

**FOOD WASTE CASE STUDY: EMPOWER CITIES TO PREVENT, RESCUE, AND RECYCLE**

# SAN FRANCISCO COMPOSTING FROM FORK TO FARM AND BACK



RECOLOGY WORKER MIGUEL ROJAS THROWS A BAG OF COMPOSTABLE MATERIAL INTO HIS TRUCK

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**LOCATION:**

San Francisco, CA

**DATE STARTED:**

1996

**ORGANIZATION TYPE:**

City government agencies

**LEAD ORGANIZATION NAME:**

San Francisco local government (Department of the Environment, the Public Works department, and the Department of Public Health)

**PARTNERS:**

Recology (recycling and composting company)

**STRATEGY IN A NUTSHELL:**

Citywide collection of food scraps and yard trimmings for composting to advance zero-waste goals

**GHG EMISSIONS AVOIDED:**

93,437 metric tons CO<sub>2</sub> equivalent/year<sup>1</sup>

**ORGANIC WASTE DIVERTED**

**FROM LANDFILL:**

255,500 tons annually, or 650 tons per day of compostable material (50 percent food scraps, 50 percent yard trimmings), converted into about 350 tons of finished compost per day

## THE CHALLENGE

In 2014, organic materials made up the largest component of municipal solid waste generated in the United States, with food and yard waste accounting for about 28 percent.<sup>2</sup> Indeed, wasted food costs the average family of four more than \$1,500 annually.<sup>3</sup> The highest priority food waste strategy should be to prevent food from being wasted in the first place, but composting food scraps is also essential: it reduces the amount of waste sent to landfills or incinerators, thereby helping avoid the potent greenhouse gas emissions generated by decomposing food in landfills, and also provides alternatives to synthetic fertilizers and soil amendments.

Composting provides a wide range of economic and environmental benefits, including improved soil health, nutrient recycling, drought mitigation, carbon sequestration, and green jobs.<sup>4</sup>

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“Composting supports soil health, which scientists say is critical in efforts to address climate change,” says Robert Reed, director at Recology, San Francisco’s refuse hauler and partner in developing the city’s waste collection and processing. (See sidebar 1.) “Sending food in the form of compost back to farms also helps farms save tremendous amounts of water because good quality compost, by weight, is 50 percent humus, which is a natural sponge that attracts and retains water. Studies in the United States and Europe show you can grow 31 percent more food in drought years if you farm naturally with compost compared to farming with synthetic or chemical fertilizers.”

Unfortunately, America’s solid waste infrastructure is primarily set up for landfills, which is one of the main reasons the average combined U.S. recycling and composting diversion rate is only 34.5 percent, and only about 5 percent of food waste is composted.<sup>5</sup> There are approximately 3,000 active landfills in the United States, including large, regional landfills, that are permitted to accept 5,000 tons of waste per day. Meanwhile, there are only about 500 approved compost facilities nationally that are permitted to compost food scraps.<sup>6</sup> Even though there is more landfill capacity than composting capacity nationwide, San Francisco has upended the average national recycling and composting rate and has achieved the highest diversion rate of any large city in North America.

## RECIPE FOR SUCCESS

Since 2012, San Francisco has diverted more than 80 percent of all discarded waste from landfills.<sup>7</sup> San Francisco’s exceptional organics recycling is an essential component of its comprehensive, globally recognized zero-waste program. The city’s advanced waste legislation (see sidebar 2), financial incentives, three-bin system, and extensive multilingual outreach to residents and businesses have all helped San Francisco achieve its high diversion rate.

## ABOUT RECOLOGY

Recology’s mission is to “create a world without waste by developing and discovering sustainable resource recovery practices that can be implemented globally.”<sup>18</sup> The company has worked with San Francisco since 1921 and has been employee owned since the 1980s. Recology is now the city’s sole permitted waste collector. Recology’s companies operate in California, Nevada, Oregon, and Washington, coordinating recycling and composting programs to recover a variety of materials for more than 670,000 residential and 95,000 commercial customers. San Franciscans have repeatedly voted to maintain the city’s contract with Recology because of the company’s high standards of environmental sustainability and customer service.

In 1996, San Francisco became the first city in the nation to establish a large-scale food composting program. The city achieved the statewide goal of 50 percent landfill diversion in 2000. In 2002, San Francisco expanded its commitment with a goal of 75 percent diversion by 2010 and zero waste by 2020.<sup>8</sup> In 2009, the city implemented a mandatory recycling and composting policy for residents and businesses.<sup>9</sup> By 2011, the city exceeded its goal with a 78 percent diversion rate. (See sidebar 2 for more detailed legislative history.)

The San Francisco Department of the Environment (DOE), also known as SF Environment, and the city’s department of public works (San Francisco Public Works) partnered with Recology on a suite of strategies for building the city’s composting and zero-waste programs.

“San Francisco’s success in compost collection was achieved by taking numerous steps,” said Reed. “We tested different ways to collect compostable material. We undertook a strong and consistent outreach campaign. We gave presentations at community meetings. The City passed an ordinance requiring all properties in San Francisco to participate in the food scrap compost program. Successive mayors championed composting.”

## ADDITIONAL HISTORY ON WASTE LEGISLATION IN SAN FRANCISCO

Since October 2009, the city’s mandatory recycling and composting ordinance has required that all San Francisco residents and businesses use a three-bin system to separate refuse into recyclables, compostables, and trash.<sup>19</sup> In 2011, California law AB341 was passed, setting a statewide goal of at least 75 percent recycling, composting, or source reduction of solid waste by 2020.<sup>20</sup> This law not only represents an increase from the previous goal of 50 percent landfill diversion set in 1989, but also changes the language to specifically require recycling, composting, and source reduction.

In 2012, California adopted mandatory commercial recycling for generators of four cubic yards or more of commercial solid waste per week and multifamily residential dwellings of five units or more.<sup>21</sup> As of 2014, California also has required commercial organics recycling for large generators of organic waste, defined as “food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste.”<sup>22</sup> The city of San Francisco strongly supported the mandatory organics recycling law as a critical tool to help reduce the amount of food waste sent to landfills.<sup>23</sup>

In 2002, San Francisco expanded its commitment to landfill diversion and set a goal of 75 percent diversion by 2010; in 2003, the city set a goal of reaching zero waste by 2020. The DOE states, “Zero Waste is sending nothing to landfill or incineration. We create policies that reduce waste, and increase access to recycling and composting.”<sup>24</sup>

The DOE is responsible for drafting the city’s zero-waste policies for consideration by the city’s Board of Supervisors, and also manages program outreach, education, and policy compliance. San Francisco Public Works, working closely with the DOE, sets residential and commercial refuse rates, including allocating different fees for different-sized containers to encourage residents to use bigger recycling bins and smaller landfill bins. Recology is responsible for operating the technologies and infrastructure that divert material from landfills.

Recology collects approximately 650 tons of organics each day, at least half of which is food waste, according to Kevin Drew, residential and special projects zero waste coordinator for the DOE. Recology’s Jepson Prairie Organics, one of the most modern food scrap composting operations in the nation, then converts the organic waste into about 350 tons of finished compost every day. Jepson Prairie Organics, one of two compost facilities serving the city and located approximately 60 miles east, processes about 100,000 tons of organic material annually from across the Bay Area.

“Working closely with Recology, we have been able to provide feedstock for the fine line of compost products crafted at the Jepson Prairie Organics facility,” says Drew.

Composting instead of landfilling 350 tons of food waste reduces greenhouse gas emissions by 303 metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>E) per day or 93,437 MTCO<sub>2</sub>E per year.<sup>10</sup>

## KEY SUCCESS FACTORS

Hundreds of cities, businesses, and institutions around the United States would benefit from establishing food scrap composting programs. San Francisco’s policies, infrastructure, and outreach strategies offer a strong model. A successful composting program requires long-term planning and investment. The key lessons that can be drawn from San Francisco’s composting program success include:

**PHASE IN LEGISLATION TARGETING WASTE REDUCTION.** San Francisco passed a Food Service Waste Reduction Ordinance in 2006 that required restaurants and food vendors to use recyclable or compostable food serviceware and prohibited the use of polystyrene foam.<sup>11</sup> In 2007, the city passed the Plastic Bag Reduction Ordinance (updated 2012), requiring supermarkets and drugstores to use compostable plastic, recyclable paper, or reusable checkout bags.<sup>12</sup>

“We embraced BPI-certified<sup>13</sup> compostable bags and foodware early on to encourage composting participation,” said Drew. “We also took early action to eliminate plastic bags from our discard stream to reduce contamination. This helped us reach full coverage for organics recycling to all residential and commercial users, including over 8,500 apartment buildings and 20,000 businesses. Each of these efforts continues to be a work in progress, reaching for the best, stepping off the edge, but always recognizing the need for reevaluation and course correction.”

**ENSURE ACCESS TO MODERN COMPOST FACILITIES.** “It’s very important to plan, permit, and build modern compost facilities,” said Reed of Recology. “They represent key infrastructure that allows cities to implement urban compost collection programs. At our most advanced compost facility, Jepson Prairie Organics, we use a reverse-air technology. We pull air through tall rows of material we are composting to draw gasses, created in the composting process, to biofilters made of pieces of hardwood. In this way, we capture and destroy VOCs [volatile organic compounds]. So we make a lot of compost and have very low emissions.”

**USE FINANCIAL INCENTIVES TO ENCOURAGE RECYCLING AND COMPOSTING:** To discourage residents from sending waste to landfills, San Francisco’s Refuse Rate Board changed the price for residential waste collection service as of July 2017. A typical household that uses three 32-gallon bins—a black bin for trash, a green bin for composting, and a blue bin for recycling—is charged \$40.04 per month. Meanwhile, a household that switches to a smaller 16-gallon trash bin (while maintaining the 32-gallon compost and recycling bins) is charged \$33.78 per month.<sup>14</sup> This “pay-as-you-throw” system creates a \$6.26 monthly incentive that encourages residents to reduce the amount of materials going to landfill, and clearly signals the city’s strong commitment to its 2020 zero-waste goal.

**PLAN EXTENSIVE EDUCATION AND OUTREACH TO COMMUNICATE THE BENEFITS OF COMPOSTING.** Many tools have been developed to help residents and businesses participate in San Francisco’s composting programs, including an online recycling database, onsite multilingual training, a food-waste reduction education campaign, and simple, customizable color-coded signage. The city also initiated a door-to-door multilingual outreach program, funded by hauler fees, in which trained personnel visit residents and teach them how to properly manage their discards.

“Most crucially, we highlight the environmental benefits that we achieve as a community when we all participate in the curbside compost program,” says Reed. “Americans will find multiple ways to make something work in their lives when they truly want to do something. So rather than just telling people what to put in what bin, we focus our communications to help people better understand all the good reasons to compost.”

## EQUITY IMPACT

**BUILD IN CONSIDERATION OF LOW-INCOME, NON-ENGLISH SPEAKING, OR DISABLED COMMUNITIES.** It is important to allow everyone to benefit from programs such as the San Francisco Mandatory Recycling and Compost Ordinance and the pay as you throw program. In order to reach its diverse residents, the city of San Francisco conducted multilingual, door-to-door outreach to ensure that communities were aware of and understood the benefits of these programs and how to comply. Educational materials have since been translated into 20 languages.



In addition to these efforts, there can be instances when special strategies may be desirable for low-income families and individuals, such as reducing the per-household waste collection charges for eligible residents, offering a flat fee or percentage-based discount, or providing a credit on a household's overall bill.<sup>15</sup> For example, San Francisco offers a 25 percent discount to low-income residents. Furthermore, the application is available in English, Spanish, and Chinese to accommodate the city's most commonly spoken languages. In addition, San Francisco accommodates disabled residents with a special rate and provides assistance in moving carts to curbside for collection at no additional fee for those who are physically unable to do so themselves.

Even with these efforts, San Francisco is still seeing lower recycling rates in low-income neighborhoods compared with other areas in the city. The city is continuing to explore ways to reach these neighborhoods, such as by consulting with the owners of multifamily affordable housing properties to address barriers that are preventing them from reducing the amount of recyclable and compostable waste they send to landfills.

#### ENDNOTES

- 1 Based on calculation using the EPA Waste Reduction Model (WARM) Version 14, <https://www.epa.gov/warm/versions-waste-reduction-model-warm#WARM Tool V14>.
- 2 U.S. EPA, p. 7, [https://www.epa.gov/sites/production/files/2016-11/documents/2014\\_smmfactsheet\\_508.pdf](https://www.epa.gov/sites/production/files/2016-11/documents/2014_smmfactsheet_508.pdf).
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- 4 NRDC, *Greening the Playing Fields*, 2016, <http://www.nrdc.org/greenbusiness/guides/sports/sports-venues-composting.asp>.
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- 7 SF Environment, *Frequently Asked Questions*, <http://sfenvironment.org/zero-waste/overview/zero-waste-faq>.
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- 10 U.S. EPA, *Versions of the Waste Reduction Model*, <https://www.epa.gov/warm/versions-waste-reduction-model-warm#WARM Tool V14>.
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- 12 Ibid.
- 13 BPI-certified means that it has been verified by the Biodegradable Products Institute to be completely biodegradable in approved composting facilities. <http://www.bpiworld.org/BPI-Public/About.html>
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- 22 CalRecycle, *Mandatory Commercial Organics Recycling*, <http://www.calrecycle.ca.gov/recycle/commercial/organics/>.
- 23 Seedstock, *From Farm to Fork and Back Again: New California Law Seeks to Close Food Waste Loop*, <http://seedstock.com/2015/01/19/from-farm-to-fork-and-back-again-new-california-law-seeks-to-close-food-waste-loop/>.
- 24 SF Environment, *Zero Waste*, <http://sfenvironment.org/zero-waste>.

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#### About NRDC

The Natural Resources Defense Council is an international nonprofit environmental organization with more than 3 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Montana, and Beijing. Visit us at [nrdc.org](http://nrdc.org).

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**RECYCLING AND COMPOSTING CREATE JOBS.** Recycling and composting create more jobs than landfilling or incinerating waste. One and a half million new jobs would be created if the United States diverted 75 percent of its waste from landfills by 2030, according to a report commissioned by the Natural Resources Defense Council and the BlueGreen Alliance Foundation.<sup>16</sup> This increase would also yield a reduction of almost 515 million metric tons of carbon dioxide equivalent (MMTCO<sub>2</sub> E), comparable to shutting down about 72 coal power plants or taking 50 million cars off the road.<sup>17</sup>

“Recycling creates 10 times more jobs—permanent, local jobs—than landfilling or incineration,” said Reed.

Recology employs approximately 1,050 workers in San Francisco alone (not counting corporate employees in San Francisco or operations outside of San Francisco, like composting facilities). This number continues to rise as new employees are needed to sort recyclables and monitor collection routes to help meet the city's zero-waste goal.