SB 1383
Infrastructure and
Market Analysis

California Department of Resources Recycling and Recovery

April 2019

Contractor's Report
Produced Under Contract By:
Integrated Waste Management Consulting, LLC
Nevada City, CA

STATE OF CALIFORNIA

Gavin Newsom
Governor

Jared Blumenfeld
Secretary, California Environmental Protection Agency

DEPARTMENT OF RESOURCES RECYCLING AND RECOVERY

Scott Smithline
Director

Department of Resources Recycling and Recovery
Public Affairs Office
1001 I Street (MS 22-B)
P.O. Box 4025
Sacramento, CA 95812-4025
www.calrecycle.ca.gov/Publications/
1-800-RECYCLE (California only) or (916) 341-6300

Publication # DRRRR-2019-1652

To conserve resources and reduce waste, CalRecycle reports are produced in electronic format only. If printing copies of this document, please consider use of recycled paper containing 100 percent postconsumer fiber and, where possible, please print images on both sides of the paper.

Prepared as part of contract number DRR17010 for $124,875.

The California Department of Resources Recycling and Recovery (CalRecycle) does not discriminate on the basis of disability in access to its programs. CalRecycle publications are available in accessible formats upon request by calling the Public Affairs Office at (916) 341-6300. Persons with hearing impairments can reach CalRecycle through the California Relay Service, 1-800-735-2929.

Table of Contents

Tables

Figures

Acknowledgments

Project Manager

Tim Hall, Senior Environmental Scientist, Materials Management and Local Assistance Division

Principal Researcher/Author

Matthew Cotton, Integrated Waste Management Consulting, LLC

Advisory Committee

Neil Edgar	California Compost Coalition
Jeff Ziegenbein	IERCF, Association of Compost Producers
Cary Oshins	US Composting Council
Kevin Barnes	Solid Waste Director, City of Bakersfield
Rene Kaprielian	City of San Diego
Kelly Schoonmaker	Alameda County Waste Management Authority

Executive Summary

California has established itself as a leader in strategies to address climate change through a strategic climate change plan. In 2016, Governor Brown signed SB 1383 (Lara, Chapter 395, Statutes of 2016), establishing methane emissions reduction targets that will aid the state in reducing greenhouse gas emissions to below 1990 levels as prescribed in AB 32 (Núñez, Chapter 488, Statutes of 2006). As it pertains to CalRecycle, SB 1383 establishes targets to achieve a 50 percent reduction in the level of statewide disposal of organic waste from the 2014 level by 2020 and a 75 percent reduction by 2025. While there are several options for diverting organic materials from landfill disposal, CalRecycle and Integrated Waste Management Consulting expect composting and anaerobic digestion facilities to manage the bulk of these materials. California currently landfills approximately 20-23 million tons of organic waste every year, which equals two-thirds of the state's overall waste stream. Starting in 2020, California will have a goal of disposing no more than 11.5 million tons of organic waste in landfills. After 2025, that goal drops to 5.7 million tons of organic waste disposed in landfills.

California currently has more than 160 permitted compost facilities and more than a dozen anaerobic digestion facilities that accept about 6 million tons of organic materials. When SB 1383 is fully implemented, California will need to divert an additional 12 to 14 million tons of organic waste (using 2014 waste generation as a baseline), which includes materials, such as carpet and textiles, that typically cannot be composted or digested. The following report presents the results of a comprehensive statewide survey of California's compost and anaerobic digestion infrastructure, including the status of these facilities, types of feedstocks processed, existing and future processing capacity, condition of markets for recovered organic products, and barriers to facility expansion. SB 1383 requires CalRecycle to analyze the progress the waste sector, state government, and local governments have made in achieving the SB 1383 organic waste reduction goals no later than July 1, 2020, and the information in this report will be used in that 2020 Market Analysis Report. Although SB 1383 also establishes a goal of increasing statewide edible food recovery by 20 percent, this report does not address edible food recovery capacity.

This survey reveals that there is approximately 4 million tons of existing permitted capacity currently available to process additional organic materials. Across the state, 22 percent of survey respondents indicated they have 500-plus tons of available daily capacity. While this currently available capacity is not sufficient to meet the targets established by SB 1383, these results are different from what CalRecycle previously estimated and what local jurisdictions have reported throughout the SB 1383 regulation workshop process. Southern California has the most available capacity (3.08 million tons) with 38 percent of the region's facilities saying they each have 500-plus tons of daily available capacity. Although these facilities may have permitted capacity to accept a larger quantity of materials, the facilities may need to seek new or adjusted air district

permits to accommodate increased emissions from these facilities, which may be a barrier to accepting additional material.

Based on responses to surveys, 68 percent of compost and anaerobic digestion facilities do not have any plans to expand, and the single biggest factor driving facility growth and expansion is the perceived availability of feedstock materials. Since SB 1383 requires that jurisdictions provide organics collection services to all residents and businesses, these contracts will likely drive facility growth and expansion.

While California has a robust infrastructure to process wood and green wastes, the infrastructure for processing food scraps is still in its early stages of development and less than 50 percent of composters accept food scraps. This is significant considering that food waste alone comprises 18 percent (5-6 million tons) of California's disposed waste stream. Of the compost facilities that do accept food scraps, 42 percent that responded to the survey say they can process 50 to 500 tons of additional material daily, while 44 percent say they have no additional available capacity.

Many composters are wary of contaminants in collected food scraps and are concerned about the marketability of compost products produced from food scrap feedstock. Compost facilities usually strain out contaminants (like plastic) from finished compost and those contaminants end up in "overs" that are used as alternative daily cover (ADC). With SB 1383's stricter contamination standards, and a decrease in demand of ADC due to the passage of AB 1594 (Williams, Chapter 719, Statutes of 2014), these facilities are faced with a significant future challenge of managing contamination in feedstock material.

Throughout California, half of what composters produce is compost, and they sell 65 percent of their compost to the agriculture industry. This is significant since skeptics in the 1990s doubted that mainstream agriculture would ever use compost produced from urban wastes. Composters also produce mulch, boiler fuel for biomass conversion, ADC, and other products. See Figures 11A and 11E for more details.

Trends and Conclusions

While it is difficult to make too many generalizations about organics processing infrastructure due to the variation of treatment methods and the size of the state of California, the following trends and conclusions can be drawn from the responses to the survey:

- There is an estimated 4 million tons of available *permitted* capacity for composting and anaerobic digestion. To be clear, the amount of available *permitted* capacity is not sufficient to meet the goals of SB 1383, but there are existing facilities with capacity to accept additional organics, including food scraps. See the discussion starting on page 27 for more detail on the variables that can affect "available permitted capacity."

- Capacity is limited by various factors, but generators of organic materials may need to appreciate that, like landfills and biosolids composting facilities, accessing available capacity may require increases in hauling distance (and thus cost). These costs are expected to be borne by ratepayers. See the discussion starting on page 27 for more details.
- Siting a new composting facility or expanding an existing one can be challenging. State requirements and regulations have been changing to keep pace with increased diversion of organic materials from landfills to processing facilities. Thirty-eight percent of those who participated in the survey indicated that compliance costs associated with new requirements and regulations may be a limiting factor when existing facilities are considering expansion See Figure 35.
- Although the agricultural industry remains the primary market for recovered organic products, this study reveals that composters and anaerobic digesters in California supply a wide array of markets with their products. These include broad horticultural markets including landscape and nursery markets, CalTrans and local government markets, biomass facilities, and landfill uses. See Figure 14A.
- Chip and grind facilities, though not surveyed extensively for this project, are not likely to accept food scraps or other SB 1383 feedstocks (see Tables 1 and 2), with the exception of wood and yard trimmings. CalRecycle expects the current chip and grind infrastructure to continue to process wood and green waste for a variety of markets. It is unclear how the existing chipping and grinding facilities will adapt to changing market conditions (for example, the phasing out of diversion credit for landfill ADC and the decline in biomass facilities processing urban materials). See Sidebar on the decline of the biomass industry on page 42.
- Composters will need significant incentives, from processing contracts to other financing mechanisms, to make the necessary investments in infrastructure to meet the goals of SB 1383. See Figure 25.
- The development of organics collection programs, especially for food waste, will be key to expanding the state's organics processing infrastructure. California is in the early stages of diverting organics from landfills as envisioned under SB 1383. The types of collection methods, pre-processing equipment, range of processing facilities, and post-processing steps needed for California to comply fully with SB 1383 are not yet well defined or fully developed. See Figure 24.
- Based on the data in Figure 24, the primary reason organics processing facilities expand is an increase in feedstock availability via new collection programs. Facilities will expand if entities collect the material; it has become too costly, time-consuming, and risky for facility developers to create new processing capacity without a dedicated contract for feedstock. This is critical to SB 1383, as the dominant narrative has been that a lack of capacity (not supported by this report) has limited the expansion or implementation of new organics collection programs.

- There are various challenges to compost facility expansion from the regulatory, marketing, land use, and economic sectors. (See Figure 30.) Siting new facilities is also challenging because they are often unpopular with local residents who consider them to be unideal uses of the land. Many existing facilities surveyed are not expecting to take food materials (see Figure 8) or expand in the near future. See Figure 35.
- Throughout California, the use of green material as ADC has declined. This may be due to recent legislation phasing out diversion credit (AB 1594, Williams, Chapter 719, Statutes of 2014), and to the closure of the Puente Hills Landfill, a major user of organic material as ADC. See Figure 1.3.
- The acceptance of food scraps as a feedstock has also increased since the last survey of compost infrastructure by CalRecycle. See Figure 2.

Surveying the Industry

CalRecycle (and its predecessor agency the California Integrated Waste Management Board) have conducted previous statewide studies of compost infrastructure in 2001, 2004, and 2010. In 2018, surveyed facilities were somewhat less enthusiastic about providing detailed responses than in past surveys. Facilities often required multiple contacts in order to obtain a completed survey. That may be due to survey fatigue as reported by other similar projects, or it may be that the value of the survey to composters was not communicated adequately. Also, this survey was conducted 4 years before the SB 1383 regulations go into effect. Many haulers and compost manufacturers may be developing plans that they do not wish to share in an increasingly competitive marketplace. CalRecycle staff sent surveys to eight stand-alone anaerobic digestion facilities and six wastewater treatment plants, and received responses from eight facilities (see Table ES-1). Collectively, the facilities that responded to surveys process an estimated 90 percent of the tonnage processed annually by composters and anaerobic digesters. By focusing on facilities that provide, or are likely to provide, a home for green material and food waste, CalRecycle and Integrated Waste Management Consulting were able to capture meaningful data that will used to inform the 2020 Market Analysis Report.

Study Elements

The following were key elements of the study:

- A comprehensive approach that included developing a project advisory committee comprising industry representatives;
- Use of an independent contractor with strong ties to the composting industry; and,
- Extensive and persistent surveying techniques to try to achieve the highest possible response rate.

Early in the project, CalRecycle staff members chose to directly survey the anaerobic digestion facilities, primarily because they had already been surveying these facilities and cultivated a positive working relationship with them. While Integrated Waste Management Consulting wove the data that CalRecycle collected into the survey results that follow, the anaerobic digestion facilities did not use the same survey instrument and so not all of the data and charts represent both composters and anaerobic digesters.

Survey Overview

The first step in the survey process was to develop a survey instrument. IWMC created a draft survey, which the Advisory Group and CalRecycle staff reviewed. Once the Survey was complete, IWMC developed a database of facilities. The final survey is contained in Appendix A. The database methodology was similar to previous CalRecycle Infrastructure surveys. IWMC utilized CalRecycle's Solid Waste Information System (SWIS) database and made individual queries by County.

The SWIS database tends to be inclusive, so IWMC made a few exclusionary decisions. First, IWMC selected the county and "All Statuses" as the regulatory status. Similarly, IWMC chose "All Types" as the facility type. Finally, IWMC chose "Active" as the operational status. These search parameters produced a list of facilities that meet those criteria. IWMC further trimmed this list to exclude very small, on-site, or industry-specific facilities, as we judged they were not be likely to accept all SB 1383 materials, such as food scraps. Thus, IWMC excluded vineyard-specific facilities, mushroom farms, on-farm dairy composters, equestrian composters, and so on from the dataset.

Table ES-1 shows the number and type of facilities completing surveys for this report. Table ES-2 shows the tons processed by the survey respondents. The total, almost 6 million tons, is a significant fraction of the total amount of organics processed by compost and anaerobic digestion facilities in California and represents the largest processing facilities in the state. One out-of-state facility (that receives feedstock from within California) was excluded.

Table ES-1. Facilities Completing Surveys.

	Surveyed Facilities
Composting Facilities	51
Anaerobic Digestion Facilities*	
Co-Digestion	3
Stand-Alone Facilities	5
TOTAL	59

*CalRecycle staff interviewed anaerobic digestion facilities separately; its data are presented here.

Table ES-2. 2017 Tons Processed by Survey Respondents.

	Total
Composters	5,720,625
Anaerobic Digestion (AD)	
Co-Digestion	25,999
Stand-Alone Facilities	245,516
TOTAL	5,966,141

Table ES-3 shows the organics tons managed as alternative daily cover (ADC), alternative intermediate cover (AIC), and other beneficial use at landfills for 2017. These numbers are included because AB 1594 will not allow green waste used for ADC to count as recycling beginning in 2020, and because SB 1383 mandates a significant reduction of the use of organics at landfills. It is uncertain where these tons will end up, but IWMC estimates that some will be used as compost feedstock.

Table ES-4 shows the total cubic yards reported sold as finished products by composters statewide in 2017.

Table ES-3. Organics Used as ADC, Beneficial Reuse, and AIC.

Type	Tons
Green Waste ADC	1,491,679
Compost ADC	26,665
Sludge ADC	335,040
Beneficial Reuse Green Waste	90,700
Beneficial Reuse Compost	3,426
Beneficial Reuse Sludge	14,761
AIC Green Waste	3,767
AIC Compost	0
AIC Sludge	2,743
Total	1,968,781

Source: CalRecycle, 2017.

Table ES-4. Products Manufactured by Composters Statewide.

Products	Cubic Yards
Compost	2,696,401
Mulch	1,117,279
Boiler Fuel (Biomass)	169,813
ADC	1,154,933
Beneficial Reuse at Landfills	43,500
Direct Land Application	65,000
Other	181,330
Total	5,428,256

Introduction

SB 1383 (Lara, Chapter 395, Statutes of 2016) establishes ambitious targets for reduction and diversion of organic materials from landfills to help meet California's climate goals. The following report presents the results of a comprehensive statewide survey of California's compost and anaerobic digestion Infrastructure. While not all of the organics targeted under SB 1383 will be composted or digested, these facilities represent a significant part of the infrastructure required to meet these ambitious targets. This project seeks to understand how well California is poised to meet the goals of SB 1383. While California has a robust infrastructure to process wood and green wastes, it still needs more infrastructure for these materials, and the infrastructure for processing food scraps is still in its early stages of development.

This project surveyed large, operating composting and anaerobic digestion facilities in California. Fifty-one composting facilities completed a comprehensive survey covering a range of issues. CalRecycle surveyed 8 anaerobic digesters (using different methods). The facilities that responded to the survey represent over 90 percent of the current composting and AD capacity in the state. Unlike in previous surveys, chip and grind facilities were not surveyed, because CalRecycle expects the current chip and grind infrastructure to continue to process wood and green materials for a variety of markets. It is unclear how the existing chipping & grinding facilities will adapt to changing market conditions (for example, the phasing out of diversion credit for ADC and the decline in biomass facilities processing urban materials).

SB 1383

SB 1383 seeks to reduce the impact of Short-Lived Climate Pollutants (SLCPs). The bill identifies three main sources of SLCPs: Black carbon, fluorinated gases, and methane. For the solid waste sector, methane is the primary focus. SB 1383 sets three new goals for landfill methane reduction:

- A 50-percent reduction in the level of statewide disposal of organic waste from the 2014 level by 2020;
- A 75-percent reduction in the level of statewide disposal of organic waste from the 2014 level by 2025; and,
- A 20 percent increase in recovery of edible food.

Organic materials targeted under SB 1383 comprise approximately 68 percent of California's disposed waste stream (based on the 2014 waste characterization study). CalRecycle estimates that food scraps alone comprise 18 percent of total landfill disposal. The targets in SB 1383 uses the 2014 waste characterization report as the baseline. Table 1 shows the categories of organic materials in the 2014 Waste Characterization Study. Table 2 highlights those that are likely to be sent to a compost

or anaerobic digestion facility. By this very rough estimate, there is an additional 12 million tons in the waste stream potentially recoverable for composting and digestion.

Table 1. Categories of Organic Waste in the 2014 Waste Characterization Study*

Material Type	Material	% of SB 1383 Disposal	Tons of Material
Inerts and Other	Other Wood Waste	4.64%	1,543,711
Inerts and Other	Clean Dimensional Lumber	2.97%	986,572
Inerts and Other	Clean Pallets & Crates	1.97%	657,050
Inerts and Other	Clean Engineered Wood	1.59%	528,838
Other Organic	Food	16.98%	5,651,189
Other Organic	Remainder/Composite Organic	4.02%	1,337,670
Other Organic	Textiles	3.75%	1,247,963
Other Organic	Leaves and Grass	3.56%	1,185,513
Other Organic	Prunings and Trimmings	2.92%	972,590
Other Organic	Carpet	1.73%	576,332
Other Organic	Branches and Stumps	1.61%	534,166
Other Organic	Manures	0.53%	176,684
Paper	Remainder/Composite Paper - Compostable	6.15%	2,046,249
Paper	Other Miscellaneous Paper - Other	3.48%	1,159,288
Paper	Uncoated Corrugated Cardboard	2.93%	975,299
Paper	Newspaper	1.13%	376,969
Paper	Remainder/Composite Paper - Other	0.60%	198,225
Paper	Magazines and Catalogs	0.54%	180,078
Paper	White Ledger Paper	0.37%	122,943
Paper	Remainder/Composite Paper - Rigid Food & Beverage Cartons	0.32%	105,528
Paper	Other Office Paper	0.32%	104,959
Paper	Paper Bags	0.21%	71,385
Paper	Other Misc. Paper - Compostable	0.21%	69,681
Paper	Phone Books and Directories	0.04%	14,739
Biosolids Disposed & ADC		0.52%	173,000
Biosolids - ADC		1.12%	373,809
Biosolids - AIC		0.01%	4,341
Biosolids - Other Ben. Reuse		0.20%	66,109
Green Material-AIC		0.01%	2,732
Green Material-ADC		3.89%	1,294,515
Green Material-Other Ben. Reuse		0.34%	113,398
Compost - ADC		0.05%	17,126
Compost - AIC		0.00%	0
Compost - Other Ben. Reuse		0.10%	33,065
	Total Organics	68.83%	22,901,718

*Categories of organic waste as delineated in the 2014 Waste Characterization Study and beneficial reuse material types for biosolids, compost and green material and biosolids disposed and used as ADC. The numbers in this table are presented to indicate the general categories and amounts of various types of organic materials disposed in 2014.

Table 2. Organic Material in the 2014 Waste Characterization with the Potential to be Composted or Digested.

Material Category	Material	Percentage in Waste Stream	Tons
Other Organic	Food	18.1%	5,591,179
Other Organic	Leaves and Grass	3.8%	1,172,925
Other Organic	Prunings and Trimmings	3.1%	962,262
Other Organic	Branches and Stumps	1.7%	528,493
Other Organic	Manures	0.6%	174,808
Paper	Remainder/Composite Paper -	6.6%	2,024,520
Paper	Other Miscellaneous Paper -	0.2%	68,942
Biosolids Disposed & ADC		0.52%	173,000
Biosolids - ADC		1.12%	373,809
Biosolids - AIC		0.01%	4,341
Biosolids - Other Ben. Reuse		0.20%	66,109
Green Material-AIC		0.01%	2,732
Green Material-ADC		3.89%	1,294,515
Green Material-Other Ben. Reuse		0.34%	113,398
Compost- ADC		0.05%	17,126
Compost- AIC		0.00%	0
Compost- Other Ben. Reuse		0.10%	33,065
Total		40.34%	12,601,224

Markets

In three previous Compost-and Mulch-Producing Infrastructure Reports[†], CalRecycle documented that Agriculture is the single largest market for compost. This has not changed since the 2010 report; in fact, based on this current survey, the agriculture market for compost has increased. Recently, UC Davis published a report[‡] on behalf of the Almond Board and identified that *accessibility* to organic matter amendments (the study looked at yard trimmings, composted yard trimmings, manure, and composted manure) was a major barrier to adoption among non-users. This is strong confirmation that there are indeed additional untapped agricultural markets for compost.

[†] *Assessment of California's Compost- and Mulch-Producing Infrastructure*, CalRecycle (2001). *Second Assessment of California's Compost- and Mulch-Producing Infrastructure*, CalRecycle (2004), and *Third Assessment of California's Compost- and Mulch-Producing Infrastructure- Management Practices and Market Conditions*, CalRecycle (2010).

[‡] *Grower Analysis of Organic Matter Amendments in California Orchards*, Journal of Environmental Quality, May 18, 2017.

Barriers to Increased Facility Development

The barriers to increasing the quantity and capacity of organics processing facilities fall into two broad categories: lack of processing contracts (i.e., feedstock) and increased regulatory costs for facility development. Fundamentally, it is early in the SB 1383 implementation process and jurisdictions have not yet developed the collection infrastructure to deliver the massive quantities of organic materials envisioned to be diverted under SB 1383; additionally, the costs of facility development continue to increase. Thirty-eight percent of compost facilities that responded to the survey cite costs associated with permit requirements to protect air and water quality as a barrier to developing a new or expanded compost facility.

Waste Management recently developed a 500-ton per day composting facility at its Altamont Landfill outside of Livermore. Reportedly, the facility spent $1 million on purchasing air emissions offsets. In previous years, few composting facilities have incurred emissions offset costs. A recent report[§] completed by the California Air Resources Board, the California Air Pollution Control Officers Association (CAPCOA), and CalRecycle provides a significant amount of detail on these issues.

While the costs of complying with SWRCB Order WQ 2015-0121-DWQ or air pollution control district rules are not quantified within the scope of this survey, survey responses indicate that costs for compliance are a concern for compost operators anticipating facility expansion.

[§] "*Composting in California: Addressing Air Quality Permitting and Regulatory Issues for Expanding Infrastructure*" CARB, CAPCOA, CalRecycle, August 2018.

Study Design

This project followed a similar format as previous CalRecycle Infrastructure surveys. The project used an advisory committee of industry stakeholders to guide project development. A database of potential facilities was developed and a standardized survey instrument was prepared. The survey Instrument is contained in Appendix A. The database of facilities, though originating in CalRecycle's SWIS list, is not public to protect the confidentiality of participating and non-participating facilities.

Advisory Committee

The advisory committee for this project is shown in Table 3 below. The project advisory committee represented a broad swath of compost and anaerobic digestion industry representatives.

Table 3. Advisory Committee.

Name	Affiliation
Neil Edgar	California Compost Coalition
Jeff Ziegenbein	Association of Compost Producers
Cary Oshins	US Composting Council
Kevin Barnes	Solid Waste Supervisor, City of Bakersfield
Kelly Schoonmaker	Alameda County Waste Management Authority
Rene Kaprielian	City of San Diego

Data Gathering Methodology

The data gathering methodology was similar to previous CalRecycle Infrastructure surveys. The SWIS database tends to be inclusive, so IWMC made a few exclusionary decisions. First, IWMC selected the county and "All Statuses" as the regulatory status. Similarly, IWMC chose "All Types" as the facility type. Finally, IWMC chose "Active" as the operational status. These search parameters produced a list of facilities that meet those criteria. IWMC further trimmed this list to exclude very small, on-site, or industry-specific facilities, as we judged they were not be likely to accept all SB 1383 materials, such as food scraps. Thus, IWMC excluded vineyard-specific facilities, mushroom farms, on-farm dairy composters, equestrian composters, and so on from the dataset.

Survey Instrument

As mentioned above, IWMC developed a survey form using the core of previous CalRecycle survey projects of the California Compost- and Mulch-Producing Industries. The questions included on the survey form are included as Appendix A. The questions on the survey form were entered into an electronic software service (SurveyMonkey) to allow participants to complete the survey online. The majority of the survey respondents used the SurveyMonkey Form.

The survey form collected data on:

1. Types of facilities.
2. Types of composting systems.
3. Quantity, type, and source of feedstocks.
4. Current incoming and future processing capacity.
5. Ability of the facility to accept food scraps.
6. Quantities of organic products sold.
7. Market categories for organic products.
8. Additional services provided by composters.
9. Participation in compost certification programs and whether product is sold as organic.
10. Volumes of “overs” produced and ultimate destination (“Overs” are the oversize pieces left after screening compost).
11. Concerns about feedstock contamination.
12. The motivation for the facility.
13. Plans for and barriers to facility expansion.
14. Current status of various regulatory agencies’ permits and permitted capacity or throughput.
15. Employment information.
16. Tipping fee information.
17. Information on product revenue.
18. Expected impact of SB 1383 on the facility.

Geographical Distribution

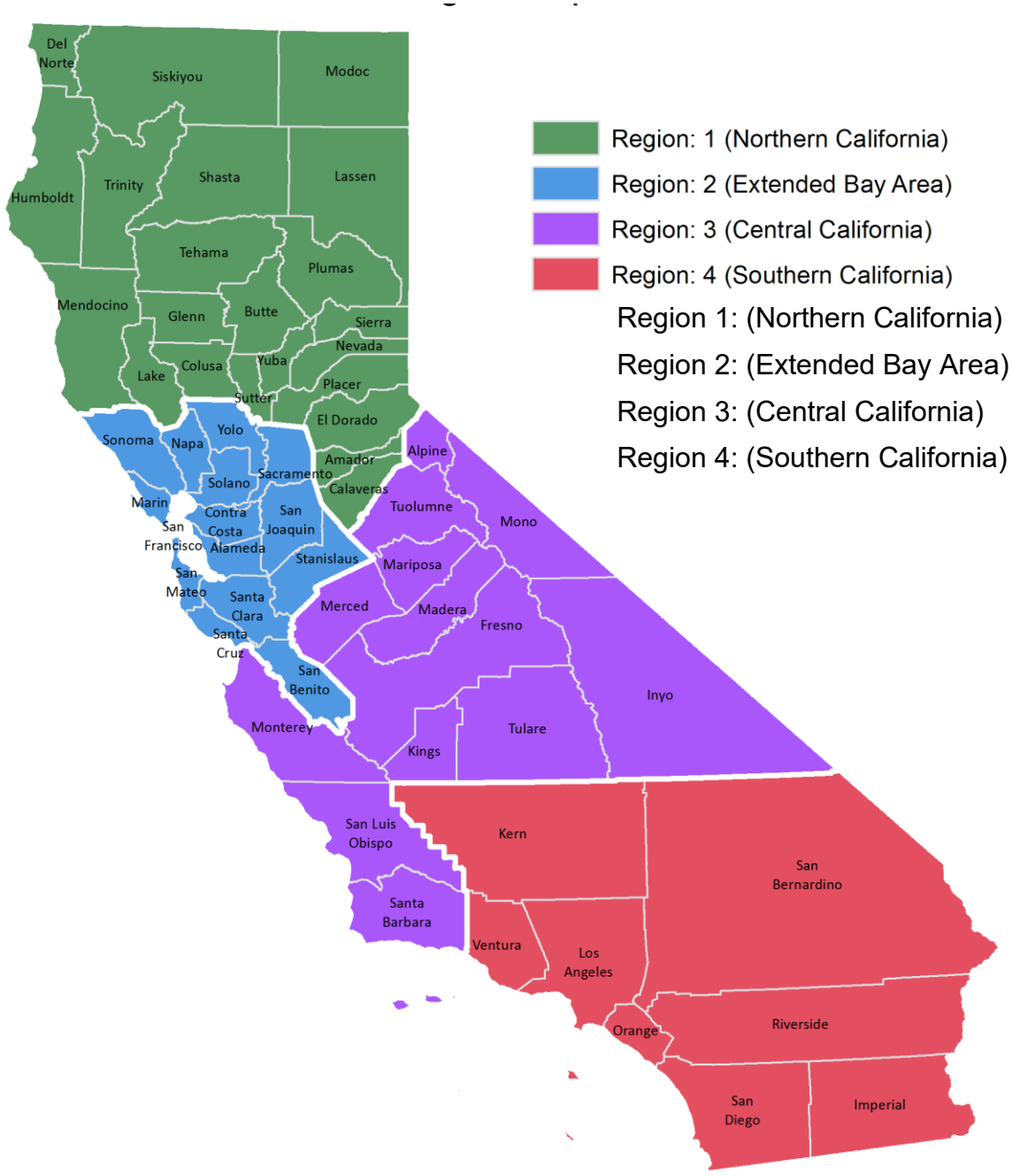
Figure 1 shows the geographical distribution that IWMC used to aggregate some data by regions. IWMC utilized CalRecycle’s FacIT database regions definitions, which

divides the state into four regions. While these definitions are arbitrary, in IWMC's opinion, they are reasonable and reflect how some organic materials move between counties. While these regions were used to aggregate regional data from the survey of composters, because the number of anaerobic digestion facilities is so small, it was impossible to include regional breakdowns of anaerobic digestion data without risking the chance that readers of this report could readily identify individual facility data. Table 4 shows the distribution of counties within the four regions.

Data Aggregation

IWMC identified data by county, which allows for various aggregations. Unfortunately, the regional distribution and even county boundaries do not correspond well to the jurisdictional boundaries used by the various regulatory agencies (regional water quality control boards, air quality management districts, or air pollution control districts).

Figure 1: Study Regions



http://www.calrecycle.ca.gov/FacIT/images/Regions.gif [11/29/2017 4:36:34 PM]

Table 4. Counties Included in FacIT regions.

Region	County	
1 (Northern California)	Amador Butte Calaveras Colusa Del Norte El Dorado Glenn Humboldt Lake Lassen Mendocino	Modoc Nevada Placer Plumas Shasta Sierra Siskiyou Sutter Tehama Trinity Yuba
2 (Extended Bay Area)	Alameda Contra Costa Marin Napa Sacramento San Benito San Francisco San Joaquin	San Mateo Santa Clara Santa Cruz Solano Sonoma Stanislaus Yolo
3 (Central California)	Alpine Fresno Kings Inyo Madera Mariposa	Merced Mono Monterey San Luis Obispo Santa Barbara Tulare
4 (Southern California)	Imperial Kern Los Angeles Orange	Riverside San Bernardino San Diego Ventura

Limitations

- Not every permitted composting and/or anaerobic digestion facility in the State participated in the survey;
- Not every permitted composting or anaerobic digestion facility in the State was contacted;
- All data has been aggregated at a regional level to protect the confidentiality of specific facilities;
- Not all respondents provided complete information for each survey question.

Results

This section presents the survey results.

Types of Facilities Surveyed

The survey targeted primarily composting facilities and was supplemented by a CalRecycle survey of anaerobic digestion facilities. Fifty-one composting facilities completed all or portions of the survey. Of these 51 facilities, 13 reported also doing significant chipping and grinding; seven were co-located at landfills (either closed or open); five were located at transfer stations; seven were located at material recovery facilities; and one was co-located with a wastewater treatment plant. The survey deliberately excluded those composting facilities that are not currently and are not likely to be handling SB 1383 materials. The primary organic materials envisioned under SB 1383 (see Tables 1 & 2) are generally handled at larger, commercial facilities.

Small, feedstock-specific facilities are not likely to make the investments required to handle food scraps or biosolids (for example). Some counties permit composting facilities at wineries (which generally manage their own on-site generated materials) or mushroom growing facilities, which may sell or give away the spent mushroom substrate (sometimes referred to as “mushroom compost”). In the Central Valley and southeastern part of California, there are a number of large, generally feedlot-based manure composting facilities; these and the few dairy composting sites were also excluded because they are not likely to be processing food scraps, biosolids, or food-soiled paper. IWMC also excluded several small facilities that process their own material for their own use, like those at parks and at equestrian facilities.

CalRecycle staff surveyed eight operating anaerobic digestion facilities. Three of these facilities co-digest collected food scraps at existing wastewater treatment plants. Co-digestion is seen as a way of using existing infrastructure to manage food scraps. Five of the digesters surveyed were stand-alone digesters. Of the stand-alone digesters, two were located at transfer stations, two were located at closed landfills, and one is co-located at a rendering facility.

Type of Composting System

As shown in Figure 1.1, the majority of composters surveyed use an outdoor windrow composting method (71 percent), with only 25 percent reporting the use of aerated static pile (ASP) composting. This ratio of windrow to ASP facilities is likely to change as new and expanded facilities come on line. The promulgation of the SWRCB’s general order will likely be driving more large facilities towards ASP composting, as the ability to manage the same or more throughput in a smaller area reduces the cost of compliance. In addition, an increasing number of air districts have rules requiring ASP technology for composting of food scraps (like the South Coast Air Quality Management District) and for very large facilities (like the San Joaquin Valley Air Pollution Control District). The Bay Area Air Quality Management District (BAAQMD) is currently developing an

emissions rule, which may further drive operators of windrow composting to ASP systems.

Figure 1.1: Types of Composting Systems

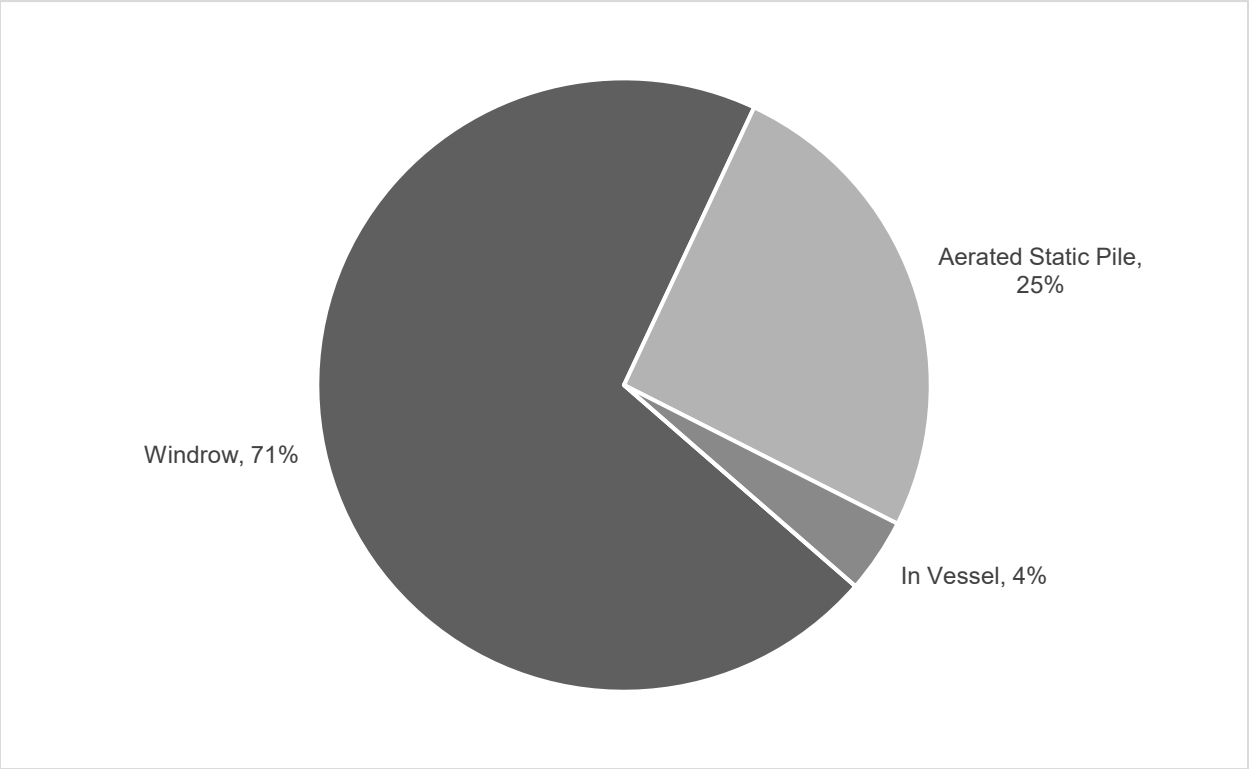
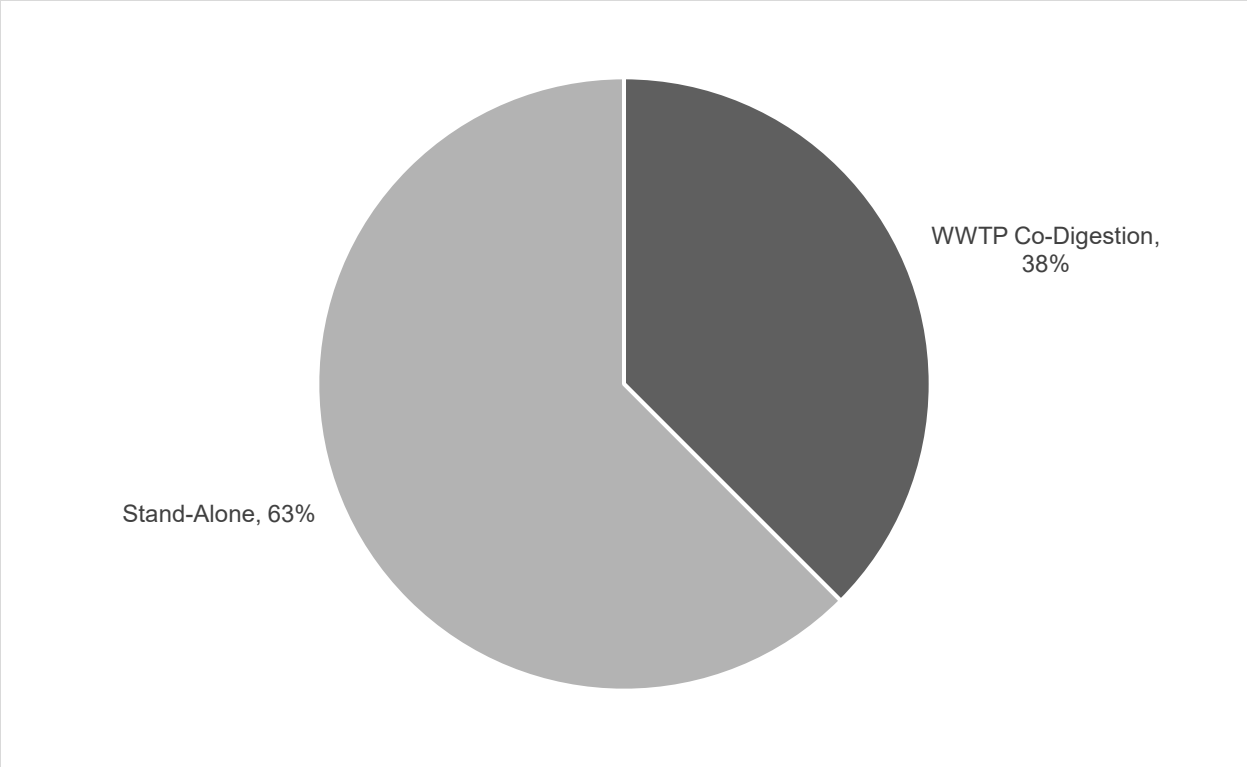


Figure 1.2: Types of Anaerobic Digestion Systems



Type of Anaerobic Digestion Systems

As shown in Figure 1.2, CalRecycle staff surveyed anaerobic digestion facilities handling municipal food scraps and green waste. The majority of those responding to the survey were stand-alone digesters that accept food and green waste. Thirty-eight percent were facilities that co-digest municipal food scraps at a wastewater treatment plant (WWTP). Applying anaerobic digestion technology to municipally generated organic waste is relatively new in California, although it has been used for biosolids and some agricultural feedstocks (manure) for decades. California pioneered the co-digestion of these urban feedstocks at WWTPs. Many observers believe there will be an increase in these types of facilities to help manage SB 1383 feedstocks. At the facilities surveyed, the solid digestate from co-digested solids at a WWTP is usually commingled with and managed as biosolids. It is difficult to determine the fate of food scraps once digested, as they go where the biosolids go. The majority of biosolids in California are applied land to land, at least during the dry months, but some biosolids are composted, some are incinerated, and some are used as Alternative Daily Cover (ADC). ADC use and direct landfilling is more common during the winter months when land application sites become inaccessible. Most of the stand-alone anaerobic digesters surveyed sent their solid digestate to a compost facility for further processing. Other facilities apply the digestate to land or send it to a landfill.

Total Feedstocks Processed

This survey represents roughly 6 million tons of organics processed in California in 2017. However, it is important to note that this is not the total volume of organics

processed in the state. The numbers in Table 5 represent the total tons processed by the survey respondents. This excludes many chip and grind facilities, and other facilities which were not part of the survey universe, as discussed above. However, it is a significant enough volume of tons surveyed to provide a reasonable estimate of current behavior of those facilities.

Table 5. Tons Processed by Survey Respondents.

	Total
Composters	5,720,625
Anaerobic Digestion (AD)	
Co-Digestion	25,999
Stand-Alone Facilities*	245,516
TOTAL	5,966,141

*Tons processed by some stand-alone digesters was subtracted from the total to avoid double counting. These tons are delivered to compost facilities post-digestion and those tons were included in the composters total.

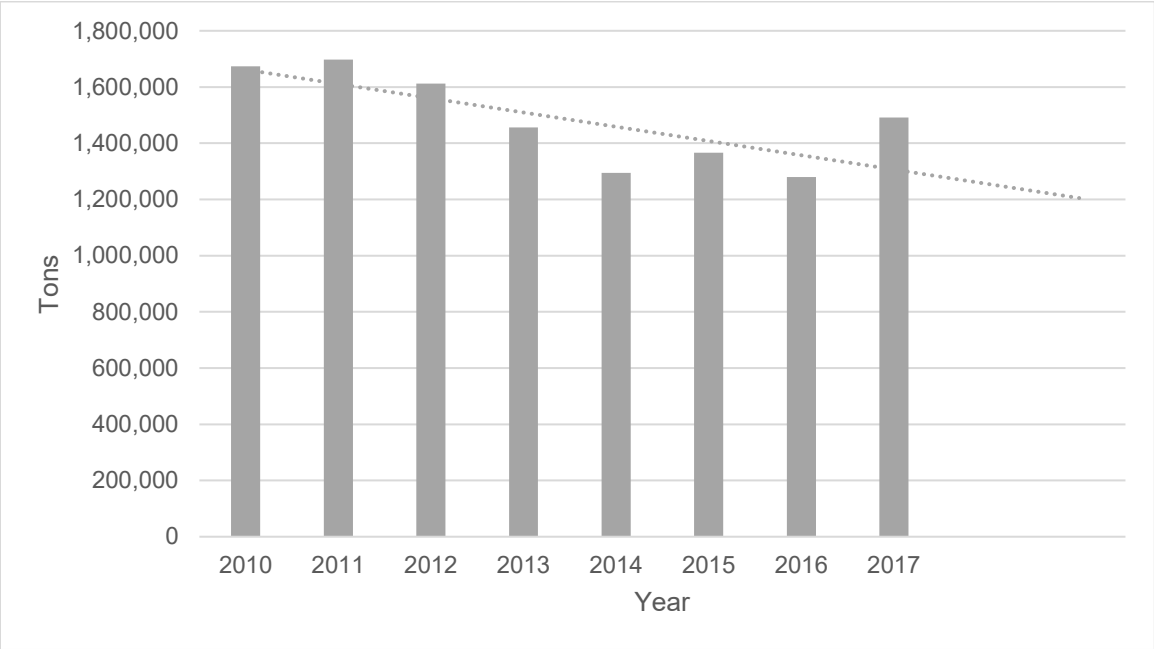
This survey did not take a significant look at the use of Alternative Daily Cover (ADC) as a disposal alternative for green material. AB 1594 phases out the diversion credit for green waste ADC in 2020. SB 1383 further clarifies the ability of organic materials to be used on landfills, but does not prohibit it explicitly. CalRecycle expects the volumes of green waste used as ADC, alternative intermediate cover (AIC), and beneficial reuse at landfills to decrease in the next five years as AB 1594 and SB 1383 are implemented. Table 6 highlights the volume of organic materials (including green waste, compost, and sludge) as ADC, AIC, and beneficial reuse. This represents almost 2 million tons of all materials combined in 2017. This is down from only a few years ago when green waste ADC use, by itself, was over 3 million tons. Figure 1.3 shows the trend in declining green waste ADC tonnage.

Table 6. Organics Use as ADC, Beneficial Reuse, and AIC.

Type	Tons
Green Waste ADC	1,491,679
Compost ADC	26,665
Biosolids ADC	335,040
Beneficial Reuse Green Waste	90,700
Beneficial Reuse Compost	3,426
Beneficial Reuse Sludge	14,761
AIC Green Waste	3,767
AIC Compost	0
AIC Biosolids	2,743
TOTAL	1,968,781

Source: CalRecycle, 2017.

Figure 1.3: Historical Use of Green Material ADC (Statewide)



Types of Feedstocks

The survey looked at a broad category of organic materials commonly handled by compost and anaerobic digestion facilities. These include residential and commercial green material, wood waste, agricultural residues (including manure), food scraps, biosolids, and others.

Organic material processors surveyed for this report receive a wide array of feedstocks. Figure 2 indicates 98 percent of all compost facilities that responded to the survey process some quantity of green material; 73 percent process wood waste (which technically, as defined by CalRecycle regulations, is a subset of green material); 37 percent process agricultural byproducts; 49 percent process food scraps; 22 percent process biosolids; and 24 percent reported processing other feedstocks, which included liquid wastes, palm, and other organic wastes. Because many facilities handle multiple feedstocks, these percentages are not additive, but merely represent the breadth of types of feedstock handled by the surveyed facilities. All of the digesters surveyed accept food scraps and most of the stand-alone digesters also accept green materials.

Figure 2: Percent of Composters Processing Certain Feedstocks

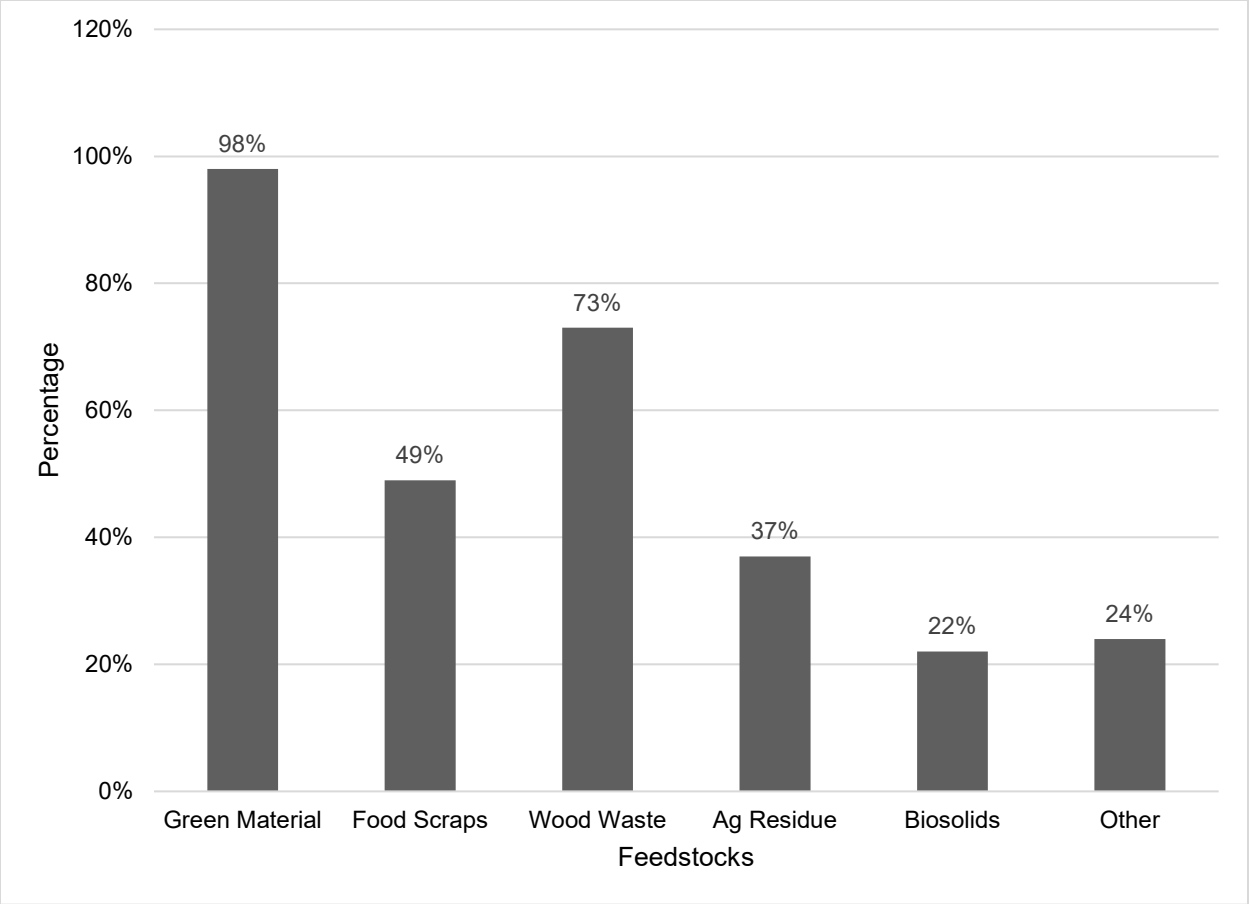


Figure 3 shows the percentage of feedstocks from specific sources. Respondents accept feedstocks from a wide variety of sources. Forty-seven percent of respondents report accepting feedstocks from municipal sources, and 57 percent from commercial sources. Relatively small volumes of feedstocks come from material recovery facilities (MRFs) (22 percent). The most commonly reported source of feedstock was from self-haul (65 percent). Agricultural sources provide feedstock to 31 percent of facilities. Wastewater treatment plants and institutional sources provide feedstocks to 16 percent and 14 percent of facilities, respectively.

Of the facilities receiving residential green material, only 30 percent of responding facilities report receiving residential food scraps commingled with residential green material. SB 1383 regulations currently envision requiring jurisdictions to begin co-collecting residential food scraps with residential green material, and it is likely that most of these will co-collect residential food scraps with residential green material. However, this is not currently a widespread practice.

Figure 3: Percentage of Composters Using Feedstocks from Specific Sources

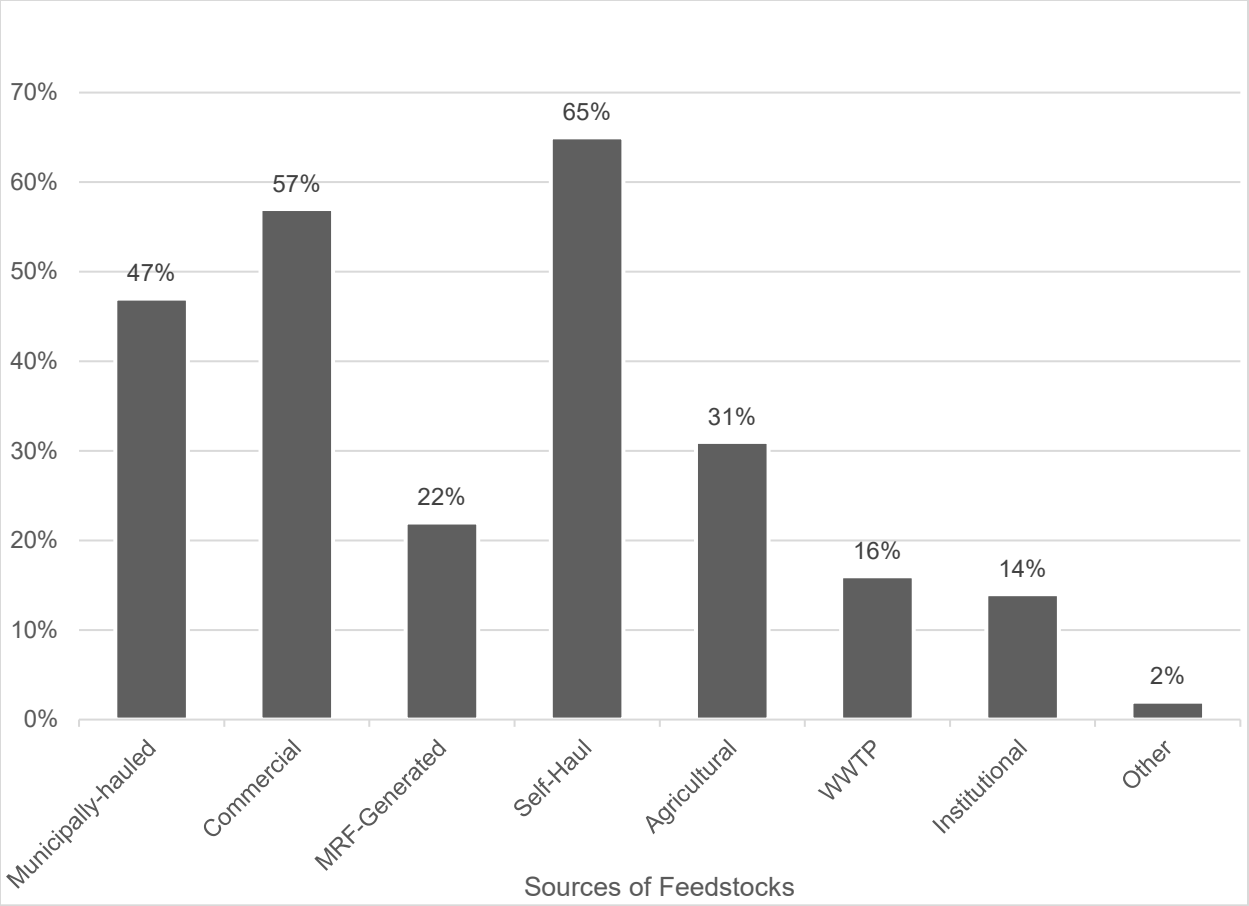
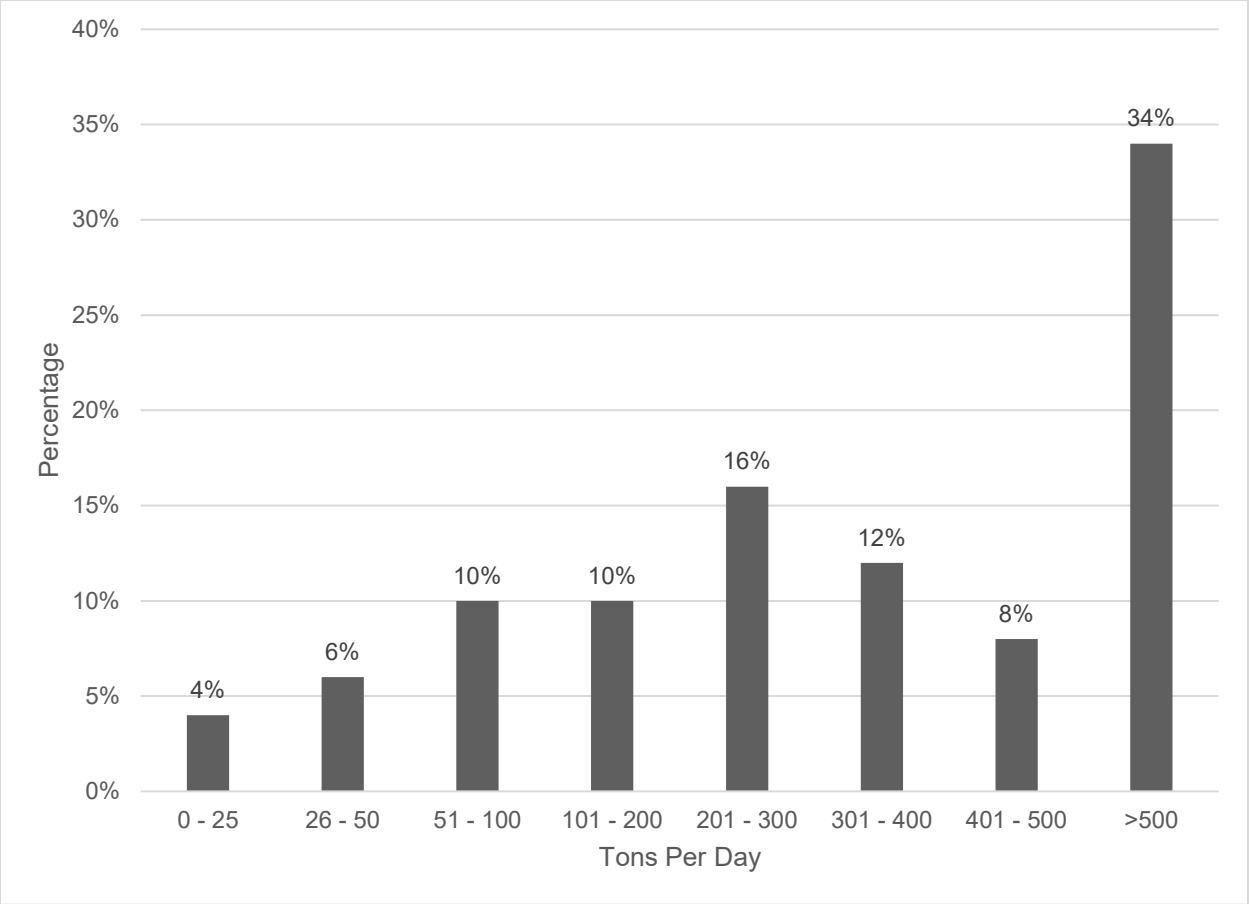


Figure 3 represents tonnage from specific sources and identifies the sources of those tons. Of the facilities collecting residential food scraps, about 50 percent allowed residents to include food-soiled paper. As with co-collection of food scraps and residential green material, the inclusion of food-soiled paper appears likely to increase as jurisdictions implement SB 1383 organics diversion programs. Far more facilities allow commercial food scraps programs to include food-soiled paper (71 percent). It is unknown whether this is a direct result of AB 1826, which envisions the diversion of food-soiled paper, or whether it is just the nature of food scraps collection programs. Numerical diversion targets drive most commercial and residential food scraps collection programs in CA, so they tend to be *inclusive,* allowing a wide array of organic materials (like food, meat, dairy, compostable food service ware, and food-soiled paper). It is hard to find a restaurant or grocery store food scrap collection program that does not include cardboard, especially wet-strength cardboard, in which much of the produce is delivered.

Daily Incoming Processing Capacity

Figure 4 summarizes responses to the question of current daily incoming processing capacity in tons per day. To be clear, daily incoming processing capacity is different than annual capacity. Responses to the incoming daily processing capacity question probably have more to do with processing capacity (i.e., equipment capacity) than space or annual permit limitations. In general, there is a wide distribution of daily incoming processing capacity. It is somewhat surprising that the largest group (34 percent) report 500 tons per day of existing, incoming processing capacity. This has a variety of explanations. Generally, most facilities hope to have more daily incoming processing capacity then they expect to receive on a given day as a way of managing peak flows. Green material generation can vary based on a wet year, management practices, and other factors. Food scraps are more consistent, though there are an increasing number of programs (both public and private) that seek to reduce food scraps generation. Sixteen percent of facilities, the second largest segment of facilities reporting on incoming process capacity, report receiving 201 to 300 tons per day. The survey resulted in good feedback from facilities at all levels of daily incoming processing capacity.

Figure 4: Daily Incoming Processing Capacity



Figures 5A through Figure 5E show reported values of daily *available* processing capacity. Daily available processing capacity is defined as the permitted capacity minus the actual throughput (on a given day). For example, a facility that is permitted to accept 500 tons per day, but is only typically receiving 200 tons per day, would report a daily available processing capacity of 300 tons per day. Twenty-two percent (almost a quarter of all facilities surveyed) report a daily available processing capacity of over 500 tons per day. As shown in Figures 5B and 5E, most of this daily available processing capacity is located in Region 1 and Region 4. There can be a significant difference between *permitted* capacity (i.e. how much material a facility is legally entitled to receive on a daily or annual basis—sometimes referred to as maximum daily throughput) and *operational* capacity (what a facility is actually able to process based on available land, pad space, manpower, mechanical equipment, and so on). Facilities that push past their operational capacity—even if they are well within their legal permit maximums—risk odors and significant operational failures that could jeopardize relations with neighbors and regulators. Furthermore, there may be differences in the maximum permitted capacity in a solid waste permit versus the amount the facility's air district permit would allow.

This analysis looks broadly at the difference between available permitted capacity and reports of quantities of organic material processed in 2017. This finding is significant,

specifically in Region 4 (Southern California) where many observers (primarily local government, but also haulers) have decried a lack of available processing capacity and the challenges of permitting local capacity. This appears not to be the case; however, transportation distance, a site's daily traffic limitations, company affiliations, feedstock quality, and other factors can all have an impact on how much capacity is truly "available." Substantial existing available capacity is a positive finding for those hoping to develop new collection programs. However, available capacity on a statewide basis may not be a useful metric since many decisions go into why a jurisdiction decides to offer organics collection to residents, businesses, or both. This service is often franchised to a private company, which may or may not want to deliver collected material to a competitor and will likely want to keep the collected organics in-house if possible. There are many individual decisions that lead a processor to expand or develop additional capacity. As of this report, the current situation resembles a "chicken and egg" dilemma, in that generators do not want to develop collection programs until there are available facilities. Facility developers, on the other hand, cannot justify investing in new capacity unless collection contracts are in place, especially given the significant expense in developing new facilities.

Figure 5B (Region 1, Northern California) shows that while there is a surprising amount of available processing capacity (25 percent reporting greater than 500 tons per day), 50 percent of facilities report having either no capacity or less than 25 tons per day available.

Figure 5A: Daily Available Processing Capacity, Composters, Statewide

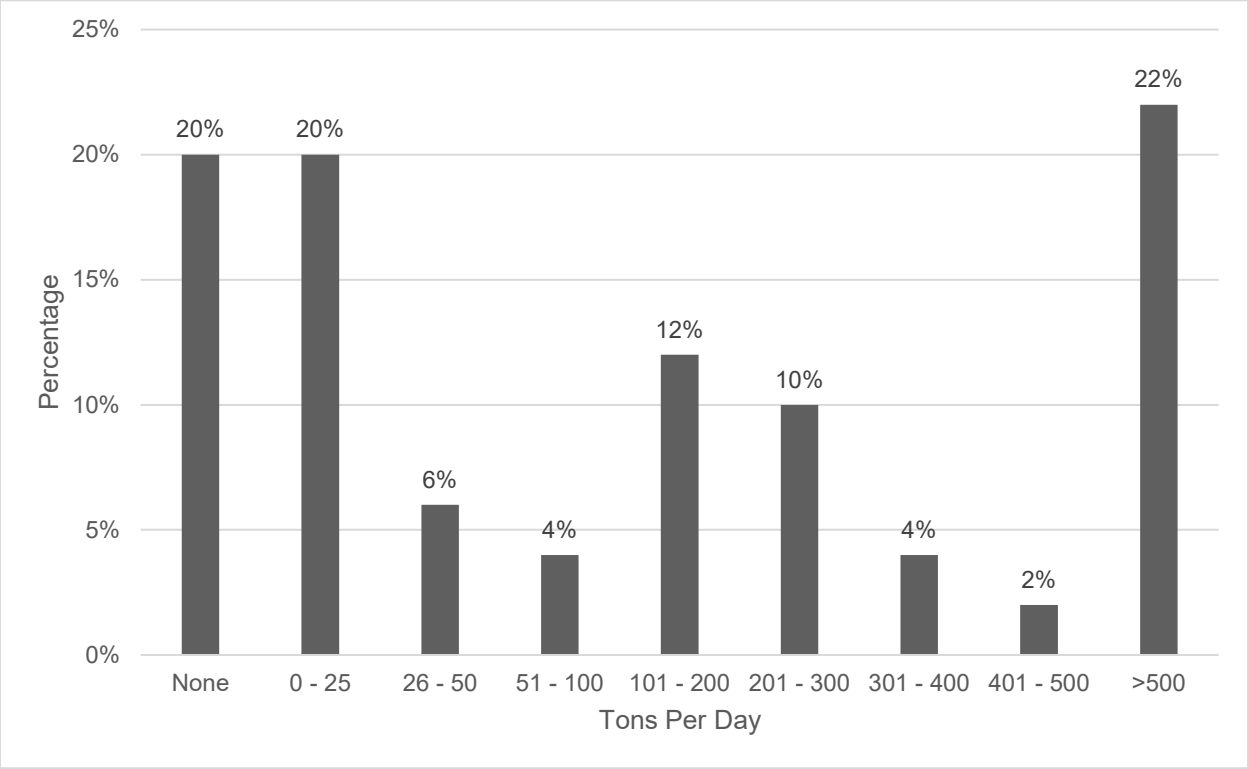


Figure 5B: Daily Available Processing Capacity, Composters, Region 1

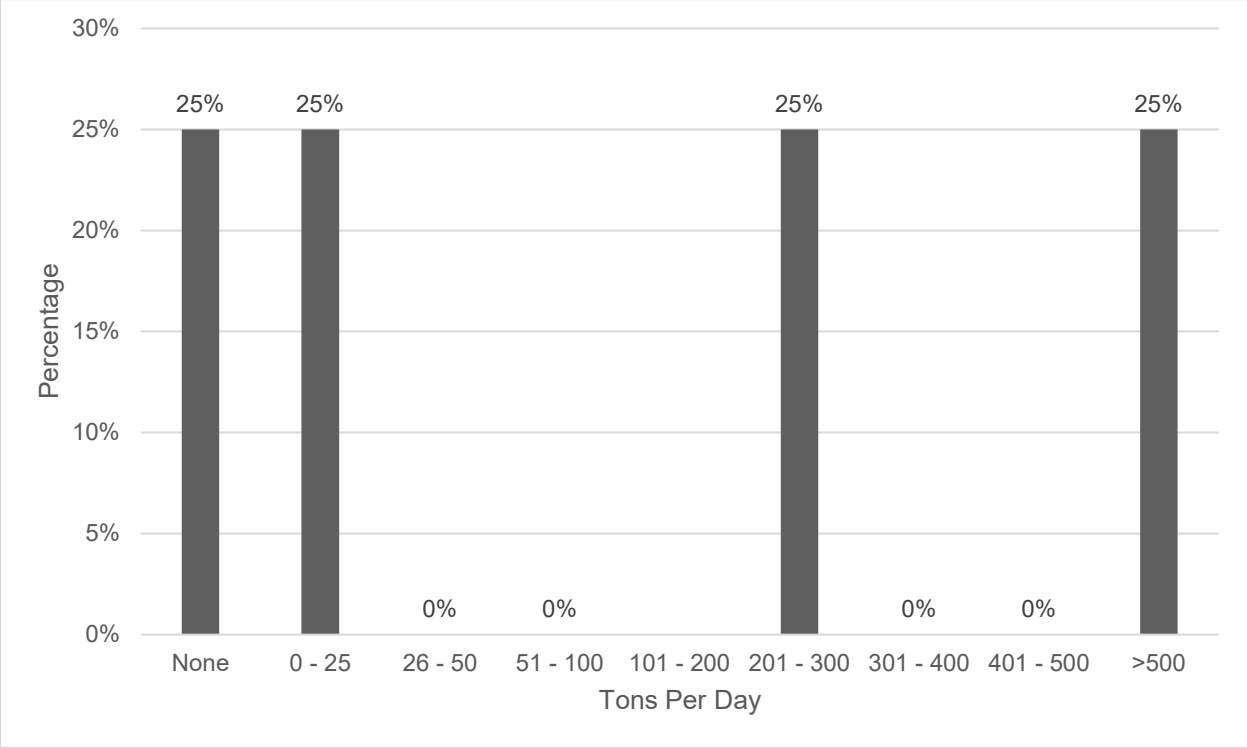


Figure 5C: Daily Available Processing Capacity, Composters, Region 2

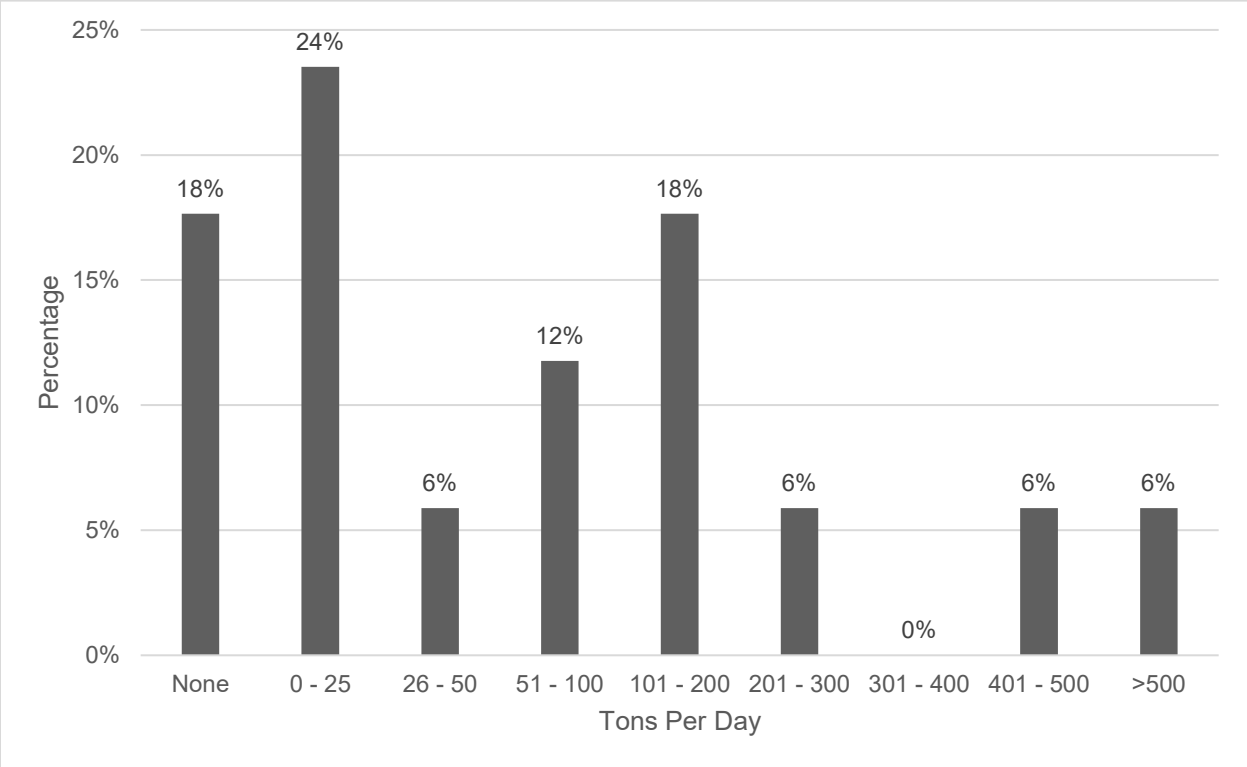


Figure 5D: Daily Available Processing Capacity, Composters, Region 3

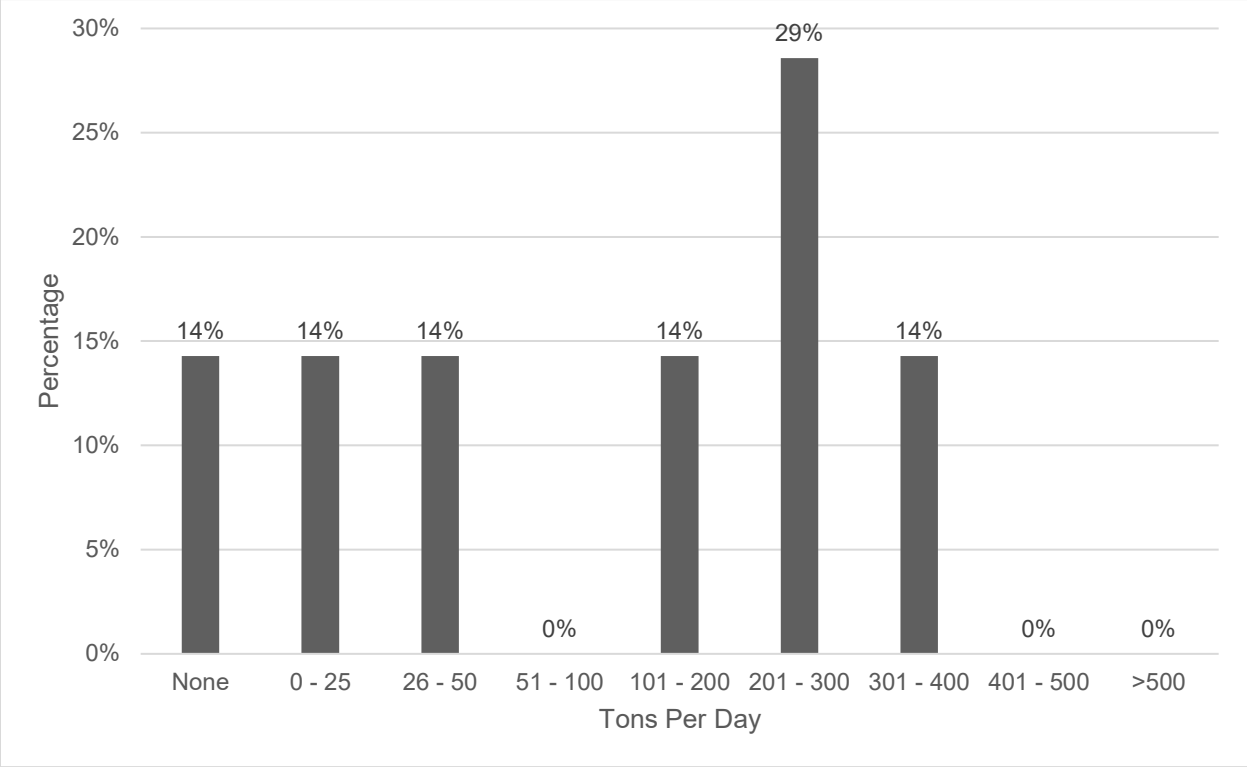


Figure 5E: Daily Available Processing Capacity, Composters, Region 4

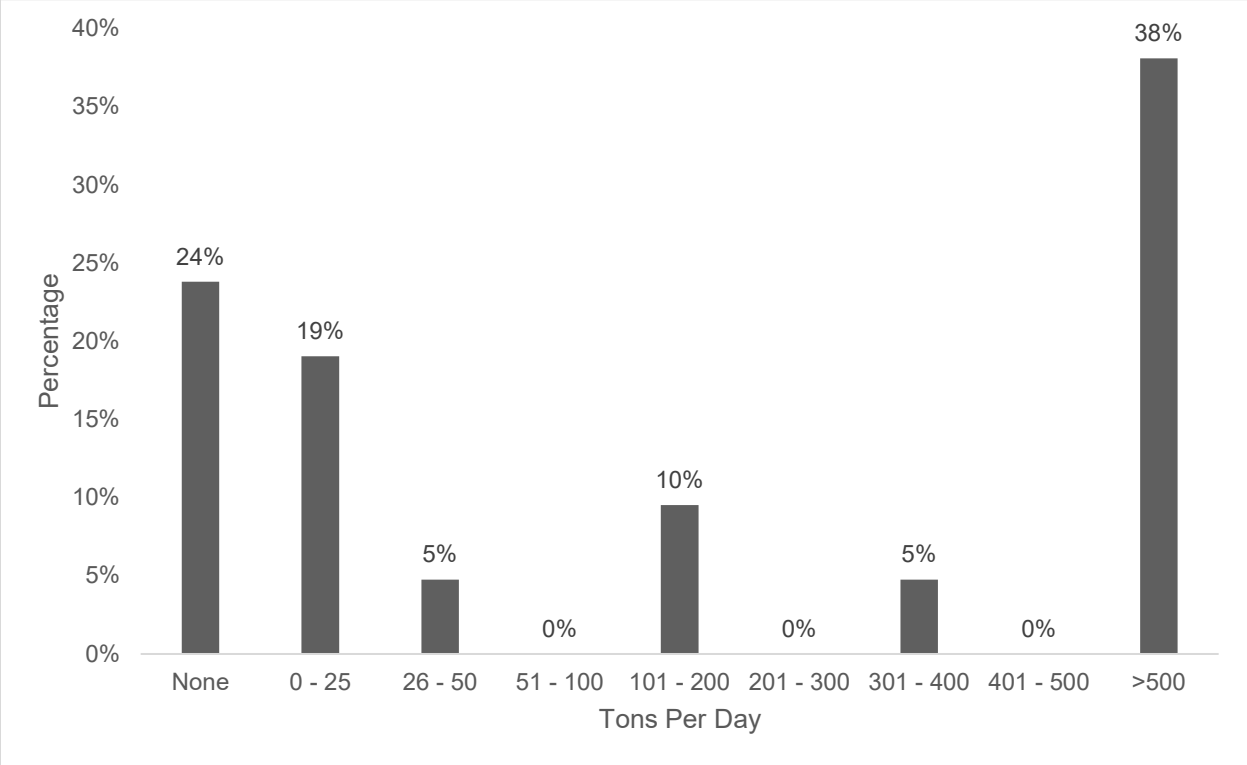


Figure 5C (Region 2, extended Bay Area) shows a much broader range of daily available processing capacity – with only 12 percent of facilities reporting greater than 400 tons per day available processing capacity. A number of new composting facilities are being built or have opened since the 2017 data that this survey is based upon, but clearly there are acute capacity shortages within Region 2, with 42 percent of facilities reporting 0 to less than 25 tons per day of daily available processing capacity. Recent plans by the BAAQMD to develop both VOC and methane-based emission rules may further increase the costs of new or expanded facilities in this region.

Figure 5D (Region 3 Central California) also shows a lack of significant daily available processing capacity, with no facilities reporting greater than 400 tons per day of available processing capacity. Forty-two percent (almost half) of facilities within the Central California Region report 50 tons per day or less daily available processing capacity. On the other hand, 43 percent (again, almost half) reporting between 200 and 400 tons per day of daily available processing capacity.

Significantly, Figure 5E (Region 4 – Southern California) shows 38 percent of all facilities reporting with over 500 tons per day of daily available processing capacity. This is somewhat counter to expectations and should provide some optimism to solid waste planners in Southern California. At the same time, 28 percent of facilities report less than 50 tons per day of available processing capacity. An entirely new large composting facility has not opened in the Southern California Region in over a decade, though two large anaerobic digesters did start operations.

Table 7 summarizes permitted *annual* capacity for composters and anaerobic digestion facilities by region. This table was created using SWIS system data, solid waste facility permits, Reports of Composting Site Information, and other data and "normalizing" it. Normalizing efforts primarily included converting cubic yard limitations into tons so that facilities were compared on an apples-to-apples basis. Table 7 shows the difference by region, between annual *permitted* capacity and *actual* reported throughput for 2017. This table may overstate the actual available annual capacity, and does not estimate operational capacity, but gives a broad regional picture of annual available capacity.

Table 7. Permitted and Actual Annual Capacity by Region (2017).

	Adjusted Annual Permitted Capacity (tons)	Reported Annual Throughput (tons) 2017)	Difference
Region 1	243,000	140,000	103,000
Region 2	2,899,000	2,507,000	392,000
Region 3	1,052,000	661,000	490,000
Region 4	5,386,000	2,306,000	3,081,000
Total	9,580,000	5,613,000	4,067,000

*Numbers have been rounded.

Estimating the available annual permitted capacity of a compost facility involves many factors. Solid waste facility permits (SWFP) often refer to daily incoming tonnages and total on-site volumes. Feedstock materials often arrive, are weighed, and the weight is recorded as tons. However, both the mass and the volume of compost changes over time. The available processing equipment and processing area as well as the retention time of a given composting system could have a significant impact on a facility's available annual capacity. Thus, it can be challenging to determine a regional or statewide estimate of available annual capacity. A facility permit may list a tonnage number that the site could not realistically process on that site, for a variety of reasons. Publicly run facilities rarely share capacity with other jurisdictions, so while a publicly-owned site may appear to have available capacity, that capacity may be reserved for materials generated in that jurisdiction (or for private companies, for materials hauled by that company).

Ultimately, available annual capacity is also dictated by the volume of feedstock delivered to a given site, which may be further dictated by a contractual relationship with a hauler, or it may be purely merchant capacity. For facilities that have contracted deliveries, their available capacities can change if a contract ends or a new contract is lost to a competitor. Thus, the available annual capacity of a given site can be fairly fluid. Table 7 (above) highlights a summary of the estimated available capacity based on responses to the survey. However, these estimates should be taken as order-of-magnitude estimates only. Many factors went into these estimates. Survey respondents reported annual throughput. The *adjusted annual permitted capacity* came from a number of sources, including survey responses, personal communications, the CalRecycle SWIS list, solid waste facility permit documents, reports of composting site information for specific facilities, regional air quality and regional water quality control board permits, and other sources.

Many of these documents use cubic yards as opposed to tons. In the case that only a volume-based limitation was listed, IWMC converted these volumes to tons using very

general estimates of bulk density. Bulk density can change significantly at a compost facility from the feedstock to the finished product. Moisture content can also have a significant impact on bulk density. To further complicate things, adding two different feedstocks of equal volume does not always equal the sum of those volumes. For example, if you have 100 cubic yards of green material and you add 10 cubic yards of food scraps, the resulting pile is not 110 cubic yards because the food scraps may fill the voids in the green material, increasing its bulk density but not necessarily increasing its volume linearly. Different feedstock sources may behave differently.

The data reveals that a significant amount of available annual permitted capacity exists in the state. Some regions have more than others. Region 4 (Southern California Region) shows the largest amount of available capacity. However, that capacity is not equally distributed throughout the region. Hauling distances, franchise fees, and even imported pest quarantine zones may limit the ability for some feedstocks to be sent to some facilities. Also, the estimates in Table 7 are not feedstock-specific and not every compost facility can accept every feedstock (without significant and often costly permit amendments). Historically, composting facilities focused on one primary feedstock, but the variety of feedstocks accepted at a given facility tends to expand as the facility matures and as feedstocks become available.

Figure 6 highlights the relatively small amount of food scraps currently handled by composters. Not all of the available annual capacity shown in Table 7 could necessarily accept food scraps without new permits and possibly other entitlement amendments. Fifty-two percent of composters surveyed do not currently accept food scraps. Forty percent of those surveyed process between 1 and 10 percent food scraps. As shown in Figure 2, most composters in California handle green material. Food scraps are commonly composted along with green material (or other feedstocks) in relatively small ratios of food scraps to green material. Only 8 percent of facilities surveyed report accepting more than 30 percent food scraps.

Especially if food comes in commingled with other materials, it can be hard to estimate how much food scraps a facility is receiving. Many collection programs are inclusive, meaning they include other materials in addition to food, such as paper products, food service ware, and materials that are commonly disposed of with food. This is particularly true if food scraps are mixed with cardboard or residential green material.

Figure 7 shows the maximum capacity of those facilities that do accept food scraps to accept additional food materials. Again, a large component of these (44 percent) have no capacity to accept additional food scraps, whereas 42 percent can process an additional 50 to 500 tons of additional food scraps.

Figure 6: Percentage of Food Scraps Currently Accepted (Composters)

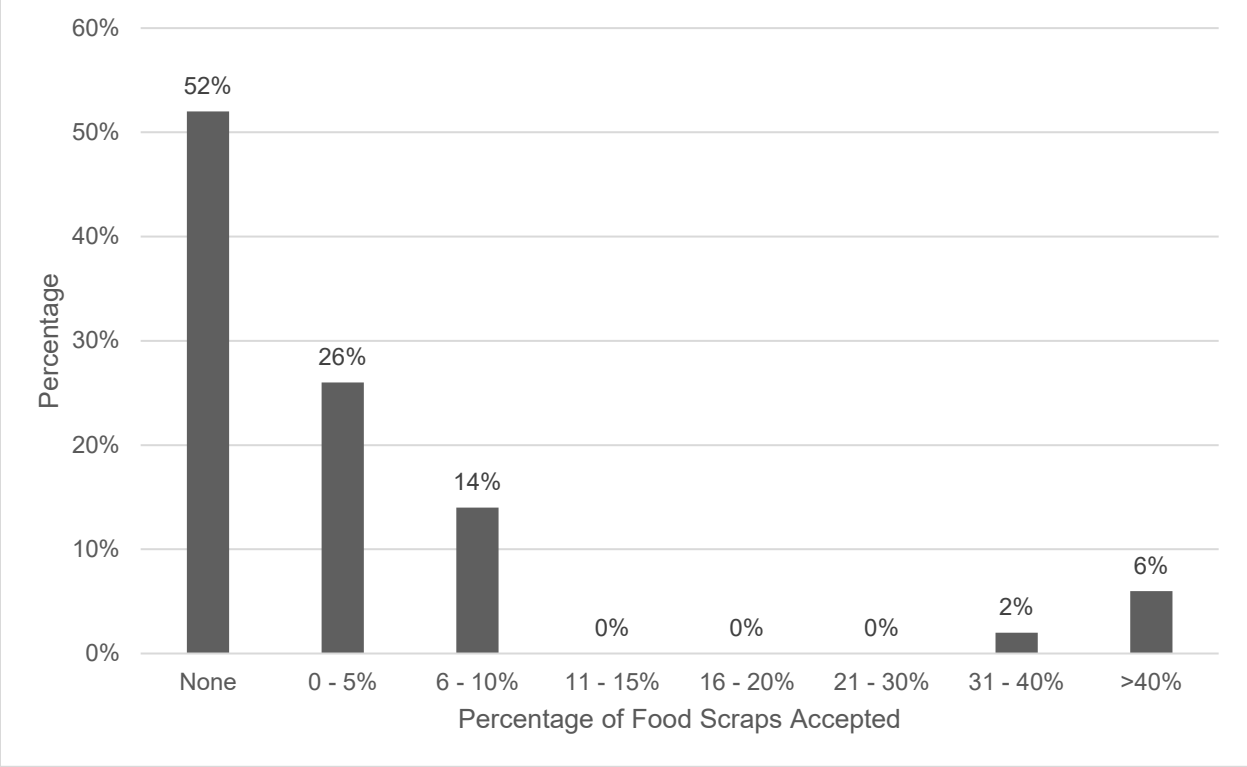


Figure 7: Maximum Capacity to Accept Additional Food Scraps

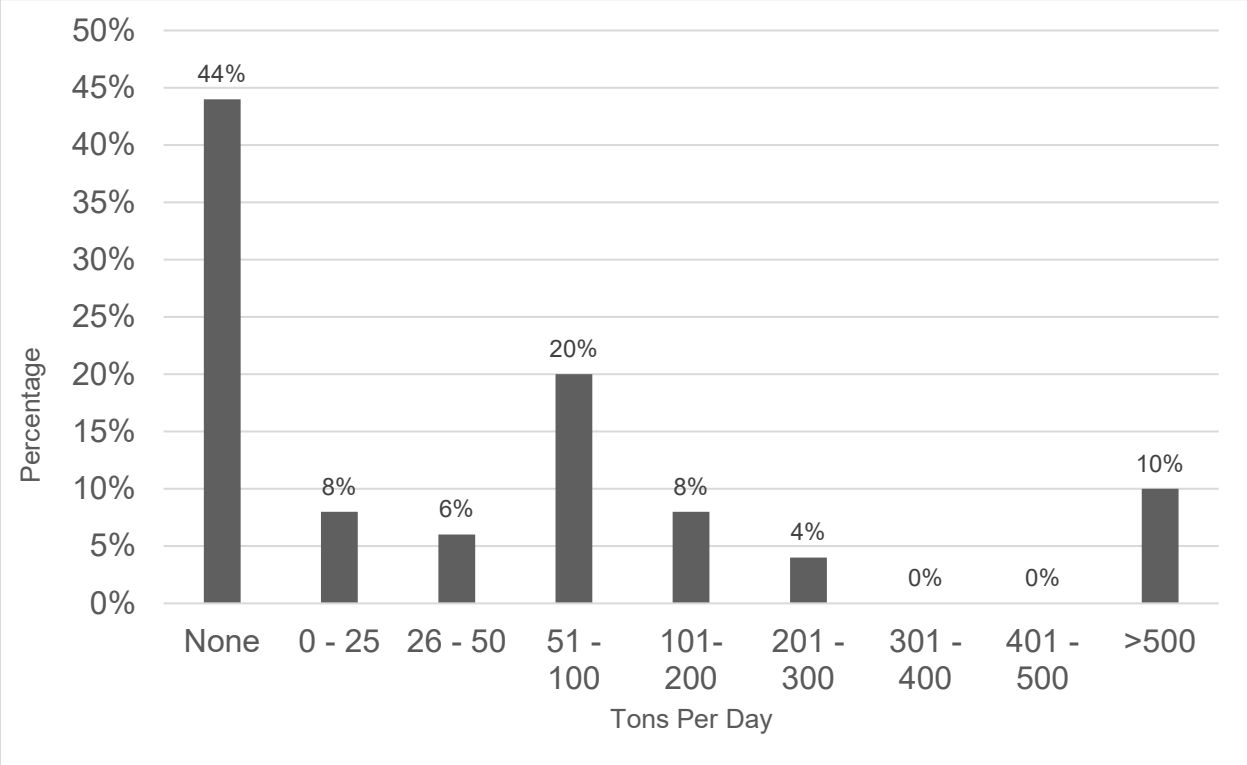


Figure 8 makes this point even more clearly: 66 percent of facilities responded that they are not planning any additional future capacity to accept food scraps. Figure 9 reports the limitations composters cite when considering accepting food scraps. Concerns about feedstock quality (i.e., contamination) top the list, with 46 percent reporting this concern. The need to amend existing permits is a barrier to 46 percent of respondents and concern over odors is next with 38 percent of composters listing this as a barrier to accepting food scraps. “Other” reasons (18 percent of respondents) include the need to upgrade processing technology, the need to maintain enough green material to balance the C:N ratio with food scraps, acceptance by neighbors, concerns about permit limitations, and other concerns. Odor is still the number one reason composting facilities close and was a factor in the closure of a few recent anaerobic digestion projects. To be clear, it is not likely that any single one of these concerns is the barrier, but rather the combination of concerns that is keeping developers from adding new capacity.

Figure 8: Anticipate Accepting Food Scraps in the Next Five Years

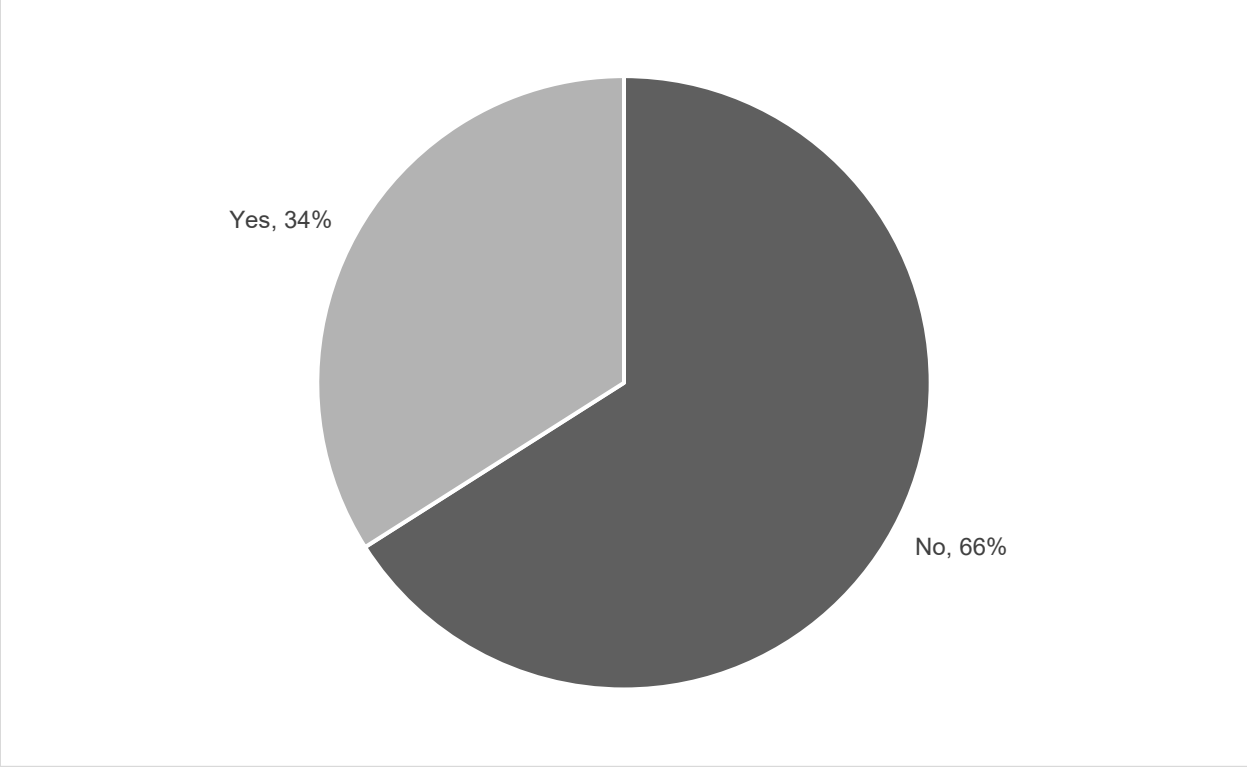
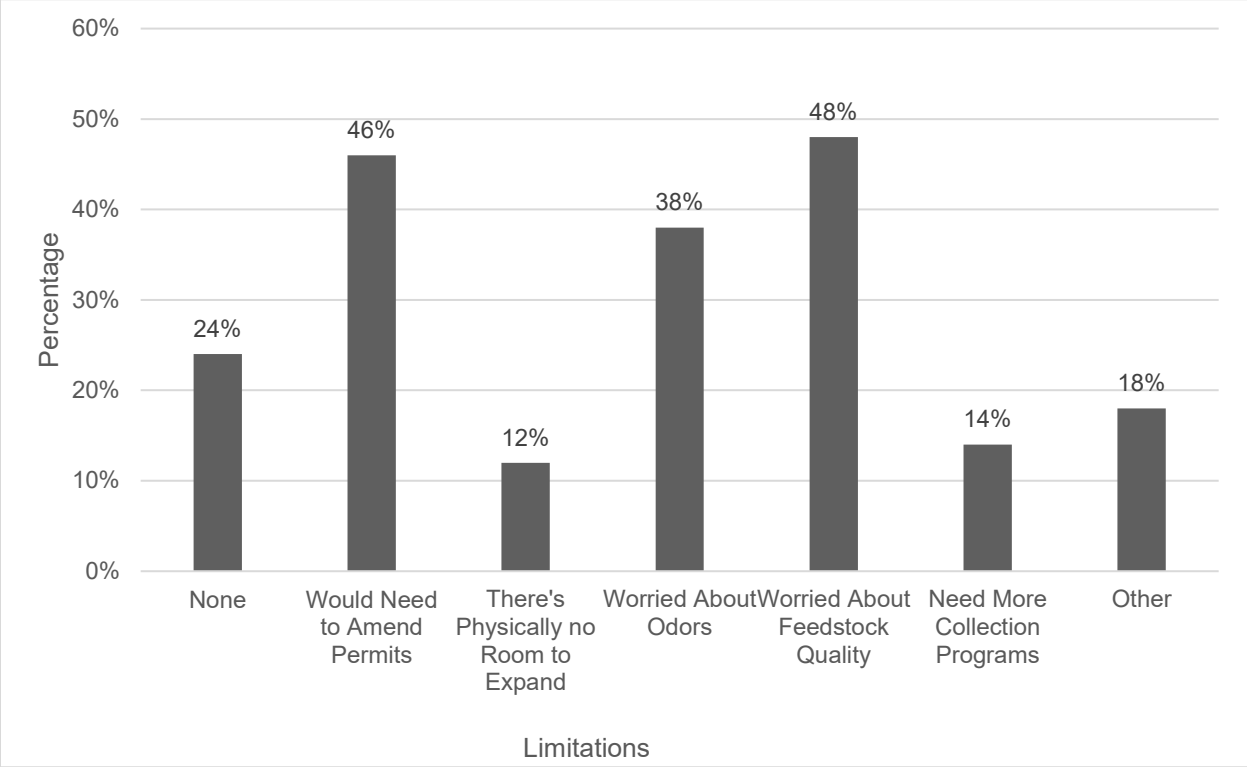


Figure 9: What are the Limitations to this Site Accepting Food Scraps

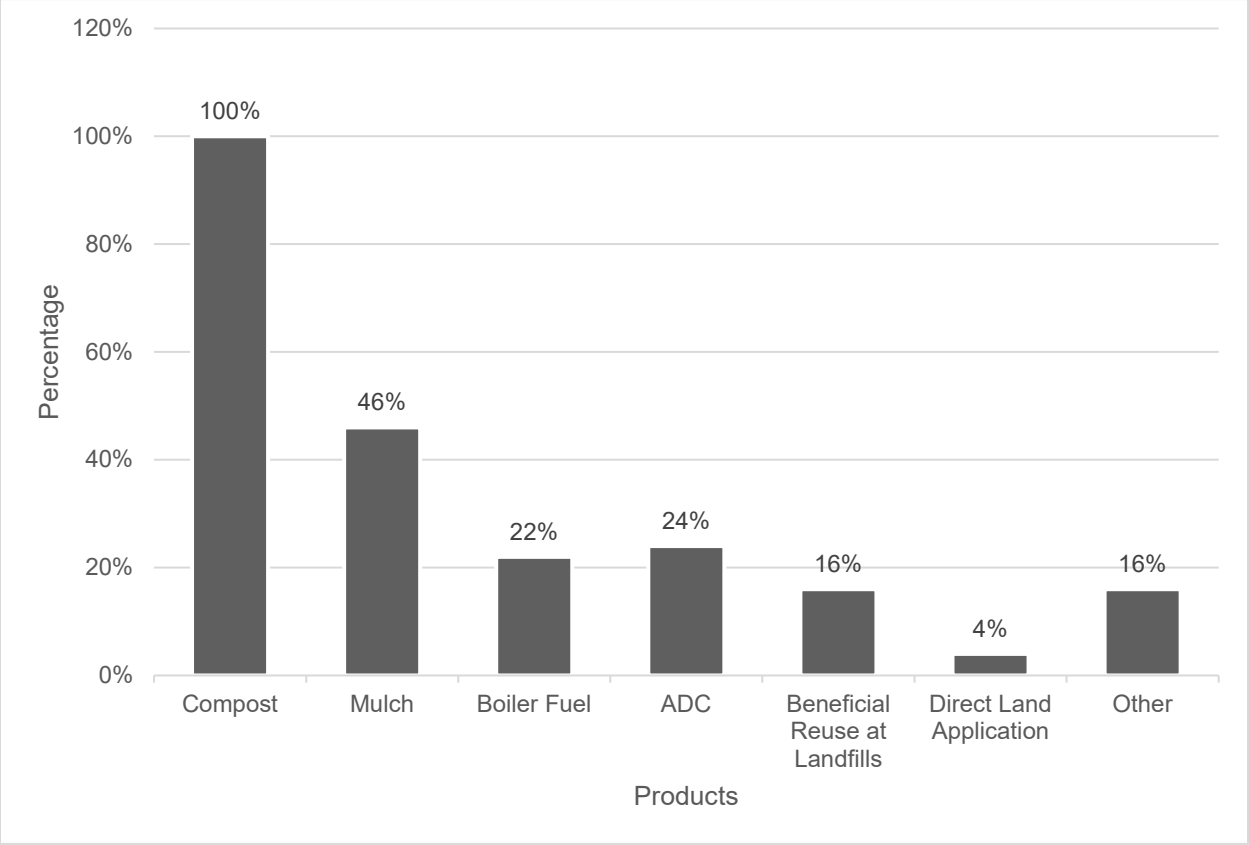


Products Made by Composters

Figure 10 lists the products made by composters. Not surprisingly, all of the survey respondents make compost (100 percent). But slightly less than half also make and sell mulch. The next largest category is landfill uses (24 percent of composters report making ADC and 16 percent make material for other beneficial uses at landfills). This may be because ADC use was widely available until recently and a number of composting facilities are located on or near landfills that use ADC. It may also reflect a general reduction in the use of ADC at landfills statewide. AB 1594, which phases out the provision of diversion credit for green waste used as ADC starting in 2020 may also be having an impact. Twenty-two percent sell boiler fuel, which may be indicative of the loss of a number of biomass energy plants in the last five years, and increasing quality standards. In the 2010 *Infrastructure* survey, biomass fuel was 10 percent of what composters produced. This survey reveals that this has declined to 3 percent (based on total tonnage).

As mentioned above, CalRecycle surveyed operators of anaerobic digestion facilities (both stand-alone and co-digested at a WWTP) by using a different survey process. Because there are so few manufacturers and the uses and markets for products generated by anaerobic digestion are in the very early stages of development, it is difficult to analyze the markets for these products. However, operators of anaerobic digesters do make products sold into the marketplace. These generally include biogas, either sold onto the grid (via a local utility) or compressed into a transportation fuel. At least two of the larger anaerobic digesters are using compressed recycled natural gas (RNG) as fuel for their collection vehicles. Stand-alone digesters are also making both solid and liquid digestate. Solids from the WWTP co-digestion projects were primarily land applied with biosolids, though at least one of the facilities is composting a portion of the solids from the co-digestion process. Generally, the solids from co-digestion of food scraps at WWTPs are considered biosolids and are treated and managed as biosolids. The majority of biosolids in California are directly applied to land without further processing.

Figure 10: Products Made by Composters



Figures 11A through 11E present the products made by composters in easier-to-read pie charts. Figure 11A shows the breakdown statewide, which, as stated, is dominated by compost. Figure 11B shows compost is the dominant product for Region 1 (Northern California) composters with other uses (like colored wood chips and planter mixes) accounting for over a quarter (27 percent) of all products. Clearly, composters in the Northern California region do not produce large quantities of ADC (3 percent) or boiler fuel (0 percent).

Figure 11C shows Bay Area composters produce almost as much compost (40 percent) as they do ADC (41 percent). This also reflects the fact that Region 2 (extended Bay Area) leads the state in composters who accept food scraps. Food scraps have a higher percentage of contaminants (plastic and glass) than do other feedstocks. Composters are screening out contaminants from the finished compost. This has been a common practice for years, but it is increasing as the implementation of SB 1383 regulations draws near, which establish contamination thresholds for finished compost. These contaminants (especially plastic) end up in the “overs,” and the overs are generally what is used as ADC. How these facilities deal with contaminated overs once diversion credit for ADC is phased out is a significant future challenge. Overs are also significantly more voluminous than fines, so, by volume percentage, ADC numbers will look bigger than compost numbers. Region 2 composters also make significant quantities of mulch (12 percent) and are also sending less and less material to boiler fuel (3 percent). The decrease in statewide biomass capacity is also having the effect of sending more overs to ADC.

Figure 11A: Products Produced by Composters, Statewide

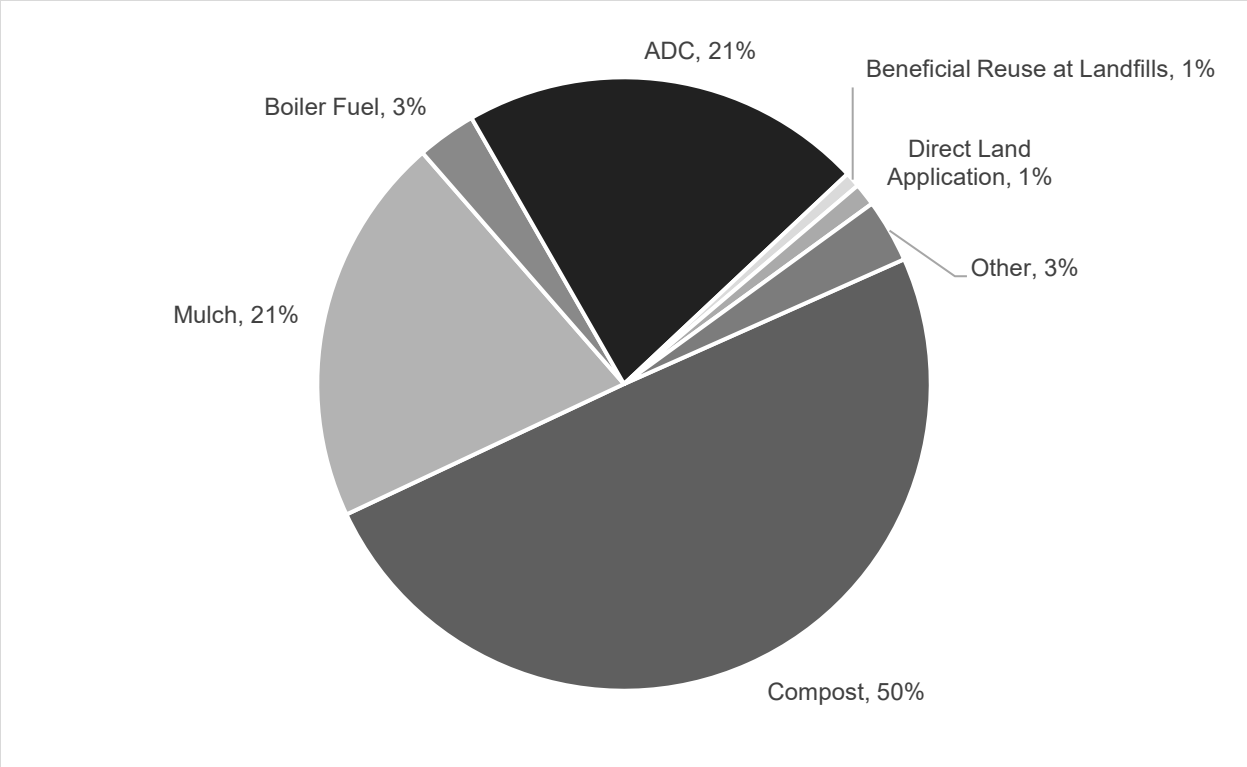


Figure 11B: Products Produced by Composters, Region 1

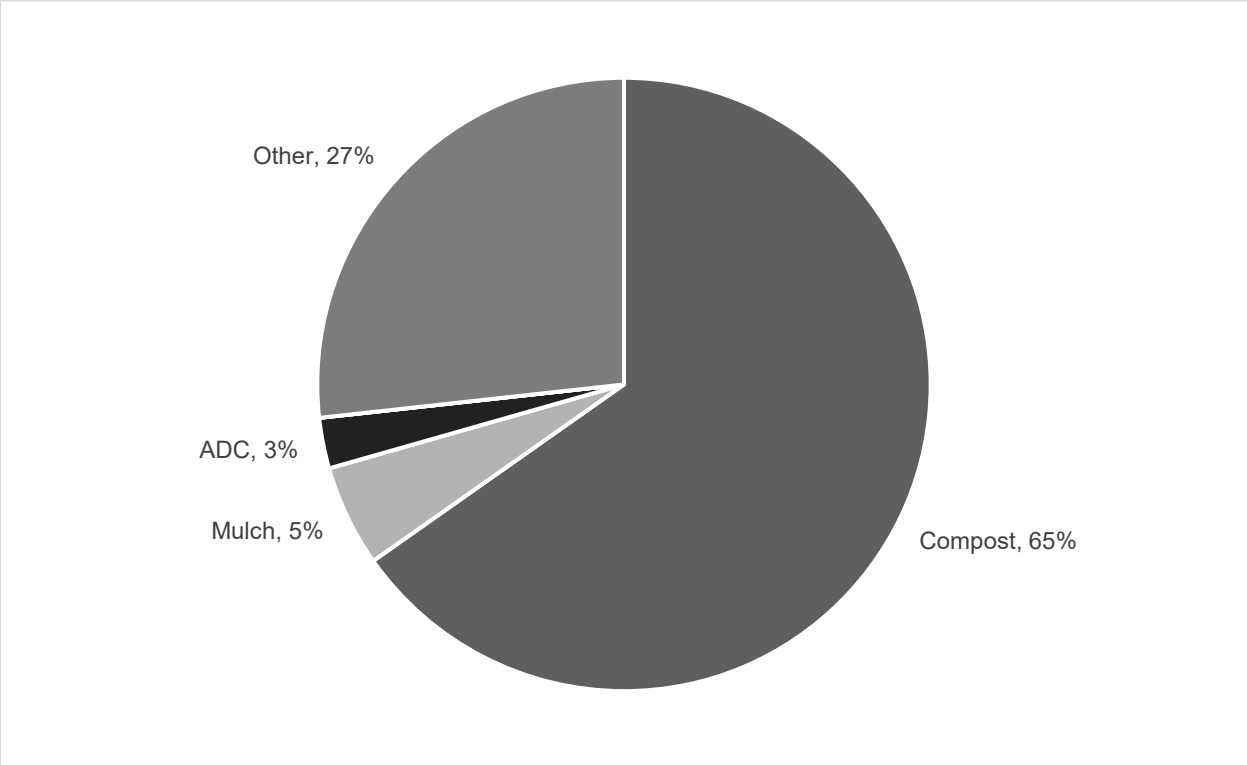


Figure 11C: Products Produced by Composters, Region 2

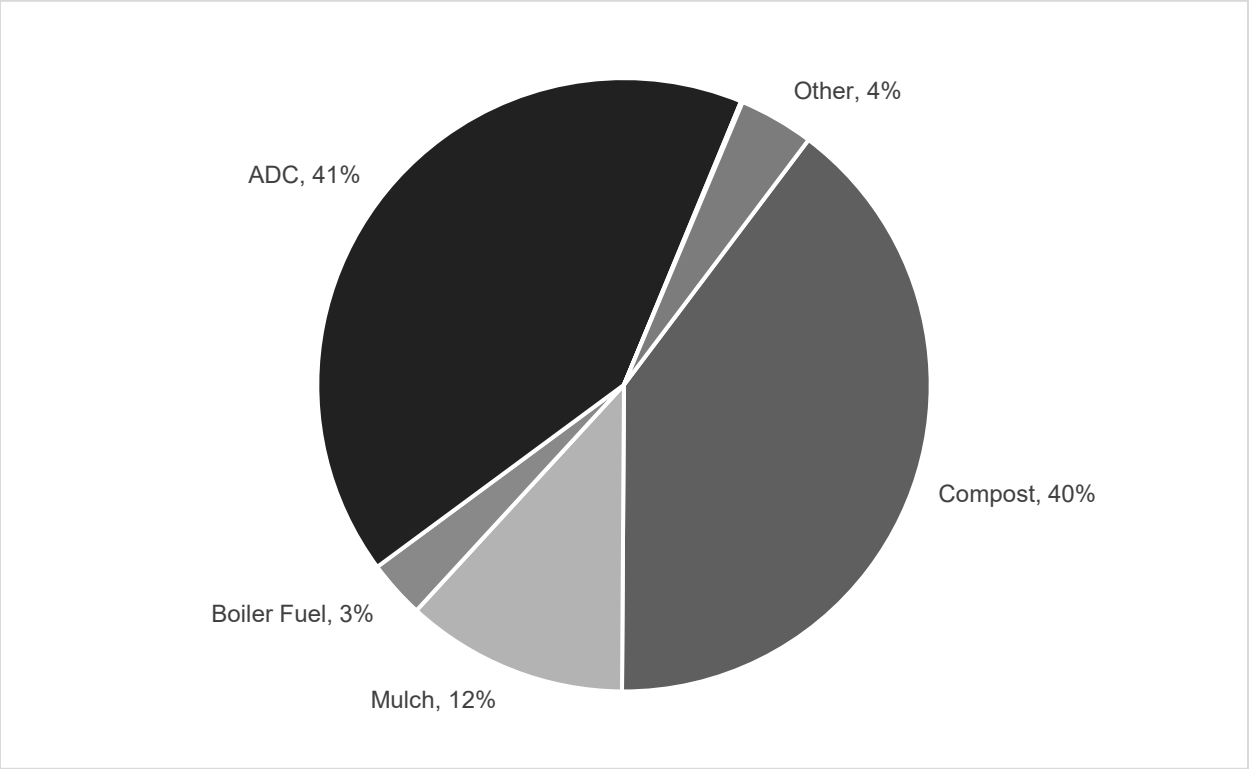


Figure 11D shows a clear preference for compost by Region 3 (Central Valley) composters. This region of California has the largest production agriculture of any region in this study. At the same time, landfills in the Central California region do not use significant amounts of ADC. The closure of some biomass energy plants in the Central California region appears to have impacted boiler fuel production (at 6 percent). With biomass energy plant closures, other, still operating plants can be more selective when choosing fuel, and compost overs have a hard time competing as fuel with kiln-dried wood (like pallets) from chipping & grinding facilities.

Figure 11E shows the breakdown of products in the Southern California Region. The Southern California Region is dominated by compost (54 percent) followed by mulch (34 percent). Other products produced in the Southern California region are boiler fuel (3 percent), direct land application (also 3 percent), ADC (2 percent), and beneficial reuse at landfills (2 percent). This reflects current trends in the region, with biomass becoming more competitive, and ADC markets shrinking. The Puente Hills Landfill, which closed in 2013, was at one time a significant market for ADC.

Figure 11D: Products Produced by Composters, Region 3

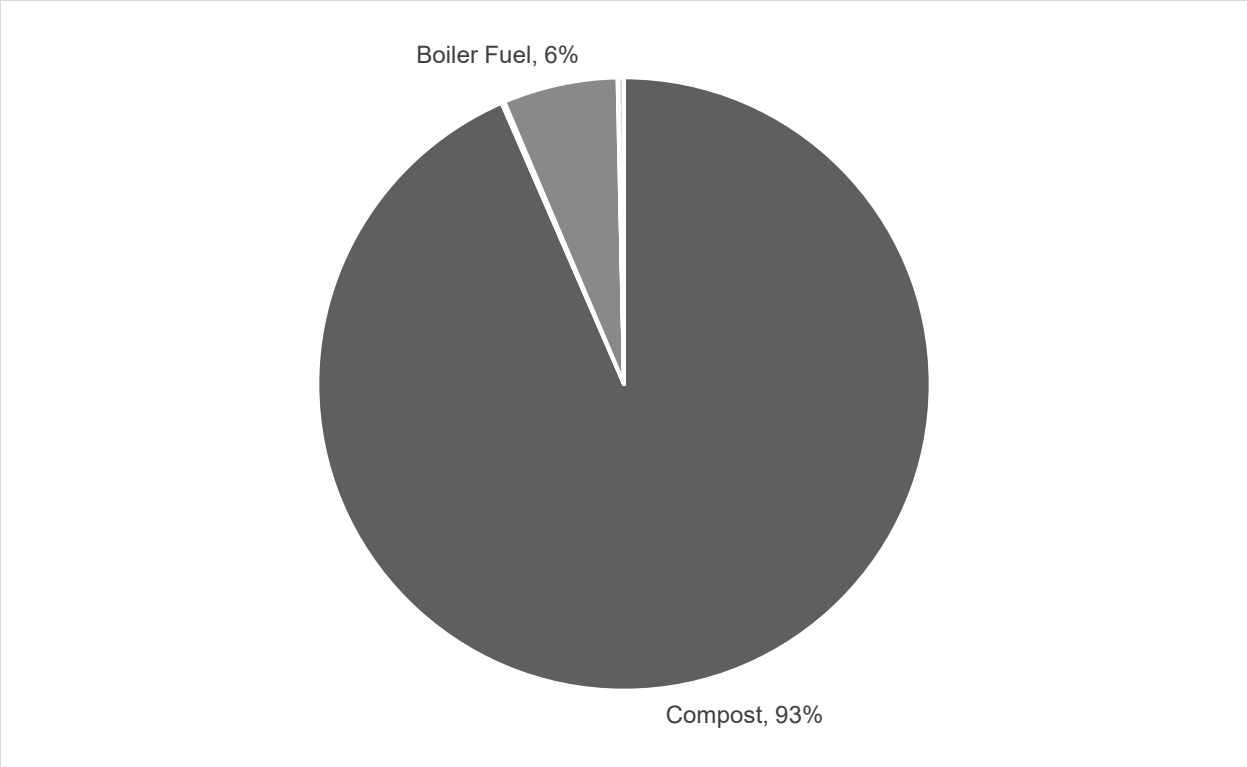
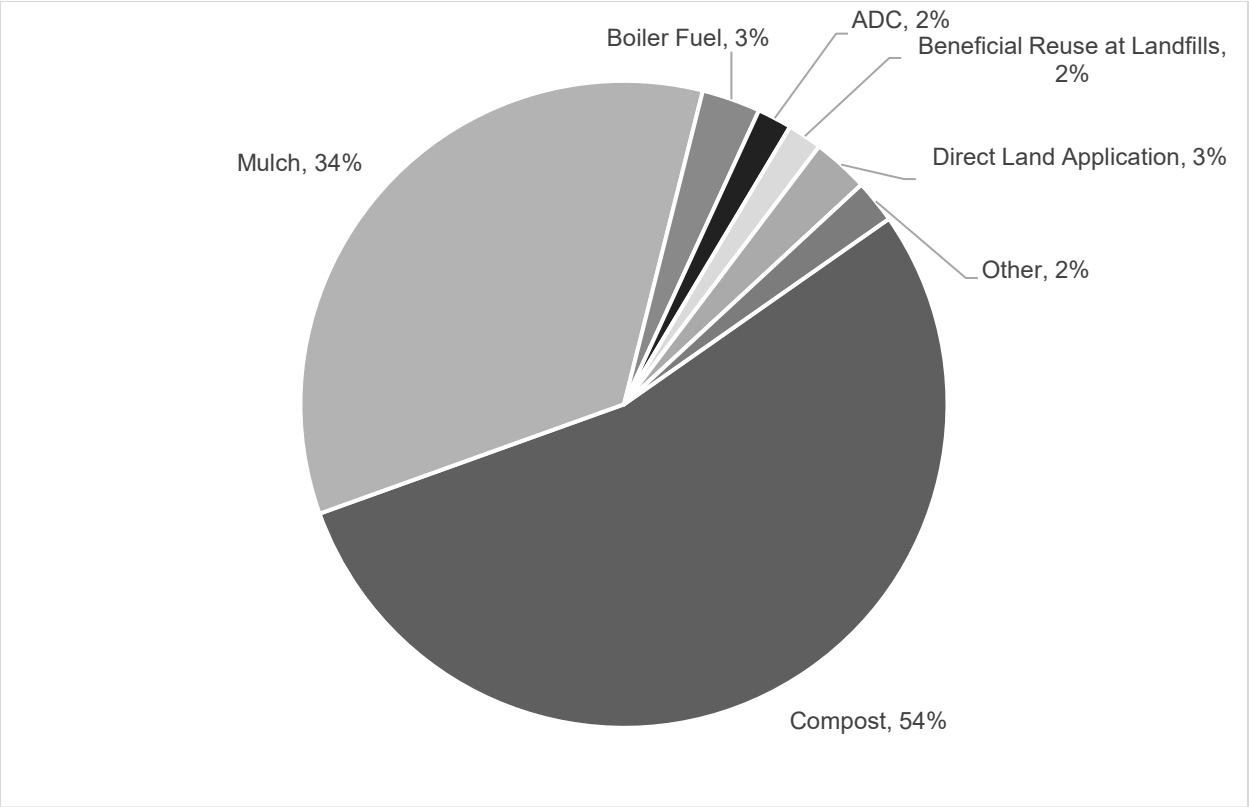

Boiler Fuel, 6%
Compost, 93%

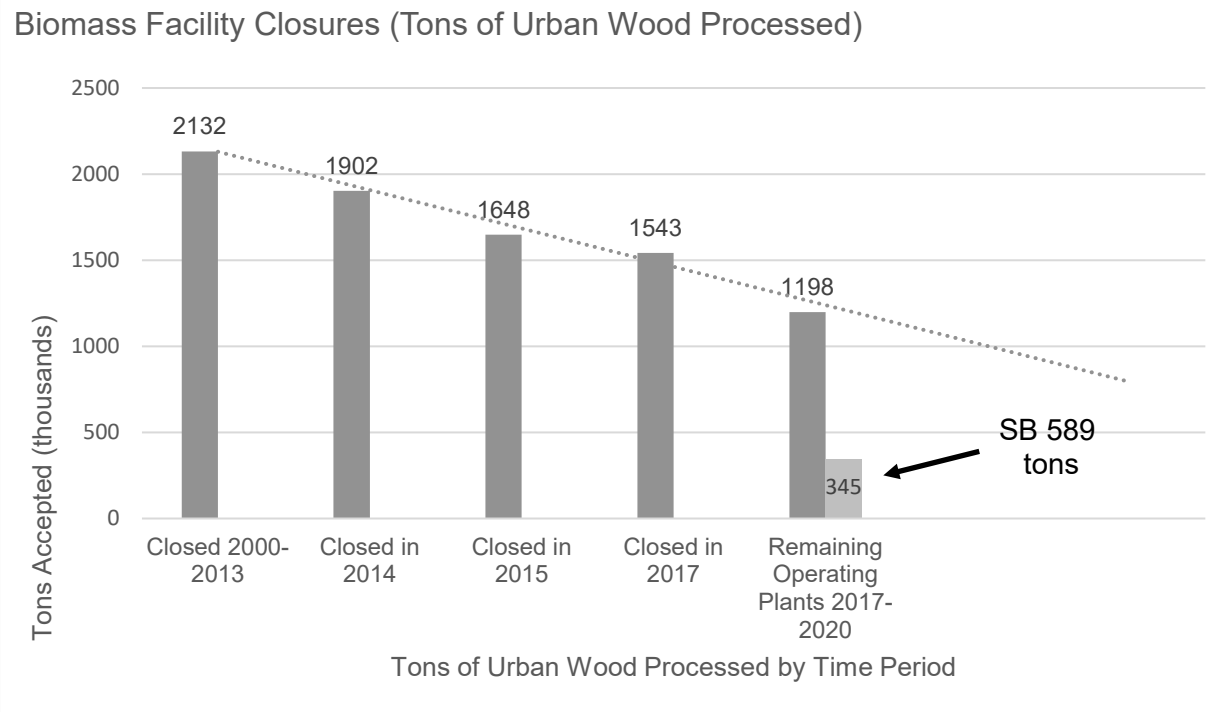
Figure 11E: Products Produced by Composters, Region 4



The Impact of Recent Biomass Facility Closures

At one time California had over 60 biomass-to-energy plants operating statewide. These plants processed woody materials from forest and sawmills, agricultural residues, and from urban sources. Many composting facilities sent woody materials (whether excess feedstocks or overs) to biomass plants as a way to diversify markets and to generate revenue. Historically biomass markets have been an important outlet for composters. In the 2010 organics infrastructure survey, compost facilities sent almost 600,000 tons of material to biomass (about 10 percent of all products produced). In the most recent survey, this number is down to 170,000 tons, or about 3 percent.

The chart below illustrates the decline in the tonnage of urban woody wastes received by biomass plants. From 2000 to 2017, the amount of urban woody wastes consumed by biomass decreased by 1 million tons. This decline is a combination of a number of factors, though the most important one is that the price utilities are willing to pay for mandated renewable power is below what it takes to operate a biomass plant. Electricity from other renewable sources (i.e., solar, wind, etc.) is generally cheaper.



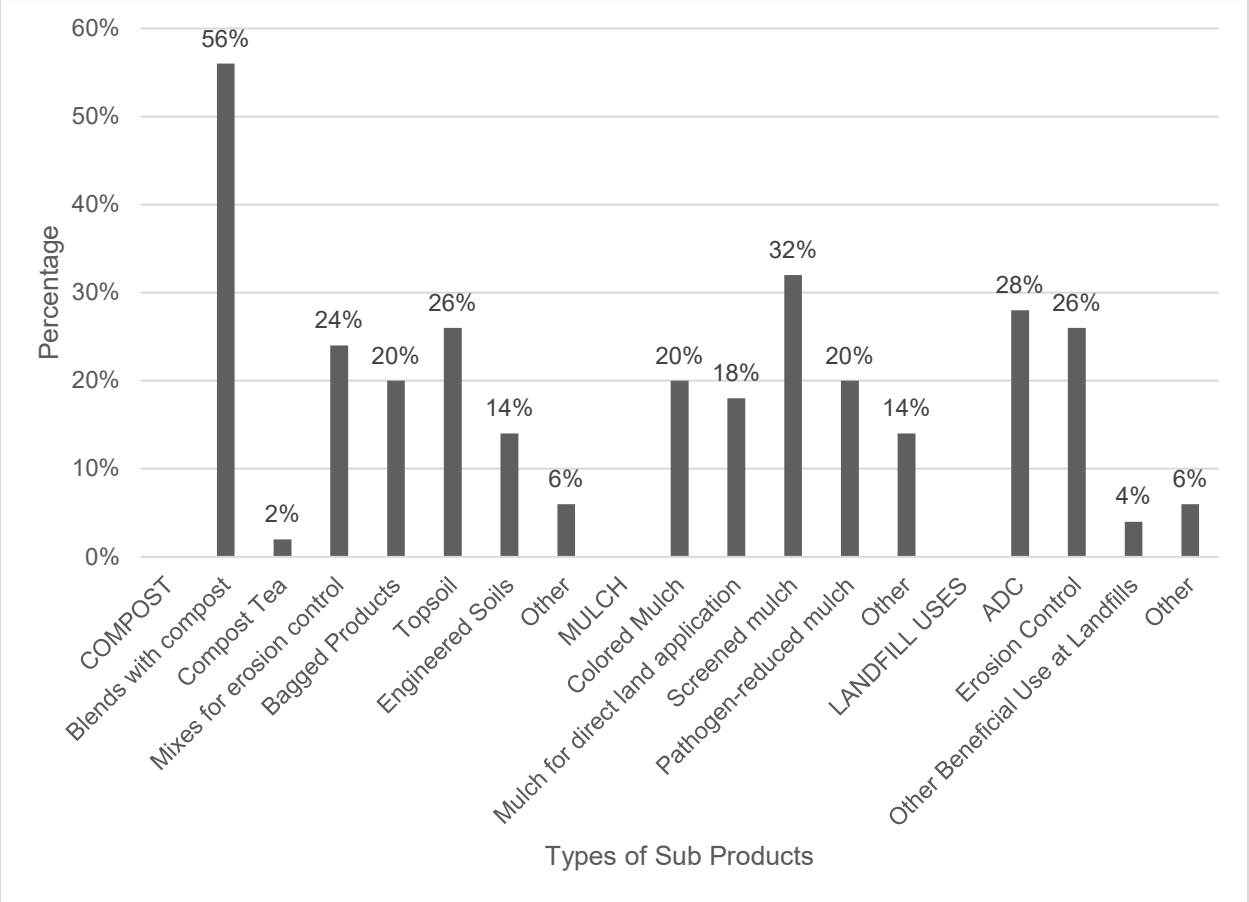
Legislators designed SB 859 (Chapter 368, Statues of 2016) to facilitate biomass plants processing dead and dying trees in response to the tree mortality crisis in California. However, while SB 859 did extend the lives of a few biomass plants by 5 years, it did not increase capacity for urban woody wastes. The chart shows 345,000 tons of dead and dying trees estimated to be processed under SB 589.

Source:
https://ucanr.edu/sites/WoodyBiomass/Technical_Assistance/California_Biomass_Power_Plants/ and Personal Communication, Chris Trott, CTBioenergy

Sub-Products Made by Composters

Figure 12 shows a number of sub-products manufactured by composters. Sub-products are those products made from the larger categories of compost, mulch, and landfill uses. Soil blends using compost leads the list with 56 percent of composters reporting this use, but composters also make topsoil (26 percent), mixes for erosion control (24 percent), and bagged products (20 percent). Only 6 percent of composters report producing engineered soil, showing perhaps the technical nature of that use. As a sub-product of mulch, composters make screened mulch (32 percent), pathogen reduced-mulch and colored mulch (20 percent each), and mulch for direct land application (18 percent). As for landfill uses, ADC dominates at 28 percent, with erosion control a close second at 26 percent.

Figure 12: Types of Sub-Products Manufactured



Materials Sold by Market Segment

Figure 13 lists the category of markets into which these organic products are sold. These figures show how many composters sell to these market segments, but the figures do not represent total cubic yards sold into these markets. (Figures 14A through 14E do that). Most composters report selling to both landscape and agricultural markets (78 percent and 76 percent respectively). Forty-eight percent of composters report selling into the nursery market; 36 percent into municipal projects; 20 percent to boiler fuel; 18 percent to landfills for ADC; and 16 percent to landfills for other beneficial use.

Figure 13: Materials Sold by Market Segment

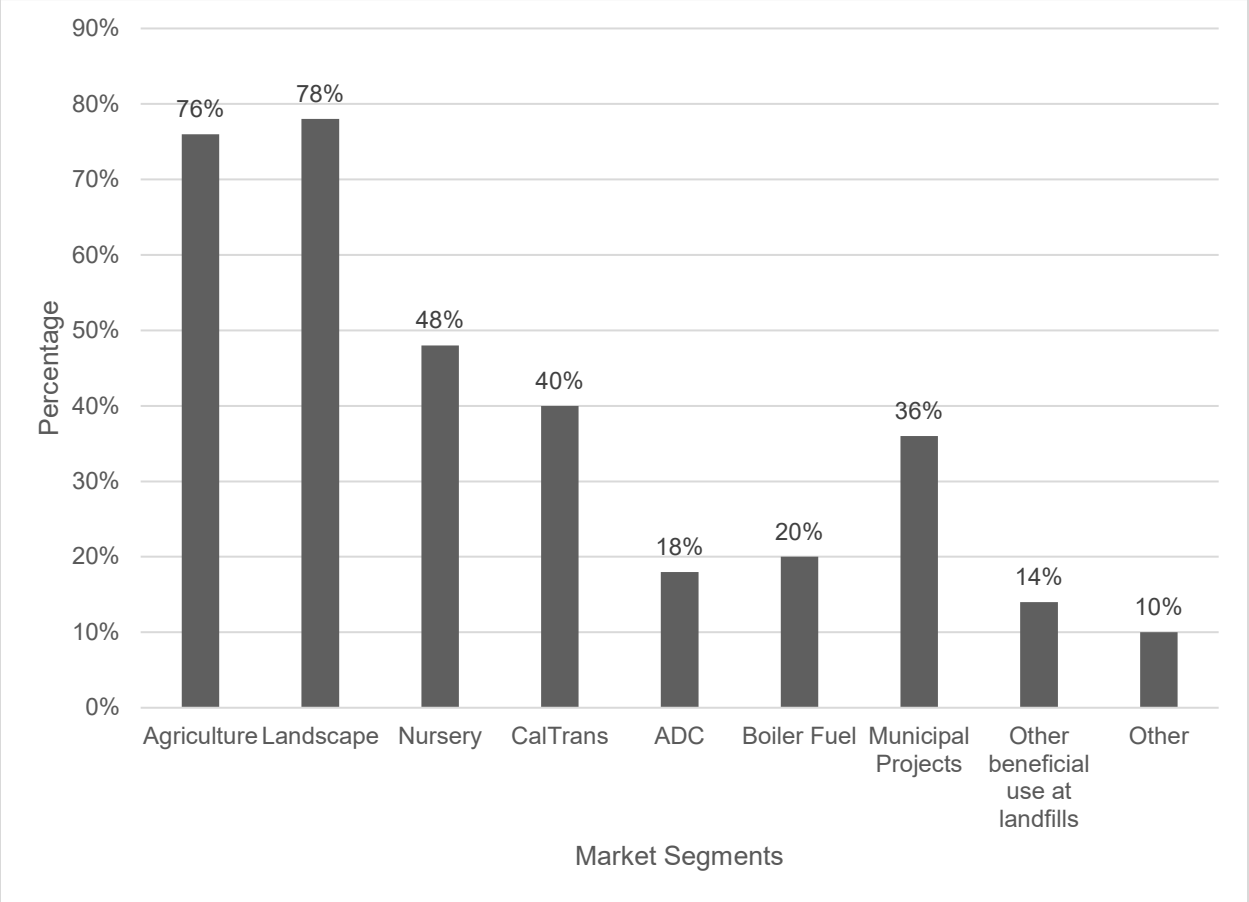
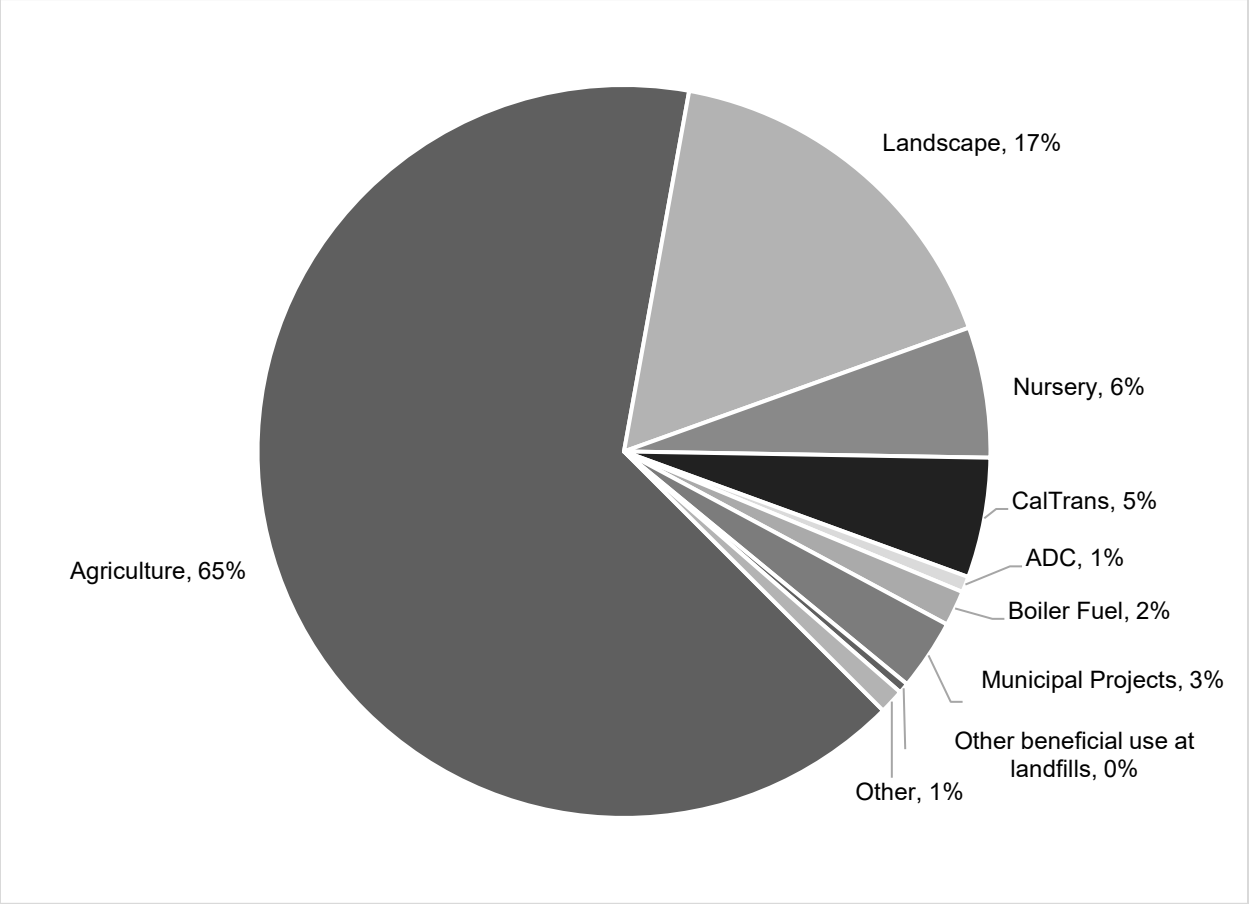


Figure 14A shows materials sold into specific market segments statewide. Like similar statewide studies before it, this report documents that agriculture remains the most significant market for composters in California, with composters selling 65 percent of the state's compost to the agriculture industry. While this may not seem surprising in a state with the world's largest agricultural production, it is worth noting that CalRecycle Reports in the early 1990s doubted that mainstream agriculture would ever use compost produced from urban wastes. Clearly, that is not the case. Figure 14A also shows that landscape and nursery markets (17 percent and 6 percent respectively) are still important. This survey–which focused on the largest composters–may be underrepresenting smaller, urban composters who tend to supply local landscape and nursery markets. The use of compost by CalTrans, a market that CalRecycle (and others) worked very diligently for many years to promote, comes in at 5 percent. This represents a significantly larger market share than previous CalRecycle surveys (in 2010, CalTrans use represented one percent). ADC and boiler fuel do not appear to be significant markets for composters on a statewide basis. While only three percent of the compost produced in 2017 was sold to municipal projects, demand in this market is expected to increase after implementation of SB 1383 regulations, which will require local governments to procure products made from organic waste.

Figure 14A: Materials Sold by Market Segment



In the Northern California region, the agriculture market is even more important to composters at 85 percent with landscape markets at 8 percent, nursery markets at 5 percent and boiler fuel at only 2 percent (see Figure 14B). Figure 14C shows market segments for composters in the extended Bay Area region, which shows agriculture as the most important market at 53 percent, landscape markets at 23 percent, CalTrans at 9 percent, and nursery markets at 8 percent. Composters in the extended Bay Area region sell boiler fuel (at 3 percent), municipal projects (at 3 percent), and ADC (at 91 percent).

Figure 14D shows the markets accessed by composters in Region 3. As with the other regions, agriculture is the dominant market in Region 3 (66 percent). Landscape and nursery markets are both 11 percent, with CalTrans close behind at 10 percent. Boiler fuel, ADC, and other beneficial reuse at landfills do not seem to be important markets for composters in Region 3.

Figure 14E shows markets for compost in the Southern California region. Like other regions, composters in the Southern California region sell to the agricultural industry above all others (75 percent). Landscape markets comprise 14 percent of the market (though again, the larger facilities surveyed may skew this result: it is likely small, more

urban composters sell to landscape markets to a greater degree. Municipal projects comprise the next largest market at 4 percent, with nurseries and other markets comprising 2 percent, and boiler fuel, ADC, and other beneficial reuse at landfills comprising 1 percent each.

These results seem consistent with anecdotal evidence shared by composters. Agricultural markets are steady, and green material ADC use, in general, has declined as a result of both the closure of Puente Hills and upcoming implementation of AB 1594. To be clear, ADC was typically an easy, low cost way for composters to dispose of "overs" and this is still the case in 2017. Boiler fuel markets are also declining statewide as power purchase agreements expire and new ones fail to compete economically with cheaper, renewable alternatives. Again, composters do not usually send compost to be used as boiler fuel, so much as they send overs. As some boiler fuel plants close, the remaining plants enjoy an abundance of supply of better quality fuel, so compost overs become a less desirable fuel. Some composters do sell un-composted wood waste to boiler fuel markets.

Figure 14B: Materials Sold to Market Segment, Composters, Region 1

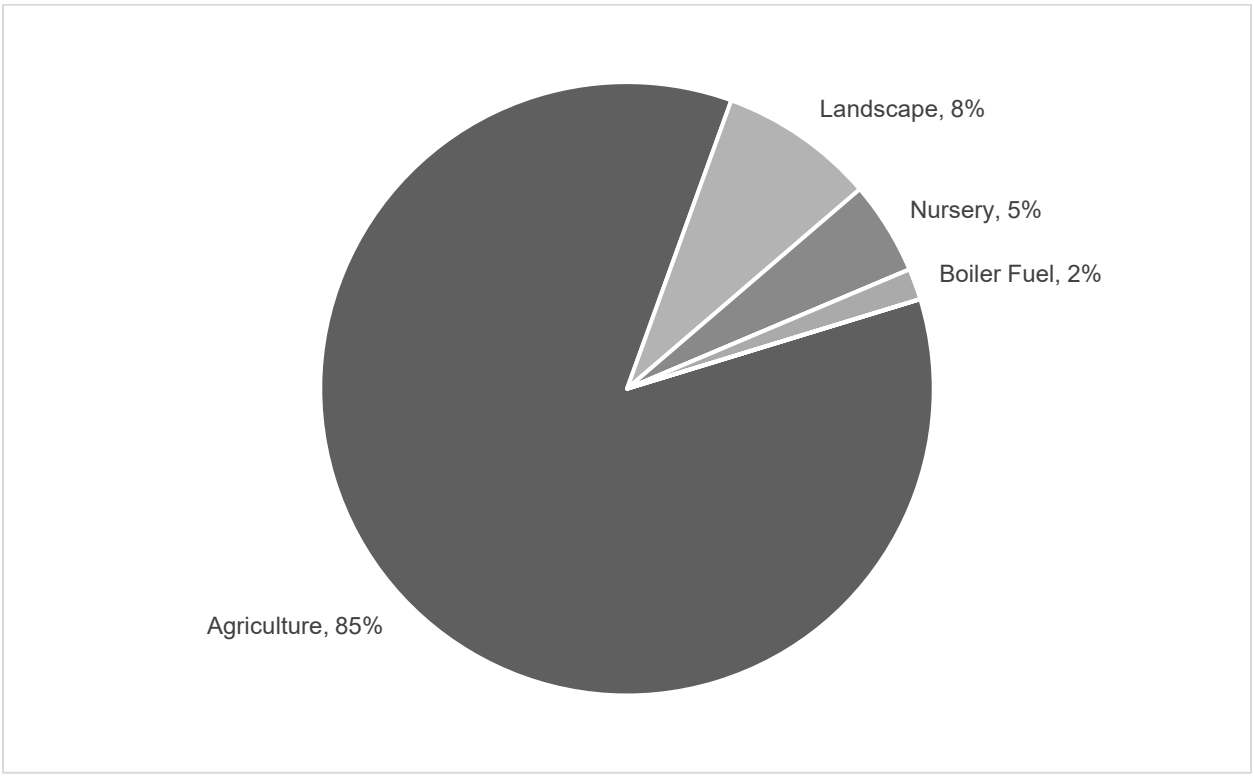


Figure 14C: Materials Sold by Market Segment, Composters, Region 2

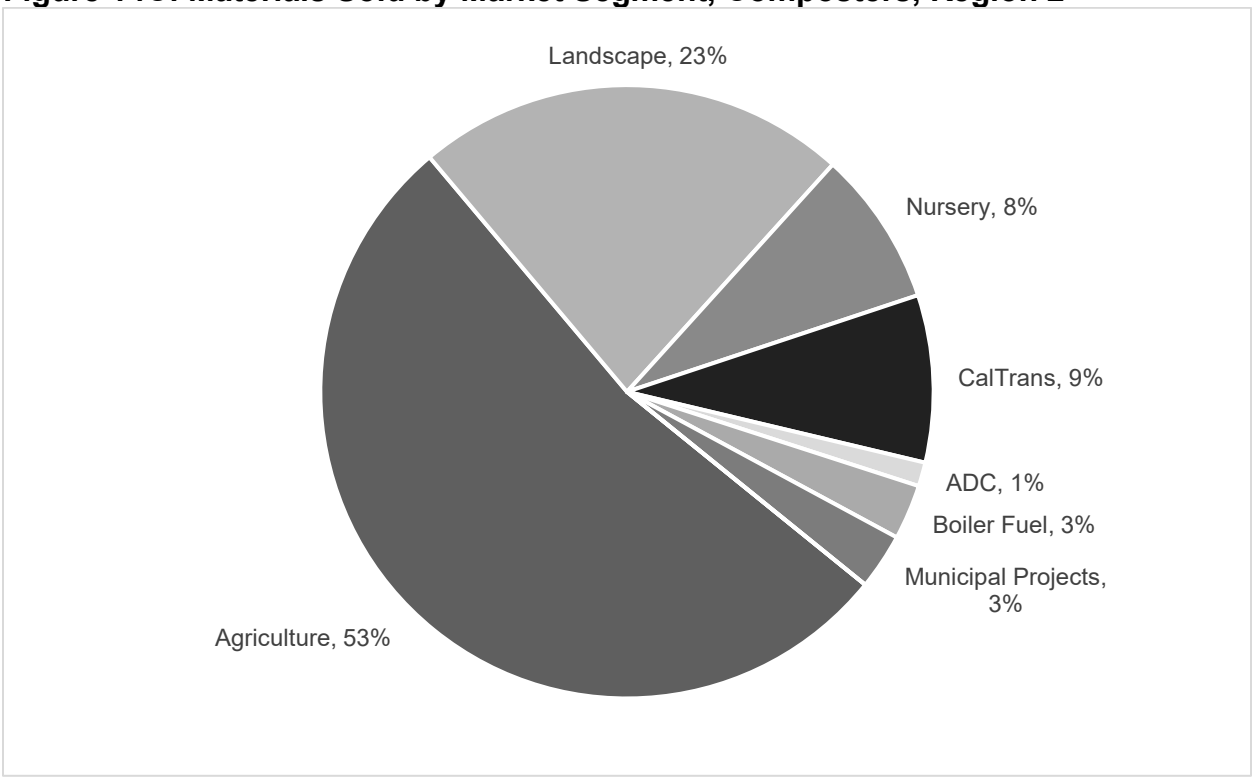


Figure 14D: Materials Sold to Market Segments, Composters, Region 3

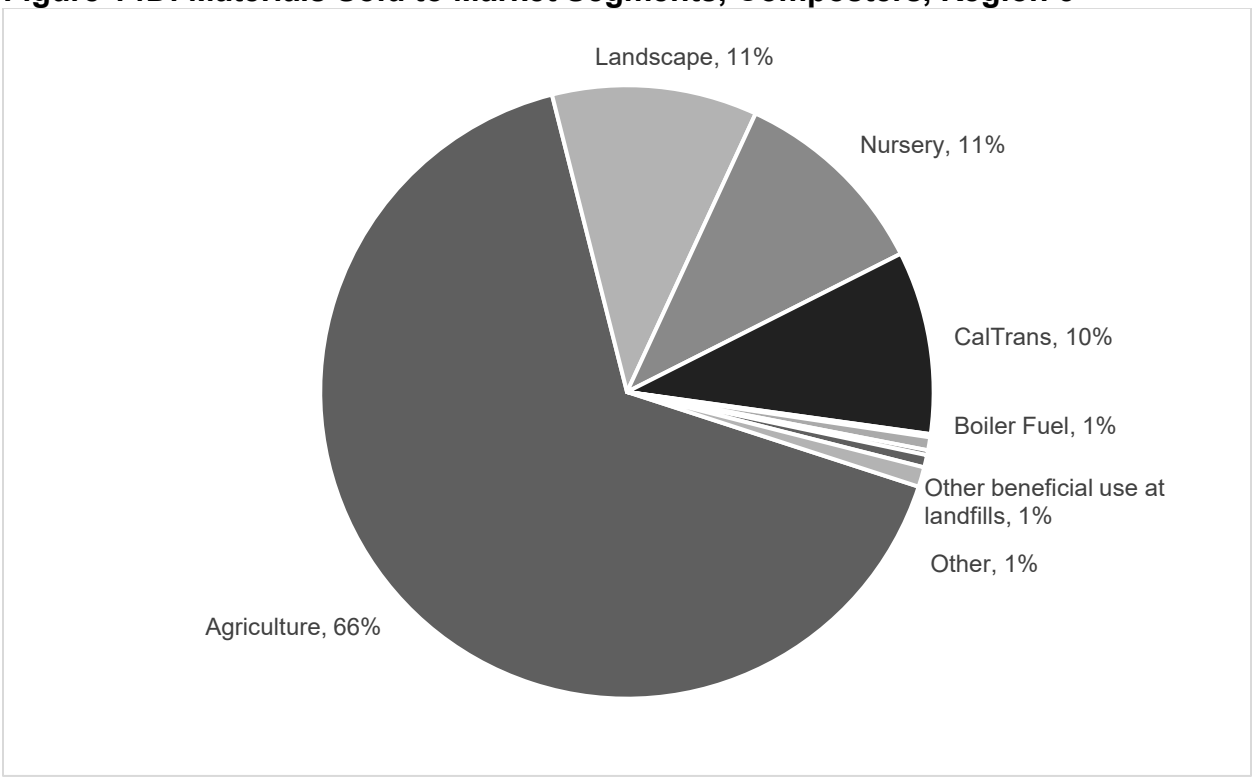
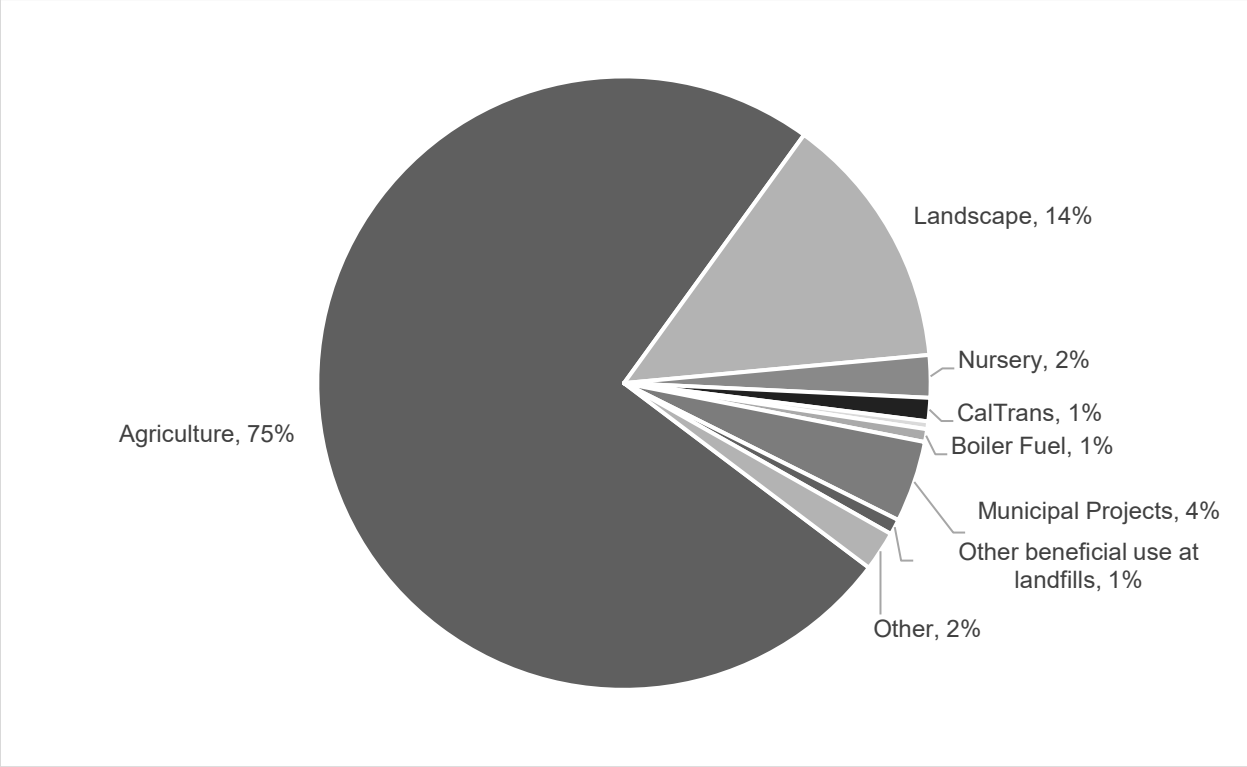


Figure 14E: Materials Sold to Market Segment, Composters, Region 4

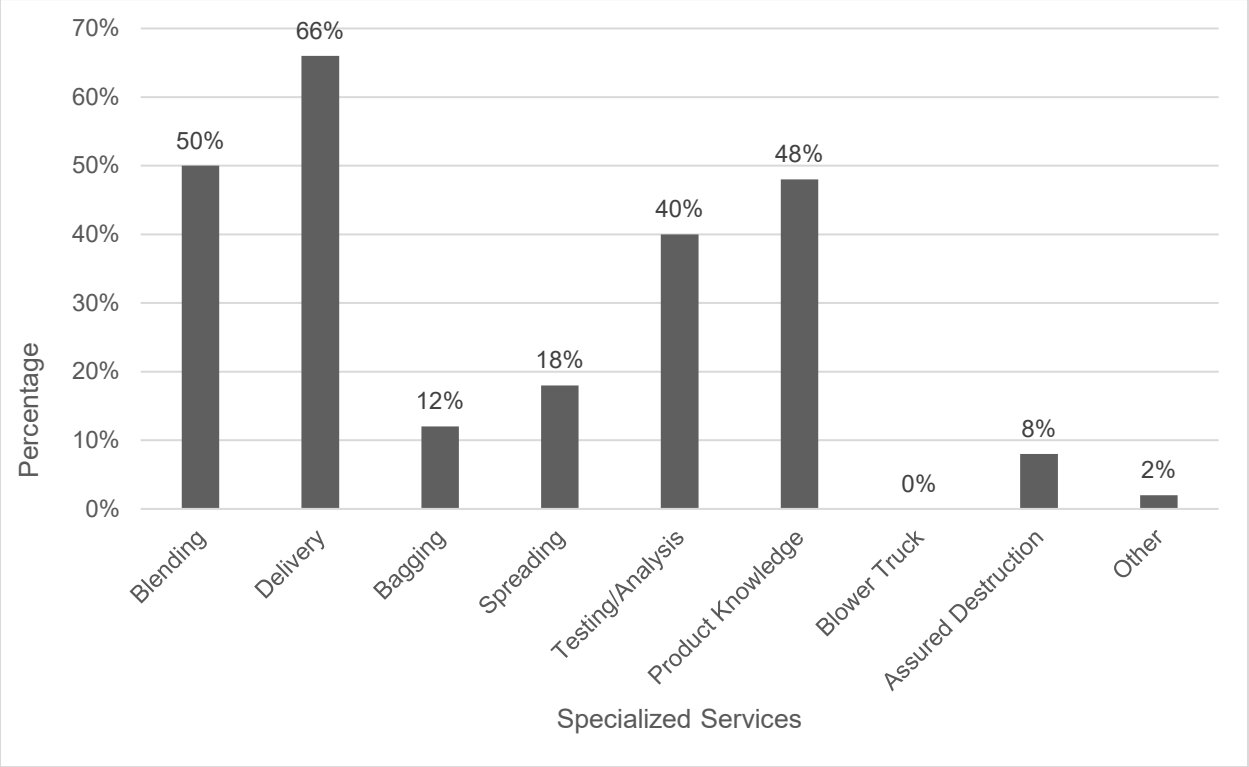


Specialized Services

Some composters provide additional services as a way of adding value and increasing compost sales. Figure 15 lists the various services participating composters add to provide extra value. These include delivery (66 percent of composters provide this service), blending (50 percent), product knowledge (48 percent), and testing and analysis (40 percent). Spreading (at 18 percent) and bagging (at 12 percent) are far less frequent services provided by compost manufacturers. Assured destruction[**], which is really more of an upfront, feedstock-attracting service, was listed by 8 percent of composters.

[**] "Assured Destruction" is a process where goods (like food, especially packaged food) is destroyed so that it is not re-sold, and the process is documented.

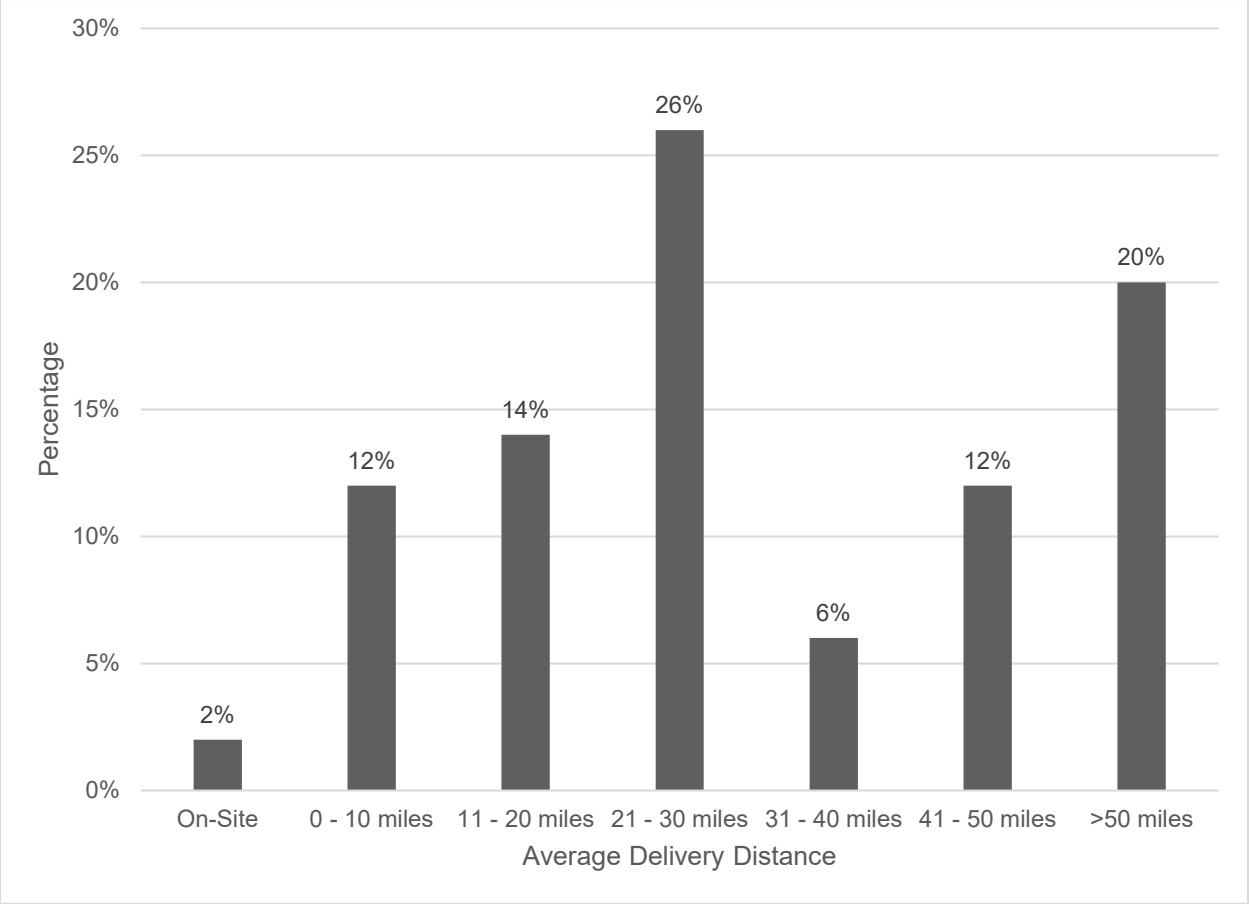
Figure 15: Specialized Services Provided



Delivery Distance

In most cases, composters strive to deliver material to local destinations with shorter travel times. With even relatively short haul distances, the cost of transport can easily start to exceed the cost of the product. Several composters reported hauling compost over 500 miles, but these are rare and unusual trips and likely represent compost industry outliers. Figure 16 shows average compost delivery distances. The most common distance was 21 to 30 miles (26 percent). Over 20 percent of composters responded that they regularly haul compost over 50 miles. The next largest groups were 11- 20 miles (14 percent) and 41 to 50 miles (12 percent).

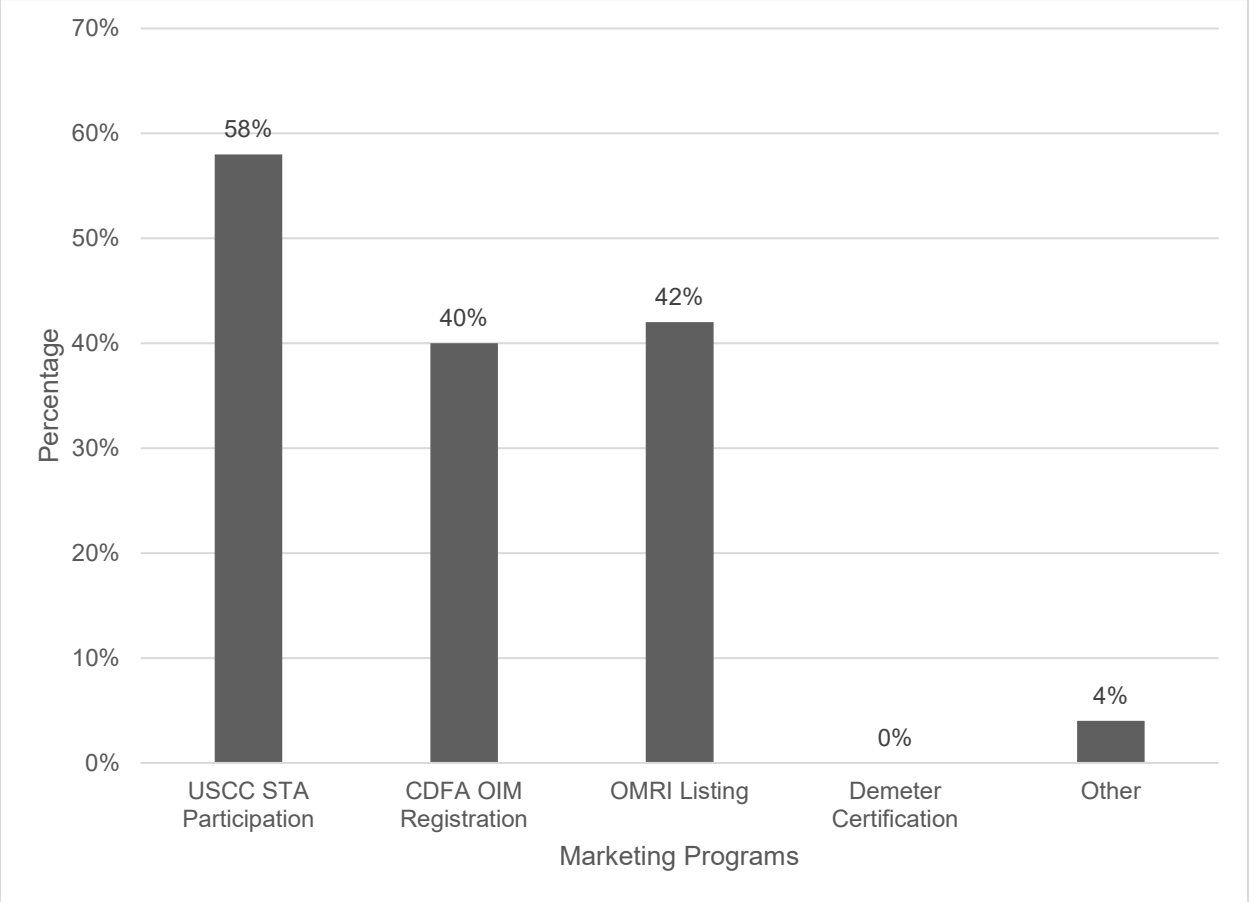
Figure 16: Average Product Delivery Distance



Marketing and Certification Programs

Both the compost manufacturing process and the compost sales industry are highly regulated in California. The survey found relatively high participation in programs that are designed to help manufacturers sell compost. One of these, the California Department of Food and Agriculture (CDFA)'s Organic Input Material Program (OIM), is a relatively new program with mandatory participation for producers selling compost into certified organic agriculture. Figure 17 shows the participation of composters in these marketing and regulatory schemes. Interestingly, reported participation in the OIM program (at 40 percent), was slightly *lower* than reported participation in the Organic Material Review Institute's (OMRI) compost registration program (at 42 percent). If a producer makes a claim that their compost is suitable for use in organic production (for example, by registering with OMRI) then they are required by law to be part of the CDFA OIM program.

Figure 17: Participation in Marketing/Certification Programs



The US Composting Council (USCC) operates a product testing and disclosure program for composters called the Seal of Testing Assurance (STA) program. Participation in the STA program was reported at 58 percent. While the OIM and OMRI programs are targeted at organic agriculture, the STA program's target audience is primarily landscapers and users like CalTrans (which requires STA participation for their compost vendors). Again, the largest compost producers responded to this survey, which may slightly skew this relatively high number of STA participants.. Participation in the STA program tends to appeal to large producers, though not exclusively.

Production of "Overs"

At the end of the compost manufacturing process, most commercial producers sort their material through large mechanical screens. These screens produce two or three streams of products. The finer material passing through the screening device is often called the "fines." This is what most people recognize as compost. The larger fraction, which does not pass through the screen, is referred to as the "overs," (with a three-pass screen, the middle fraction is sometimes referred to as "mids"). Ideally, a compost producer wants to maximize production of "fines" as that is where most of the product revenue comes from.

Figure 18 shows a range of overs production by percentage of total production. Thirty percent of composters say they are screening 11 to 20 percent of overs from their outbound compost material. Twenty-eight percent say they are screening 10 percent or less of overs. Twenty-two percent of respondents reported screening 41 to 50 percent of overs from outbound compost material. Overs production depends on a number of factors and varies based on feedstocks processed, bulking agent types (if used), intensity of the grinding process (especially the size and type of screens used in the grinder) and the robustness of the composting process.

Figure 18: Production of "Overs"

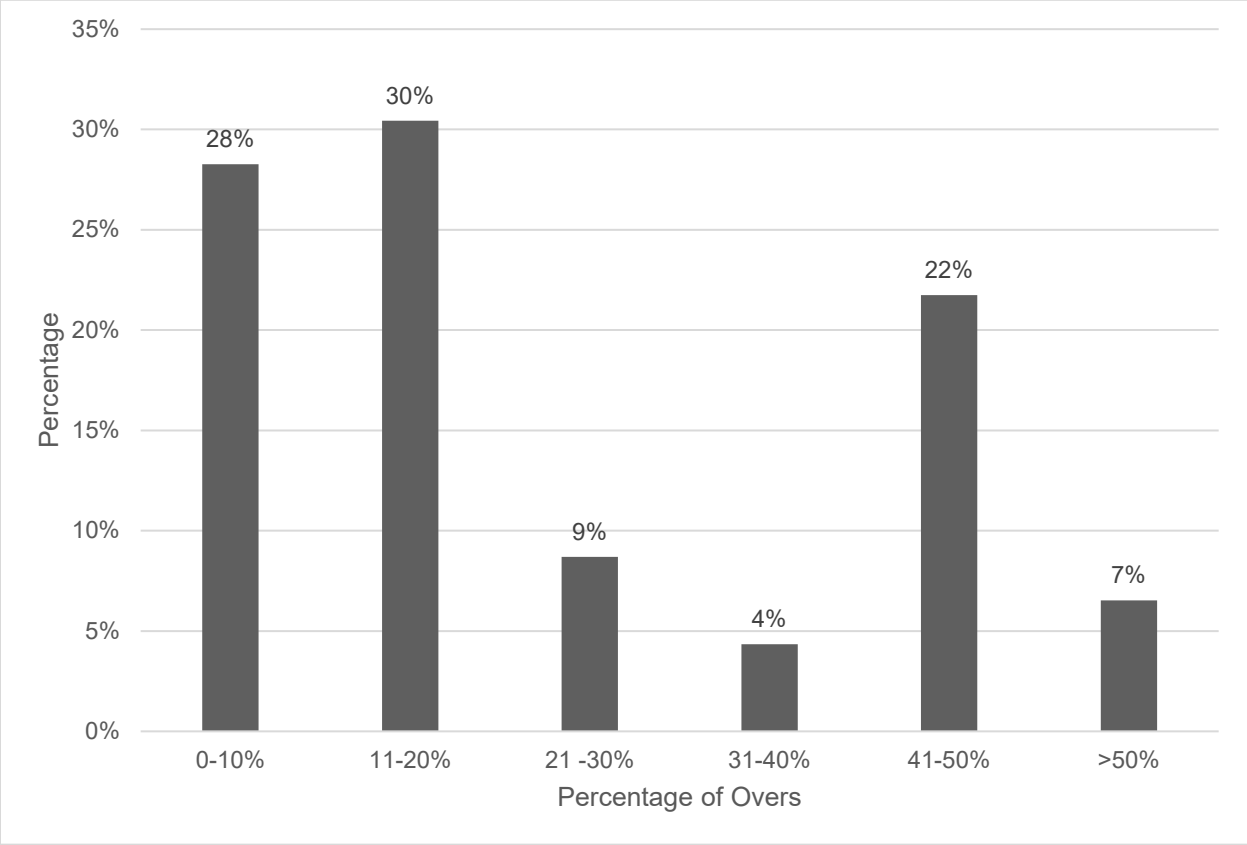


Figure 19 charts the types of end uses for overs as reported by composters. By far the largest response (62 percent) was that overs were recycled back into the compost. This is a very common practice among biosolids composters. The next largest use was for ADC. ADC is a popular use because it has very little sensitivity to contamination (versus other, non-landfill uses). Much of the contamination in some compost piles ends up in the overs, especially film plastic. Other uses reported were grind into mulch (18 percent), landfill (16 percent), biomass (12 percent), and other uses at landfills (10 percent). With the rise of food scraps collection programs, the amount of plastic contamination in overs is on the rise statewide. In order to beneficially re-use overs, this contamination must be reduced. This is especially true as diversion credit for ADC is phased out.

Figure 19: Destination of "Overs"

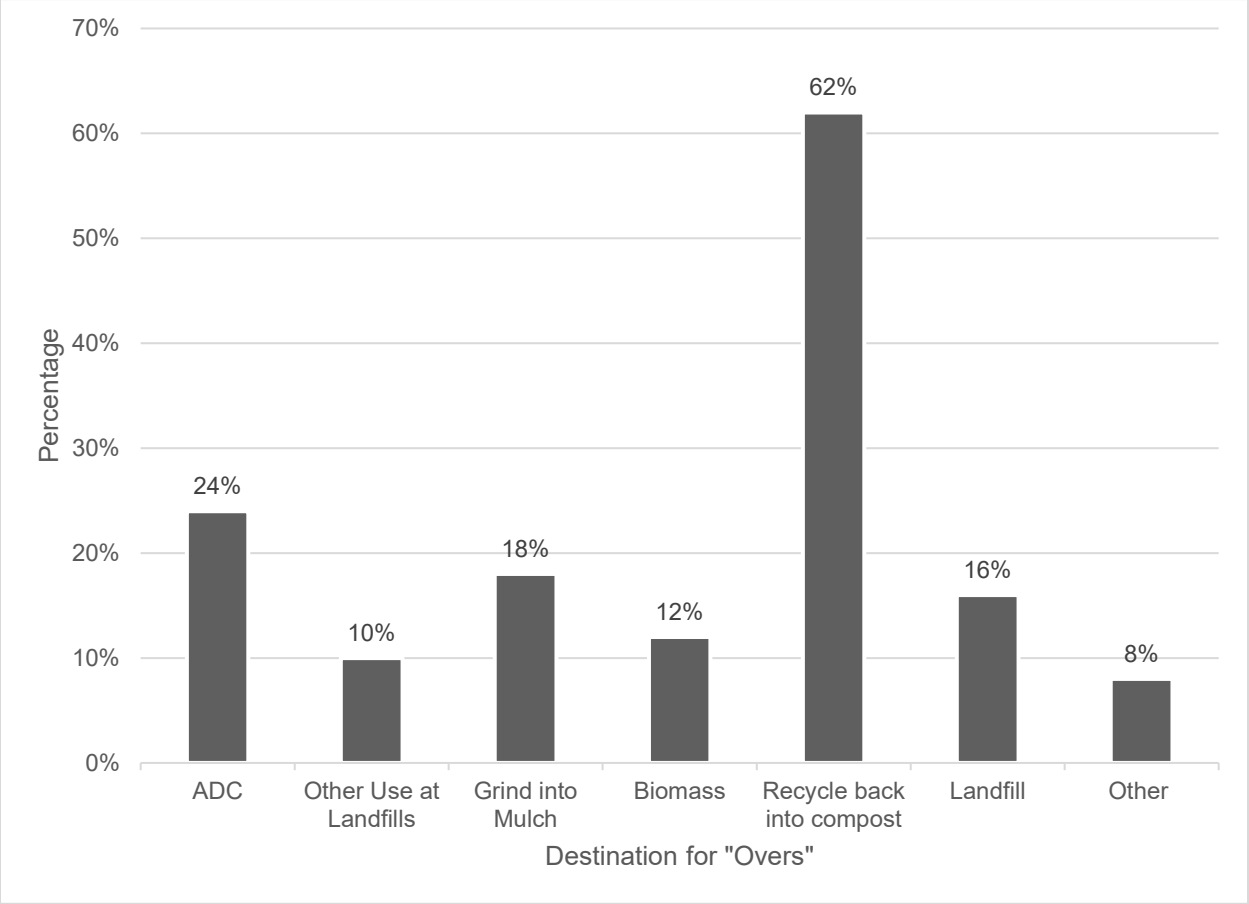
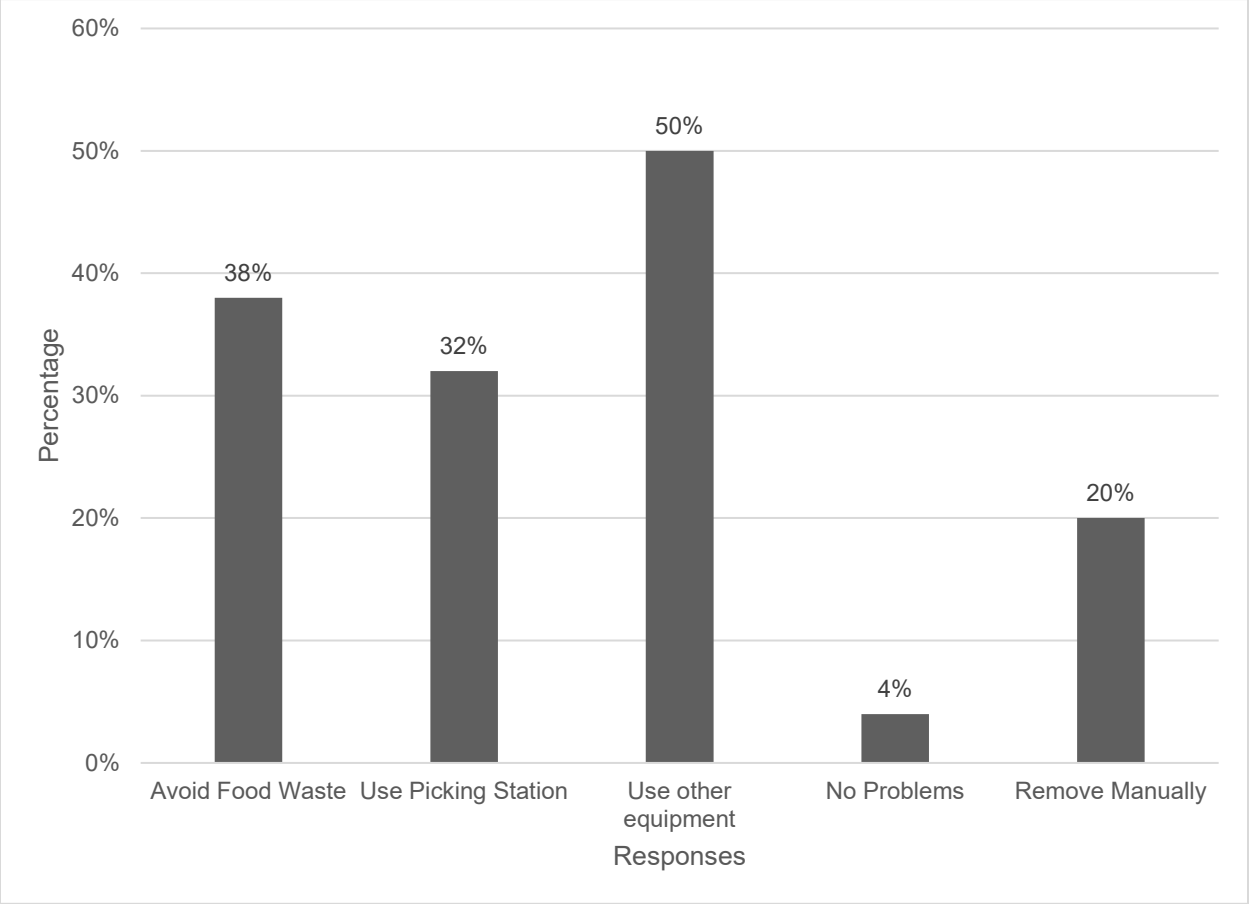


Figure 20 highlights concerns composters have with this increase in contamination and highlights strategies they have adopted to deal with contamination. The largest group (50 percent) reported using screening or other equipment to help remove contamination. Thirty-eight facilities responded that they avoid contamination by avoiding the acceptance of food scraps. Thirty-two percent reported using a picking station. Twenty percent use manual labor to remove contamination. Only 4 percent reported no issues with contamination. Contamination in feedstock—which, if not removed, ends up in either the compost or the “overs”—is a bigger concern than these numbers might lead a reader to assume. It may be that composters currently have markets (biomass or ADC) for contaminated overs, but because of SB 1383 and AB 1594, as well as the decline in the biomass market, this issue may become more important in the next three to five years.

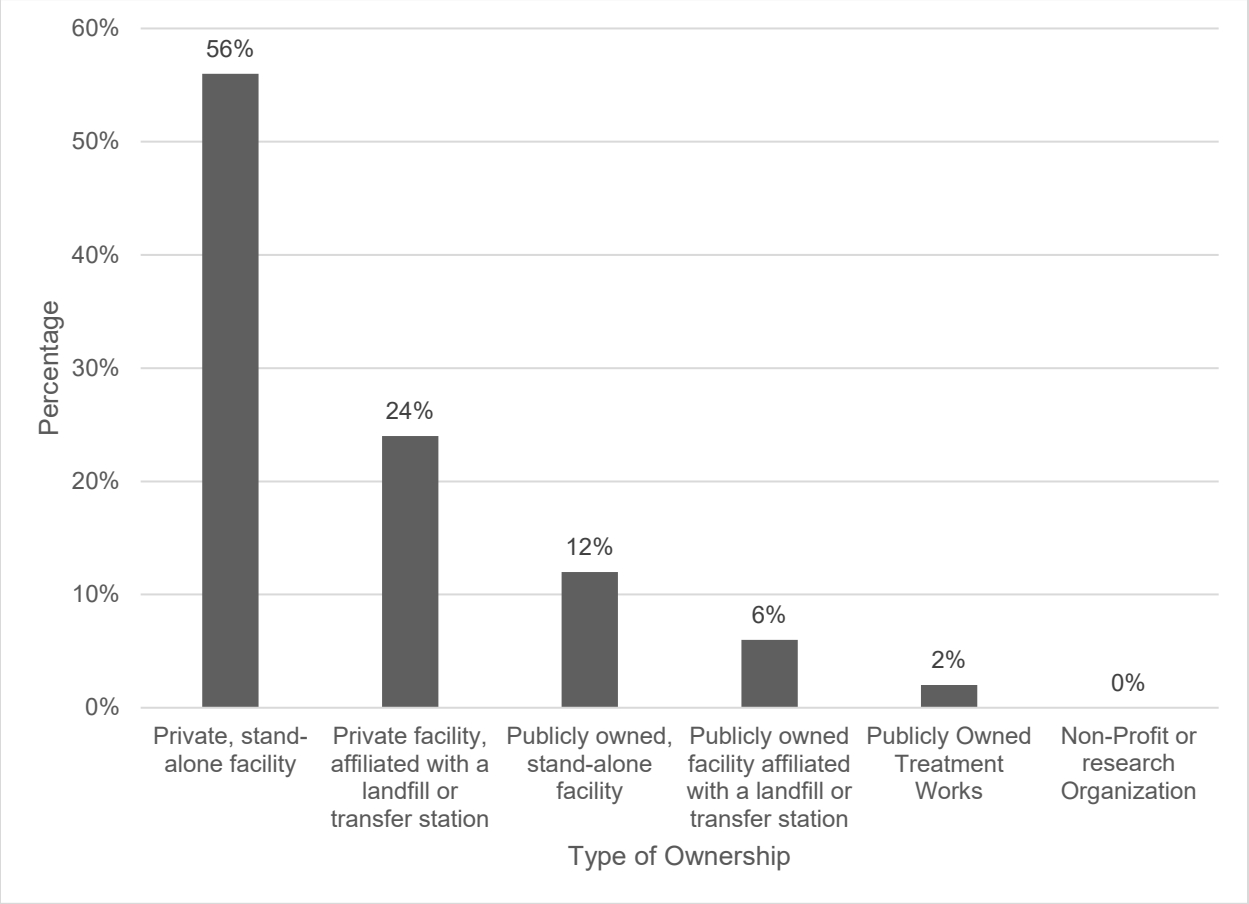
Figure 20: Feedstock Contamination Impacts Product Marketability



Facility Ownership

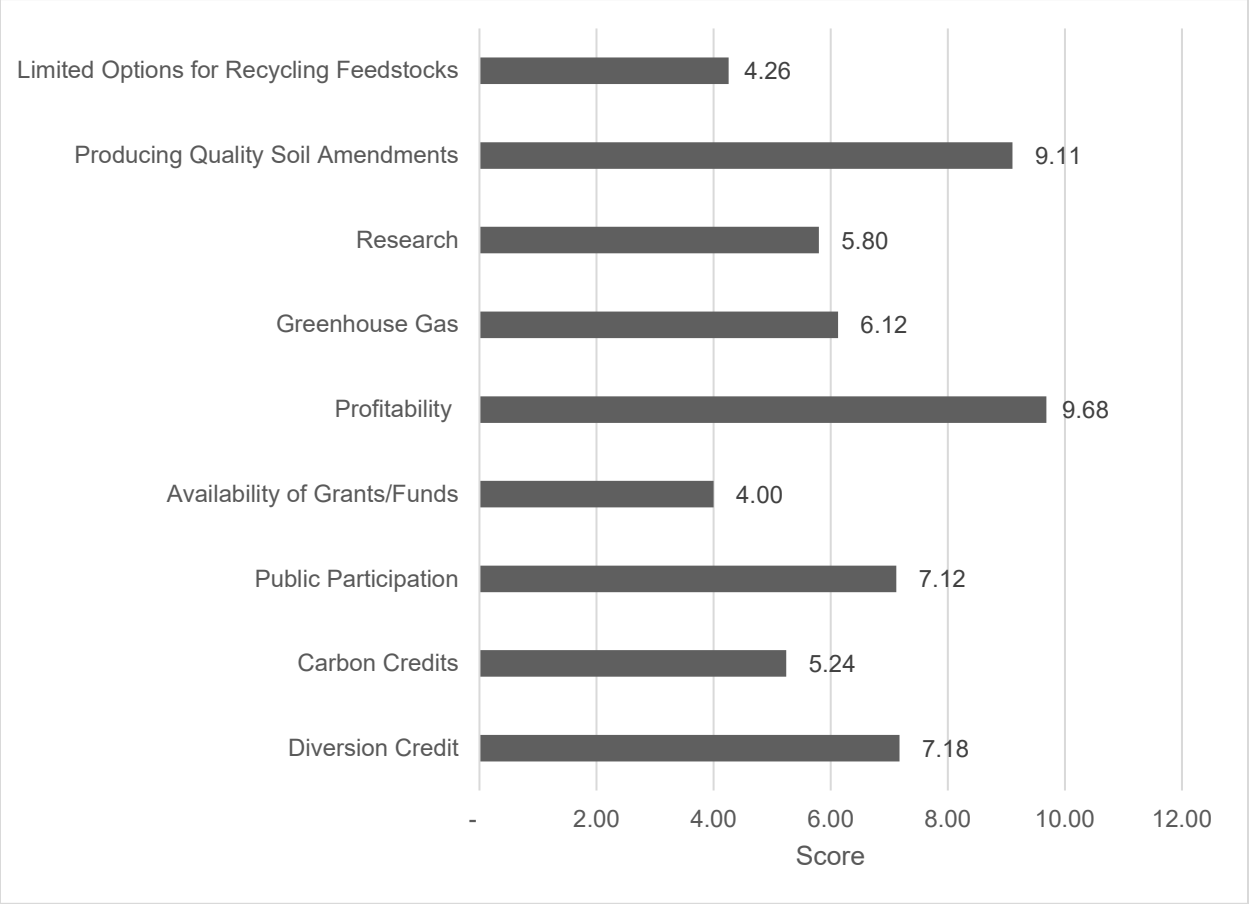
As shown in Figure 21, the vast majority of facilities surveyed are private, stand-alone facilities (56 percent). The next largest group are private, stand-alone facilities affiliated with (or co-located with) a landfill or transfer station. Only 12 percent of facilities surveyed were stand-alone public facilities and only 6 percent were publicly owned and co-located with a publicly owned landfill or transfer station. Only 2 percent were located at wastewater treatment plants. The survey indicates 80 percent of responding facilities were privately owned, while 20 percent of responding facilities are publicly owned.

Figure 21: Facility Ownership



To better understand the factors motivating facility owners, respondents were asked to rank those factors which were important to the facility's decision-making entity. These rankings were then averaged to create a score for each category. The results are shown in Figure 22. The highest scoring reason was profitability (with a score of 9.68), followed by a desire to produce high quality soil amendments (9.11). The ability to receive diversion credit is closely ranked with public perception (7.18 and 7.12 respectively). This is an interesting finding and one that will be tested as the ability to receive diversion credit for the use of green material as ADC will be phased out both by AB 1594 and SB 1383. This relatively high ranking might indicate that ADC use will indeed decline (at least ADC produced by composters). Reducing greenhouse gas was listed as the next highest (6.13) followed by conducting research (5.8), and the ability to receive carbon credits (5.24). Developing a facility to manage limited options for certain feedstocks scored relatively low on the scale (4.26) and the ability to receive grants received the lowest score (4.0).

Figure 22: Motivations for the Facility



Facility Expansion Plans

Figure 23 shows the change in facility throughput for composting facilities operating in 2017. The overwhelming majority (69 percent) of composters reported throughout staying the same (i.e., no growth) in 2017. Only 20 percent reported increasing throughput, while 11 percent reported decreasing throughput. Figure 24 compares the reasons given for throughout expansion. An increase of processing contracts is the most common reason for facility expansion, with over 78 percent reporting new feedstock contracts. Increases in equipment capacity can also result in an increase in throughout and 33 percent reported this. The next most popular reason for facility expansion was “other,” which included increasing process efficiency and receiving feedstock from other sources (though not via contract). Finally, increasing the permitted acreage of a facility and increasing sales volume (both 11 percent) were also reported as reasons for expansion.

Figure 23: Change in Facility Throughput

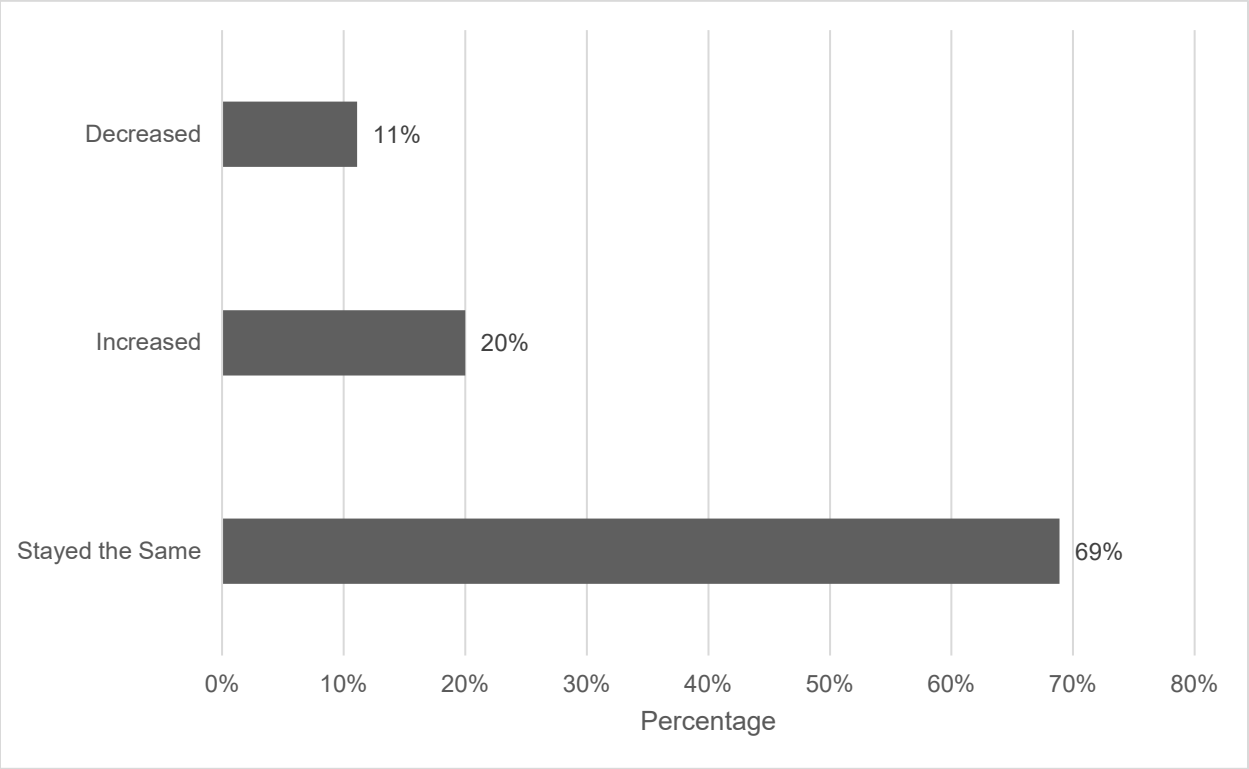
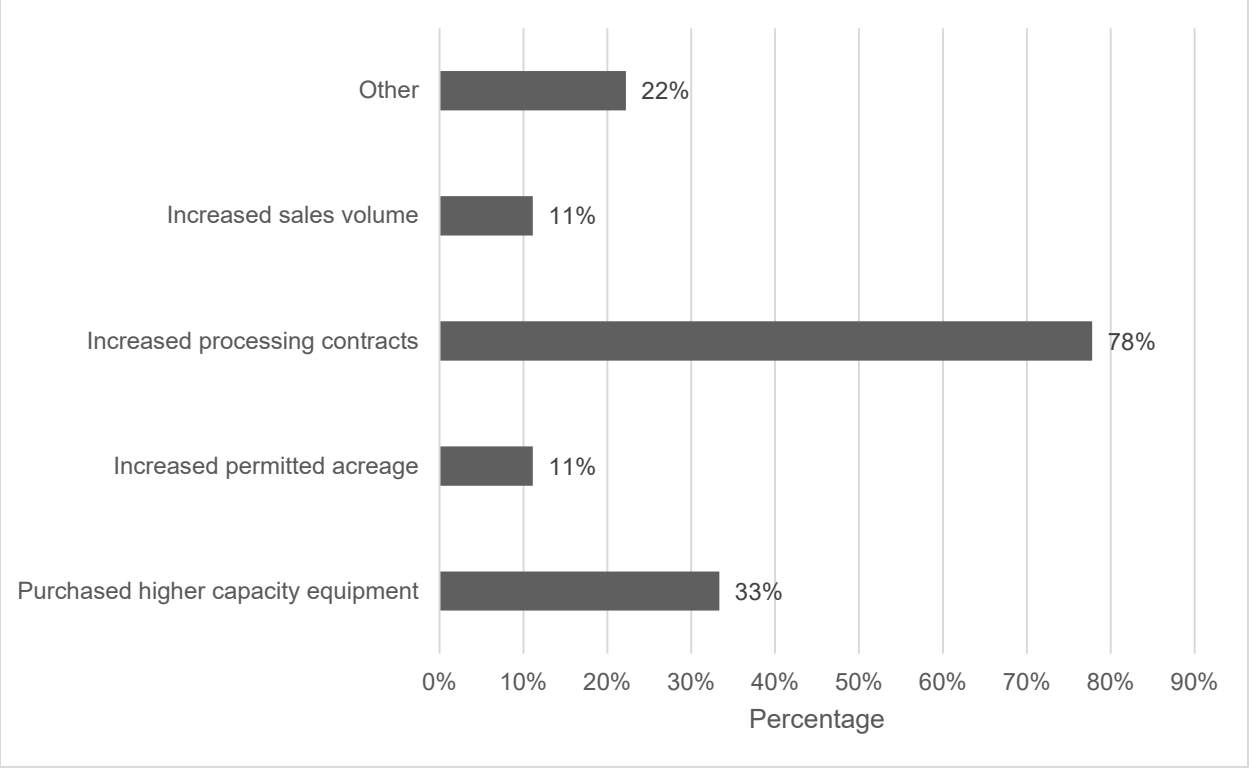


Figure 24: Reasons for Facility Expansion



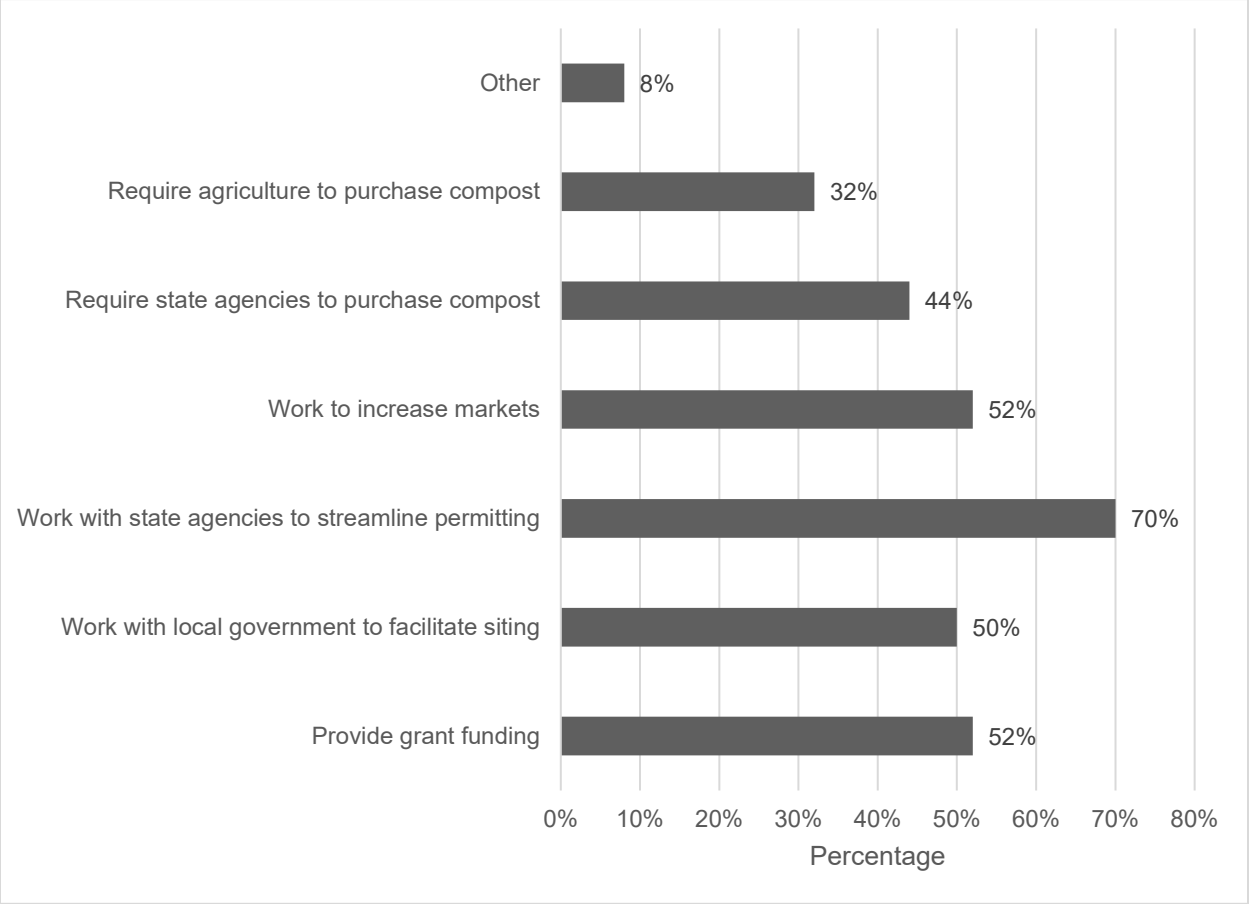
It is critical to note that, based on this data, the primary reason composting facilities expand is an *increase in feedstock availability* via new collection programs. Facilities will expand if entities collect the material, not the other way around. This is critical to SB 1383, as the dominant narrative has been that a lack of capacity (not supported by this report) has limited the ability of new food scraps collection programs to expand or be implemented.

State Incentives

Figure 25 lists responses about the types of efforts the state could undertake to incentivize new or expanded facilities. Most composters (70 percent), understanding that the three main agencies involved in permitting are state agencies, recommended that CalRecycle work with state agencies to streamline permitting. This is not a new idea. In fact, composters have been asking for this since the state first developed stand-alone composting regulations in 1993. In 2016, the legislature passed AB 1045 as the most recent formal attempt to provide regulatory relief. The intent of AB 1045 was to encourage collaboration between state agencies to promote composting and facility development, and these discussions are ongoing. Permitting a solid waste facility in California is a challenging undertaking with multiple entities making many decisions at the local and state level. While it may be desirable to expedite this process or reduce the cost, it may not be realistic.

Composters also support the provision of grant funding (52 percent), and some of the respondents to the survey were recipients of recent Greenhouse Gas Reduction Fund grants. Composters also want the state to work to increase markets (52 percent). Composters would like help working with local government to facilitate facility siting (50 percent). Many composters also indicated that requiring state agencies to purchase compost (44 percent) and requiring agriculture to purchase compost (32 percent) would be beneficial.

Figure 25: State Assistance



Permits

Figures 26A through 29D highlight the challenges of streamlining permitting for compost facilities. Each of the major agencies require discretionary permits for a new or expanded compost facility. Each of these permits may impose specific requirements based on throughput or volume on site at any given time. Figure 26A shows that 85 percent of respondents have a Conditional Use Permit. Seventy-nine percent of those CUPs contain throughput limitations (as shown in Figure 26B).

Figure 26A: Conditional Use Permit

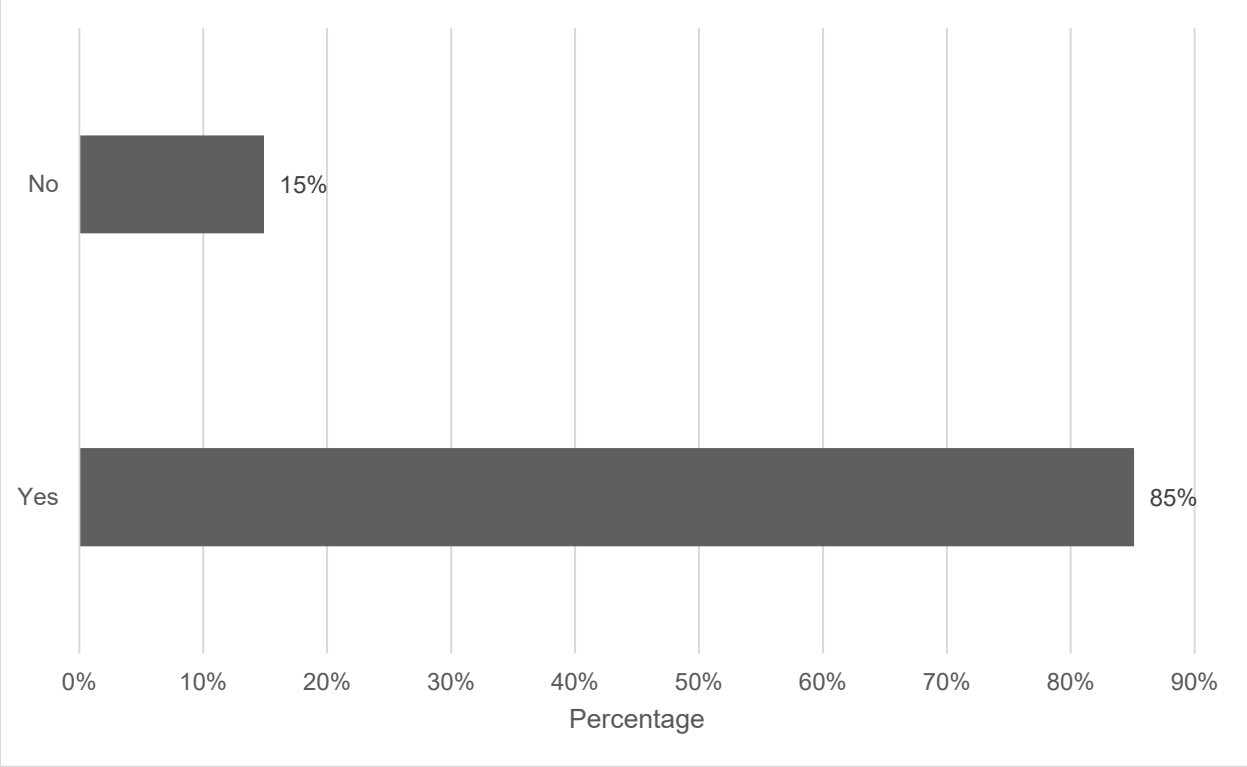


Figure 26B: CUP Throughput Limitations

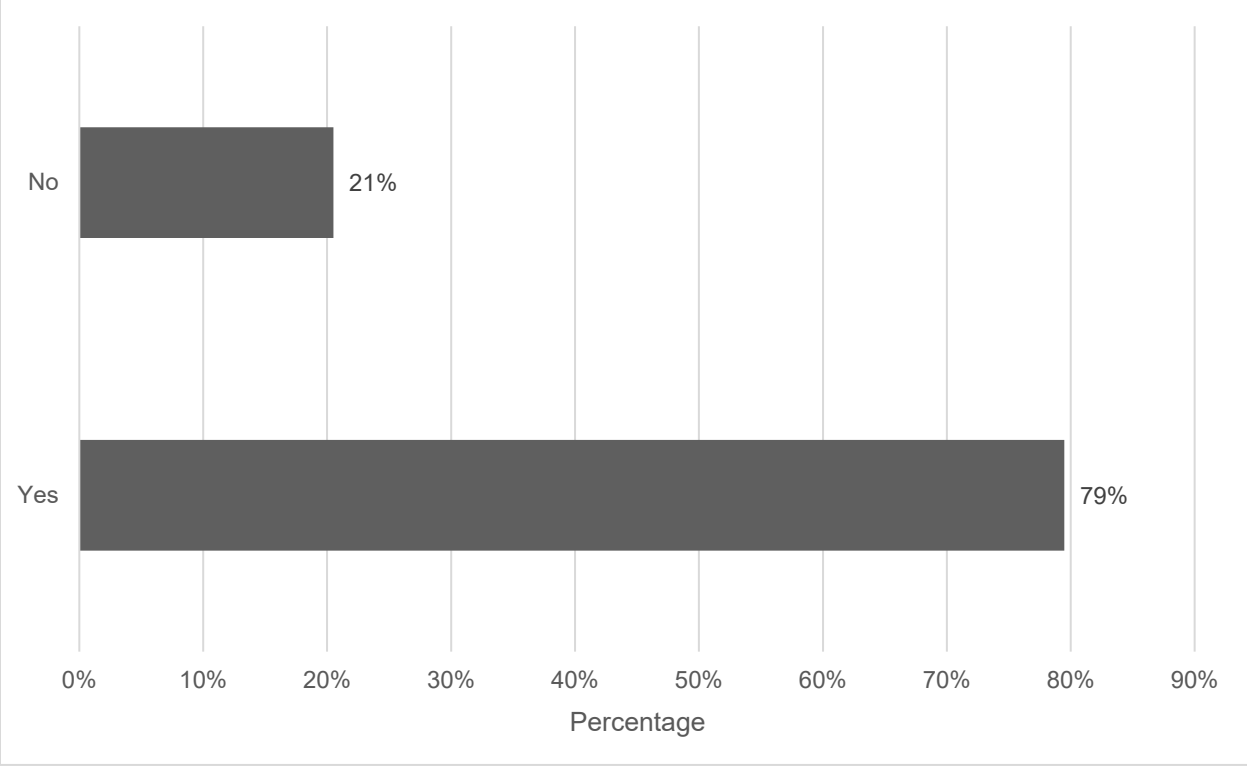
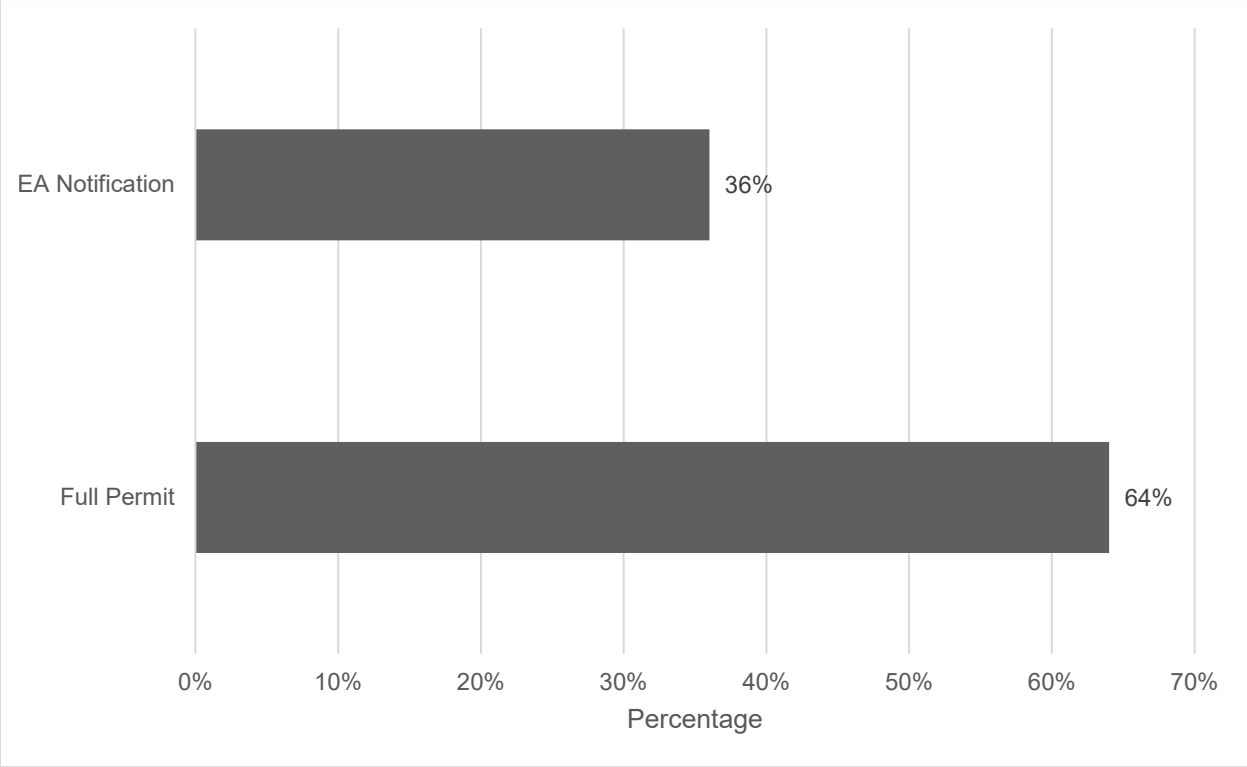


Figure 27 shows that, of the composters participating in the survey, 64 percent operate under a full Solid Waste Facility Permit (SWFP), and 36 percent operate under an EA Notification. All SWFPs include throughput and capacity limits.

Figure 27: CalRecycle/Local Enforcement Agency Entitlement



Water Board Permits

Figure 28A highlights facilities that have a Regional Water Quality Control Board permit. Some facilities have individual Waste Discharge Requirements, some have conditional waivers of waste discharge requirements, and others are seeking coverage under the Order WQ 2015-0121-DWQ. Eighty-nine percent of respondents indicated that they had some coverage from the RWQCB. It is unclear whether the remaining 11 percent are in the process of seeking a permit from the RWQCB or whether site circumstances do not require coverage. Figure 28B lists those composters that have capacity or throughput limitations based on their RWQCB permit. Although facilities enrolled in Tier 2 of the WQ 2015-0121-DWQ do not generally have capacity or throughput limitations, Tier 1 facilities are capped at 25,000 CY on site at any given time. Of the facilities with a RWQCB permit that responded to the survey, 57 percent reported no capacity or throughput limitations. Twenty-seven percent of respondents indicated that their RWQCB permits do have capacity or throughput limitations.

Figure 28A: Regional Water Quality Control Board Permit

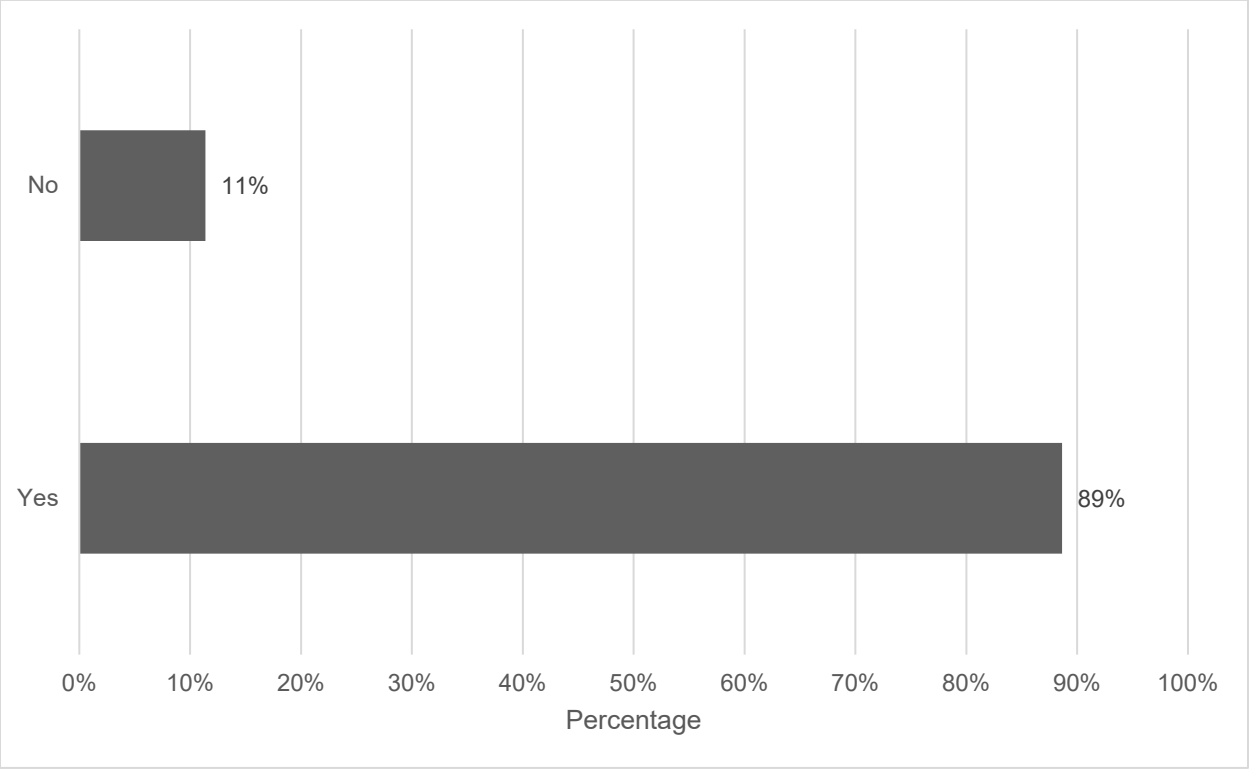
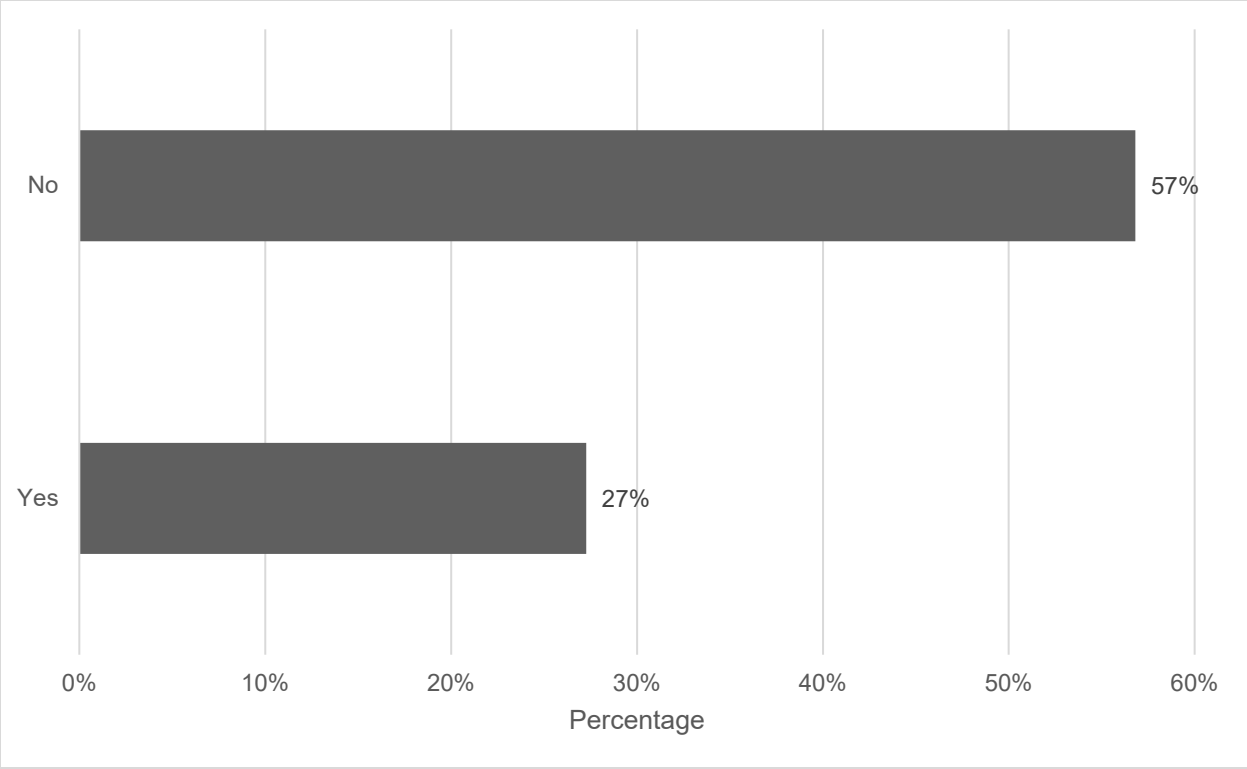


Figure 28B: Regional Water Quality Control Board Permit Capacity of Throughput Limitations



A recent Report†† on the implementation of the General Order listed 71 facilities enrolled under the General Order, six that were exempted under the "Notice of Non-applicability," 26 that had individual WDRs, and 13 enrolled under a specific San Diego region waiver. Of the seventy-one enrolled in the General Order, 13 were in Tier 1, 27 were Tier 2, and 31 were still in process.

Tier 1 is limited to those facilities processing under 25,000 cubic yards on-site and relatively low risk feedstocks. Tier 2 includes facilities greater than 25,000 cubic yards on-site or processing higher risk feedstocks.

The recent SWRCB report indicates that roughly 3,058,000 tons per year of throughput are covered under the General Order; 1,547,000 tons per year are covered under individual WDRs; 927,000 tons per years are either at POTWs, landfills, qualify for NONA or other; and 268,000 tons per year are covered under the Region 9 (San Diego) Conditional Waiver process.

Compost facility operators develop business models, including feedstocks and volumes to process, based on business operations and site conditions, and the Regional Water Board issues waste discharge requirements accordingly. If a facility is enrolled in Tier 1 of the General Order, there is a maximum allowable volume on site; if a facility is enrolled in Tier 2 of the General Order, there is no maximum volume on site. If

†† Implementation of General Waste Discharge Requirements for Composting Operations (Order WQ 2015-0121-DWQ

expansion is proposed at a Tier 2 facility, additional investments may be needed to modify containment structures (e.g. low permeability pad and pond) so they are sized appropriately for the acreage. .

Air Quality Permits

Figure 29A shows that 86 percent of surveyed composters have a permit from an APCD or AQMD. Figure 29B shows that 69 percent of facilities have an APCD or AQMD permit that contains an emissions limit. Seventy-five percent of facilities report that the AQMD/APCD emissions may limit the facility from expanding (see Figure 29C). Figure 29D shows that 88 percent of composters have throughput limitations in their AQMD/APCD permits.

It is noteworthy that specific throughput limits on operating permits may be a significant barrier to a facility's ability to expand. Obtaining an AQMD/APCD permit for a new composting facility is a costly and time-consuming process. In addition, the majority of tonnage included in this report, is within the boundaries of the San Joaquin Air Pollution Control District or the South Coast Air Quality Management District. These two districts both developed prohibitory[‡‡] rules for composting facilities based on limiting VOC emissions. Consequently, there has not been a major new composting facility within the SCAQMD since Rule 1133[§§] went into effect. Rule 1133 may prove to be particularly limiting for new facilities hoping to help implement SB 1383 programs, as the Rule requires any composting facility accepting food scraps to use forced aeration technology, technology that the AQMD classifies as air pollution control technology. This designation triggers additional regulatory control and mitigation. Thus, Rule 1133 provides a significant barrier to new or expanded compost capacity in the SCAQMD.

Figure 29A: Local Air Quality Management District/Air Pollution Control District

[‡‡] A "Prohibitory Rule" in air quality permitting, means a rule that imposes a standard set of terms and conditions for many similar sources at the same time.

[§§] Rule 1133 in the South Coast AQMD was the first rule to address VOC emissions from composting facilities.

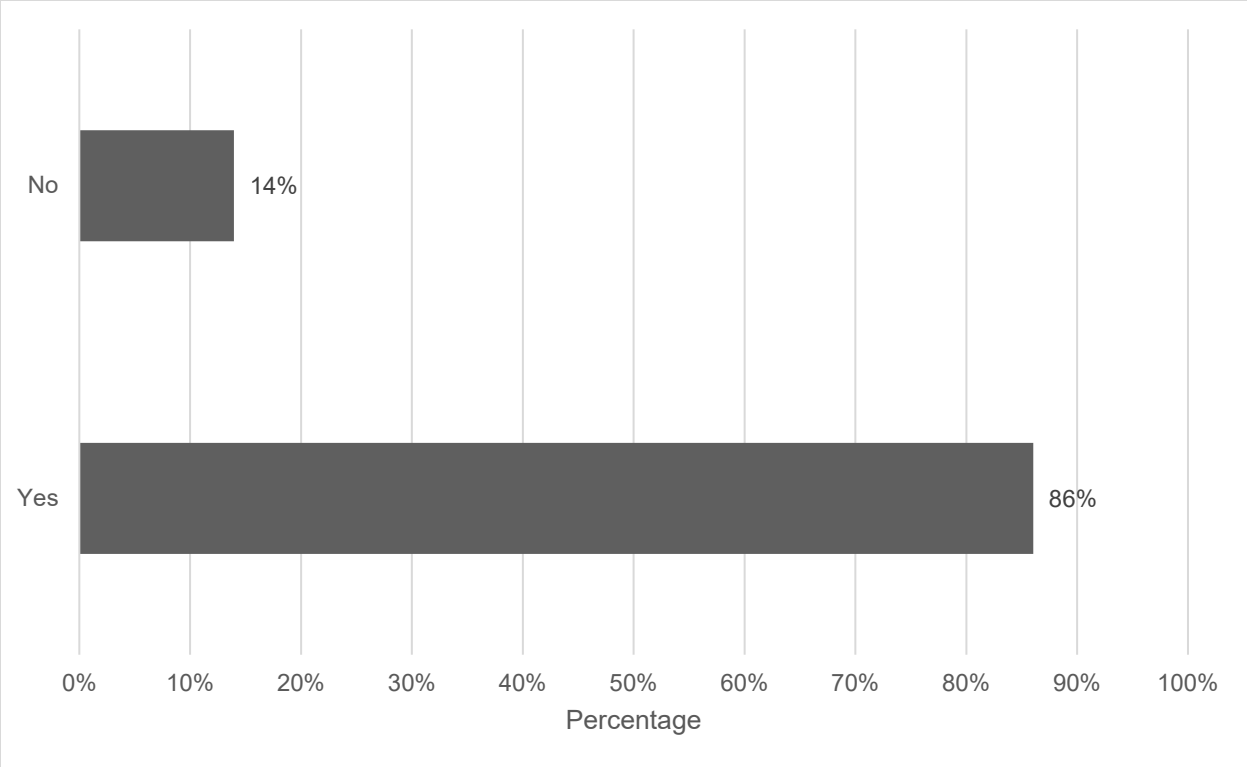

No
14%
Yes
86%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percentage

Figure 29B: AQMD/APCD Emissions Limit

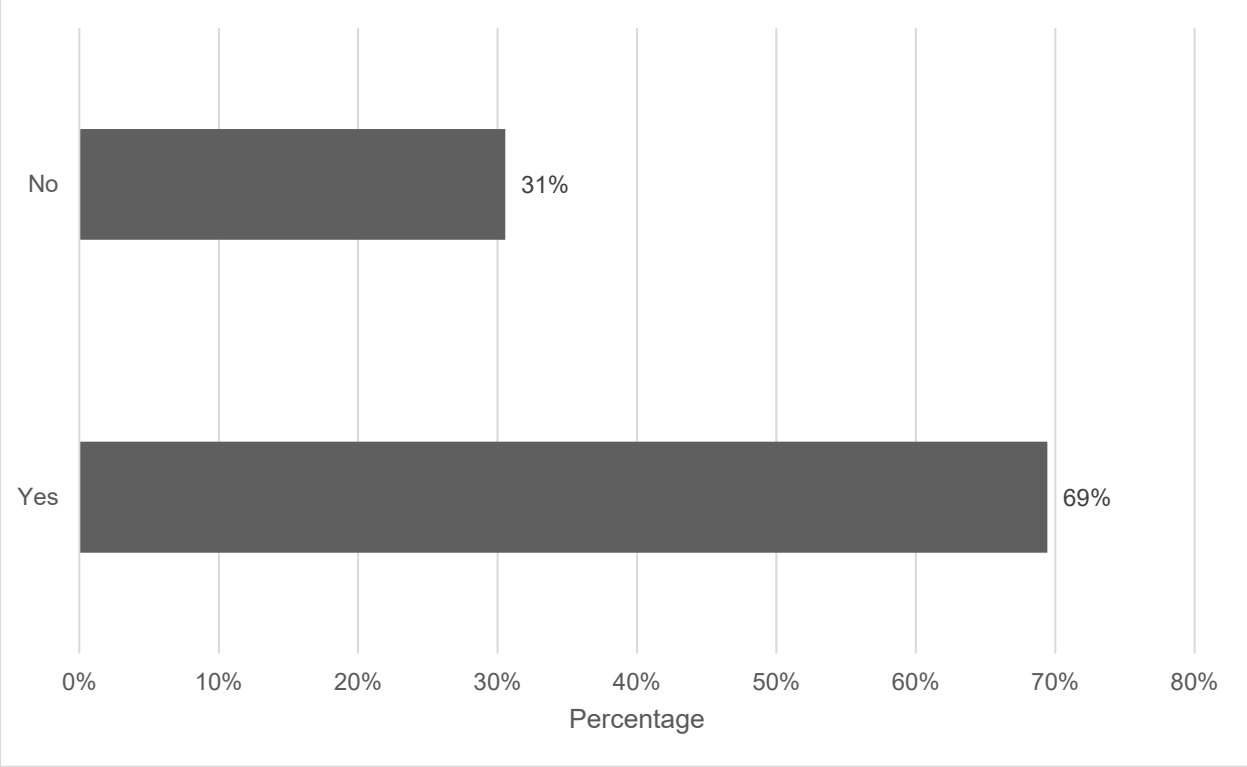


Figure 29C: AQMD/APCD Emissions Limit Prohibit Facility From Expanding

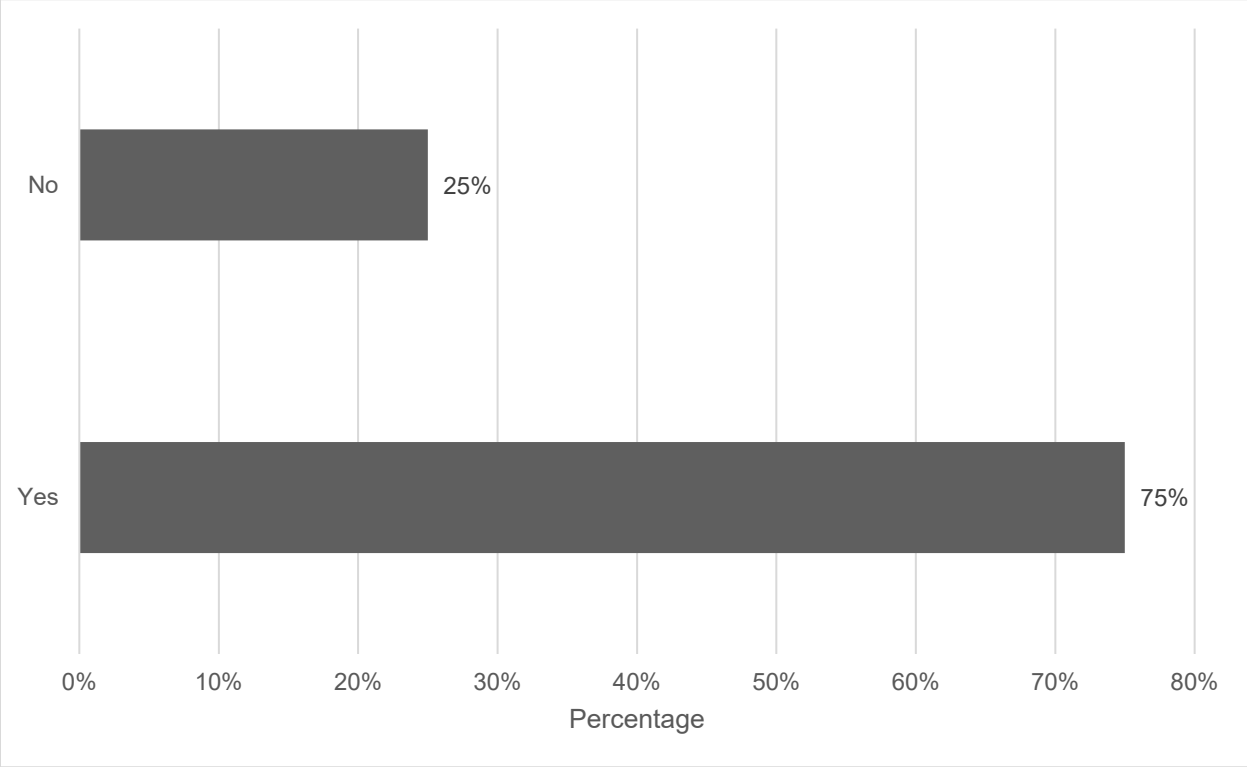
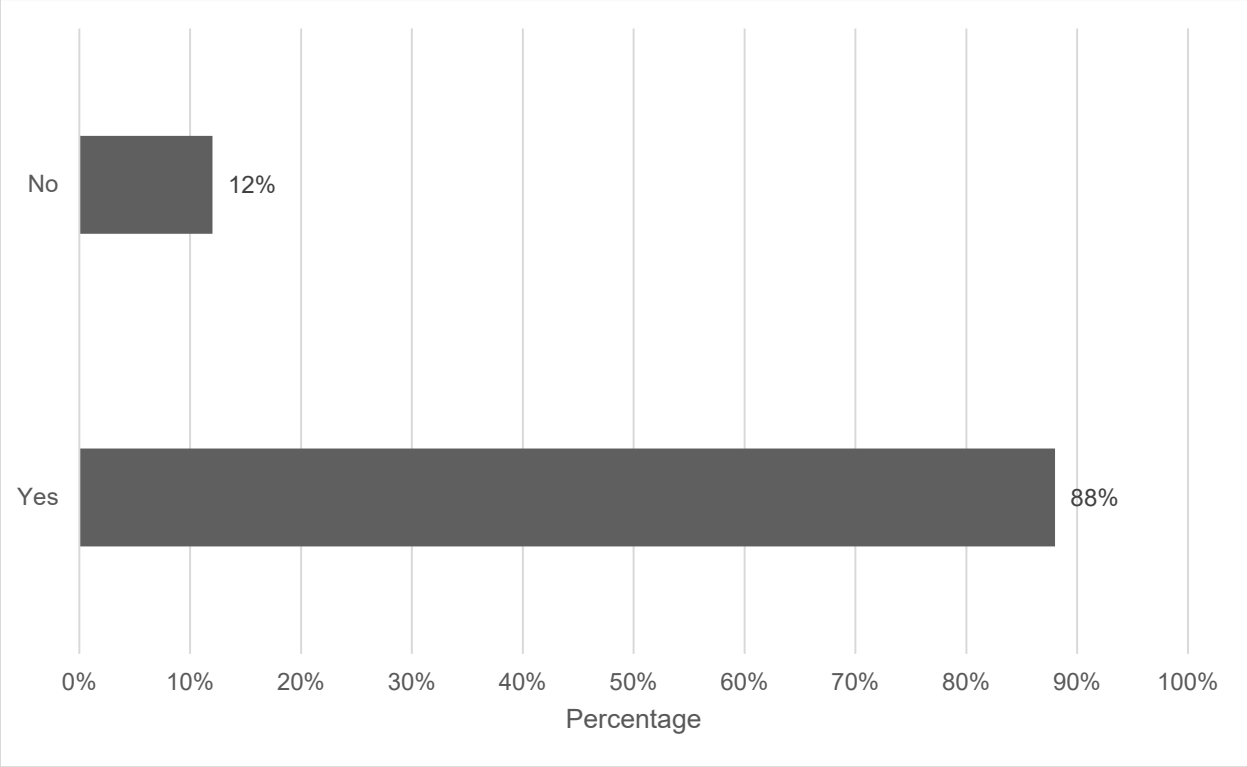


Figure 29D: Throughput Limitations in the AQMD/APCD Permit



Barriers to Increased Facility Development

A significant focus of CalRecycle's work under SB 1383 will be identifying and overcoming barriers to facility expansion and development. The survey sought to quantify and rank perceptions that composters had relative to the existing barriers to facility expansion. Figure 30 seeks to collate the various barrier types perceived by composters. These include the following.

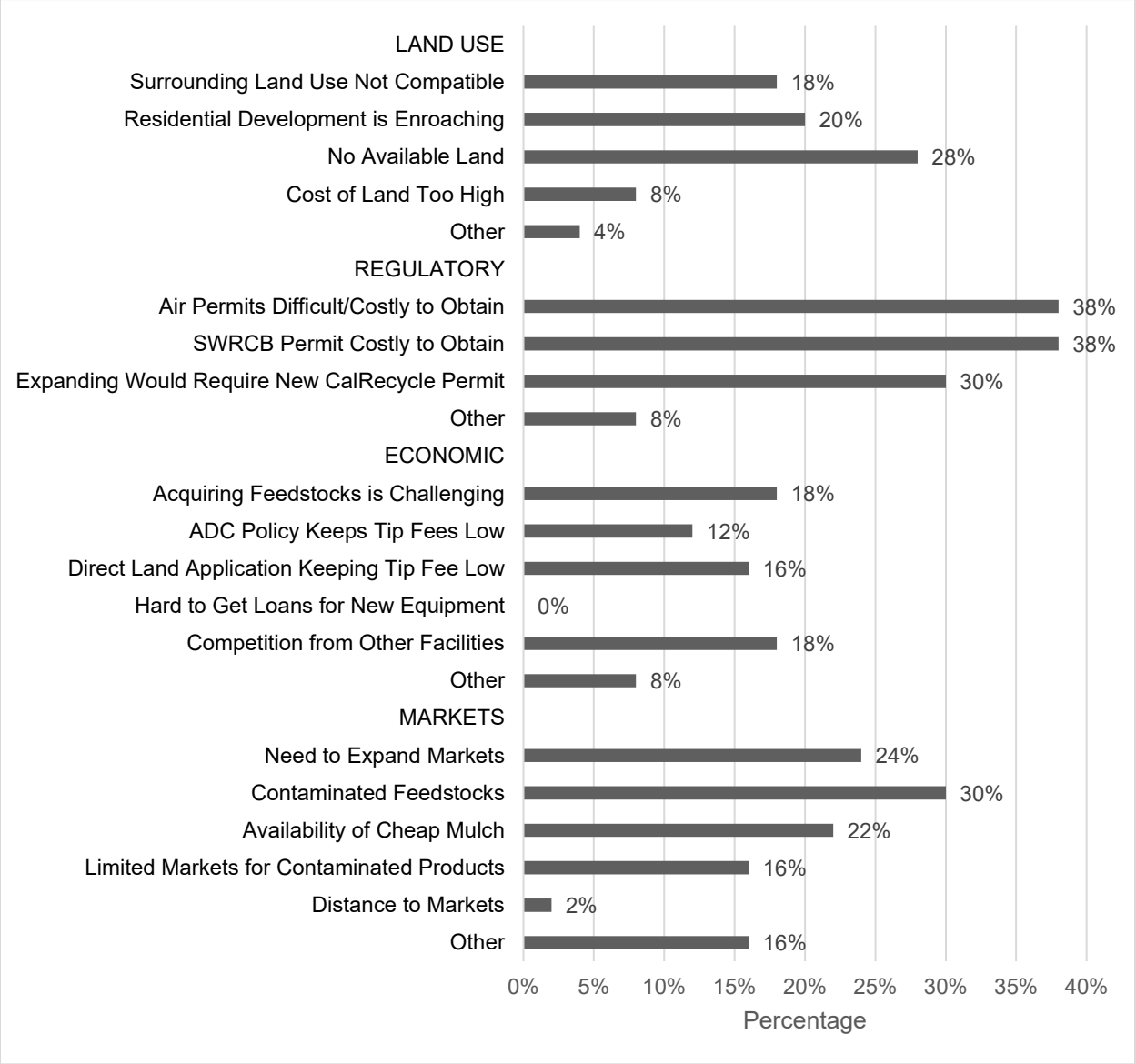
Land Use Barriers to Facility Expansion. Composters seeking to expand their manufacturing sites face a number of land use challenges. The most common response was no available land (28 percent). This was followed by encroaching residential development (20 percent) which was closely followed by incompatible surrounding land use (18 percent). Compost facilities are often initially located on the fringe of suburban areas and many are encroached upon by growing development. The cost of land was not a major factor for composters, with only 8 percent reporting this.

Regulatory Barriers to Facility Expansion. As discussed above, there are significant regulatory barriers to expanding an existing composting facility. That said, historically it has been easier to expand existing facilities than it has been to start brand new ones. Composters seem equally concerned about air permits and the SWRCB's General Order being costly to comply with, with both issues being noted by 38 percent of respondents. Worry that an expansion would require a new permit from CalRecycle was a slightly lower concern (at 30 percent).

Economic Barriers to Facility Expansion. Economic concerns were cited by fewer composters than other categories of barriers. Competition for feedstocks from competitors and the challenges of acquiring feedstocks were both reported by 18 percent of respondents. Competition from lower-priced disposal alternatives—including direct land application—was reported by 16 percent and ADC was reported by 12 percent. Recent legislative actions have set California on a path to phase out diversion credit for ADC (AB 1594), and SB 1383 will also significantly reduce the use of organic waste as ADC at landfills. To date, no legislation or regulation has had a significant impact on the amount of low-cost land application of organic materials, and as long as un-composted green waste material is spread on agricultural land, it may be hard to convince manufacturers to make the investments needed to develop new or expanded compost capacity. While estimates of the annual volumes of green material being land applied were not identified in this report, better estimates will be available after AB 901 regulations are implemented and reporting begins.

Market Barriers to Facility Expansion. Composters were deeply concerned about contaminated feedstocks (30 percent responding), though the need to expand existing markets prior to committing to facility expansion was mentioned by 24 percent of respondents. Twenty-two percent of respondents are concerned about competing with low-cost direct land application of un-composted green material. Finally, concerns about markets for contaminated products was listed by 16 percent of facilities. Only 2 percent of respondents listed distance to markets as a major market barrier.

Figure 30: Barriers to Facility Expansion



Employment

The survey asked respondents to list full and part time employees, as well as distinguish between, management, labor, and marketing employees. Forty-three respondents provided full-time employee data. The range of employees was from 1 (probably an outlier) to 150 (also probably an outlier). The challenge with understanding employment at composting facilities is that an increasing number of facilities are co-located at landfills, transfer stations, material recovery facilities, and similar, integrated facilities. Taking the total number of employees reported (from all facilities) and dividing by the reported incoming tons, the average is 5,336 incoming tons per employee. The

volumes of incoming tons per employee goes up as facilities handle an increasing number of tons. The highest ratio was 18,500 incoming tons per employee.

When the integrated facilities (those located at a landfill, transfer station, or material recovery facility, etc.) and very small facilities are omitted, the range of employee per ton is from 1,000 to 18,500 incoming tons per employee. The average, however, only goes up slightly to 6,761 incoming tons per employee. These results are summarized in Table 8.

Table 8: Number of Employees.

	Compost Facilities
Range of Employees (All Composters)	1 - 150
Range of Employees (Normalized)	2 - 100
Average Number of Employees (All Composters)	27
Average Number of Employees (Normalized)	19
Average Incoming Tons per Employee (All Composters)	5,258
Average Incoming Tons per Employee (Normalized)	6,607

**Normalized* = large, integrated facilities and very small facilities removed)

The survey also looked at different classifications of employees. The survey used the classification of Management, Process, and Marketing. The results of these questions are summarized in Table 9.

Table 9. Types of Employees at Composting Facilities.

	Composters
Range of Management Employees	1 - 10
Range of Process Employees	2 - 140
Range of Marketing Employees	0 - 9
Average Number of Management Employees	3
Average Number of Process Employees	22
Average Number of Marketing Employees	2

These numbers are not surprising given the spectrum of facilities in the survey pool, ranging from relatively small to very large. Some facilities (even relatively large ones) do

not employ a full-time marketing person. It is likely that some facilities rely on a management person, who has other duties in addition to marketing their finished products. However, a total of 48.75 (some respondents provided an estimate of part time efforts) people were identified as full time marketing staff.

Tipping Fees

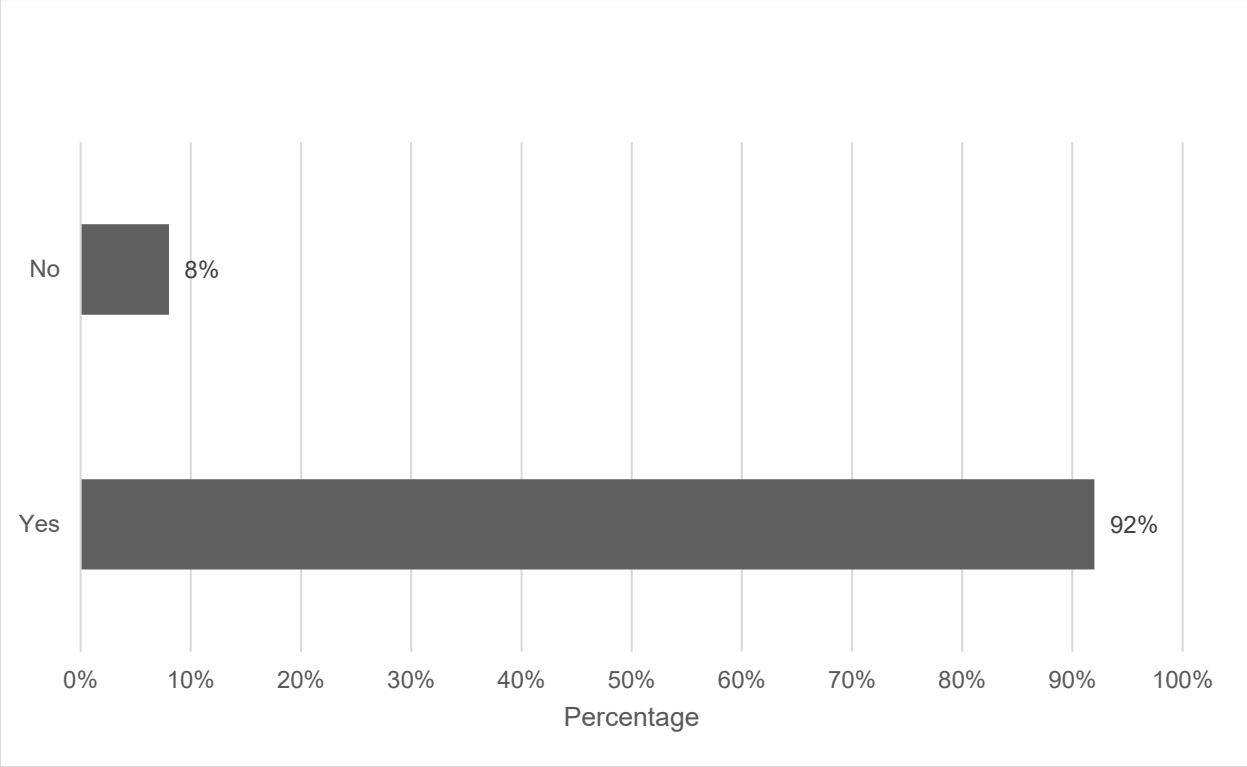
As shown in Figure 31, the vast majority of facilities surveyed (92 percent) charge a tipping fee to accept materials. The facilities that reported not charging a tipping fee were generally biosolids composting facilities associated with the generator of their feedstocks (a wastewater treatment plant owned by the same entity). However, when asked for the details of the tipping fee, few composters were willing to disclose this information. This may be because some view it as proprietary, or it may be that tipping fees tend to fluctuate somewhat depending on the business relationship, volume delivered, etc. In fact, many respondents simply put “varies” as their response. Table 10 summarizes the tipping fee data that was supplied. To further add to the confusion, some facilities charge incoming feedstocks visually (by the cubic yard) versus with a scale (by the ton). Without knowing the bulk density of the feedstocks (some of which vary seasonally) it is very hard to convert these figures accurately.

Table 10. Adjusted Tipping Fee Information.

Feedstock	Adjusted Tipping Fee Range (per ton)	Adjusted Average Tipping Fee (per ton)
Green Material	$2 - $64	$38
Wood Waste	$15 - $69	$38
Construction Wood	$25 - $121	$54
Manure	$5 – $121	$46
Grape Pomace	$20 - $44	$30
Cannery Waste	$26 - $44	$33
Other Ag waste	$26 - $44	$34
Food Scraps - Residential	$26 - $85	$52
Food Scraps - Commercial	$26-$121	$61
Food Scraps - Other	$26 - $75	$52

The tipping fee responses were adjusted in a number of ways to try to normalize the data. When tipping fees were reported in cubic yards, they were converted to tons using an appropriate conversion factor (which varies by material type). Also, if a range was given, the midpoint of the range was used.

Figure 31: Facility Tipping Fee



Liquid waste was excluded because so few respondents listed it. It is likely that liquid wastes are also charged differently from solid feedstocks and thus might be challenging to compare. Similarly, the tipping fee for biosolids was excluded due to low data response and the likelihood that the total fee usually includes a combined bid price for both transportation and tipping/processing fee.

Product Revenue

As shown in Figure 32, roughly a third of respondents get some revenue from product sales (though tipping fees are more significant to most composters). Table 11 summarizes product revenue from various products. As with tipping fees, responses had to be normalized in order to compare apples-to-apples information. In this case, if product revenue was reported in tons, a conversion factor was used to convert to cubic yards.

Table 11. Revenue from Product Sales.

Product	Adjusted Product Revenue Range (per cubic yard)	Adjusted Average Revenue (per cubic yard)
Compost	$0 - $30	$12
Mulch	$0 - $35	$11
Boiler Fuel (Biomass)	-$10 - $6	$0

In general, questions regarding revenue did not return a high rate of response. Many composters felt that this information was confidential. Products for which less than 5 facilities provided revenue data were excluded. While compost and mulch appear to command reasonable prices, the revenue from boiler fuel is in steady decline. Some producers reported having to subsidize both the transport and "tipping fee" for boiler fuel. Contrast this with the late 1980s when biomass plants were able to pay producers $45 per bone dry ton.

Of course, a "statewide average" for a product like compost or mulch is somewhat meaningless, as most composters set the price for compost or mulch based on availability. In some cases, the transport cost of compost and mulch can exceed the value of the product itself.

Figure 32 highlights the fact that tipping fees often constitute the majority of the revenue for a compost facility.

Figure 32: Sources of Revenue

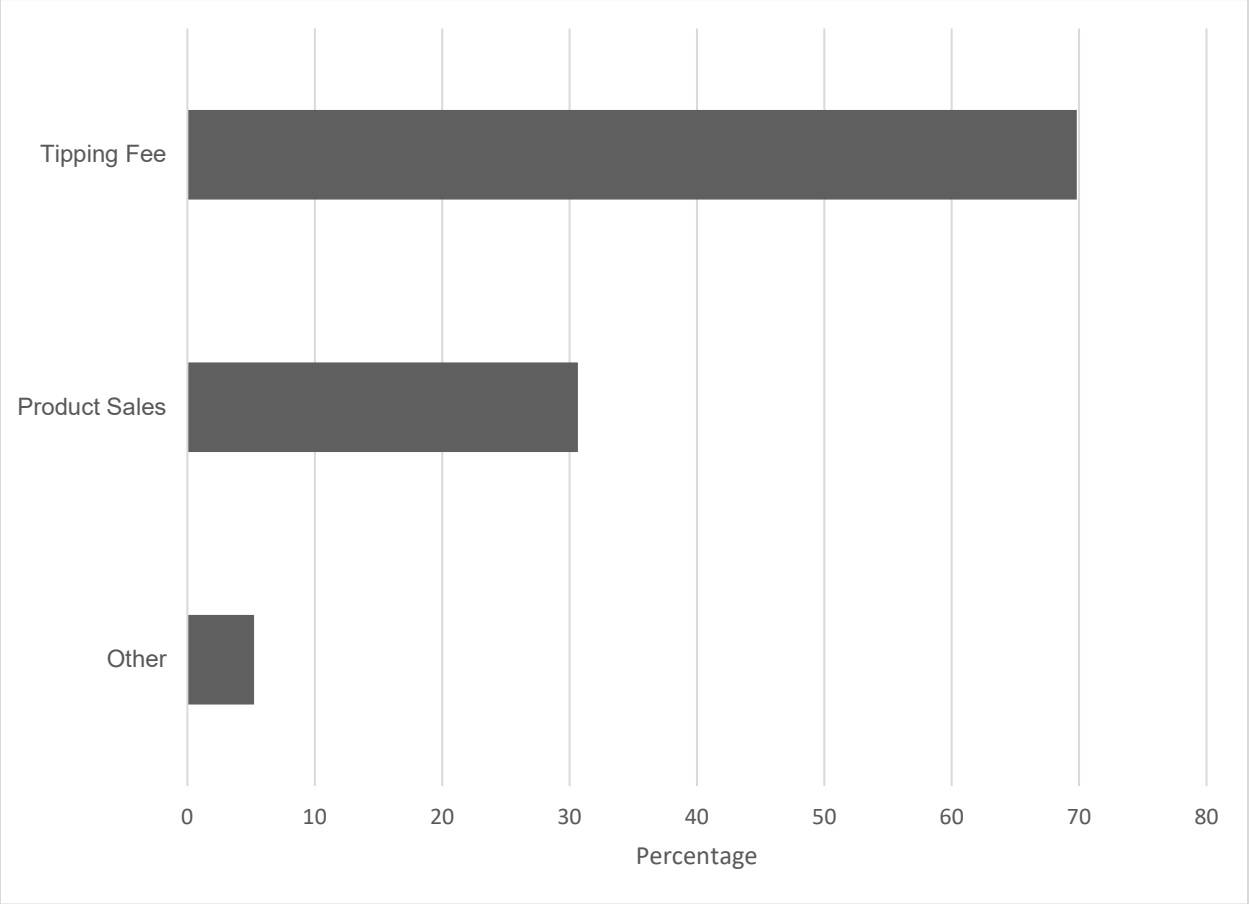
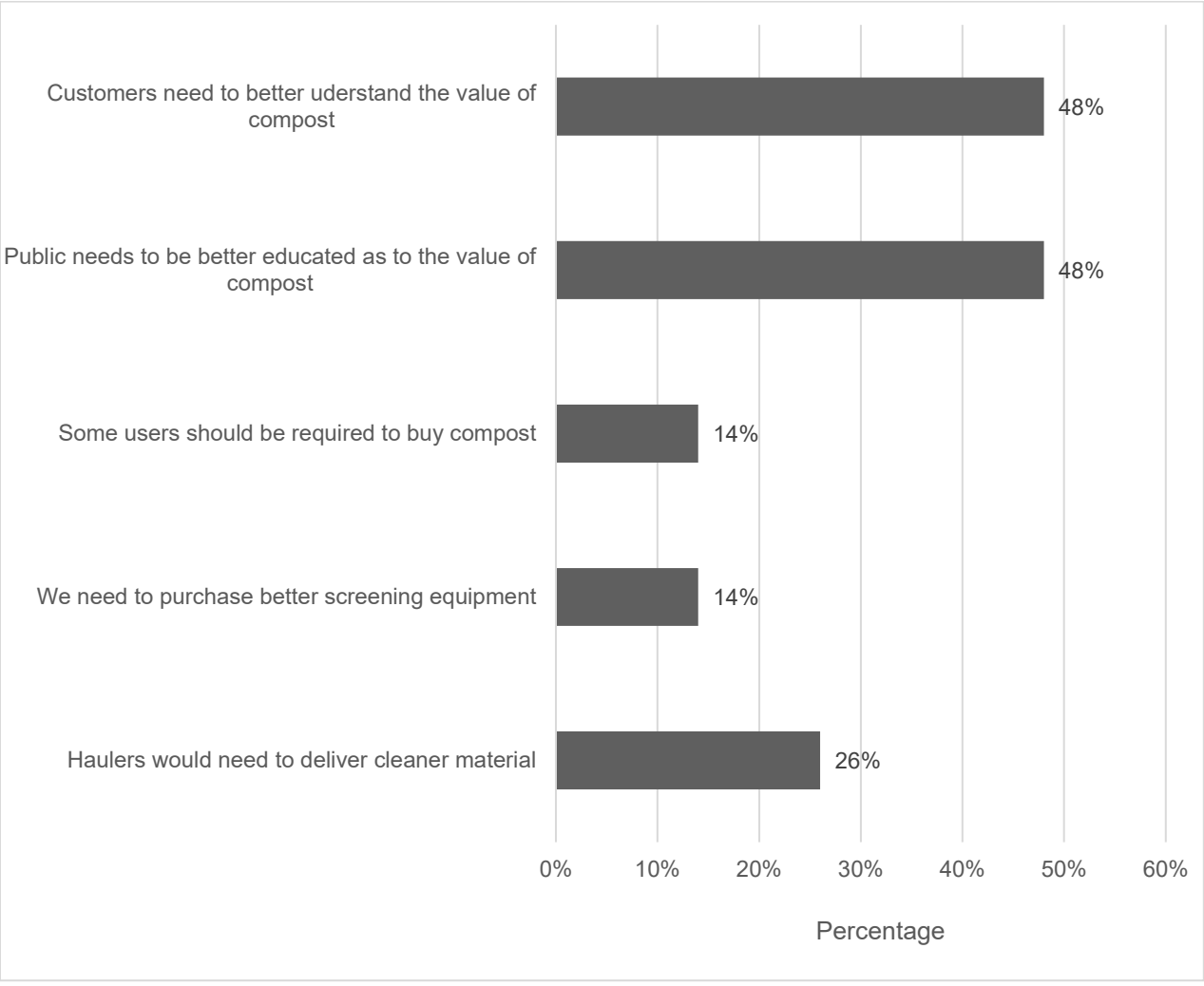


Figure 33 lists what composters think it will take to increase revenue from sales of products. The most popular responses were customers needing to better understand the value of compost and the public needing to be better educated on the value of compost (48 percent). Twenty-six percent of those surveyed felt that haulers need to deliver cleaner material and that composters should be allowed to charge more for the compost. Fourteen percent of respondents need to purchase better screening requirements and would like to see compost purchasing requirements (that would help drive demand for products). Many compost manufacturers may not be aware that the regulations for SB 1383 do include a provision requiring local government to purchase compost.

Figure 33: How to Increase Product Revenue



SB 1383

Figure 34 lists composters' expectations of the impact that SB 1383 will have on their business. Though it is very early in the SB 1383 process, some impacts are clear to composters: 46 percent expect there to be greater contamination in their feedstocks. Forty percent believe that there will need to be more market development to manage the increase in available compost after SB 1383 regulations are implemented. Thirty-six percent of composters believe there will be increased availability of feedstocks, and 36 percent also believe this will be mostly increased food scraps. Fourteen percent of composters surveyed do not believe SB 1383 will have an impact on their business at all. Only 6 percent of respondents were not familiar with SB 1383.

Figure 34: SB 1383 Impact on Business

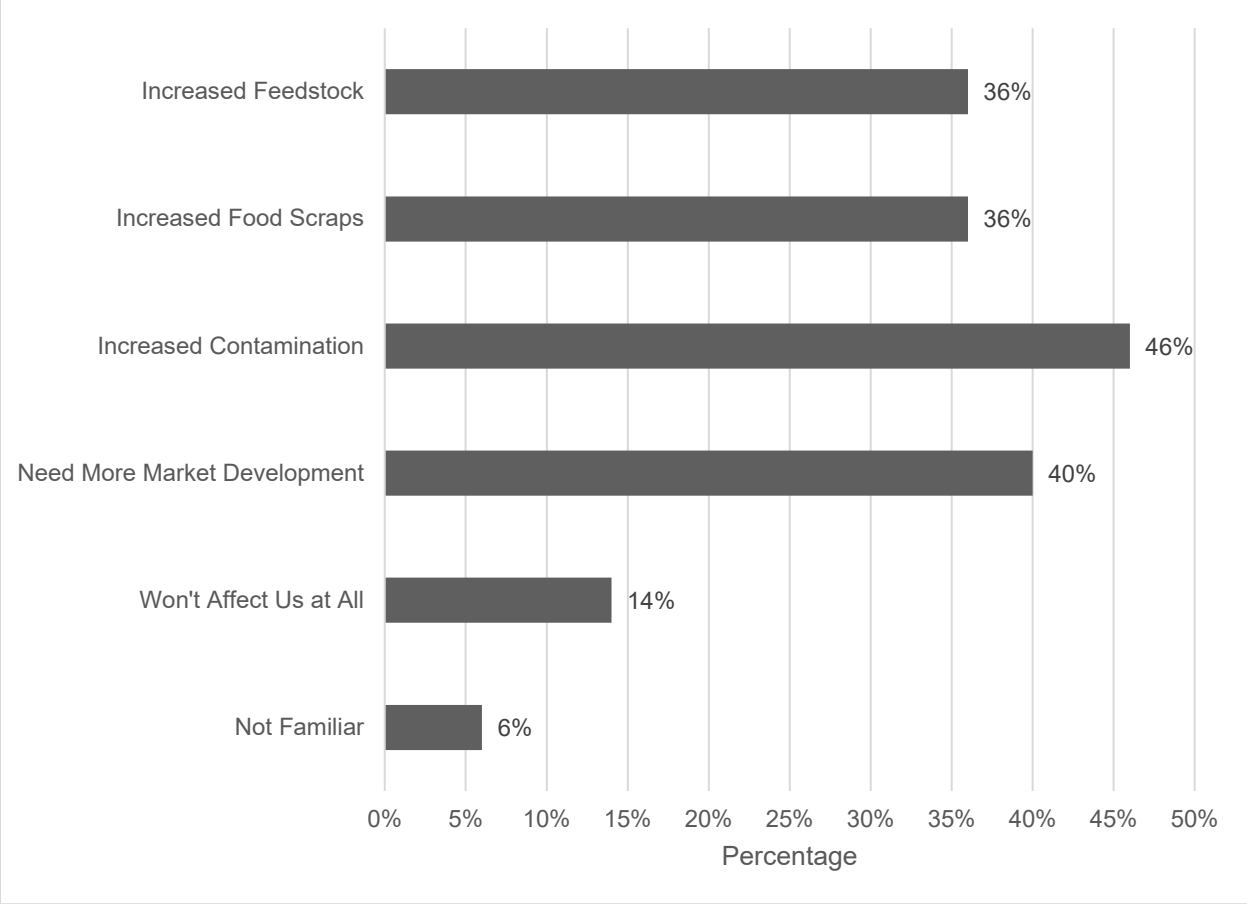
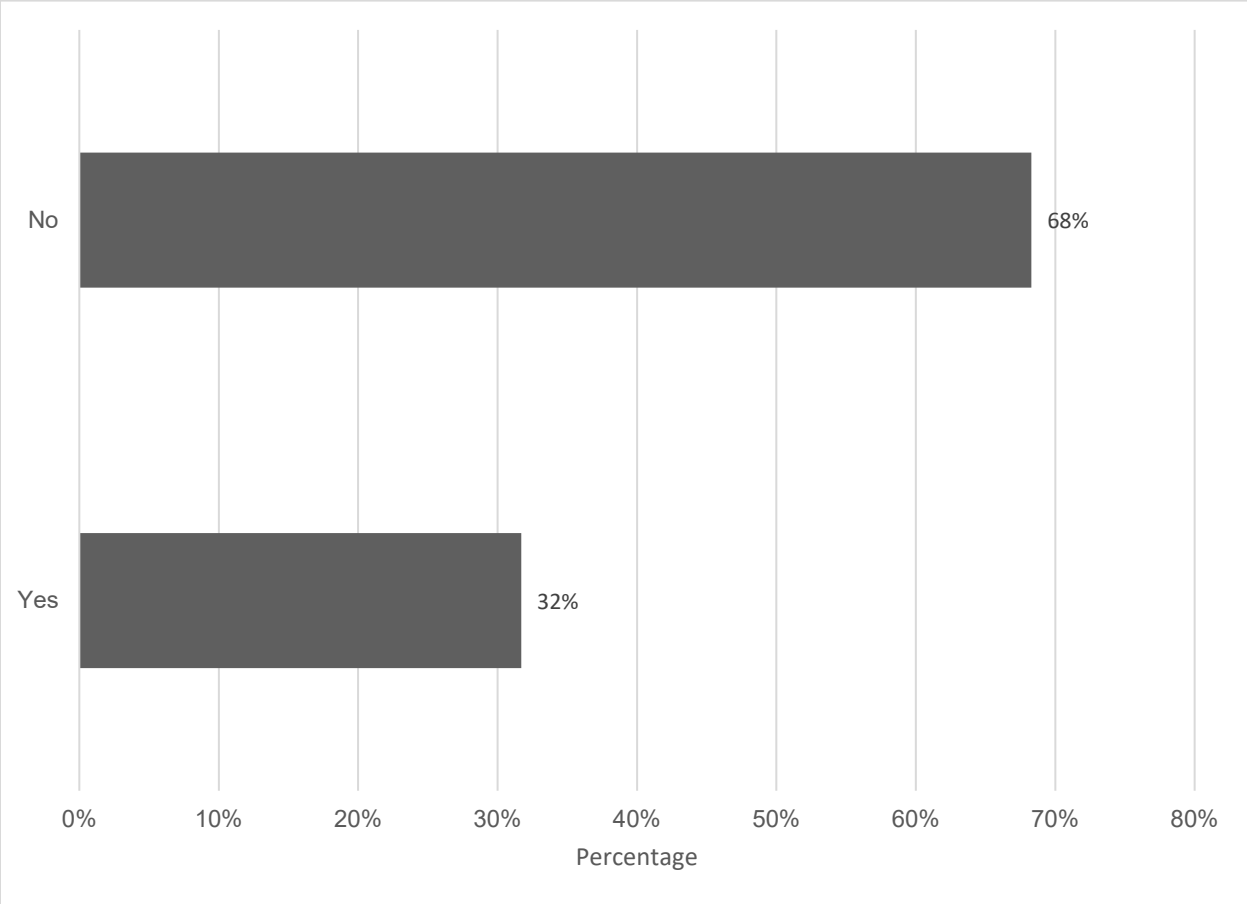


Figure 35 lists responses regarding future expansion plans. Nearly 70 percent of responding facilities indicated they do not have any plans to expand their existing facility. From Figure 24, one could assume that this is largely a projection of the lack of immediate availability of processing (feedstock) contracts. Availability of feedstock is the

single biggest factor driving facility expansion. In the 1990s and after AB 939 was implemented, business developers frequently built facilities before a collection contract was in place, but it is a less common today due to the substantial increase in the cost of developing or expanding a facility.

Figure 35: Facility Expansion Plans



Messages for CalRecycle

The final question of the survey asked composters to share additional comments with CalRecycle. The following are responses to that question:

"We would like to see more stringent standards for feedstock contamination. Educate pre-collection."

"City government leaders, at this time, will not ask taxpayers to fund-invest in the compost operation, expansion and new equipment. CalRecycle, Water, and Air Board regulations will require more accessible grant funds."

"Slow down on regulations. Is there any consideration for the cost of implementing programs?"

"Air District does not share the same enthusiasm as the State on composting."

"Bay Area Air District is not on the same page as CalRecycle for supporting compost operations."

"The biggest challenges by far for composters are from regulatory agencies and County City Planning Departments."

"Please consider simplifying and streamlining the permitting process for new or expanding facilities seeking to increase capacity or add feedstock (e.g., food waste, manure, sub-class B biosolids). This includes Solid Waste Facility Permit, Air Permits, and WDR. Similarly, please consider streamlining the CEQA process."

"HELP!!!!!" (This facility had invested in permits and was having difficulty attracting sufficient feedstock)

"Indirect jobs trucking, Mechanics, etc., Contamination of feedstock, lack of planning for facilities on a regional basis."

"Dirty chip and grind being dumped into compost markets is a serious threat to compost manufacturers."

"Continued regulations without adequate market development & enforcement will be a recipe for disaster. CalRecycle cannot continue to implement new rules without fully understanding the impact on industry - Use by agriculture is an absolute requirement"

"There are two types of food waste A: Concentrated source, pure or depackagable B: Diffused source, variable and mixed with paper. They require different systems to capture."

"The organic market is uncertain right now. Southern California has less options as Central and Northern CA."

"SB 1383 will be handled by companies contracted by the City and City facilities modified to accommodate the food feedstocks such as our transfer station in downtown, or our compost facilities."

"I moved my organics recycling business to California in 1988 expecting a legislatively driven mandate to divert organics - still waiting for it to happen 30 years later. the lower cost of landfill disposal has been an insurmountable barrier to meaningful organics diversion in California."

Reasons for Non-Participation

Because the survey focused on composters, the number of non-participants was low relative to previous survey efforts. Most composters were happy to participate, though clearly some provided more complete responses than others. This may be due to survey fatigue and a lack of clear benefit (of survey participation) to compost operators. CalRecycle staff surveyed anaerobic digestion facilities (the first time AD facilities had been surveyed) and had a slightly harder time getting AD operators to participate in the survey.

Conclusion

Surveying an industry as varied as California's compost and anaerobic digestion infrastructure is challenging. Moving millions of tons of organics from landfill disposal to composting or anaerobic digestion is a massive undertaking involving hundreds of facilities and thousands of individual decisions. In general, California is fortunate to have a robust network of composting and anaerobic digestion facilities available. The significant increase in food scraps availability envisioned under SB 1383 will present new challenges for these facilities. Some of these challenges are known and some are unknown. The chicken-and-egg challenge of whether to develop collection programs or facility infrastructure first will be solved by haulers and others as more jurisdictions commit the resources to implement SB 1383 programs. All stakeholders will need to ramp up efforts to reduce contamination (glass and plastic) of feedstock. Once again, CalRecycle has documented that agricultural markets are and will continue to be critical to the success of the California compost community. California is fortunate to have robust markets in most market segments, and most facility operators believe that end use markets for recovered organics are not a limitation for California's ambitious climate goals.

Findings

1. **Available capacity.** There is an estimated 4 million tons of available *permitted* capacity for composting and anaerobic digestion. (See Table 7). While this capacity may not be conveniently located, it will take the development of robust organics collection programs to exhaust the current capacity (on a statewide basis). To be clear, the amount of available capacity is not sufficient to meet the goals of SB 1383, but there are facilities with existing capacity.
2. **Increased hauling distance.** Capacity is limited by various factors, but generators of organic materials may need to appreciate that, like landfills and biosolids composting facilities, accessing available capacity may significantly increase hauling distance (and thus cost).
3. **Collection drives infrastructure.** Compost facilities go through the arduous process of expanding when collection programs are implemented or expanded, not before.
4. **Markets are robust.** California composters continue to provide a diversity of end product markets. It is evident that, at least statewide, there is not reliance on a single market. Agriculture is and will continue to be the single largest statewide market for compost, as first identified by previous CalRecycle Infrastructure studies, but confirmed by this one as well (CalRecycle, 2000, 2003, 2010).
5. **Contamination is significant.** Increased food scraps collection results in increased contamination. While some composters are investing in equipment and developing procedures to manage this, more effort needs to be made upstream to manage contamination.
6. **Chip and grind facilities won't help with food or related materials.** Chip and grind facilities, though not surveyed extensively for this project, with few exceptions, are not likely to provide an outlet for food scraps, food-soiled paper or related materials.
7. **Investing in new or expanded facilities is costly.** Composters will need significant incentives, from processing contracts or other vehicles, to make the necessary investments in infrastructure to meet the goals of SB 1383. The development of collection programs for food scraps will be key to expanding the organics processing infrastructure. (See Figure 35).
8. **Developing a new compost facility or expanding an existing one has become more challenging.** Each of the major state agencies require permits for a new or expanded compost facility. State requirements and regulations have been changing to keep pace with increased diversion of organic materials from landfills to processing facilities. While these requirements are designed to protect air quality, water quality, and public health, they may also increase the cost of

developing a new or expanded compost facility. The costs of complying with these requirements are not explored within the scope of this survey or analysis.

9. **Prohibitory rules are a barrier.** Prohibitory rules in two of the largest air districts in the state provide significant barriers to facility establishment or expansion, particularly for those facilities handling food scraps. The trend seems to be more of these types of rules, not less. The fact that SCAQMD characterizes food scraps that are composted to require ASP technology and ASP technology is further categorized as an air pollution control device to be permitted significantly increases the cost of adding food scraps to an existing compost facility within the SCAQMD.
10. **Many tools to divert food scraps.** There are many tools available to California jurisdictions and their haulers to manage the organic waste stream, while composting continues to be the most likely outlet for most of these tons, other alternatives are in the early stages of providing alternatives (stand-alone anaerobic digestion or co-digestion at wastewater treatment plants, enzymatic digestion, food rescue and recovery, etc.).
11. **Early days.** It is very early in the process of diverting food scraps from landfills as envisioned under SB 1383. The types of collection programs and needed infrastructure is not yet well defined or mature.
12. **Slow Growth in 2017**. Almost 80 percent of facilities surveyed either maintained their levels of throughput or decreased in 2017. (See Figure 23).
13. **Green waste ADC use is down**. The use of green material as ADC is down substantially from previous surveys. This may be due to recent legislation phasing out diversion credit (AB 1594), and to the closure of the Puente Hills Landfill, a major user of green material ADC.
14. **Food Waste Acceptance Up**. The acceptance of food scraps as a feedstock has also increased since the last survey of compost infrastructure by CalRecycle, but significant investments in collection programs need to be made to meet the goals of SB 1383.

-Abbreviations and Acronyms

AB	Assembly Bill
ADC	Alternative Daily Cover
AIC	Alternative Intermediate Cover
APCD	Air Pollution Control District
ARB	Air Resources Board
AQMD	Air Quality Management District
CalRecycle	California Department of Resources, Recycling and Recovery
C:N Ratio	Carbon to Nitrogen Ratio
C&G	Chipping and Grinding facilities
LEA	Local Enforcement Agency
POTW	Publicly-Owned Treatment Works
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SWRCB	State Water Resources Control Board
WWTP	Wastewater Treatment Plant

Glossary of Terms

Alternative daily cover (ADC) and Alternative intermediate cover (AIC): The use of materials to cover disposed waste in a landfill cell at the end of the landfill operating day (daily cover) or at some other interval (intermediate cover) to control odors, fire, vectors, litter, and scavenging.

Anaerobic Digestion: A process of decomposing organic material under very low (or no) oxygen conditions

Biomass conversion: The process of using controlled combustion of specified types of organic materials (essentially wood, lawn, or crop residue) to produce electricity.

Biomethane: Methane made via anaerobic processes, such as anaerobic digestion

Chipping and grinding: The process that separates, grades, and resizes woody green wastes or used lumber to be sent to a composting facility, a landfill to be used for ADC, or miscellaneous end markets such as feedstock at biomass-to-energy plants.

Digestate: The liquid and/or solid results of the anaerobic digestion process.

Disposal: The process of collecting municipal solid waste and transferring it to a transfer station, landfill, or transformation facility. The types of activities that are considered disposal vary by regulatory program.

Edible food: Food that could be consumed without harm by humans.

Green waste: Urban landscape waste generally consisting of leaves, grass clippings, weeds, yard trimmings, wood waste, branches and stumps, home garden residues, and other miscellaneous organic materials.

Landfill: A permitted facility that provides a legal site for final disposal of materials including mixed solid waste, beneficial materials used for landfill construction, ADC, and specialized material sites such as waste tires and construction and demolition waste.

Municipal solid waste (MSW): Refuse that may be mixed with or contain nonorganic material, processed industrial materials, plastics, or other recyclables with the potential for recovery. It includes residential, commercial, and institutional wastes.

Organic materials management: Processes that grind, chip, and/or decompose organic wastes in a controlled process for intermediate or final use as a landscape material or soil amendment.

Other beneficial reuse: The use of a waste byproduct or other low-value material for a productive use, other than ADC/AIC, at a landfill within regulatory guidelines.

Tipping Fee: The amount of money per unit of material charged at the gate of a processing facility or landfill.

Appendix A
Survey Form

1.

Thank you for participating in the SB 1383 Infrastructure and Market Analysis Survey.

You can exit the survey at any time. Be sure to click the "Done" button at the bottom of the screen before exiting. Your answers will be saved, and if you return to this page (https://www.surveymonkey.com/r/SB1383FacilitySurvey), you can continue the survey.

Feel Free to skip any questions that do not apply to your facility.

Person Filling in Form

- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ] RF)
- [ ] Depackaging Equipment
- [ ] Animal Feed Processing
- [ ] Gasification
- [ ] Other (please specify)

3. FACILITY DESCRIPTION

* 3. What is the operational acreage of this organics processing facility?

4. FACILITY DESCRIPTION

* 4. What type of Composting Facility?

- ◯ Windrow
- ◯ Aerated Static Pile
- ◯ In Vessel
- ◯ Other

Other (please specify)

5. FEEDSTOCKS - GREEN MATERIAL

The following questions will provide us with information on the feedstocks of the facility including Green Material, Food Scraps, Wood Waste, Agricultural Residues, Biosolids, and any other organic materials.

For purposes of the next few questions:

- **Green Materials means grass cuttings, wood, branches, brush and similar materials.**
- **Food Scraps means fruits, vegetables, grains, dairy products, meat, and acceptable food packaging items.**

* 5. Does this facility accept Green Material?

- ◯ Yes
- ◯ No

6. FEEDSTOCKS - GREEN MATERIAL

6. How many tons/year of Green Material does the facility accept?

Residential	
Commercial	

7. Does Residential green material include commingled food?

- ◯ Yes
- ◯ No

7. FEEDSTOCKS - FOOD SCRAPS

* 8. Does this facility accept Food Scraps?

- ◯ Yes
- ◯ No

8. FEEDSTOCKS - FOOD SCRAPS

9. How many tons/year of Food Scraps does the facility accept?

Residential	
Commercial	
Pre-Consumer	
Post-Consumer	
Liquid Waste	
Other (please specify material type and tons/year)	

10. Does Residential food scraps include food soiled paper?

- ◯ Yes
- ◯ No

11. Does Commercial food scraps include food soiled paper?

- ◯ Yes
- ◯ No

9. FEEDSTOCKS - WOOD WASTE

* 12. Does this facility accept Wood Waste?

- ◯ Yes
- ◯ No

10. FEEDSTOCKS - WOOD WASTE

13. How many tons/year of Wood Waste does the facility accept?

Construction & demolition wood	
Stumps and large natural wood	
Other (please specify material and tons/year)	

11. FEEDSTOCKS - AGRICULTURAL RESIDUE

* 14. Does this facility accept Agricultural Residue?

- ◯ Yes
- ◯ No

12. FEEDSTOCKS - AGRICULTURAL RESIDUE

4

15. How many tons/year of Agricultural Residue does the facility accept?

Manure	
Grape Pomace	
Cannery Waste	
Culls/packinghouse waste	
Cannabis Waste	
Other (please specify material type and tons/year)	

13. FEEDSTOCKS - BIOSOLIDS

* 16. Does this facility accept Biosolids?

- ◯ Yes
- ◯ No

14. FEEDSTOCKS - BIOSOLIDS

17. How many tons/year of Biosolids does the facility accept?

15. FEEDSTOCKS - OTHER

* 18. Does this facility accept other organic material?

- ◯ Yes
- ◯ No

16. FEEDSTOCKS - OTHER

*

comes from these sources.

(This should add up to 100%)

18. CAPACITY

6

* 22. What is the TOTAL incoming processing capacity of this facility (actual, not permitted)?

- ◯ 0-25 tpd
- ◯ 26-50 tpd
- ◯ 51-100 tpd
- ◯ 101-200 tpd
- ◯ 201-300 tpd
- ◯ 301-400 tpd
- ◯ 401-500 tpd
- ◯ Over 500 tpd

* 23. What is the TOTAL *available capacity* of this facility (if there is any)?
("Available capacity" is the permitted capacity minus the permitted capacity/throughput)

- ◯ 0-25 tpd
- ◯ 26-50 tpd
- ◯ 51-100 tpd
- ◯ 101-200 tpd
- ◯ 201-300 tpd
- ◯ 301-400 tpd
- ◯ 401-500 tpd
- ◯ Over 500 tpd
- ◯ There is no available capacity at this site.

* 24. How much food scraps does this facility accept?

- ◯ None.
- ◯ 0-5%
- ◯ 6-10%
- ◯ 11-15%
- ◯ 16-20%
- ◯ 21-30%
- ◯ 31-40%
- ◯ Over 40%

* 25. What is the maximum capacity of this facility (if there is any) to accept food scraps? Count this capacity as a part of the total available capacity provided above (this is not additive, but a subcategory). (i.e., how much more food scraps could you accept?)

- ◯ 1-25 tpd
- ◯ 26-50 tpd
- ◯ 51-100 tpd
- ◯ 101-200 tpd
- ◯ 201-300 tpd
- ◯ 301-400 tpd
- ◯ 401-500 tpd
- ◯ Over 500 tpd
- ◯ There is no capacity to accept food scraps at this site.

* 26. Do you anticipate accepting food scraps in the next five (5) years?

- ◯ Yes
- ◯ No

* 27. What are the limitations to this site accepting food scraps?

- ☐ None
- ☐ Would need to amend permits
- ☐ There's physically no room to expand
- ☐ Worried about odors
- ☐ Worried about feedstock quality
- ☐ Need to have more collection programs/generators not collecting

Other (please specify)

19. QUANTITY OF ORGANIC PRODUCTS SOLD

8

- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]

age bulk density of each product the facility produces (yards/ton)?

9

- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]

- [ ]
- [ ]
- [ ]
- [ ]
- [ ]

- [ ]
- [ ]
- [ ]
- [ ]

ty produces? Please specify in the comment box below.

% Sold

ercentage of your production is sold into these market segments?

11

% Sold

☐
☐
☐
☐
☐
☐
☐
☐
☐

ercentage of your production is sold into these market segments?

11

38. Has this increased or decreased in the past 12 months?

	Increase	Decrease	No Change
Agriculture	◯	◯	◯
Landscape	◯	◯	◯
Nursery	◯	◯	◯
CalTrans	◯	◯	◯
ADC	◯	◯	◯
Boiler Fuel	◯	◯	◯
Municipal Projects	◯	◯	◯
Other beneficial uses at landfills	◯	◯	◯
[Insert text from Other]	◯	◯	◯

39. By what percentage has this changed in the past 12 months?

Agriculture	
Landscape	
Nursery	
CalTrans	
ADC	
Boiler Fuel	
Municipal Projects	
Other beneficial uses at landfills	
[Insert text from Other]	

12

Agriculture (Wholesale)

ple,

table grapes, citrus, etc.) Please list in the comment box below.

23. QUANTITY OF ORGANIC PRODUCTS SOLD

13

42. What additional services do you provide at the point of sale?

- [ ] Blending
- [ ] Delivery
- [ ] Bagging
- [ ] Spreading
- [ ] Testing/Analysis
- [ ] Product Knowledge
- [ ] Blower Truck
- [ ] Assured Destruction
- [ ] Other (please specify)

43. What is the average distance for product deliveries?

- ◯ All used on-site
- ◯ 0-10 miles
- ◯ 11-20 miles
- ◯ 21-30 miles
- ◯ 31-40 miles
- ◯ 41-50 miles
- ◯ Over 50 miles

44. What is the longest distance you have delivered (in miles)?

45. Do you participate in any marketing/certification programs?

- [ ] USCC STA participation
- [ ] CDFA OIM Registration
- [ ] OMRI Listing
- [ ] Demeter Certification
- [ ] Other (please specify)

14

46. Approximately how much of your compost is approved for certified organic?

- ◯ 0%
- ◯ Other (please specify)

24. QUANTITY OF ORGANIC PRODUCTS SOLD

47. What percentage of your approved compost is sold to actual organic farmers (as opposed to conventional farmers who also buy compost certified for organic)?

- ◯ 0%
- ◯ Other (please specify)

25. QUANTITY OF ORGANIC PRODUCTS SOLD

48. Does this facility send any processed or unprocessed material to a composting facility?

- ◯ No
- ◯ Yes

If yes, please list the facility

49. Approximately what percentage of your feedstocks become overs?

- ◯ 0-10%
- ◯ 11-20%
- ◯ 21-30%
- ◯ 31-40%
- ◯ 41-50%
- ◯ Over 50%

15

50. What do you do with your overs? (select as many as apply)

- [ ] ADC
- [ ] Other beneficial uses at landfills
- [ ] Grind into mulch
- [ ] Biomass
- [ ] Recycle back into compost
- [ ] Landfill
- [ ] Other (please specify)

51. How does feedstock contamination affect product marketability? (select all that apply)

- [ ] I avoid accepting food waste, so I don't have a lot of contamination.
- [ ] I have a picking station to remove contamination.
- [ ] I use equipment to remove contamination after composting.
- [ ] I have no problem selling compost, even if it has some contamination in it.
- [ ] Other (please specify)

26. OWNERSHIP/PURPOSE

52. Please identify the category below that best describes the organization that operates the facility (check **only** one).

- ◯ Private, stand-alone facility
- ◯ Private facility affiliated with a landfill or transfer station
- ◯ Publicly owned, stand-alone facility
- ◯ Publicly owned facility affiliated with a landfill or transfer station
- ◯ Publicly Owned Treatment Works (POTW)
- ◯ Non-profit organization or research facility
- ◯ Other (please specify)

53. Please rank the following factors 1 being the most important and 9 being least important to the decision-making entity regarding the current operation of this organic material processing facility:

	Diversion credit
	Carbon credits
	Public perception
	Availability of grants/funds
	Profitability of business (tipping fee and/or markets)
	Greenhouse gas (methane) emission reductions
	Research
	Producing Quality Soil Amendments
	Limited available options for recycling on or more feedstocks

27. FACILITY EXPANSION

54. Has the annual throughput of this facility changed in the past year?

- ◯ No, annual throughput has stayed the same.
- ◯ Yes, annual throughput has decreased.
- ◯ Yes, annual throughput has increased.

28. FACILITY EXPANSION

55. How much has the annual throughput of this facility decreased in the past year? Please provide the change in total tons per year.

29. FACILITY EXPANSION

56. How much has the annual throughput of this facility increased in the past year? Please provide the change in total tons per year.

57. Annual throughput has increased because we:

- [ ] Purchased higher capacity equipment
- [ ] Increased our permitted acreage
- [ ] Increased processing contracts
- [ ] Curbside program expanded
- [ ] Increased sales volume
- [ ] Other (please specify)

30. FACILITY EXPANSION

58. What could the State do to help increase new or expanded facilities?

- [ ] Provide grant funding
- [ ] Work with local government to facilitate facility siting
- [ ] Work with state agencies to streamline permitting
- [ ] Work to increase markets for recycled organic products
- [ ] Require state agencies to purchase compost
- [ ] Require agricultural users to purchase compost
- [ ] Other (please specify)

31. PERMITTED CAPACITY: Local Agency

59. Does this facility have a Conditional Use Permit (CUP) issued by a local agency?

- ◯ Yes
- ◯ No

32. PERMITTED CAPACITY: Local Agency

60. Are there capacity or throughput limitations in the CUP?

- ◯ Yes
- ◯ No

33. PERMITTED CAPACITY: CalRecycle/Local Enforcement Agency (LEA)

61. What type of permit does this facility have from CalRecycle or the LEA?

- ◯ Excluded
- ◯ Full Permit
- ◯ EA Notification
- ◯ Part of other SWFP Permit
- ◯ Registration Permit
- ◯ Other (please specify)

62. What are the permitted capacity and throughput limitations of this facility?

Permitted Capacity (Cubic Yards/Tons per year)	
Annual Throughput (Cubic Yards/Tons per year)	
Total on-site volume at one time (Cubic Yards on-site)	

34. PERMITTED CAPACITY: Regional Water Quality Control Board

63. Is this facility covered under any Regional Water Board permit?

- ◯ Yes
- ◯ No

35. PERMITTED CAPACITY: Regional Water Quality Control Board

64. Are there capacity or throughput limitations in the Regional Water Board permit?

- ◯ No
- ◯ Yes

If yes, what are the limits?

36. PERMITTED CAPACITY: Local Air Quality Management District/Air Pollution Control District

65. Is this facility governed by an AQMD/APCD permit?

- ◯ Yes
- ◯ No

37. PERMITTED CAPACITY: Local Air Quality Management District/Air Pollution Control District

66. Is the facility governed by an emissions limit?

- ◯ Yes
- ◯ No

38. PERMITTED CAPACITY: Local Air Quality Management District/Air Pollution Control District

67. Does the emissions limit, prohibit or limit the ability of the facility from expanding?

- ◯ Yes
- ◯ No

If yes, how?

68. Are there capacity or throughput limitations in the AQMD/APCD permit?

- ◯ Yes
- ◯ No

If yes, what are the limits?

39. PERMITTED CAPACITY

- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]

Please specify any other barriers to your facility expanding?

oy?

71. What part of the operation are they affiliated with?

Management - Number of Employees

Process - Number of Employees

Marketing/Sales - Number of Employees

41. TIPPING FEES

72. Does this facility charge a tipping fee to accept feedstock?

- ◯ Yes
- ◯ No

42. TIPPING FEES

Green Material/Yard trimmings	

ge of total revenue of the business derived from "Other", please specify.

76. What would have to change for you to sell end products for a higher price?

- [ ] Haulers need to deliver cleaner material
- [ ] We need to purchase better screening equipment
- [ ] Some users should be required to buy compost
- [ ] Public needs to be better educated as to the value of compost
- [ ] Customers need to better understand the value of compost

44. PRODUCT REVENUE

Compost

78. If you entered a revenue for "Other", please specify the type of product.

45. SB 1383

79. How do you expect SB 1383 to affect your business?

- [ ] There will be a lot more feedstock available.
- [ ] There will be a lot more food scraps available.
- [ ] Required collection programs will increase the contamination in feedstocks.
- [ ] We will need a lot more market development to help manage all the material that will be collected under SB 1383.
- [ ] I don't expect SB 1383 to affect my business at all.
- [ ] I am not familiar with SB 1383.

80. Do you have any plans to expand your current facility or to build a new one?

- ◯ Yes
- ◯ No

46. SB 1383

81. Where do you plan to expand your current facility or build a new facility?

82. When do you plan to expand your current facility or build a new facility?

47. SB 1383

83. Is there anything else you'd like CalRecycle to know?

Source Reference Notes

1. *CalRecycle, Third Assessment of California's Compost and Mulch-Producing Infrastructure, 2010.*
2. *CalRecycle, Second Assessment of California's Compost- and Mulch-Producing Infrastructure, 2004.*
3 *CalRecycle, Assessment of California's Compost- and Mulch-Producing Infrastructure. 2001.*
4. *Implementation of General Waste Discharge Requirements for Composting Operations (Order WQ 2015-0121-DWQ) State Water Resources Control Board, 2015.*
5. *A Roadmap to Reduce US Food Waste by 20 percent. https://www.refed.com/downloads/ReFED_Report_2016.pdf*