the tools provided, which highlights the ease of use of the program. Only a small number of respondents indicated that they are interested in participating, but felt that they were unable to do so. Those respondents that expressed confusion and included their name were contacted directly by management with information on how to participate. A general email was also sent by management to all tenants reminding them to come to the office if they were in need of an organics collection kit.

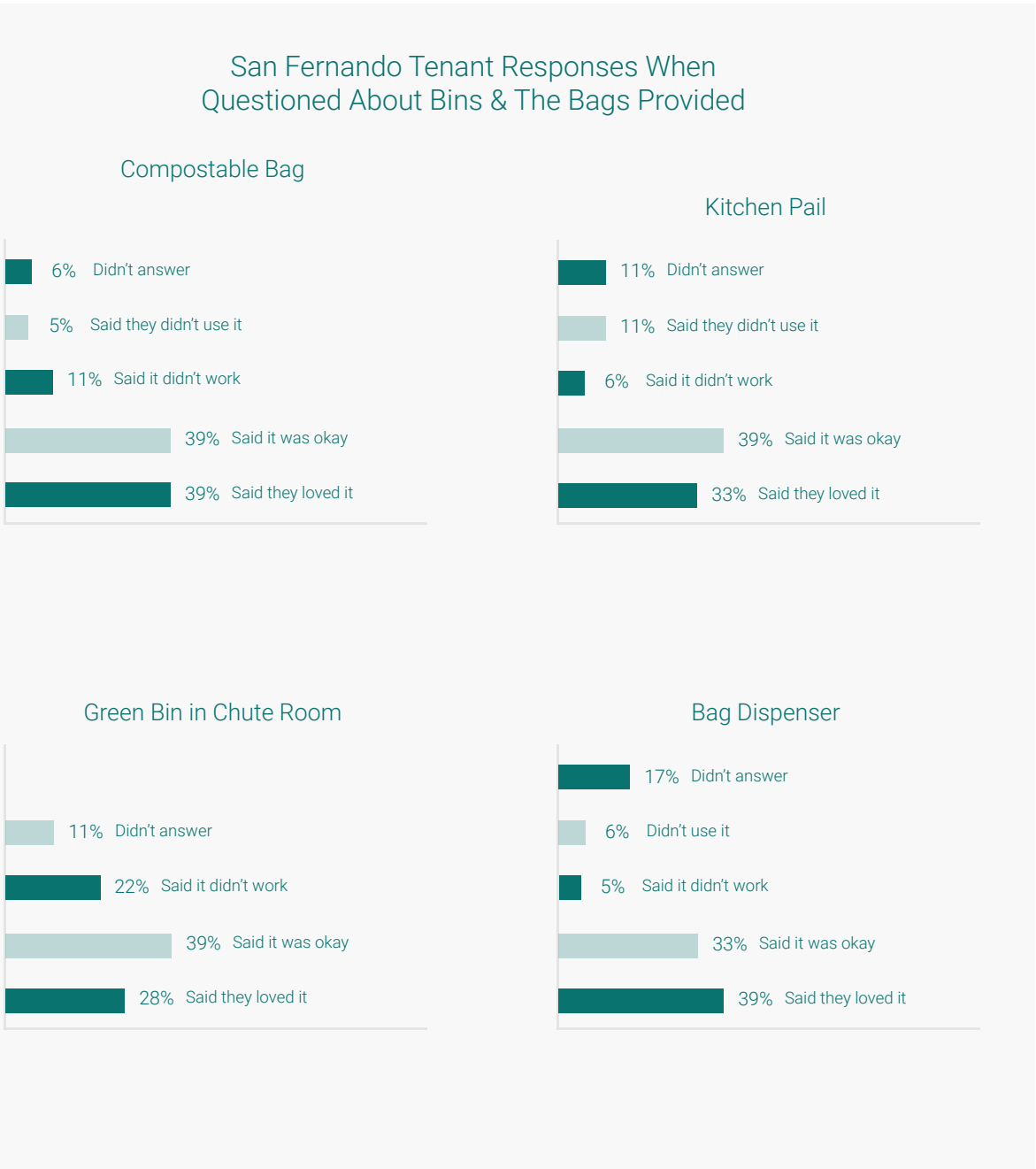


Figure 13. Findings when tenants asked what they thought of each piece of equipment.

Question 6

Please share your thoughts on the bins and bags provided.

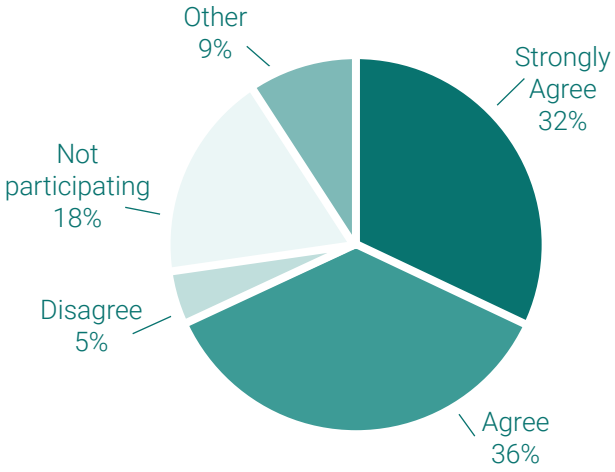
Figure 13 indicates that for each piece of equipment, the majority of respondents approved of and found it easy to use them. However, there were some suggestions for changes, which are outlined in the explanation of Question 9.

Note that this does not include feedback from people who were not participating in the program.

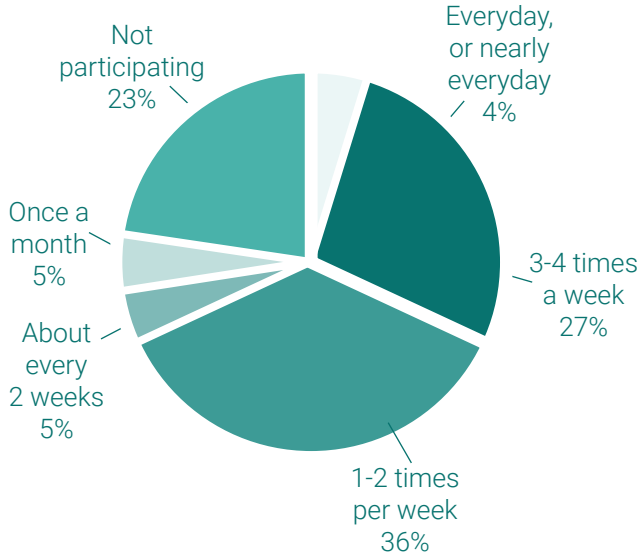
Figure 14. (left) Tenant's responses when questioned about how they feel about the building's new food scrap diversion system

Figure 15. (right) Tenant's responses when questioned about how often they empty the pail

Is the Sytem Easy, Clean, and Convenient?



How often do you empty the pail?



Question 7

Do you agree that the new system for separating and disposing of your food scraps and compostables is easy, clean, and convenient?

The findings in **Figure 14** are very encouraging, as it shows that most of the respondents found the system satisfactory. Those who checked the "Other" option generally liked the program, but had suggestions for how to make it easier (these suggestions are outlined in the explanation of Question 9).

Only one respondent indicated that they "Strongly Diagreed," but unfortunately did not give any suggestions for improvement.

Question 8

How often do you empty your kitchen pail?

The findings in **Figure 15** are consistent with expectations and results Global Green has observed in other cities. This also demonstrates the value of having a compost bag dispenser in the building, since tenants use several bags per week.

Question 9

Do you think anything should be improved about the food scrap recovery program including the equipment, educational information, signage, bags, and/or maintenance? If so, please explain.

Recommendations Based on Comments and Suggestions (All of these were addressed by Athens Services and EcoSafe staff after receiving the comments):

- Overall, tenants were very happy that the program was available – 44% either had no negative comments or specifically wrote that they loved the program as is.
- The green container in one of the chute rooms had an odor issue. This was rectified by the maintenance staff, who increased the frequency of emptying the 23-gallon organic collection containers on all floors.
- Two tenants indicated an interest in a bigger kitchen pail or a bigger bag
- Some tenants also felt that the bags were not strong enough and tore too easily.
- There were some pieces of information that the tenants wanted to see:
    - A schedule of when the 23 gal. containers are emptied
    - Contact information for bag refills
    - A more detailed list of what can and can't be composted

Actions Taken & Next Steps

In order to ensure demands and improvements of the program were addressed and resolved as they arose, several actions were undertaken as well as next steps planned for continued success.

Additional Actions Taken

Updated Signage in Sorting Rooms and on Containers

Following the second waste audit, new signage was added for further clarity and included:

- Household hazardous waste (HHW) identification and S.A.F.E. Permanent Collection Center drop-off information
- Cardboard placement signage
- New wet (organics) and dry (mixed waste/recycling) signage for the sorting rooms
- 3-yard bin signage indicating if the bin is for MFD or restaurant usage

Identified Contaminants from the Waste Audit and Contacted the Sources

Management assumed that some contaminates (diapers) were being generated by an onsite nurse who had not been fully briefed on what was accepted in the compost stream. Athens Services is also working with the first floor restaurants to implement their own food scrap recycling program.

Lock Added to the 3-yard Organics Bin

Adding a combination lock reduced contamination by making the bin accessible only to the San Fernando Building management and maintenance staff; preventing the addition of waste from the restaurant or other unauthorized sources. It was also determined that a combination lock was preferred to a key lock, so as to reduce issues with misplacement or needing a central location to house the key.

Planned Next Steps for Future MFD Food Scrap Programs

Coordinating Expectations with Building Management and Maintenance

Athens, EcoSafe, and Global Green identified several important relationship components, including:

- A written agreement that lays out the relative roles and goals of the building management/maintenance crew, the hauler and equipment provider(s)
- A quarterly tenant email, on which the program representative(s) will be blind carbon-copied
- Contaminant fee to be levied if the contamination of the organics bin is determined to be egregious
- A process to ensure that any new maintenance vendors include the organics system as part of their training and daily check sheet

Further Updates to Materials and Signs

These may include:

- Notification in the sorting room that indicated what days the 32 gal. organics containter will be emptied, who to contact to get additional bags, and information on what happens to the organics material
- Mark the kitchen caddies with the apartment number to determine tenant participation if caddy is returned, misplaced, or broken.

By making these changes, the staff of Athens Services and EcoSafe Zero Waste ensured the success of the program at the San Fernando Building, as well as building an effective toolkit to be utilized by other MFDs served by Athens Services across the City of Los Angeles and elsewhere.

The Program has Been Temporarily Discontinued

During the composition of this report, the food waste collection pilot in the San Fernando Building in the Old Bank District of Downtown Los Angeles has since been completed. In February 2016, the property was sold, and with its sale, the program was discontinued. However, the program will be re-introduced to the new property owners for their review in order to keep the program in place. Considerations are still in progress.

Acknowledgments

About Global Green USA and its Coalition for Resource Recovery

The Coalition for Resource Recovery (CoRR) is a working group of companies, under the direction of Global Green USA, dedicated to combating climate change and generating business value by transforming waste into assets. CoRR conducts pilots and related research to identify and accelerate development of scalable, transferable waste diversion programs and technologies.

The Coalition for Resource Recovery is a project of Global Green USA, a nonprofit, 501(c)(3) tax-exempt organization. Global Green works to create sustainable urban environments and combat global warming through a unique cross-cutting approach that merges innovative research, technical assistance, cutting-edge community based projects and targeted education and outreach.

Report prepared by:

Lily Kelly, Global Green USA

Matt de la Houssaye, Global Green USA

Madisen Gittlin, Global Green USA

Special thanks to:

Jessica Aldridge, Jennifer Duet, Eric Romero, and Araceli Vallejo of Athens Services

Jason Sanders of EcoSafe Zero Waste

Justin Schoenfelder, Gilmore Associates

For more information, please contact:

Global Green USA
Coalition for Resource Recovery

2218 Main St.
Santa Monica, CA 90405
310-581-2700
corr@globalgreen.org

www.thecorr.org

www.globalgreen.org

Notes

1. Average total pounds of food waste is calculated from averaging each audit's pounds of food waste recovered.

2. Based on the average pounds of food waste diverted per week divided by the 71 apartment units in the San Fernando Building, but this number would vary per unit, as we cannot confirm that each unit participated in the program.

3. EPA WARM Tool.

4. City of Los Angeles. Zero Waste LA - FRANCHISE. LA Sanitation. Web.

5. Mayor's Office of Sustainability. The City of Los Angeles Sustainable City pLAn. Los Angeles: April 2015. p.41.

6. Don't Waste LA: Facts and Impacts - Waste Industry Jobs and Safety Standards. Web.

7. U.S. Census Bureau. Los Angeles city, California. Families & Living Arrangements. Web.

8. From 2013-2014, over 7,500 rental units were finished in Los Angeles; this is an increase of over 62% from the previous year. With the increase in multi-family housing stock, the vacancy rate concurrently fell by 10.8% of the previous year; therefore, multi-family housing stock grew both in supply and demand in Los Angeles.

9. City of Los Angeles. "City of Los Angeles Solid Waste Planning Background Studies Summary Report". LA Sanitation. Web.

10. EPA. Waste Reduction Model: WARM tool version 14. United States Environmental Protection Agency. March 2016. Web.

11. EPA. Energy and the Environment: GHG Equivalencies Calculator - Calculations and References. United States Environmental Protection Agency. Web.

12. EPA. Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2012. United States Environmental Protection Agency. February 2014. p.6.

13. EPA. Energy and the Environment: GHG Equivalencies Calculator - Calculations and References. United States Environmental Protection Agency. Web.

14. CalRecycle. Mandatory Commercial Recycling-Implementation Dates. CalRecycle. Web.

15. U.S. Census Bureau. Los Angeles city, California: Population. Web.

16. Los Angeles Population in the year 2000: 3.704 million; 2014: 3.929 million.

17. EPA. Waste Reduction Model WARM tool. United States Environmental Protection Agency. Version 14. March 2016. Web.

15-17. 815,000 tons/year of food scraps landfilled in the year 2000, with a 5% compost rate. Accounting for population increase, the amount of food scraps landfilled today is estimated at 860,000 tons/ year.

18. EPA. Waste Reduction Model WARM tool. Version 14. March 2016. Web. 1 ton of food scraps landfilled produces 1 ton of GHG equivalent.

19. De la Houssaye, M., and Miller, R. Why Methane Matters. Global Green USA. New York, NY: 2015. p.3.

20. Environmental Protection Agency. "Overview of Greenhouse Gases." United States Environmental Protection Agency. N.p., 2015. Web. 13 Apr. 2015.

21. Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestvedt, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, 2013: Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. p. 712-714.

22. Rent per square footage and tenant medium income provided by phone interview with Justin Schoenfelder of Gilmore Associates, 2014.

23. City of Los Angeles. Construction and Demolition Recycling. LA Sanitation. Web.

24. This calculation is based on the additional 60% of misc. pile (22.89 lbs) being food scraps in addition to the 11.8 lbs of food scraps wrongly placed in the mixed waste bins – this combined 34.69 lbs of food scraps landfilled is 25.8% of the 111.6 lbs

25. This calculation is based on the 8.2 lbs of organic waste put in the Small Custom Bin, divided by the overall 227.3 lbs of organic waste recorded in the May 2015 waste audit.

26. This calculation is based on the 11.8 lbs of organic waste put in the Small Custom Bin + the 28.89 lbs of food waste found in the misc. pile (indicated as 60% of pile in audit form), divided by the overall 99.94 lbs of organic waste recorded in the October 2015 waste audit (organic waste in green bin + food scraps in mixed use bins).

27. This calculation is based on the 23.3 lbs of organic waste put in the Small Custom Bin, divided by the overall 434.35 lbs of organic waste recorded in the February 2016 waste audit.